

MISTAR



**29 different types.
Line up 1830 sizes.**

29 different types. Line up 1830 sizes.

General Use Series

559 Size



Long Neck
Taper Neck Series

660 Size



High Helix
End Mill Series

177 Size



For Rib Processing
Series

361 Size



For Small
Automatic Lathes Series














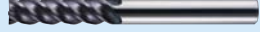







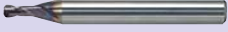





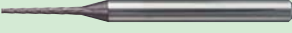

73 Size



1830

29 Series/1830 Size

INDEX

| Type | Features | No. of Flutes | Product Code | Shape | Size Range | Dimensions | Cutting Conditions |
|------------|---------------------------|---------------|----------------|---|---|----------------|--------------------|
| SQUARE | General Use | 2 | MS255 |  | $\phi 0.1-\phi 12$ | $\ominus P.3$ | $\ominus P.63$ |
| | | 2 | MS2M5 |  | $\phi 0.2-\phi 20$ | $\ominus P.4$ | $\ominus P.63$ |
| | | 2 | MS2J5 |  | $\phi 0.1-\phi 12$ | $\ominus P.6$ | $\ominus P.64$ |
| | | 2 | MS2L5 |  | $\phi 0.2-\phi 12$ | $\ominus P.7$ | $\ominus P.65$ |
| | | 4 | MS45C |  | $\phi 1-\phi 12$ | $\ominus P.8$ | $\ominus P.66$ |
| | | 4 | MS4MC |  | $\phi 1-\phi 20$ | $\ominus P.9$ | $\ominus P.66$ |
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| | | 2 | MS2XL6 |  | $\phi 0.3-\phi 2.5$ | $\ominus P.14$ | $\ominus P.69$ |
| | | 4 | MS4XL |  | $\phi 1-\phi 10$ | $\ominus P.16$ | $\ominus P.70$ |
| | High Helix | 3 | MSMHZD |  | $\phi 1-\phi 20$ | $\ominus P.19$ | $\ominus P.71$ |
| | | 4 | MS5HD |  | $\phi 3-\phi 20$ | $\ominus P.20$ | $\ominus P.72$ |
| | | 4 | MSMHD |  | $\phi 2-\phi 25$ | $\ominus P.21$ | $\ominus P.72$ |
| | | 4 | MSJHD |  | $\phi 2-\phi 20$ | $\ominus P.23$ | $\ominus P.73$ |
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| | | 3 | MS3E5 |  | $\phi 3-\phi 12$ | $\ominus P.25$ | $\ominus P.74$ |
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| | BALL | General Use | 2 | MS25B |  | R0.1-R6 | $\ominus P.27$ |
| 2 | | | MS2MB |  | R0.25-R6 | $\ominus P.28$ | $\ominus P.75$ |
| Long Neck | | 2 | MS2XLB |  | R0.1-R3 | $\ominus P.29$ | $\ominus P.76$ |
| Taper Neck | | 2 | MS2XB |  | R0.1-R2 | $\ominus P.35$ | $\ominus P.77$ |
| RADIUS | General Use | 2 | MS2MRB |  | $\phi 1 \times R0.1-\phi 12 \times R3$ | $\ominus P.39$ | $\ominus P.63$ |
| | | 4 | MS4MRB |  | $\phi 3 \times R0.1-\phi 20 \times R3$ | $\ominus P.41$ | $\ominus P.78$ |
| | Long Neck | 2 | MS2XLRB |  | $\phi 1 \times R0.1-\phi 6 \times R0.5$ | $\ominus P.43$ | $\ominus P.79$ |
| | High Helix | 4 | MSMHDRB |  | $\phi 2 \times R0.2-\phi 20 \times R3$ | $\ominus P.44$ | $\ominus P.80$ |
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| | Ball | 2 | MS2MTB |  | R0.2-R1.5 | $\ominus P.50$ | $\ominus P.75$ |
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| | | 4 | MS4LTB |  | R0.3-R1 | $\ominus P.57$ | $\ominus P.83$ |

General Use
Long Neck
High Helix
For Small Automatic Lathe
General Use
Long Neck
Taper Neck
General Use
Long Neck
High Helix
General Use
Ball
For Rib Processing

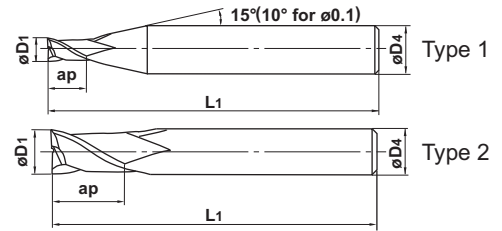
MSTAR END MILLS

MS2SS

End mill, Short cut length, 2 flute



D1=0.1 0 - -0.010
0.1<D1 0 - -0.020



● 2 flute end mill for general use.

Unit : mm

| Order Number | Dia. | Length of Cut | Overall Length | Shank Dia. | No. of Flutes | Stock | Type |
|--------------|------|---------------|----------------|------------|---------------|-------|------|
| | D1 | ap | L1 | D4 | N | | |
| MS2SSD0010 | 0.1 | 0.15 | 40 | 4 | 2 | ● | 1 |
| D0020 | 0.2 | 0.3 | 40 | 4 | 2 | ● | 1 |
| D0030 | 0.3 | 0.45 | 40 | 4 | 2 | ● | 1 |
| D0040 | 0.4 | 0.6 | 40 | 4 | 2 | ● | 1 |
| D0050 | 0.5 | 0.75 | 40 | 4 | 2 | ● | 1 |
| D0060 | 0.6 | 0.9 | 40 | 4 | 2 | ● | 1 |
| D0070 | 0.7 | 1.1 | 40 | 4 | 2 | ● | 1 |
| D0080 | 0.8 | 1.2 | 40 | 4 | 2 | ● | 1 |
| D0090 | 0.9 | 1.4 | 40 | 4 | 2 | ● | 1 |
| D0100 | 1 | 1.5 | 40 | 4 | 2 | ● | 1 |
| D0120 | 1.2 | 1.8 | 40 | 4 | 2 | ● | 1 |
| D0150 | 1.5 | 2.3 | 40 | 4 | 2 | ● | 1 |
| D0180 | 1.8 | 2.7 | 40 | 4 | 2 | ● | 1 |
| D0200 | 2 | 3 | 40 | 4 | 2 | ● | 1 |
| D0250 | 2.5 | 3.8 | 40 | 4 | 2 | ● | 1 |
| D0300 | 3 | 4.5 | 45 | 6 | 2 | ● | 1 |
| D0400 | 4 | 6 | 50 | 6 | 2 | ● | 1 |
| D0500 | 5 | 7.5 | 50 | 6 | 2 | ● | 1 |
| D0600 | 6 | 9 | 50 | 6 | 2 | ● | 2 |
| D0700 | 7 | 10.5 | 60 | 8 | 2 | ● | 1 |
| D0800 | 8 | 12 | 60 | 8 | 2 | ● | 2 |
| D0900 | 9 | 13.5 | 70 | 10 | 2 | ● | 1 |
| D1000 | 10 | 15 | 70 | 10 | 2 | ● | 2 |
| D1100 | 11 | 16.5 | 75 | 12 | 2 | ● | 1 |
| D1200 | 12 | 18 | 75 | 12 | 2 | ● | 2 |

General Use
Long Neck
SQUARE
High Helix
For Small Automatic Lathe
BALL
Taper Neck
RADIUS
General Use
Long Neck
High Helix
General Use
Ball
TAPER

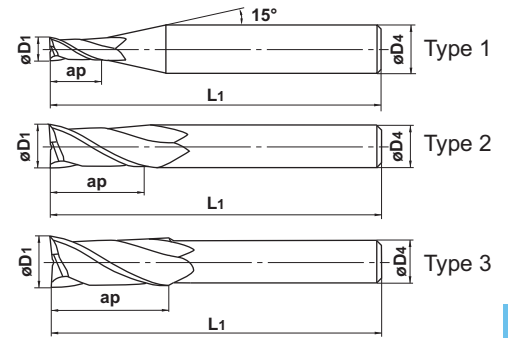
● : Inventory maintained.

CUTTING CONDITIONS





● 2 flute end mill for general use.



Unit : mm

| Order Number | Dia. | Length of Cut | Overall Length | Shank Dia. | No. of Flutes | Stock | Type |
|--------------|------|---------------|----------------|------------|---------------|-------|------|
| | D1 | ap | L1 | D4 | N | | |
| MS2MSD0020 | 0.2 | 0.4 | 40 | 4 | 2 | ● | 1 |
| D0030 | 0.3 | 0.6 | 40 | 4 | 2 | ● | 1 |
| D0040 | 0.4 | 0.8 | 40 | 4 | 2 | ● | 1 |
| D0050 | 0.5 | 1 | 40 | 4 | 2 | ● | 1 |
| D0060 | 0.6 | 1.2 | 40 | 4 | 2 | ● | 1 |
| D0070 | 0.7 | 1.4 | 40 | 4 | 2 | ● | 1 |
| D0080 | 0.8 | 1.6 | 40 | 4 | 2 | ● | 1 |
| D0090 | 0.9 | 1.8 | 40 | 4 | 2 | ● | 1 |
| D0100 | 1 | 2 | 40 | 4 | 2 | ● | 1 |
| D0110 | 1.1 | 2.2 | 40 | 4 | 2 | ● | 1 |
| D0120 | 1.2 | 2.4 | 40 | 4 | 2 | ● | 1 |
| D0130 | 1.3 | 2.6 | 40 | 4 | 2 | ● | 1 |
| D0140 | 1.4 | 2.8 | 40 | 4 | 2 | ● | 1 |
| D0150 | 1.5 | 3 | 40 | 4 | 2 | ● | 1 |
| D0160 | 1.6 | 3.2 | 40 | 4 | 2 | ● | 1 |
| D0170 | 1.7 | 3.4 | 40 | 4 | 2 | ● | 1 |
| D0180 | 1.8 | 3.6 | 40 | 4 | 2 | ● | 1 |
| D0190 | 1.9 | 3.8 | 40 | 4 | 2 | ● | 1 |
| D0200 | 2 | 4 | 40 | 4 | 2 | ● | 1 |
| D0210 | 2.1 | 4.2 | 40 | 4 | 2 | ● | 1 |
| D0220 | 2.2 | 4.4 | 40 | 4 | 2 | ● | 1 |
| D0230 | 2.3 | 4.6 | 40 | 4 | 2 | ● | 1 |
| D0240 | 2.4 | 4.8 | 40 | 4 | 2 | ● | 1 |
| D0250 | 2.5 | 5 | 40 | 4 | 2 | ● | 1 |
| D0260 | 2.6 | 5.2 | 40 | 4 | 2 | ● | 1 |
| D0270 | 2.7 | 5.4 | 40 | 4 | 2 | ● | 1 |
| D0280 | 2.8 | 5.6 | 40 | 4 | 2 | ● | 1 |
| D0290 | 2.9 | 5.8 | 40 | 4 | 2 | ● | 1 |
| D0300 | 3 | 6 | 45 | 6 | 2 | ● | 1 |
| D0310 | 3.1 | 6.2 | 45 | 6 | 2 | ● | 1 |
| D0320 | 3.2 | 6.4 | 45 | 6 | 2 | ● | 1 |
| D0330 | 3.3 | 6.6 | 45 | 6 | 2 | ● | 1 |
| D0340 | 3.4 | 6.8 | 45 | 6 | 2 | ● | 1 |
| D0350 | 3.5 | 7 | 45 | 6 | 2 | ● | 1 |
| D0360 | 3.6 | 7.2 | 45 | 6 | 2 | ● | 1 |
| D0370 | 3.7 | 7.4 | 45 | 6 | 2 | ● | 1 |
| D0380 | 3.8 | 7.6 | 45 | 6 | 2 | ● | 1 |
| D0390 | 3.9 | 7.8 | 45 | 6 | 2 | ● | 1 |

General Use

SQUARE
Long Neck

High Helix

For Small Automatic Lathe

BALL
Long Neck

Taper Neck

General Use

RADIUS
Long Neck

High Helix

General Use

TAPER
Ball Processing

MSTAR END MILLS

MS2MS

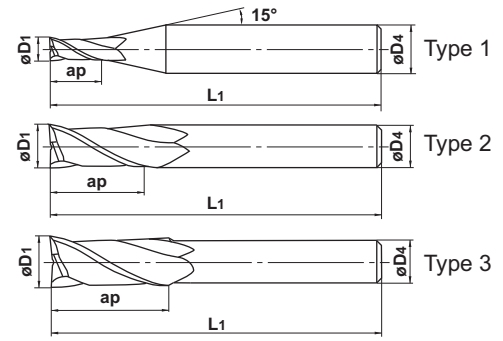
End mill, Medium cut length, 2 flute



$D_1 \leq 12$ 0 - -0.020
 $12 < D_1$ 0 - -0.030



● 2 flute end mill for general use.



Unit : mm

| Order Number | Dia. | Length of Cut | Overall Length | Shank Dia. | No. of Flutes | Stock | Type |
|--------------|------|---------------|----------------|------------|---------------|-------|------|
| | D1 | ap | L1 | D4 | N | | |
| MS2MSD0400 | 4 | 8 | 50 | 6 | 2 | ● | 1 |
| D0410 | 4.1 | 8.2 | 50 | 6 | 2 | ● | 1 |
| D0420 | 4.2 | 8.4 | 50 | 6 | 2 | ● | 1 |
| D0430 | 4.3 | 8.6 | 50 | 6 | 2 | ● | 1 |
| D0440 | 4.4 | 8.8 | 50 | 6 | 2 | ● | 1 |
| D0450 | 4.5 | 9 | 50 | 6 | 2 | ● | 1 |
| D0460 | 4.6 | 9.2 | 50 | 6 | 2 | ● | 1 |
| D0470 | 4.7 | 9.4 | 50 | 6 | 2 | ● | 1 |
| D0480 | 4.8 | 9.6 | 50 | 6 | 2 | ● | 1 |
| D0490 | 4.9 | 9.8 | 50 | 6 | 2 | ● | 1 |
| D0500 | 5 | 10 | 50 | 6 | 2 | ● | 1 |
| D0510 | 5.1 | 10.2 | 50 | 6 | 2 | ● | 1 |
| D0520 | 5.2 | 10.4 | 50 | 6 | 2 | ● | 1 |
| D0530 | 5.3 | 10.6 | 50 | 6 | 2 | ● | 1 |
| D0540 | 5.4 | 10.8 | 50 | 6 | 2 | ● | 1 |
| D0550 | 5.5 | 11 | 50 | 6 | 2 | ● | 1 |
| D0560 | 5.6 | 11.2 | 50 | 6 | 2 | ● | 1 |
| D0570 | 5.7 | 11.4 | 50 | 6 | 2 | ● | 1 |
| D0580 | 5.8 | 11.6 | 50 | 6 | 2 | ● | 1 |
| D0590 | 5.9 | 11.8 | 50 | 6 | 2 | ● | 1 |
| D0600 | 6 | 12 | 50 | 6 | 2 | ● | 2 |
| D0650 | 6.5 | 13 | 60 | 8 | 2 | ● | 1 |
| D0700 | 7 | 14 | 60 | 8 | 2 | ● | 1 |
| D0750 | 7.5 | 15 | 60 | 8 | 2 | ● | 1 |
| D0800 | 8 | 16 | 60 | 8 | 2 | ● | 2 |
| D0850 | 8.5 | 17 | 70 | 10 | 2 | ● | 1 |
| D0900 | 9 | 18 | 70 | 10 | 2 | ● | 1 |
| D0950 | 9.5 | 19 | 70 | 10 | 2 | ● | 1 |
| D1000 | 10 | 20 | 70 | 10 | 2 | ● | 2 |
| D1100 | 11 | 22 | 75 | 12 | 2 | ● | 1 |
| D1200 | 12 | 24 | 75 | 12 | 2 | ● | 2 |
| D1600 | 16 | 32 | 90 | 16 | 2 | ● | 2 |
| D1800 | 18 | 36 | 90 | 16 | 2 | ● | 3 |
| D2000 | 20 | 40 | 100 | 20 | 2 | ● | 2 |

The diameter tolerance is only applied to items produced after July 2006.

● : Inventory maintained.

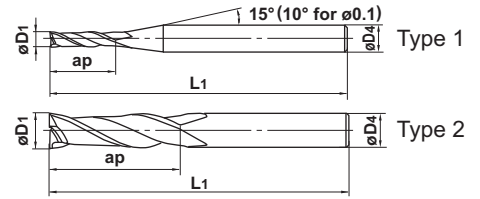
CUTTING CONDITIONS



P.63



D1=0.1 0 - -0.010
0.1 < D1 0 - -0.020



D1 < 3

D1 < 3

3 ≤ D1

● 2 flute end mill for general use.

Unit : mm

| Order Number | Dia. | Length of Cut | Overall Length | Shank Dia. | No. of Flutes | Stock | Type |
|--------------|------|---------------|----------------|------------|---------------|-------|------|
| | D1 | ap | L1 | D4 | N | | |
| MS2JSD0010 | 0.1 | 0.3 | 40 | 4 | 2 | ● | 1 |
| D0020 | 0.2 | 0.6 | 40 | 4 | 2 | ● | 1 |
| D0030 | 0.3 | 0.9 | 40 | 4 | 2 | ● | 1 |
| D0040 | 0.4 | 1.2 | 40 | 4 | 2 | ● | 1 |
| D0050 | 0.5 | 1.5 | 40 | 4 | 2 | ● | 1 |
| D0060 | 0.6 | 1.8 | 40 | 4 | 2 | ● | 1 |
| D0070 | 0.7 | 2.1 | 40 | 4 | 2 | ● | 1 |
| D0080 | 0.8 | 2.4 | 40 | 4 | 2 | ● | 1 |
| D0090 | 0.9 | 2.7 | 40 | 4 | 2 | ● | 1 |
| D0100 | 1 | 3 | 40 | 4 | 2 | ● | 1 |
| D0120 | 1.2 | 3.6 | 40 | 4 | 2 | ● | 1 |
| D0150 | 1.5 | 4.5 | 40 | 4 | 2 | ● | 1 |
| D0180 | 1.8 | 5.4 | 40 | 4 | 2 | ● | 1 |
| D0200 | 2 | 6 | 40 | 4 | 2 | ● | 1 |
| D0250 | 2.5 | 7.5 | 40 | 4 | 2 | ● | 1 |
| D0300 | 3 | 9 | 45 | 6 | 2 | ● | 1 |
| D0400 | 4 | 12 | 50 | 6 | 2 | ● | 1 |
| D0500 | 5 | 15 | 50 | 6 | 2 | ● | 1 |
| D0600 | 6 | 18 | 50 | 6 | 2 | ● | 2 |
| D0800 | 8 | 24 | 70 | 8 | 2 | ● | 2 |
| D1000 | 10 | 30 | 90 | 10 | 2 | ● | 2 |
| D1200 | 12 | 36 | 90 | 12 | 2 | ● | 2 |

The diameter tolerance is only applied to items produced after July 2006.

General Use

SQUARE
Long Neck

High Helix

For Small Automatic Lathe

BALL

Long Neck
Taper Neck

RADIUS
Long Neck

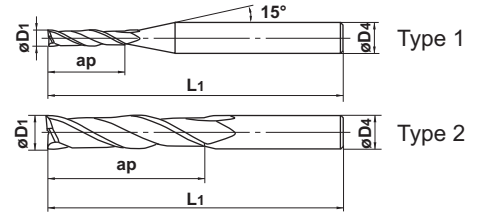
General Use

TAPER
Ball
For Rib Processing

MSTAR END MILLS

MS2LS

End mill, long cut length, 2 flute



$D1 < 3$

$D1 < 3$

$3 \leq D1$

● 2 flute end mill for general use.

Unit : mm

| Order Number | Dia. | Length of Cut | Overall Length | Shank Dia. | No. of Flutes | Stock | Type |
|--------------|------|---------------|----------------|------------|---------------|-------|------|
| | D1 | ap | L1 | D4 | N | | |
| MS2LSD0020 | 0.2 | 0.8 | 40 | 4 | 2 | ● | 1 |
| D0030 | 0.3 | 1.2 | 40 | 4 | 2 | ● | 1 |
| D0040 | 0.4 | 1.6 | 40 | 4 | 2 | ● | 1 |
| D0050 | 0.5 | 2 | 40 | 4 | 2 | ● | 1 |
| D0060 | 0.6 | 2.4 | 40 | 4 | 2 | ● | 1 |
| D0070 | 0.7 | 2.8 | 40 | 4 | 2 | ● | 1 |
| D0080 | 0.8 | 3.2 | 40 | 4 | 2 | ● | 1 |
| D0090 | 0.9 | 3.6 | 40 | 4 | 2 | ● | 1 |
| D0100 | 1 | 4 | 40 | 4 | 2 | ● | 1 |
| D0150 | 1.5 | 6 | 40 | 4 | 2 | ● | 1 |
| D0200 | 2 | 8 | 40 | 4 | 2 | ● | 1 |
| D0250 | 2.5 | 10 | 50 | 4 | 2 | ● | 1 |
| D0300 | 3 | 12 | 50 | 6 | 2 | ● | 1 |
| D0400 | 4 | 16 | 50 | 6 | 2 | ● | 1 |
| D0500 | 5 | 20 | 60 | 6 | 2 | ● | 1 |
| D0600 | 6 | 24 | 60 | 6 | 2 | ● | 2 |
| D0800 | 8 | 32 | 70 | 8 | 2 | ● | 2 |
| D1000 | 10 | 40 | 90 | 10 | 2 | ● | 2 |
| D1200 | 12 | 48 | 110 | 12 | 2 | ● | 2 |

General Use

Long Neck

High Helix

For Small Automatic Lathe

General Use

Long Neck

General Use

Long Neck

High Helix

General Use

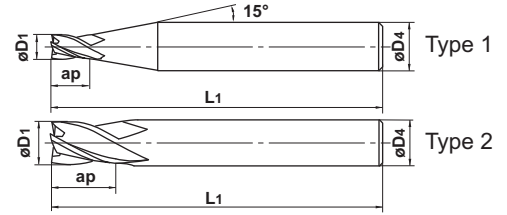
Ball

Radius

Taper

MS45C

End mill, Short cut length, 4 flute



● 4 flute end mill for general use.

Unit : mm

| Order Number | Dia. | Length of Cut | Overall Length | Shank Dia. | No. of Flutes | Stock | Type |
|--------------|------|---------------|----------------|------------|---------------|-------|------|
| | D1 | ap | L1 | D4 | N | | |
| MS4SCD0100 | 1 | 1.5 | 40 | 4 | 4 | ● | 1 |
| D0150 | 1.5 | 2.3 | 40 | 4 | 4 | ● | 1 |
| D0200 | 2 | 3 | 40 | 4 | 4 | ● | 1 |
| D0250 | 2.5 | 3.8 | 40 | 4 | 4 | ● | 1 |
| D0300 | 3 | 4.5 | 50 | 6 | 4 | ● | 1 |
| D0400 | 4 | 6 | 50 | 6 | 4 | ● | 1 |
| D0500 | 5 | 7.5 | 50 | 6 | 4 | ● | 1 |
| D0600 | 6 | 9 | 50 | 6 | 4 | ● | 2 |
| D0800 | 8 | 12 | 60 | 8 | 4 | ● | 2 |
| D1000 | 10 | 15 | 70 | 10 | 4 | ● | 2 |
| D1200 | 12 | 18 | 75 | 12 | 4 | ● | 2 |

General Use

SQUARE
Long Neck

High Helix

For Small Automatic Lathe

BALL

Taper Neck
Long Neck

RADIUS

General Use
High Helix
Long Neck

TAPER

General Use
Ball
For Rib Processing

MSTAR END MILLS

MS4MC

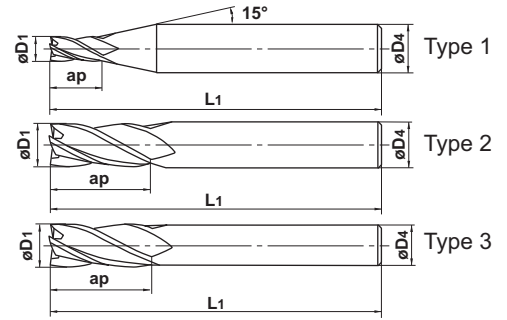
End mill, Medium cut length, 4 flute



$D_1 \leq 12$ 0 - -0.020
 $12 < D_1$ 0 - -0.030



● 4 flute end mill for general use.



Unit : mm

| Order Number | Dia. | Length of Cut | Overall Length | Shank Dia. | No. of Flutes N | Stock | Type |
|--------------|------|---------------|----------------|------------|--------------------|-------|------|
| | D1 | ap | L1 | D4 | | | |
| MS4MCD0100 | 1 | 2.5 | 40 | 4 | 4 | ● | 1 |
| D0150 | 1.5 | 3.8 | 40 | 4 | 4 | ● | 1 |
| D0200 | 2 | 5 | 40 | 4 | 4 | ● | 1 |
| D0250 | 2.5 | 6.3 | 40 | 4 | 4 | ● | 1 |
| D0300 | 3 | 7.5 | 50 | 6 | 4 | ● | 1 |
| D0350 | 3.5 | 9 | 50 | 6 | 4 | ● | 1 |
| D0400 | 4 | 10 | 50 | 6 | 4 | ● | 1 |
| D0450 | 4.5 | 11.5 | 50 | 6 | 4 | ● | 1 |
| D0500 | 5 | 12.5 | 50 | 6 | 4 | ● | 1 |
| D0550 | 5.5 | 14 | 50 | 6 | 4 | ● | 1 |
| D0600 | 6 | 15 | 50 | 6 | 4 | ● | 2 |
| D0650 | 6.5 | 16.5 | 60 | 8 | 4 | ● | 1 |
| D0700 | 7 | 17.5 | 60 | 8 | 4 | ● | 1 |
| D0750 | 7.5 | 19 | 60 | 8 | 4 | ● | 1 |
| D0800 | 8 | 20 | 60 | 8 | 4 | ● | 2 |
| D0850 | 8.5 | 21.5 | 70 | 10 | 4 | ● | 1 |
| D0900 | 9 | 22.5 | 70 | 10 | 4 | ● | 1 |
| D0950 | 9.5 | 24 | 70 | 10 | 4 | ● | 1 |
| D1000 | 10 | 25 | 70 | 10 | 4 | ● | 2 |
| D1100 | 11 | 27.5 | 75 | 12 | 4 | ● | 1 |
| D1200 | 12 | 30 | 90 | 12 | 4 | ● | 2 |
| D1400 | 14 | 35 | 90 | 12 | 4 | ● | 3 |
| D1600 | 16 | 40 | 100 | 16 | 4 | ● | 2 |
| D1800 | 18 | 45 | 100 | 16 | 4 | ● | 3 |
| D2000 | 20 | 50 | 110 | 20 | 4 | ● | 2 |

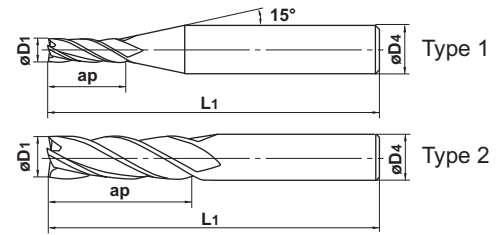
The diameter tolerance is only applied to items produced after July 2006.

General Use
 Long Neck
 SQUARE
 High Helix
 For Small Automatic Lathe
 BALL
 Taper Neck
 General Use
 RADIUS
 High Helix
 General Use
 TAPER
 For Rib Processing
 BALL

● : Inventory maintained.

MS4JC

End mill, Semi long cut length, 4 flute



D1<3

● 4 flute end mill for general use.

Unit : mm

| Order Number | Dia. | Length of Cut | Overall Length | Shank Dia. | No. of Flutes | Stock | Type |
|--------------|------|---------------|----------------|------------|---------------|-------|------|
| | D1 | ap | L1 | D4 | N | | |
| MS4JCD0100 | 1 | 4 | 40 | 4 | 4 | ● | 1 |
| D0150 | 1.5 | 6 | 40 | 4 | 4 | ● | 1 |
| D0200 | 2 | 8 | 40 | 4 | 4 | ● | 1 |
| D0250 | 2.5 | 10 | 50 | 4 | 4 | ● | 1 |
| D0300 | 3 | 12 | 50 | 6 | 4 | ● | 1 |
| D0400 | 4 | 16 | 50 | 6 | 4 | ● | 1 |
| D0500 | 5 | 20 | 60 | 6 | 4 | ● | 1 |
| D0600 | 6 | 24 | 60 | 6 | 4 | ● | 2 |
| D0800 | 8 | 32 | 70 | 8 | 4 | ● | 2 |
| D1000 | 10 | 40 | 90 | 10 | 4 | ● | 2 |
| D1200 | 12 | 48 | 110 | 12 | 4 | ● | 2 |

The diameter tolerance is only applied to items produced after July 2006.

General Use

SQUARE
Long Neck

High Helix

For Small Automatic Lathe

BALL

Taper Neck
Long Neck

RADIUS
Long Neck

High Helix
General Use

TAPER
Ball

For Rib Processing
General Use

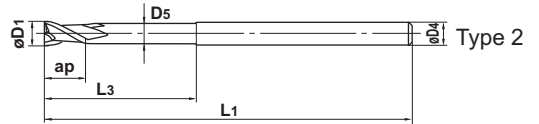
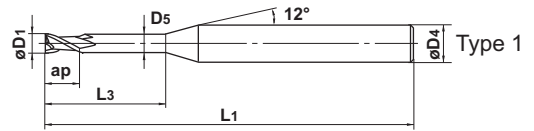
MSTAR END MILLS

MS2XL

End mill, Short cut length, 2 flute, Long neck



$D_1 < 0.5$ 0 - -0.010
 $0.5 \leq D_1$ 0 - -0.020



$D_1 < 0.4$

$0.4 \leq D_1$

● 2 flute long neck end mill.

Unit : mm

| Order Number | Dia. D1 | Length of Cut ap | Neck Length L3 | Neck Dia. D5 | Overall Length L1 | Shank Dia. D4 | No. of Flutes N | Stock | Type |
|----------------|------------|------------------------|----------------------|--------------------|-------------------------|---------------------|-----------------------|-------|------|
| MS2XLD0020N005 | 0.2 | 0.3 | 0.5 | 0.18 | 45 | 4 | 2 | ● | 1 |
| D0020N010 | 0.2 | 0.3 | 1 | 0.18 | 45 | 4 | 2 | ● | 1 |
| D0020N015 | 0.2 | 0.3 | 1.5 | 0.18 | 45 | 4 | 2 | ● | 1 |
| D0030N010 | 0.3 | 0.4 | 1 | 0.28 | 45 | 4 | 2 | ● | 1 |
| D0030N020 | 0.3 | 0.4 | 2 | 0.28 | 45 | 4 | 2 | ● | 1 |
| D0030N030 | 0.3 | 0.4 | 3 | 0.28 | 45 | 4 | 2 | ● | 1 |
| D0030N060 | 0.3 | 0.4 | 6 | 0.28 | 45 | 4 | 2 | ● | 1 |
| D0030N090 | 0.3 | 0.4 | 9 | 0.28 | 45 | 4 | 2 | ● | 1 |
| D0040N020 | 0.4 | 0.6 | 2 | 0.37 | 45 | 4 | 2 | ● | 1 |
| D0040N030 | 0.4 | 0.6 | 3 | 0.37 | 45 | 4 | 2 | ● | 1 |
| D0040N040 | 0.4 | 0.6 | 4 | 0.37 | 45 | 4 | 2 | ● | 1 |
| D0040N080 | 0.4 | 0.6 | 8 | 0.37 | 45 | 4 | 2 | ● | 1 |
| D0040N120 | 0.4 | 0.6 | 12 | 0.37 | 45 | 4 | 2 | ● | 1 |
| D0050N020 | 0.5 | 0.7 | 2 | 0.46 | 45 | 4 | 2 | ● | 1 |
| D0050N040 | 0.5 | 0.7 | 4 | 0.46 | 45 | 4 | 2 | ● | 1 |
| D0050N060 | 0.5 | 0.7 | 6 | 0.46 | 45 | 4 | 2 | ● | 1 |
| D0050N080 | 0.5 | 0.7 | 8 | 0.46 | 50 | 4 | 2 | ● | 1 |
| D0050N100 | 0.5 | 0.7 | 10 | 0.46 | 50 | 4 | 2 | ● | 1 |
| D0050N150 | 0.5 | 0.7 | 15 | 0.46 | 50 | 4 | 2 | ● | 1 |
| D0060N020 | 0.6 | 0.9 | 2 | 0.56 | 45 | 4 | 2 | ● | 1 |
| D0060N040 | 0.6 | 0.9 | 4 | 0.56 | 45 | 4 | 2 | ● | 1 |
| D0060N060 | 0.6 | 0.9 | 6 | 0.56 | 45 | 4 | 2 | ● | 1 |
| D0060N080 | 0.6 | 0.9 | 8 | 0.56 | 50 | 4 | 2 | ● | 1 |
| D0060N100 | 0.6 | 0.9 | 10 | 0.56 | 50 | 4 | 2 | ● | 1 |
| D0060N120 | 0.6 | 0.9 | 12 | 0.56 | 50 | 4 | 2 | ● | 1 |
| D0060N180 | 0.6 | 0.9 | 18 | 0.56 | 50 | 4 | 2 | ● | 1 |
| D0070N020 | 0.7 | 1 | 2 | 0.66 | 45 | 4 | 2 | ● | 1 |
| D0070N040 | 0.7 | 1 | 4 | 0.66 | 45 | 4 | 2 | ● | 1 |
| D0070N060 | 0.7 | 1 | 6 | 0.66 | 45 | 4 | 2 | ● | 1 |
| D0070N080 | 0.7 | 1 | 8 | 0.66 | 50 | 4 | 2 | ● | 1 |
| D0070N100 | 0.7 | 1 | 10 | 0.66 | 50 | 4 | 2 | ● | 1 |
| D0080N040 | 0.8 | 1.2 | 4 | 0.76 | 45 | 4 | 2 | ● | 1 |
| D0080N060 | 0.8 | 1.2 | 6 | 0.76 | 45 | 4 | 2 | ● | 1 |
| D0080N080 | 0.8 | 1.2 | 8 | 0.76 | 50 | 4 | 2 | ● | 1 |
| D0080N100 | 0.8 | 1.2 | 10 | 0.76 | 50 | 4 | 2 | ● | 1 |
| D0080N120 | 0.8 | 1.2 | 12 | 0.76 | 50 | 4 | 2 | ● | 1 |
| D0080N160 | 0.8 | 1.2 | 16 | 0.76 | 50 | 4 | 2 | ● | 1 |
| D0080N240 | 0.8 | 1.2 | 24 | 0.76 | 60 | 4 | 2 | ● | 1 |

● : Inventory maintained.

| Order Number | Dia. D1 | Length of Cut ap | Neck Length L3 | Neck Dia. D5 | Overall Length L1 | Shank Dia. D4 | No. of Flutes N | Stock | Type |
|----------------|------------|------------------------|----------------------|--------------------|-------------------------|---------------------|-----------------------|-------|------|
| MS2XLD0090N060 | 0.9 | 1.4 | 6 | 0.86 | 45 | 4 | 2 | ● | 1 |
| D0090N080 | 0.9 | 1.4 | 8 | 0.86 | 50 | 4 | 2 | ● | 1 |
| D0090N100 | 0.9 | 1.4 | 10 | 0.86 | 50 | 4 | 2 | ● | 1 |
| D0090N150 | 0.9 | 1.4 | 15 | 0.86 | 60 | 4 | 2 | ● | 1 |
| D0100N040 | 1 | 1.5 | 4 | 0.95 | 50 | 4 | 2 | ● | 1 |
| D0100N060 | 1 | 1.5 | 6 | 0.95 | 50 | 4 | 2 | ● | 1 |
| D0100N080 | 1 | 1.5 | 8 | 0.95 | 50 | 4 | 2 | ● | 1 |
| D0100N100 | 1 | 1.5 | 10 | 0.95 | 50 | 4 | 2 | ● | 1 |
| D0100N120 | 1 | 1.5 | 12 | 0.95 | 50 | 4 | 2 | ● | 1 |
| D0100N160 | 1 | 1.5 | 16 | 0.95 | 60 | 4 | 2 | ● | 1 |
| D0100N200 | 1 | 1.5 | 20 | 0.95 | 60 | 4 | 2 | ● | 1 |
| D0100N250 | 1 | 1.5 | 25 | 0.95 | 70 | 4 | 2 | ● | 1 |
| D0100N300 | 1 | 1.5 | 30 | 0.95 | 70 | 4 | 2 | ● | 1 |
| D0120N060 | 1.2 | 1.8 | 6 | 1.15 | 50 | 4 | 2 | ● | 1 |
| D0120N080 | 1.2 | 1.8 | 8 | 1.15 | 50 | 4 | 2 | ● | 1 |
| D0120N100 | 1.2 | 1.8 | 10 | 1.15 | 50 | 4 | 2 | ● | 1 |
| D0120N120 | 1.2 | 1.8 | 12 | 1.15 | 50 | 4 | 2 | ● | 1 |
| D0120N160 | 1.2 | 1.8 | 16 | 1.15 | 60 | 4 | 2 | ● | 1 |
| D0120N200 | 1.2 | 1.8 | 20 | 1.15 | 60 | 4 | 2 | ● | 1 |
| D0150N060 | 1.5 | 2.3 | 6 | 1.45 | 50 | 4 | 2 | ● | 1 |
| D0150N080 | 1.5 | 2.3 | 8 | 1.45 | 50 | 4 | 2 | ● | 1 |
| D0150N100 | 1.5 | 2.3 | 10 | 1.45 | 50 | 4 | 2 | ● | 1 |
| D0150N120 | 1.5 | 2.3 | 12 | 1.45 | 50 | 4 | 2 | ● | 1 |
| D0150N140 | 1.5 | 2.3 | 14 | 1.45 | 60 | 4 | 2 | ● | 1 |
| D0150N160 | 1.5 | 2.3 | 16 | 1.45 | 60 | 4 | 2 | ● | 1 |
| D0150N180 | 1.5 | 2.3 | 18 | 1.45 | 60 | 4 | 2 | ● | 1 |
| D0150N200 | 1.5 | 2.3 | 20 | 1.45 | 60 | 4 | 2 | ● | 1 |
| D0150N250 | 1.5 | 2.3 | 25 | 1.45 | 70 | 4 | 2 | ● | 1 |
| D0150N300 | 1.5 | 2.3 | 30 | 1.45 | 70 | 4 | 2 | ● | 1 |
| D0150N380 | 1.5 | 2.3 | 38 | 1.45 | 80 | 4 | 2 | ● | 1 |
| D0150N450 | 1.5 | 2.3 | 45 | 1.45 | 80 | 4 | 2 | ● | 1 |
| D0200N060 | 2 | 3 | 6 | 1.94 | 50 | 4 | 2 | ● | 1 |
| D0200N080 | 2 | 3 | 8 | 1.94 | 50 | 4 | 2 | ● | 1 |
| D0200N100 | 2 | 3 | 10 | 1.94 | 50 | 4 | 2 | ● | 1 |
| D0200N120 | 2 | 3 | 12 | 1.94 | 50 | 4 | 2 | ● | 1 |
| D0200N140 | 2 | 3 | 14 | 1.94 | 60 | 4 | 2 | ● | 1 |
| D0200N160 | 2 | 3 | 16 | 1.94 | 60 | 4 | 2 | ● | 1 |
| D0200N180 | 2 | 3 | 18 | 1.94 | 60 | 4 | 2 | ● | 1 |
| D0200N200 | 2 | 3 | 20 | 1.94 | 60 | 4 | 2 | ● | 1 |
| D0200N250 | 2 | 3 | 25 | 1.94 | 70 | 4 | 2 | ● | 1 |
| D0200N300 | 2 | 3 | 30 | 1.94 | 70 | 4 | 2 | ● | 1 |
| D0200N350 | 2 | 3 | 35 | 1.94 | 80 | 4 | 2 | ● | 1 |
| D0200N400 | 2 | 3 | 40 | 1.94 | 90 | 4 | 2 | ● | 1 |
| D0200N500 | 2 | 3 | 50 | 1.94 | 100 | 4 | 2 | ● | 1 |
| D0200N600 | 2 | 3 | 60 | 1.94 | 110 | 4 | 2 | ● | 1 |
| D0250N080 | 2.5 | 3.7 | 8 | 2.4 | 50 | 4 | 2 | ● | 1 |
| D0250N120 | 2.5 | 3.7 | 12 | 2.4 | 50 | 4 | 2 | ● | 1 |
| D0250N160 | 2.5 | 3.7 | 16 | 2.4 | 60 | 4 | 2 | ● | 1 |

General Use

SQUARE
Long Neck

High Helix

For Small
Automatic LatheBALL
Long NeckRADIUS
Long NeckHigh Helix
UseTAPER
Ball Processing

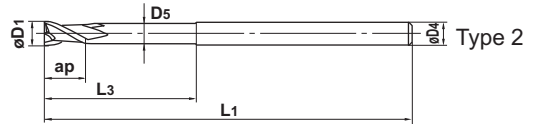
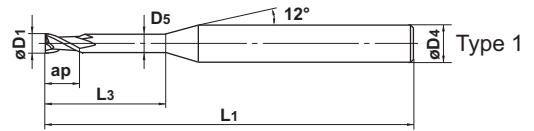
MSTAR END MILLS

MS2XL

End mill, Short cut length, 2 flute, Long neck



$D_1 < 0.5$ 0 - -0.010
 $0.5 \leq D_1$ 0 - -0.020



$D_1 < 0.4$

$0.4 \leq D_1$

● 2 flute long neck end mill.

Unit : mm

| Order Number | Dia. D1 | Length of Cut ap | Neck Length L3 | Neck Dia. D5 | Overall Length L1 | Shank Dia. D4 | No. of Flutes N | Stock | Type |
|----------------|------------|---------------------|-------------------|-----------------|----------------------|------------------|--------------------|-------|------|
| MS2XLD0250N200 | 2.5 | 3.7 | 20 | 2.4 | 60 | 4 | 2 | ● | 1 |
| D0250N250 | 2.5 | 3.7 | 25 | 2.4 | 70 | 4 | 2 | ● | 1 |
| D0250N300 | 2.5 | 3.7 | 30 | 2.4 | 70 | 4 | 2 | ● | 1 |
| D0250N400 | 2.5 | 3.7 | 40 | 2.4 | 90 | 4 | 2 | ● | 1 |
| D0250N500 | 2.5 | 3.7 | 50 | 2.4 | 100 | 4 | 2 | ● | 1 |
| D0300N080 | 3 | 4.5 | 8 | 2.85 | 50 | 6 | 2 | ● | 1 |
| D0300N120 | 3 | 4.5 | 12 | 2.85 | 50 | 6 | 2 | ● | 1 |
| D0300N160 | 3 | 4.5 | 16 | 2.85 | 60 | 6 | 2 | ● | 1 |
| D0300N200 | 3 | 4.5 | 20 | 2.85 | 60 | 6 | 2 | ● | 1 |
| D0300N250 | 3 | 4.5 | 25 | 2.85 | 70 | 6 | 2 | ● | 1 |
| D0300N300 | 3 | 4.5 | 30 | 2.85 | 70 | 6 | 2 | ● | 1 |
| D0300N400 | 3 | 4.5 | 40 | 2.85 | 90 | 6 | 2 | ● | 1 |
| D0300N500 | 3 | 4.5 | 50 | 2.85 | 100 | 6 | 2 | ● | 1 |
| D0400N120 | 4 | 6 | 12 | 3.8 | 50 | 6 | 2 | ● | 1 |
| D0400N160 | 4 | 6 | 16 | 3.8 | 60 | 6 | 2 | ● | 1 |
| D0400N200 | 4 | 6 | 20 | 3.8 | 60 | 6 | 2 | ● | 1 |
| D0400N250 | 4 | 6 | 25 | 3.8 | 70 | 6 | 2 | ● | 1 |
| D0400N300 | 4 | 6 | 30 | 3.8 | 70 | 6 | 2 | ● | 1 |
| D0400N350 | 4 | 6 | 35 | 3.8 | 80 | 6 | 2 | ● | 1 |
| D0400N400 | 4 | 6 | 40 | 3.8 | 90 | 6 | 2 | ● | 1 |
| D0400N450 | 4 | 6 | 45 | 3.8 | 90 | 6 | 2 | ● | 1 |
| D0400N500 | 4 | 6 | 50 | 3.8 | 100 | 6 | 2 | ● | 1 |
| D0400N600 | 4 | 6 | 60 | 3.8 | 110 | 6 | 2 | ● | 1 |
| D0500N160 | 5 | 7.5 | 16 | 4.8 | 60 | 6 | 2 | ● | 1 |
| D0500N250 | 5 | 7.5 | 25 | 4.8 | 70 | 6 | 2 | ● | 1 |
| D0500N350 | 5 | 7.5 | 35 | 4.8 | 80 | 6 | 2 | ● | 1 |
| D0500N500 | 5 | 7.5 | 50 | 4.8 | 110 | 6 | 2 | ● | 1 |
| D0500N600 | 5 | 7.5 | 60 | 4.8 | 120 | 6 | 2 | ● | 1 |
| D0600N200 | 6 | 9 | 20 | 5.8 | 80 | 6 | 2 | ● | 2 |
| D0600N300 | 6 | 9 | 30 | 5.8 | 90 | 6 | 2 | ● | 2 |
| D0600N400 | 6 | 9 | 40 | 5.8 | 100 | 6 | 2 | ● | 2 |
| D0600N500 | 6 | 9 | 50 | 5.8 | 110 | 6 | 2 | ● | 2 |
| D0600N600 | 6 | 9 | 60 | 5.8 | 120 | 6 | 2 | ● | 2 |

General Use

Long Neck
SQUARE

High Helix

For Small Automatic Lathe

General Use

Long Neck
BALL

General Use

Long Neck
RADIUS

General Use

Ball
TAPER

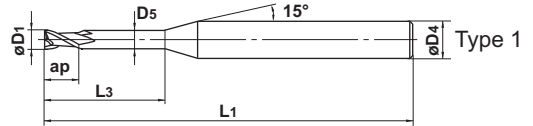


MS2XL6

End mill, Short cut length, 2 flute, 6mm shank



0 - -0.020



- 2 flute long neck end mill.
- $\phi 6$ shank type.

Unit : mm

| Order Number | Dia. D1 | Length of Cut ap | Neck Length L3 | Neck Dia. D5 | Overall Length L1 | Shank Dia. D4 | No. of Flutes N | Stock | Type |
|-----------------|------------|---------------------|-------------------|-----------------|----------------------|------------------|--------------------|-------|------|
| MS2XL6D0030N008 | 0.3 | 0.8 | — | — | 50 | 6 | 2 | ● | 1 |
| D0030N015 | 0.3 | 0.5 | 1.5 | 0.27 | 50 | 6 | 2 | ● | 1 |
| D0040N010 | 0.4 | 0.6 | 1 | 0.36 | 50 | 6 | 2 | ● | 1 |
| D0040N020 | 0.4 | 0.6 | 2 | 0.36 | 50 | 6 | 2 | ● | 1 |
| D0050N013 | 0.5 | 0.8 | 1.3 | 0.46 | 50 | 6 | 2 | ● | 1 |
| D0050N025 | 0.5 | 0.8 | 2.5 | 0.46 | 50 | 6 | 2 | ● | 1 |
| D0060N015 | 0.6 | 0.9 | 1.5 | 0.56 | 50 | 6 | 2 | ● | 1 |
| D0060N030 | 0.6 | 0.9 | 3 | 0.56 | 50 | 6 | 2 | ● | 1 |
| D0070N018 | 0.7 | 1.1 | 1.8 | 0.66 | 50 | 6 | 2 | ● | 1 |
| D0070N035 | 0.7 | 1.1 | 3.5 | 0.66 | 50 | 6 | 2 | ● | 1 |
| D0080N020 | 0.8 | 1.2 | 2 | 0.76 | 50 | 6 | 2 | ● | 1 |
| D0080N040 | 0.8 | 1.2 | 4 | 0.76 | 50 | 6 | 2 | ● | 1 |
| D0090N023 | 0.9 | 1.4 | 2.3 | 0.86 | 50 | 6 | 2 | ● | 1 |
| D0090N045 | 0.9 | 1.4 | 4.5 | 0.86 | 50 | 6 | 2 | ● | 1 |
| D0100N025 | 1 | 1.5 | 2.5 | 0.94 | 50 | 6 | 2 | ● | 1 |
| D0100N050 | 1 | 1.5 | 5 | 0.94 | 50 | 6 | 2 | ● | 1 |
| D0110N028 | 1.1 | 1.7 | 2.8 | 1.04 | 50 | 6 | 2 | ● | 1 |
| D0110N055 | 1.1 | 1.7 | 5.5 | 1.04 | 50 | 6 | 2 | ● | 1 |
| D0120N030 | 1.2 | 1.8 | 3 | 1.14 | 50 | 6 | 2 | ● | 1 |
| D0120N060 | 1.2 | 1.8 | 6 | 1.14 | 50 | 6 | 2 | ● | 1 |
| D0130N033 | 1.3 | 2 | 3.3 | 1.24 | 50 | 6 | 2 | ● | 1 |
| D0130N065 | 1.3 | 2 | 6.5 | 1.24 | 50 | 6 | 2 | ● | 1 |
| D0140N035 | 1.4 | 2.1 | 3.5 | 1.34 | 50 | 6 | 2 | ● | 1 |
| D0140N070 | 1.4 | 2.1 | 7 | 1.34 | 50 | 6 | 2 | ● | 1 |
| D0150N038 | 1.5 | 2.3 | 3.8 | 1.44 | 50 | 6 | 2 | ● | 1 |
| D0150N075 | 1.5 | 2.3 | 7.5 | 1.44 | 50 | 6 | 2 | ● | 1 |
| D0160N040 | 1.6 | 2.4 | 4 | 1.54 | 50 | 6 | 2 | ● | 1 |
| D0160N080 | 1.6 | 2.4 | 8 | 1.54 | 50 | 6 | 2 | ● | 1 |
| D0170N043 | 1.7 | 2.6 | 4.3 | 1.64 | 50 | 6 | 2 | ● | 1 |
| D0170N085 | 1.7 | 2.6 | 8.5 | 1.64 | 50 | 6 | 2 | ● | 1 |
| D0180N045 | 1.8 | 2.7 | 4.5 | 1.74 | 50 | 6 | 2 | ● | 1 |
| D0180N090 | 1.8 | 2.7 | 9 | 1.74 | 50 | 6 | 2 | ● | 1 |
| D0190N048 | 1.9 | 2.9 | 4.8 | 1.84 | 50 | 6 | 2 | ● | 1 |
| D0190N095 | 1.9 | 2.9 | 9.5 | 1.84 | 50 | 6 | 2 | ● | 1 |
| D0200N050 | 2 | 3 | 5 | 1.90 | 50 | 6 | 2 | ● | 1 |
| D0200N100 | 2 | 3 | 10 | 1.90 | 50 | 6 | 2 | ● | 1 |
| D0210N053 | 2.1 | 3.2 | 5.3 | 2.00 | 50 | 6 | 2 | ● | 1 |
| D0210N105 | 2.1 | 3.2 | 10.5 | 2.00 | 60 | 6 | 2 | ● | 1 |

General Use

SQUARE Long Neck

High Helix

For Small Automatic Lathe

BALL Taper Neck | Long Neck

RADIUS High Helix | General Use

TAPER Ball Use | General Use

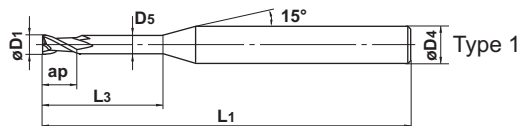
MSTAR END MILLS

MS2XL6

End mill, Short cut length, 2 flute, 6mm shank



0 - -0.020



- 2 flute long neck end mill.
- $\phi 6$ shank type.

Unit : mm

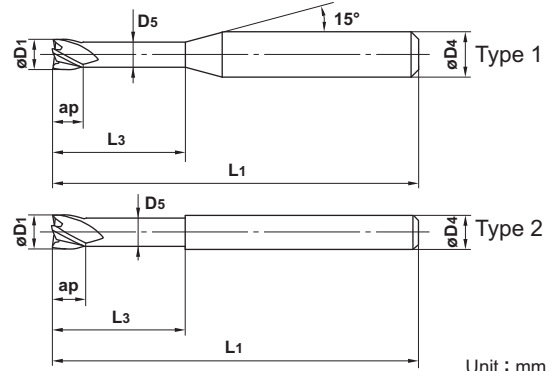
| Order Number | Dia. D1 | Length of Cut ap | Neck Length L3 | Neck Dia. D5 | Overall Length L1 | Shank Dia. D4 | No. of Flutes N | Stock | Type |
|------------------------|------------|---------------------|-------------------|-----------------|----------------------|------------------|--------------------|-------|------|
| MS2XL6D0220N055 | 2.2 | 3.3 | 5.5 | 2.10 | 50 | 6 | 2 | ● | 1 |
| D0220N110 | 2.2 | 3.3 | 11 | 2.10 | 60 | 6 | 2 | ● | 1 |
| D0230N058 | 2.3 | 3.5 | 5.8 | 2.20 | 50 | 6 | 2 | ● | 1 |
| D0230N115 | 2.3 | 3.5 | 11.5 | 2.20 | 60 | 6 | 2 | ● | 1 |
| D0240N060 | 2.4 | 3.6 | 6 | 2.30 | 50 | 6 | 2 | ● | 1 |
| D0240N120 | 2.4 | 3.6 | 12 | 2.30 | 60 | 6 | 2 | ● | 1 |
| D0250N063 | 2.5 | 3.8 | 6.3 | 2.40 | 50 | 6 | 2 | ● | 1 |
| D0250N125 | 2.5 | 3.8 | 12.5 | 2.40 | 60 | 6 | 2 | ● | 1 |

The diameter tolerance is only applied to items produced after April 2005.

General Use
 Long Neck
 SQUARE
 High Helix
 For Small Automatic Lathe
 BALL
 Taper Neck
 General Use
 RADIUS
 High Helix
 General Use
 BALL
 For Rib Processing
 TAPER



● 4 flute long neck end mill.



Unit : mm

| Order Number | Dia. | Length of Cut | Neck Length | Neck Dia. | Overall Length | Shank Dia. | No. of Flutes | Stock | Type |
|----------------|------|---------------|-------------|-----------|----------------|------------|---------------|-------|------|
| | D1 | ap | L3 | D5 | L1 | D4 | N | | |
| MS4XLD0100N040 | 1 | 1 | 4 | 0.94 | 50 | 4 | 4 | ● | 1 |
| D0100N060 | 1 | 1 | 6 | 0.94 | 50 | 4 | 4 | ● | 1 |
| D0100N080 | 1 | 1 | 8 | 0.94 | 50 | 4 | 4 | ● | 1 |
| D0100N100 | 1 | 1 | 10 | 0.94 | 50 | 4 | 4 | ● | 1 |
| D0100N120 | 1 | 1 | 12 | 0.94 | 50 | 4 | 4 | ● | 1 |
| D0100N160 | 1 | 1 | 16 | 0.94 | 60 | 4 | 4 | ● | 1 |
| D0110N060 | 1.1 | 1.1 | 6 | 1.04 | 50 | 4 | 4 | ● | 1 |
| D0110N100 | 1.1 | 1.1 | 10 | 1.04 | 50 | 4 | 4 | ● | 1 |
| D0110N160 | 1.1 | 1.1 | 16 | 1.04 | 60 | 4 | 4 | ● | 1 |
| D0120N060 | 1.2 | 1.2 | 6 | 1.14 | 50 | 4 | 4 | ● | 1 |
| D0120N080 | 1.2 | 1.2 | 8 | 1.14 | 50 | 4 | 4 | ● | 1 |
| D0120N100 | 1.2 | 1.2 | 10 | 1.14 | 50 | 4 | 4 | ● | 1 |
| D0120N120 | 1.2 | 1.2 | 12 | 1.14 | 50 | 4 | 4 | ● | 1 |
| D0120N160 | 1.2 | 1.2 | 16 | 1.14 | 60 | 4 | 4 | ● | 1 |
| D0130N060 | 1.3 | 1.3 | 6 | 1.24 | 50 | 4 | 4 | ● | 1 |
| D0130N120 | 1.3 | 1.3 | 12 | 1.24 | 50 | 4 | 4 | ● | 1 |
| D0130N180 | 1.3 | 1.3 | 18 | 1.24 | 60 | 4 | 4 | ● | 1 |
| D0140N060 | 1.4 | 1.4 | 6 | 1.34 | 50 | 4 | 4 | ● | 1 |
| D0140N080 | 1.4 | 1.4 | 8 | 1.34 | 50 | 4 | 4 | ● | 1 |
| D0140N100 | 1.4 | 1.4 | 10 | 1.34 | 50 | 4 | 4 | ● | 1 |
| D0140N120 | 1.4 | 1.4 | 12 | 1.34 | 50 | 4 | 4 | ● | 1 |
| D0140N140 | 1.4 | 1.4 | 14 | 1.34 | 60 | 4 | 4 | ● | 1 |
| D0140N160 | 1.4 | 1.4 | 16 | 1.34 | 60 | 4 | 4 | ● | 1 |
| D0140N220 | 1.4 | 1.4 | 22 | 1.34 | 60 | 4 | 4 | ● | 1 |
| D0150N060 | 1.5 | 1.5 | 6 | 1.44 | 50 | 4 | 4 | ● | 1 |
| D0150N080 | 1.5 | 1.5 | 8 | 1.44 | 50 | 4 | 4 | ● | 1 |
| D0150N100 | 1.5 | 1.5 | 10 | 1.44 | 50 | 4 | 4 | ● | 1 |
| D0150N120 | 1.5 | 1.5 | 12 | 1.44 | 50 | 4 | 4 | ● | 1 |
| D0150N140 | 1.5 | 1.5 | 14 | 1.44 | 60 | 4 | 4 | ● | 1 |
| D0150N160 | 1.5 | 1.5 | 16 | 1.44 | 60 | 4 | 4 | ● | 1 |
| D0150N180 | 1.5 | 1.5 | 18 | 1.44 | 60 | 4 | 4 | ● | 1 |
| D0150N200 | 1.5 | 1.5 | 20 | 1.44 | 60 | 4 | 4 | ● | 1 |
| D0160N060 | 1.6 | 1.6 | 6 | 1.54 | 50 | 4 | 4 | ● | 1 |
| D0160N080 | 1.6 | 1.6 | 8 | 1.54 | 50 | 4 | 4 | ● | 1 |
| D0160N100 | 1.6 | 1.6 | 10 | 1.54 | 50 | 4 | 4 | ● | 1 |
| D0160N120 | 1.6 | 1.6 | 12 | 1.54 | 50 | 4 | 4 | ● | 1 |
| D0160N140 | 1.6 | 1.6 | 14 | 1.54 | 60 | 4 | 4 | ● | 1 |
| D0160N160 | 1.6 | 1.6 | 16 | 1.54 | 60 | 4 | 4 | ● | 1 |

General Use

SQUARE

Long Neck

High Helix

For Small Automatic Lathe

BALL

Long Neck

General Use

RADIUS

High Helix

General Use

TAPER

Ball Processing

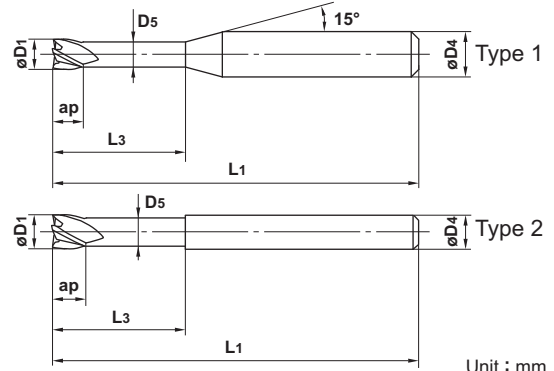
MSTAR END MILLS

MS4XL

End mill, Short cut length, 4 flute, Long neck



● 4 flute long neck end mill.



Unit : mm

| Order Number | Dia. D1 | Length of Cut ap | Neck Length L3 | Neck Dia. D5 | Overall Length L1 | Shank Dia. D4 | No. of Flutes N | Stock | Type |
|----------------|------------|---------------------|-------------------|-----------------|----------------------|------------------|--------------------|-------|------|
| MS4XLD0160N180 | 1.6 | 1.6 | 18 | 1.54 | 60 | 4 | 4 | ● | 1 |
| D0160N200 | 1.6 | 1.6 | 20 | 1.54 | 60 | 4 | 4 | ● | 1 |
| D0160N260 | 1.6 | 1.6 | 26 | 1.54 | 70 | 4 | 4 | ● | 1 |
| D0170N060 | 1.7 | 1.7 | 6 | 1.64 | 50 | 4 | 4 | ● | 1 |
| D0170N140 | 1.7 | 1.7 | 14 | 1.64 | 60 | 4 | 4 | ● | 1 |
| D0170N240 | 1.7 | 1.7 | 24 | 1.64 | 70 | 4 | 4 | ● | 1 |
| D0180N060 | 1.8 | 1.8 | 6 | 1.74 | 50 | 4 | 4 | ● | 1 |
| D0180N080 | 1.8 | 1.8 | 8 | 1.74 | 50 | 4 | 4 | ● | 1 |
| D0180N100 | 1.8 | 1.8 | 10 | 1.74 | 50 | 4 | 4 | ● | 1 |
| D0180N120 | 1.8 | 1.8 | 12 | 1.74 | 50 | 4 | 4 | ● | 1 |
| D0180N140 | 1.8 | 1.8 | 14 | 1.74 | 60 | 4 | 4 | ● | 1 |
| D0180N160 | 1.8 | 1.8 | 16 | 1.74 | 60 | 4 | 4 | ● | 1 |
| D0180N180 | 1.8 | 1.8 | 18 | 1.74 | 60 | 4 | 4 | ● | 1 |
| D0180N200 | 1.8 | 1.8 | 20 | 1.74 | 60 | 4 | 4 | ● | 1 |
| D0180N250 | 1.8 | 1.8 | 25 | 1.74 | 70 | 4 | 4 | ● | 1 |
| D0190N060 | 1.9 | 1.9 | 6 | 1.84 | 50 | 4 | 4 | ● | 1 |
| D0190N160 | 1.9 | 1.9 | 16 | 1.84 | 60 | 4 | 4 | ● | 1 |
| D0190N280 | 1.9 | 1.9 | 28 | 1.84 | 70 | 4 | 4 | ● | 1 |
| D0200N060 | 2 | 2 | 6 | 1.9 | 50 | 4 | 4 | ● | 1 |
| D0200N080 | 2 | 2 | 8 | 1.9 | 50 | 4 | 4 | ● | 1 |
| D0200N100 | 2 | 2 | 10 | 1.9 | 50 | 4 | 4 | ● | 1 |
| D0200N120 | 2 | 2 | 12 | 1.9 | 50 | 4 | 4 | ● | 1 |
| D0200N140 | 2 | 2 | 14 | 1.9 | 60 | 4 | 4 | ● | 1 |
| D0200N160 | 2 | 2 | 16 | 1.9 | 60 | 4 | 4 | ● | 1 |
| D0200N180 | 2 | 2 | 18 | 1.9 | 60 | 4 | 4 | ● | 1 |
| D0200N200 | 2 | 2 | 20 | 1.9 | 60 | 4 | 4 | ● | 1 |
| D0200N250 | 2 | 2 | 25 | 1.9 | 70 | 4 | 4 | ● | 1 |
| D0200N300 | 2 | 2 | 30 | 1.9 | 70 | 4 | 4 | ● | 1 |
| D0250N080 | 2.5 | 2.5 | 8 | 2.4 | 50 | 4 | 4 | ● | 1 |
| D0250N120 | 2.5 | 2.5 | 12 | 2.4 | 50 | 4 | 4 | ● | 1 |
| D0250N160 | 2.5 | 2.5 | 16 | 2.4 | 60 | 4 | 4 | ● | 1 |
| D0250N200 | 2.5 | 2.5 | 20 | 2.4 | 60 | 4 | 4 | ● | 1 |
| D0250N250 | 2.5 | 2.5 | 25 | 2.4 | 70 | 4 | 4 | ● | 1 |
| D0300N080 | 3 | 3 | 8 | 2.9 | 50 | 6 | 4 | ● | 1 |
| D0300N120 | 3 | 3 | 12 | 2.9 | 50 | 6 | 4 | ● | 1 |
| D0300N160 | 3 | 3 | 16 | 2.9 | 60 | 6 | 4 | ● | 1 |
| D0300N200 | 3 | 3 | 20 | 2.9 | 60 | 6 | 4 | ● | 1 |
| D0300N250 | 3 | 3 | 25 | 2.9 | 70 | 6 | 4 | ● | 1 |

● : Inventory maintained.

| Order Number | Dia. | Length of Cut | Neck Length | Neck Dia. | Overall Length | Shank Dia. | No. of Flutes | Stock | Type |
|----------------|------|---------------|-------------|-----------|----------------|------------|---------------|-------|------|
| | D1 | ap | L3 | D5 | L1 | D4 | N | | |
| MS4XLD0300N300 | 3 | 3 | 30 | 2.9 | 70 | 6 | 4 | ● | 1 |
| D0350N150 | 3.5 | 3.5 | 15 | 3.4 | 60 | 6 | 4 | ● | 1 |
| D0350N250 | 3.5 | 3.5 | 25 | 3.4 | 70 | 6 | 4 | ● | 1 |
| D0350N350 | 3.5 | 3.5 | 35 | 3.4 | 80 | 6 | 4 | ● | 1 |
| D0400N120 | 4 | 4 | 12 | 3.9 | 50 | 6 | 4 | ● | 1 |
| D0400N160 | 4 | 4 | 16 | 3.9 | 60 | 6 | 4 | ● | 1 |
| D0400N200 | 4 | 4 | 20 | 3.9 | 60 | 6 | 4 | ● | 1 |
| D0400N250 | 4 | 4 | 25 | 3.9 | 70 | 6 | 4 | ● | 1 |
| D0400N300 | 4 | 4 | 30 | 3.9 | 70 | 6 | 4 | ● | 1 |
| D0400N350 | 4 | 4 | 35 | 3.9 | 80 | 6 | 4 | ● | 1 |
| D0400N400 | 4 | 4 | 40 | 3.9 | 90 | 6 | 4 | ● | 1 |
| D0400N450 | 4 | 4 | 45 | 3.9 | 90 | 6 | 4 | ● | 1 |
| D0400N500 | 4 | 4 | 50 | 3.9 | 100 | 6 | 4 | ● | 1 |
| D0500N160 | 5 | 5 | 16 | 4.9 | 60 | 6 | 4 | ● | 1 |
| D0500N250 | 5 | 5 | 25 | 4.9 | 70 | 6 | 4 | ● | 1 |
| D0500N350 | 5 | 5 | 35 | 4.9 | 80 | 6 | 4 | ● | 1 |
| D0500N500 | 5 | 5 | 50 | 4.9 | 110 | 6 | 4 | ● | 1 |
| D0600N200 | 6 | 6 | 20 | 5.85 | 80 | 6 | 4 | ● | 2 |
| D0600N300 | 6 | 6 | 30 | 5.85 | 90 | 6 | 4 | ● | 2 |
| D0600N400 | 6 | 6 | 40 | 5.85 | 100 | 6 | 4 | ● | 2 |
| D0600N500 | 6 | 6 | 50 | 5.85 | 110 | 6 | 4 | ● | 2 |
| D0800N300 | 8 | 8 | 30 | 7.85 | 90 | 8 | 4 | ● | 2 |
| D0800N500 | 8 | 8 | 50 | 7.85 | 110 | 8 | 4 | ● | 2 |
| D0800N700 | 8 | 8 | 70 | 7.85 | 130 | 8 | 4 | ● | 2 |
| D1000N400 | 10 | 10 | 40 | 9.7 | 100 | 10 | 4 | ● | 2 |
| D1000N600 | 10 | 10 | 60 | 9.7 | 120 | 10 | 4 | ● | 2 |
| D1000N800 | 10 | 10 | 80 | 9.7 | 140 | 10 | 4 | ● | 2 |

General Use

SQUARE
Long Neck

High Helix

For Small
Automatic Lathe

BALL

Taper
Long
Neck

RADIUS

High
Long
Helix
Neck

TAPER

For Rib
Processing

MSTAR END MILLS

MSMHZD

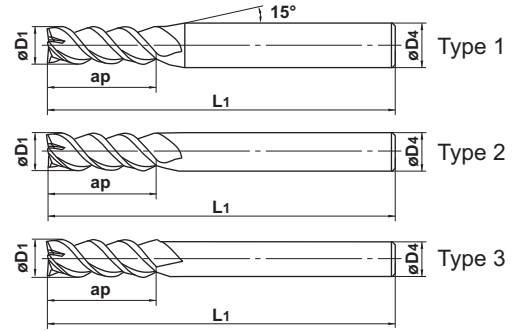
End mill, Medium cut length, 3 flute



D1 ≤ 12 0 - -0.020
12 < D1 0 - -0.030



● A single end mill for both plunging and slotting.



Unit : mm

| Order Number | Dia. | Length of Cut | Overall Length | Shank Dia. | No. of Flutes | Stock | Type |
|--------------|------|---------------|----------------|------------|---------------|-------|------|
| | D1 | ap | L1 | D4 | N | | |
| MSMHZDD0100 | 1 | 2 | 45 | 4 | 3 | ● | 1 |
| D0150 | 1.5 | 3 | 45 | 4 | 3 | ● | 1 |
| D0200 | 2 | 4 | 50 | 6 | 3 | ● | 1 |
| D0250 | 2.5 | 5 | 50 | 6 | 3 | ● | 1 |
| D0300 | 3 | 6 | 50 | 6 | 3 | ● | 1 |
| D0350 | 3.5 | 8 | 50 | 6 | 3 | ● | 1 |
| D0400 | 4 | 8 | 50 | 6 | 3 | ● | 1 |
| D0450 | 4.5 | 10 | 50 | 6 | 3 | ● | 1 |
| D0500 | 5 | 10 | 50 | 6 | 3 | ● | 1 |
| D0550 | 5.5 | 13 | 50 | 6 | 3 | ● | 1 |
| D0600 | 6 | 13 | 60 | 6 | 3 | ● | 2 |
| D0650 | 6.5 | 16 | 60 | 8 | 3 | ● | 1 |
| D0700 | 7 | 16 | 60 | 8 | 3 | ● | 1 |
| D0750 | 7.5 | 16 | 60 | 8 | 3 | ● | 1 |
| D0800 | 8 | 19 | 70 | 8 | 3 | ● | 2 |
| D0850 | 8.5 | 19 | 70 | 10 | 3 | ● | 1 |
| D0900 | 9 | 19 | 70 | 10 | 3 | ● | 1 |
| D0950 | 9.5 | 19 | 70 | 10 | 3 | ● | 1 |
| D1000 | 10 | 22 | 80 | 10 | 3 | ● | 2 |
| D1100 | 11 | 22 | 80 | 12 | 3 | ● | 1 |
| D1200 | 12 | 26 | 90 | 12 | 3 | ● | 2 |
| D1300 | 13 | 26 | 90 | 12 | 3 | ● | 3 |
| D1400 | 14 | 26 | 90 | 12 | 3 | ● | 3 |
| D1500 | 15 | 26 | 110 | 16 | 3 | ● | 1 |
| D1600 | 16 | 30 | 110 | 16 | 3 | ● | 2 |
| D2000 | 20 | 32 | 140 | 20 | 3 | ● | 2 |

General Use

Long Neck

High Helix

For Small Automatic Lathe

General Use

Long Neck

High Helix

For Rib Processing

SQUARE

BALL

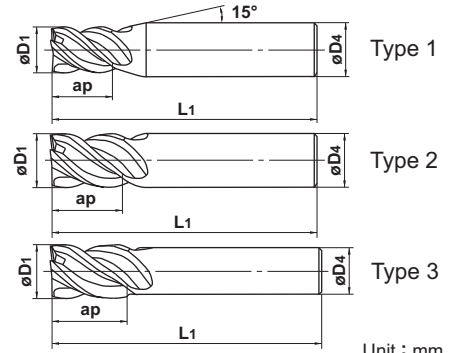
RADIUS

TAPER





● 4 flute high power end mill.



Unit : mm

| Order Number | Dia. | Length of Cut | Overall Length | Shank Dia. | No. of Flutes | Stock | Type |
|--------------|------|---------------|----------------|------------|---------------|-------|------|
| | D1 | ap | L1 | D4 | N | | |
| MSSHDD0300 | 3 | 4.5 | 45 | 6 | 4 | ● | 1 |
| D0350 | 3.5 | 5.3 | 45 | 6 | 4 | ● | 1 |
| D0400 | 4 | 6 | 45 | 6 | 4 | ● | 1 |
| D0450 | 4.5 | 6.8 | 45 | 6 | 4 | ● | 1 |
| D0500 | 5 | 7.5 | 50 | 6 | 4 | ● | 1 |
| D0550 | 5.5 | 8.3 | 50 | 6 | 4 | ● | 1 |
| D0600 | 6 | 9 | 50 | 6 | 4 | ● | 2 |
| D0650 | 6.5 | 9.8 | 60 | 8 | 4 | ● | 1 |
| D0700 | 7 | 10.5 | 60 | 8 | 4 | ● | 1 |
| D0750 | 7.5 | 11.3 | 60 | 8 | 4 | ● | 1 |
| D0800 | 8 | 12 | 60 | 8 | 4 | ● | 2 |
| D0850 | 8.5 | 12.8 | 70 | 10 | 4 | ● | 1 |
| D0900 | 9 | 13.5 | 70 | 10 | 4 | ● | 1 |
| D0950 | 9.5 | 14.3 | 70 | 10 | 4 | ● | 1 |
| D1000 | 10 | 15 | 70 | 10 | 4 | ● | 2 |
| D1100 | 11 | 16.5 | 75 | 12 | 4 | ● | 1 |
| D1200 | 12 | 18 | 75 | 12 | 4 | ● | 2 |
| D1300 | 13 | 19.5 | 75 | 12 | 4 | ● | 3 |
| D1400 | 14 | 21 | 90 | 16 | 4 | ● | 1 |
| D1500 | 15 | 22.5 | 90 | 16 | 4 | ● | 1 |
| D1600 | 16 | 24 | 90 | 16 | 4 | ● | 2 |
| D1700 | 17 | 25.5 | 100 | 16 | 4 | ● | 3 |
| D1800 | 18 | 27 | 100 | 16 | 4 | ● | 3 |
| D1900 | 19 | 28.5 | 110 | 20 | 4 | ● | 1 |
| D2000 | 20 | 30 | 110 | 20 | 4 | ● | 2 |

General Use

SQUARE
Long Neck

High Helix

For Small Automatic Lathe

BALL

Long Neck

Taper Neck

RADIUS

General Use

High Helix

General Use

TAPER

Ball Processing

MSTAR END MILLS

MSMHD

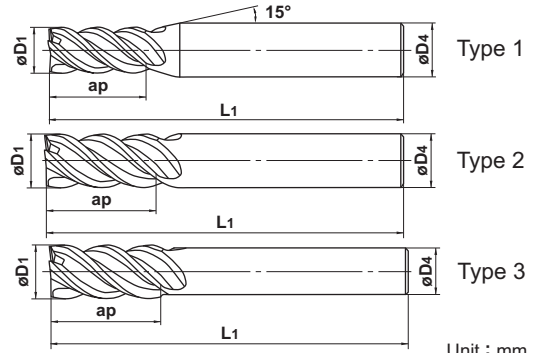
High power, Medium cut length, 4 flute



$D_1 \leq 12$ 0 - -0.020
 $12 < D_1$ 0 - -0.030



● 4 flute high power end mill.



Unit : mm

| Order Number | Dia. | | Length of Cut | | Overall Length | | Shank Dia. | | No. of Flutes N | Stock | Type |
|-------------------|------|----|---------------|----|----------------|----|------------|---|-----------------|-------|------|
| | D1 | ap | L1 | D4 | D4 | D4 | | | | | |
| MSMHDD0200 | 2 | 4 | 45 | 4 | 4 | 4 | 4 | ● | 1 | | |
| D0210 | 2.1 | 5 | 45 | 4 | 4 | 4 | 4 | ● | 1 | | |
| D0220 | 2.2 | 5 | 45 | 4 | 4 | 4 | 4 | ● | 1 | | |
| D0230 | 2.3 | 5 | 45 | 4 | 4 | 4 | 4 | ● | 1 | | |
| D0240 | 2.4 | 5 | 45 | 4 | 4 | 4 | 4 | ● | 1 | | |
| D0250 | 2.5 | 5 | 45 | 4 | 4 | 4 | 4 | ● | 1 | | |
| D0260 | 2.6 | 6 | 45 | 4 | 4 | 4 | 4 | ● | 1 | | |
| D0270 | 2.7 | 6 | 45 | 4 | 4 | 4 | 4 | ● | 1 | | |
| D0280 | 2.8 | 6 | 45 | 4 | 4 | 4 | 4 | ● | 1 | | |
| D0290 | 2.9 | 6 | 45 | 4 | 4 | 4 | 4 | ● | 1 | | |
| D0300 | 3 | 8 | 45 | 6 | 4 | 4 | 4 | ● | 1 | | |
| D0310 | 3.1 | 8 | 45 | 6 | 4 | 4 | 4 | ● | 1 | | |
| D0320 | 3.2 | 8 | 45 | 6 | 4 | 4 | 4 | ● | 1 | | |
| D0330 | 3.3 | 8 | 45 | 6 | 4 | 4 | 4 | ● | 1 | | |
| D0340 | 3.4 | 8 | 45 | 6 | 4 | 4 | 4 | ● | 1 | | |
| D0350 | 3.5 | 8 | 45 | 6 | 4 | 4 | 4 | ● | 1 | | |
| D0360 | 3.6 | 11 | 45 | 6 | 4 | 4 | 4 | ● | 1 | | |
| D0370 | 3.7 | 11 | 45 | 6 | 4 | 4 | 4 | ● | 1 | | |
| D0380 | 3.8 | 11 | 45 | 6 | 4 | 4 | 4 | ● | 1 | | |
| D0390 | 3.9 | 11 | 45 | 6 | 4 | 4 | 4 | ● | 1 | | |
| D0400 | 4 | 11 | 45 | 6 | 4 | 4 | 4 | ● | 1 | | |
| D0410 | 4.1 | 12 | 45 | 6 | 4 | 4 | 4 | ● | 1 | | |
| D0420 | 4.2 | 12 | 45 | 6 | 4 | 4 | 4 | ● | 1 | | |
| D0430 | 4.3 | 12 | 45 | 6 | 4 | 4 | 4 | ● | 1 | | |
| D0440 | 4.4 | 12 | 45 | 6 | 4 | 4 | 4 | ● | 1 | | |
| D0450 | 4.5 | 12 | 45 | 6 | 4 | 4 | 4 | ● | 1 | | |
| D0460 | 4.6 | 13 | 50 | 6 | 4 | 4 | 4 | ● | 1 | | |
| D0470 | 4.7 | 13 | 50 | 6 | 4 | 4 | 4 | ● | 1 | | |
| D0480 | 4.8 | 13 | 50 | 6 | 4 | 4 | 4 | ● | 1 | | |
| D0490 | 4.9 | 13 | 50 | 6 | 4 | 4 | 4 | ● | 1 | | |
| D0500 | 5 | 13 | 50 | 6 | 4 | 4 | 4 | ● | 1 | | |
| D0510 | 5.1 | 13 | 50 | 6 | 4 | 4 | 4 | ● | 1 | | |
| D0520 | 5.2 | 13 | 50 | 6 | 4 | 4 | 4 | ● | 1 | | |
| D0530 | 5.3 | 13 | 50 | 6 | 4 | 4 | 4 | ● | 1 | | |
| D0540 | 5.4 | 13 | 50 | 6 | 4 | 4 | 4 | ● | 1 | | |
| D0550 | 5.5 | 13 | 50 | 6 | 4 | 4 | 4 | ● | 1 | | |
| D0560 | 5.6 | 13 | 50 | 6 | 4 | 4 | 4 | ● | 1 | | |
| D0570 | 5.7 | 13 | 50 | 6 | 4 | 4 | 4 | ● | 1 | | |

● : Inventory maintained.

Unit : mm

| Order Number | Dia. | Length of Cut | Overall Length | Shank Dia. | No. of Flutes | Stock | Type |
|-------------------|------|---------------|----------------|------------|---------------|-------|------|
| | D1 | ap | L1 | D4 | N | | |
| MSMHDD0580 | 5.8 | 13 | 50 | 6 | 4 | ● | 1 |
| D0590 | 5.9 | 13 | 50 | 6 | 4 | ● | 1 |
| D0600 | 6 | 13 | 50 | 6 | 4 | ● | 2 |
| D0650 | 6.5 | 16 | 60 | 8 | 4 | ● | 1 |
| D0700 | 7 | 19 | 60 | 8 | 4 | ● | 1 |
| D0750 | 7.5 | 19 | 60 | 8 | 4 | ● | 1 |
| D0800 | 8 | 19 | 60 | 8 | 4 | ● | 2 |
| D0850 | 8.5 | 19 | 70 | 10 | 4 | ● | 1 |
| D0900 | 9 | 22 | 70 | 10 | 4 | ● | 1 |
| D0950 | 9.5 | 22 | 70 | 10 | 4 | ● | 1 |
| D1000 | 10 | 22 | 70 | 10 | 4 | ● | 2 |
| D1100 | 11 | 26 | 75 | 12 | 4 | ● | 1 |
| D1200S10 | 12 | 26 | 75 | 10 | 4 | ● | 3 |
| D1200 | 12 | 26 | 75 | 12 | 4 | ● | 2 |
| D1300 | 13 | 26 | 75 | 12 | 4 | ● | 3 |
| D1400 | 14 | 30 | 90 | 16 | 4 | ● | 1 |
| D1500 | 15 | 35 | 90 | 16 | 4 | ● | 1 |
| D1600 | 16 | 35 | 90 | 16 | 4 | ● | 2 |
| D1700 | 17 | 35 | 100 | 16 | 4 | ● | 3 |
| D1800 | 18 | 40 | 100 | 16 | 4 | ● | 3 |
| D1900 | 19 | 40 | 110 | 20 | 4 | ● | 1 |
| D2000 | 20 | 45 | 110 | 20 | 4 | ● | 2 |
| D2200 | 22 | 50 | 125 | 20 | 4 | ● | 3 |
| D2500 | 25 | 55 | 125 | 25 | 4 | ● | 2 |

SQUARE

General Use

Long Neck

High Helix

For Small Automatic Lathe

BALL

General Use

Taper Neck

General Use

Long Neck

High Helix

TAPER

General Use

Ball

For Rib Processing



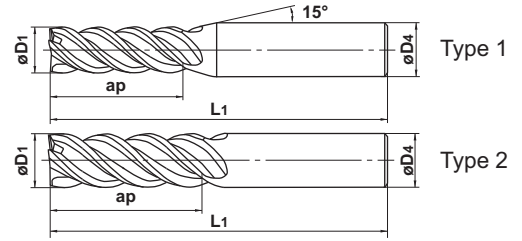
MSTAR END MILLS

MSJHD

High power, Semi long cut length, 4 flute



$D_1 \leq 12$ 0 - -0.020
 $12 < D_1$ 0 - -0.030



● 4 flute high power end mill.

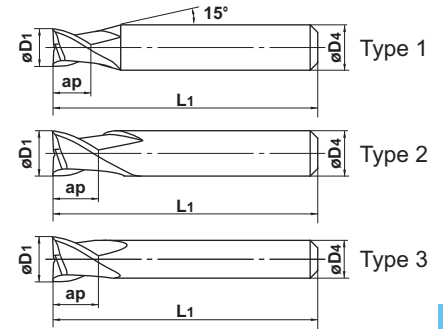
Unit : mm

| Order Number | Dia. | Length of Cut | Overall Length | Shank Dia. | No. of Flutes | Stock | Type |
|--------------|------|---------------|----------------|------------|---------------|-------|------|
| | D1 | ap | L1 | D4 | N | | |
| MSJHDD0200 | 2 | 8 | 60 | 6 | 4 | ● | 1 |
| D0250 | 2.5 | 10 | 60 | 6 | 4 | ● | 1 |
| D0300 | 3 | 12 | 60 | 6 | 4 | ● | 1 |
| D0350 | 3.5 | 14 | 60 | 6 | 4 | ● | 1 |
| D0400 | 4 | 16 | 60 | 6 | 4 | ● | 1 |
| D0450 | 4.5 | 18 | 60 | 6 | 4 | ● | 1 |
| D0500 | 5 | 20 | 60 | 6 | 4 | ● | 1 |
| D0600 | 6 | 24 | 60 | 6 | 4 | ● | 2 |
| D0700 | 7 | 25 | 80 | 8 | 4 | ● | 1 |
| D0800 | 8 | 28 | 80 | 8 | 4 | ● | 2 |
| D0900 | 9 | 32 | 90 | 10 | 4 | ● | 1 |
| D1000 | 10 | 35 | 90 | 10 | 4 | ● | 2 |
| D1100 | 11 | 35 | 100 | 12 | 4 | ● | 1 |
| D1200 | 12 | 36 | 100 | 12 | 4 | ● | 2 |
| D1400 | 14 | 42 | 110 | 16 | 4 | ● | 1 |
| D1500 | 15 | 45 | 110 | 16 | 4 | ● | 1 |
| D1600 | 16 | 48 | 125 | 16 | 4 | ● | 2 |
| D2000 | 20 | 55 | 140 | 20 | 4 | ● | 2 |

General Use
 Long Neck
 High Helix
 For Small Automatic Lathe
 General Use
 Long Neck
 General Use
 Long Neck
 High Helix
 General Use
 Ball
 Radius
 Taper



● 2 flute end mill.



Overall length 35mm

Unit : mm

| Order Number | Dia. | Length of Cut | Overall Length | Shank Dia. | No. of Flutes | Stock | Type |
|------------------|------|---------------|----------------|------------|---------------|-------|------|
| | D1 | ap | L1 | D4 | N | | |
| MS2ESD0300L35S04 | 3 | 3 | 35 | 4 | 2 | ● | 1 |
| D0350L35S04 | 3.5 | 3.5 | 35 | 4 | 2 | ● | 1 |
| D0400L35S04 | 4 | 4 | 35 | 4 | 2 | ● | 2 |
| D0500L35S05 | 5 | 5 | 35 | 5 | 2 | ● | 2 |
| D0500L35S06 | 5 | 5 | 35 | 6 | 2 | ● | 1 |
| D0600L35S05 | 6 | 6 | 35 | 5 | 2 | ● | 3 |
| D0600L35S06 | 6 | 6 | 35 | 6 | 2 | ● | 2 |
| D0700L35S07 | 7 | 6 | 35 | 7 | 2 | ● | 2 |
| D0800L35S07 | 8 | 6 | 35 | 7 | 2 | ● | 3 |
| D0800L35S08 | 8 | 6 | 35 | 8 | 2 | ● | 2 |
| D1000L35S07 | 10 | 6 | 35 | 7 | 2 | ● | 3 |
| D1000L35S10 | 10 | 6 | 35 | 10 | 2 | ● | 2 |
| D1200L35S10 | 12 | 6 | 35 | 10 | 2 | ● | 3 |

Overall length 45mm

Unit : mm

| Order Number | Dia. | Length of Cut | Overall Length | Shank Dia. | No. of Flutes | Stock | Type |
|------------------|------|---------------|----------------|------------|---------------|-------|------|
| | D1 | ap | L1 | D4 | N | | |
| MS2ESD0300L45S04 | 3 | 3 | 45 | 4 | 2 | ● | 1 |
| D0350L45S04 | 3.5 | 3.5 | 45 | 4 | 2 | ● | 1 |
| D0400L45S04 | 4 | 4 | 45 | 4 | 2 | ● | 2 |
| D0500L45S06 | 5 | 5 | 45 | 6 | 2 | ● | 1 |
| D0600L45S06 | 6 | 6 | 45 | 6 | 2 | ● | 2 |
| D0700L45S07 | 7 | 7 | 45 | 7 | 2 | ● | 2 |
| D0800L45S07 | 8 | 8 | 45 | 7 | 2 | ● | 3 |
| D0800L45S08 | 8 | 8 | 45 | 8 | 2 | ● | 2 |
| D1000L45S07 | 10 | 10 | 45 | 7 | 2 | ● | 3 |
| D1000L45S10 | 10 | 10 | 45 | 10 | 2 | ● | 2 |
| D1200L45S10 | 12 | 12 | 45 | 10 | 2 | ● | 3 |

General Use

SQUARE
Long Neck

High Helix

For Small Automatic Lathe

BALL
Long Neck

Taper Neck

RADIUS
Long Neck

General Use

TAPER
Ball

For Rib Processing

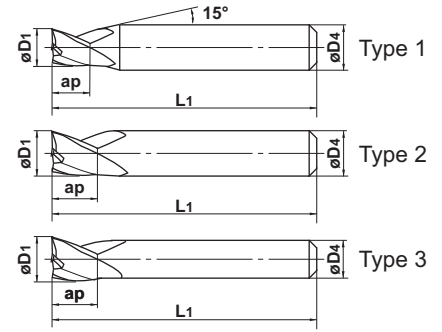
MSTAR END MILLS

MS3ES

End mill, 3 flute, For small automatic lathes



● 3 flute end mill.



Overall length 35mm

Unit : mm

| Order Number | Dia. | Length of Cut | Overall Length | Shank Dia. | No. of Flutes | Stock | Type |
|------------------|------|---------------|----------------|------------|---------------|-------|------|
| | D1 | ap | L1 | D4 | N | | |
| MS3ESD0300L35S04 | 3 | 3 | 35 | 4 | 3 | ● | 1 |
| D0350L35S04 | 3.5 | 3.5 | 35 | 4 | 3 | ● | 1 |
| D0400L35S04 | 4 | 4 | 35 | 4 | 3 | ● | 2 |
| D0500L35S05 | 5 | 5 | 35 | 5 | 3 | ● | 2 |
| D0500L35S06 | 5 | 5 | 35 | 6 | 3 | ● | 1 |
| D0600L35S05 | 6 | 6 | 35 | 5 | 3 | ● | 3 |
| D0600L35S06 | 6 | 6 | 35 | 6 | 3 | ● | 2 |
| D0700L35S07 | 7 | 6 | 35 | 7 | 3 | ● | 2 |
| D0800L35S07 | 8 | 6 | 35 | 7 | 3 | ● | 3 |
| D0800L35S08 | 8 | 6 | 35 | 8 | 3 | ● | 2 |
| D1000L35S07 | 10 | 6 | 35 | 7 | 3 | ● | 3 |
| D1000L35S10 | 10 | 6 | 35 | 10 | 3 | ● | 2 |
| D1200L35S10 | 12 | 6 | 35 | 10 | 3 | ● | 3 |

Overall length 45mm

Unit : mm

| Order Number | Dia. | Length of Cut | Overall Length | Shank Dia. | No. of Flutes | Stock | Type |
|------------------|------|---------------|----------------|------------|---------------|-------|------|
| | D1 | ap | L1 | D4 | N | | |
| MS3ESD0300L45S04 | 3 | 3 | 45 | 4 | 3 | ● | 1 |
| D0350L45S04 | 3.5 | 3.5 | 45 | 4 | 3 | ● | 1 |
| D0400L45S04 | 4 | 4 | 45 | 4 | 3 | ● | 2 |
| D0500L45S06 | 5 | 5 | 45 | 6 | 3 | ● | 1 |
| D0600L45S06 | 6 | 6 | 45 | 6 | 3 | ● | 2 |
| D0700L45S07 | 7 | 7 | 45 | 7 | 3 | ● | 2 |
| D0800L45S07 | 8 | 8 | 45 | 7 | 3 | ● | 3 |
| D0800L45S08 | 8 | 8 | 45 | 8 | 3 | ● | 2 |
| D1000L45S07 | 10 | 10 | 45 | 7 | 3 | ● | 3 |
| D1000L45S10 | 10 | 10 | 45 | 10 | 3 | ● | 2 |
| D1200L45S10 | 12 | 12 | 45 | 10 | 3 | ● | 3 |

General Use

Long Neck

High Helix

For Small Automatic Lathe

Taper Long Neck

General Use

High Helix

For Rib Processing

SQUARE

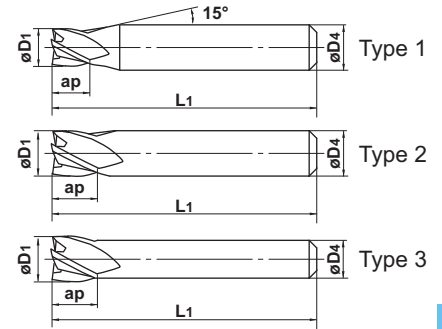
BALL

RADIUS

TAPER



● 4 flute end mill.



Overall length 35mm

Unit : mm

| Order Number | Dia. | Length of Cut | Overall Length | Shank Dia. | No. of Flutes | Stock | Type |
|------------------|------|---------------|----------------|------------|---------------|-------|------|
| | D1 | ap | L1 | D4 | N | | |
| MS4ECD0300L35S04 | 3 | 3 | 35 | 4 | 4 | ● | 1 |
| D0350L35S04 | 3.5 | 3.5 | 35 | 4 | 4 | ● | 1 |
| D0400L35S04 | 4 | 4 | 35 | 4 | 4 | ● | 2 |
| D0500L35S05 | 5 | 5 | 35 | 5 | 4 | ● | 2 |
| D0500L35S06 | 5 | 5 | 35 | 6 | 4 | ● | 1 |
| D0600L35S05 | 6 | 6 | 35 | 5 | 4 | ● | 3 |
| D0600L35S06 | 6 | 6 | 35 | 6 | 4 | ● | 2 |
| D0700L35S07 | 7 | 6 | 35 | 7 | 4 | ● | 2 |
| D0800L35S07 | 8 | 6 | 35 | 7 | 4 | ● | 3 |
| D0800L35S08 | 8 | 6 | 35 | 8 | 4 | ● | 2 |
| D1000L35S07 | 10 | 6 | 35 | 7 | 4 | ● | 3 |
| D1000L35S10 | 10 | 6 | 35 | 10 | 4 | ● | 2 |
| D1200L35S10 | 12 | 6 | 35 | 10 | 4 | ● | 3 |

Overall length 45mm

Unit : mm

| Order Number | Dia. | Length of Cut | Overall Length | Shank Dia. | No. of Flutes | Stock | Type |
|------------------|------|---------------|----------------|------------|---------------|-------|------|
| | D1 | ap | L1 | D4 | N | | |
| MS4ECD0300L45S04 | 3 | 3 | 45 | 4 | 4 | ● | 1 |
| D0350L45S04 | 3.5 | 3.5 | 45 | 4 | 4 | ● | 1 |
| D0400L45S04 | 4 | 4 | 45 | 4 | 4 | ● | 2 |
| D0500L45S06 | 5 | 5 | 45 | 6 | 4 | ● | 1 |
| D0600L45S06 | 6 | 6 | 45 | 6 | 4 | ● | 2 |
| D0700L45S07 | 7 | 7 | 45 | 7 | 4 | ● | 2 |
| D0800L45S07 | 8 | 8 | 45 | 7 | 4 | ● | 3 |
| D0800L45S08 | 8 | 8 | 45 | 8 | 4 | ● | 2 |
| D1000L45S07 | 10 | 10 | 45 | 7 | 4 | ● | 3 |
| D1000L45S10 | 10 | 10 | 45 | 10 | 4 | ● | 2 |
| D1200L45S10 | 12 | 12 | 45 | 10 | 4 | ● | 3 |
| D1400L45S10 | 14 | 14 | 45 | 10 | 4 | ● | 3 |

General Use

SQUARE
Long Neck

High Helix

For Small Automatic Lathe

BALL
Long Neck

Taper Neck

RADIUS
General Use

High Helix

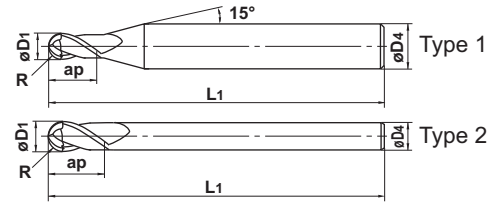
TAPER
Ball

For Rib Processing

MSTAR END MILLS

MS2SB

Ball nose end mill, Short cut length, 2 flute

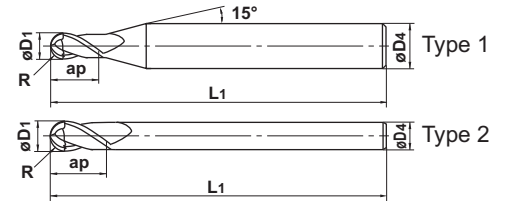


● 2 flute ball nose end mill for general use.

Unit : mm

| Order Number | Radius of Ball Nose R | Dia. D1 | Length of Cut ap | Overall Length L1 | Shank Dia. D4 | No. of Flutes N | Stock | Type |
|---------------|--------------------------|------------|---------------------|----------------------|------------------|--------------------|-------|------|
| MS2SBR0010S04 | 0.1 | 0.2 | 0.3 | 45 | 4 | 2 | ● | 1 |
| R0010S06 | 0.1 | 0.2 | 0.3 | 50 | 6 | 2 | ● | 1 |
| R0015S04 | 0.15 | 0.3 | 0.5 | 45 | 4 | 2 | ● | 1 |
| R0015S06 | 0.15 | 0.3 | 0.5 | 50 | 6 | 2 | ● | 1 |
| R0020S04 | 0.2 | 0.4 | 0.6 | 45 | 4 | 2 | ● | 1 |
| R0020S06 | 0.2 | 0.4 | 0.6 | 50 | 6 | 2 | ● | 1 |
| R0025S04 | 0.25 | 0.5 | 0.8 | 45 | 4 | 2 | ● | 1 |
| R0025S06 | 0.25 | 0.5 | 0.8 | 50 | 6 | 2 | ● | 1 |
| R0030S04 | 0.3 | 0.6 | 0.9 | 45 | 4 | 2 | ● | 1 |
| R0030S06 | 0.3 | 0.6 | 0.9 | 50 | 6 | 2 | ● | 1 |
| R0035S04 | 0.35 | 0.7 | 1.1 | 45 | 4 | 2 | ● | 1 |
| R0040S04 | 0.4 | 0.8 | 1.2 | 45 | 4 | 2 | ● | 1 |
| R0040S06 | 0.4 | 0.8 | 1.2 | 50 | 6 | 2 | ● | 1 |
| R0045S04 | 0.45 | 0.9 | 1.4 | 45 | 4 | 2 | ● | 1 |
| R0050S04 | 0.5 | 1 | 1.5 | 45 | 4 | 2 | ● | 1 |
| R0050S06 | 0.5 | 1 | 1.5 | 50 | 6 | 2 | ● | 1 |
| R0060S04 | 0.6 | 1.2 | 1.8 | 45 | 4 | 2 | ● | 1 |
| R0060S06 | 0.6 | 1.2 | 1.8 | 50 | 6 | 2 | ● | 1 |
| R0070S04 | 0.7 | 1.4 | 2.1 | 45 | 4 | 2 | ● | 1 |
| R0070S06 | 0.7 | 1.4 | 2.1 | 50 | 6 | 2 | ● | 1 |
| R0075S04 | 0.75 | 1.5 | 2.3 | 45 | 4 | 2 | ● | 1 |
| R0075S06 | 0.75 | 1.5 | 2.3 | 50 | 6 | 2 | ● | 1 |
| R0080S04 | 0.8 | 1.6 | 2.4 | 45 | 4 | 2 | ● | 1 |
| R0080S06 | 0.8 | 1.6 | 2.4 | 50 | 6 | 2 | ● | 1 |
| R0090S04 | 0.9 | 1.8 | 2.7 | 45 | 4 | 2 | ● | 1 |
| R0090S06 | 0.9 | 1.8 | 2.7 | 50 | 6 | 2 | ● | 1 |
| R0100S04 | 1 | 2 | 3 | 50 | 4 | 2 | ● | 1 |
| R0100S06 | 1 | 2 | 3 | 50 | 6 | 2 | ● | 1 |
| R0125S04 | 1.25 | 2.5 | 3.8 | 50 | 4 | 2 | ● | 1 |
| R0125S06 | 1.25 | 2.5 | 3.8 | 50 | 6 | 2 | ● | 1 |
| R0150S06 | 1.5 | 3 | 4.5 | 70 | 6 | 2 | ● | 1 |
| R0200S06 | 2 | 4 | 6 | 70 | 6 | 2 | ● | 1 |
| R0250S06 | 2.5 | 5 | 7.5 | 80 | 6 | 2 | ● | 1 |
| R0300S06 | 3 | 6 | 9 | 80 | 6 | 2 | ● | 2 |
| R0400S08 | 4 | 8 | 12 | 90 | 8 | 2 | ● | 2 |
| R0500S10 | 5 | 10 | 15 | 100 | 10 | 2 | ● | 2 |
| R0600S12 | 6 | 12 | 18 | 110 | 12 | 2 | ● | 2 |

The diameter tolerance is only applied to items produced after July 2006.



● 2 flute ball nose end mill for general use.

Unit : mm

| Order Number | Radius of Ball Nose R | Dia. D1 | Length of Cut ap | Overall Length L1 | Shank Dia. D4 | No. of Flutes N | Stock | Type |
|--------------|--------------------------|------------|---------------------|----------------------|------------------|--------------------|-------|------|
| MS2MBR0025 | 0.25 | 0.5 | 1 | 45 | 4 | 2 | ● | 1 |
| R0030 | 0.3 | 0.6 | 1.2 | 45 | 4 | 2 | ● | 1 |
| R0040 | 0.4 | 0.8 | 1.6 | 45 | 4 | 2 | ● | 1 |
| R0050 | 0.5 | 1 | 2.5 | 45 | 4 | 2 | ● | 1 |
| R0060 | 0.6 | 1.2 | 2.5 | 45 | 4 | 2 | ● | 1 |
| R0070 | 0.7 | 1.4 | 3 | 45 | 4 | 2 | ● | 1 |
| R0075 | 0.75 | 1.5 | 4 | 45 | 4 | 2 | ● | 1 |
| R0080 | 0.8 | 1.6 | 4 | 45 | 4 | 2 | ● | 1 |
| R0090 | 0.9 | 1.8 | 5 | 45 | 4 | 2 | ● | 1 |
| R0100 | 1 | 2 | 6 | 50 | 4 | 2 | ● | 1 |
| R0125 | 1.25 | 2.5 | 6 | 50 | 4 | 2 | ● | 1 |
| R0150S03 | 1.5 | 3 | 8 | 70 | 3 | 2 | ● | 2 |
| R0150 | 1.5 | 3 | 8 | 70 | 6 | 2 | ● | 1 |
| R0175 | 1.75 | 3.5 | 8 | 70 | 6 | 2 | ● | 1 |
| R0200S04 | 2 | 4 | 8 | 70 | 4 | 2 | ● | 2 |
| R0200 | 2 | 4 | 8 | 70 | 6 | 2 | ● | 1 |
| R0250 | 2.5 | 5 | 12 | 80 | 6 | 2 | ● | 1 |
| R0300 | 3 | 6 | 12 | 80 | 6 | 2 | ● | 2 |
| R0400 | 4 | 8 | 14 | 90 | 8 | 2 | ● | 2 |
| R0500 | 5 | 10 | 18 | 100 | 10 | 2 | ● | 2 |
| R0600 | 6 | 12 | 22 | 110 | 12 | 2 | ● | 2 |

The diameter tolerance is only applied to items produced after July 2006.

General Use

SQUARE
Long Neck

High Helix

For Small Automatic Lathe

BALL
General Use

Taper Long Neck

RADIUS
Long Neck

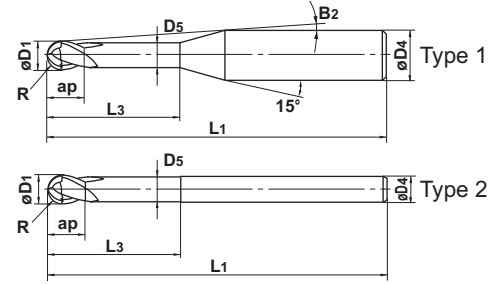
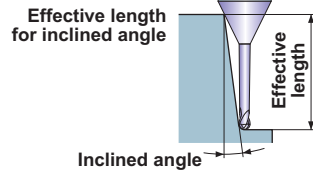
General Use

TAPER
Ball Processing

MSTAR END MILLS

MS2XLB

Ball nose end mill, Short cut length, 2 flute, Long neck



● 2 flute long neck ball nose end mill.

Unit : mm

| Order Number | Radius of Ball Nose | Dia. | Length of Cut | Neck Length | Neck Dia. | Cutting Edge to Shank Angle | Overall Length | Shank Dia. | No. of Flutes | Stock | Type | Effective length for inclined angle | | | |
|------------------|---------------------|------|---------------|-------------|-----------|-----------------------------|----------------|------------|---------------|-------|------|-------------------------------------|-----|-----|-----|
| | R | D1 | ap | L3 | D5 | B2 | L1 | D4 | N | | | 30° | 1° | 2° | 3° |
| MS2XLB R0010N005 | 0.1 | 0.2 | 0.2 | 0.5 | 0.17 | 13.7° | 50 | 4 | 2 | ● | 1 | 0.7 | 0.8 | 0.9 | 0.9 |
| R0010N005S06 | 0.1 | 0.2 | 0.2 | 0.5 | 0.17 | 14.1° | 50 | 6 | 2 | ● | 1 | 0.7 | 0.8 | 0.9 | 0.9 |
| R0010N008S06 | 0.1 | 0.2 | 0.2 | 0.8 | 0.17 | 13.8° | 50 | 6 | 2 | ● | 1 | 1.1 | 1.1 | 1.2 | 1.3 |
| R0010N010 | 0.1 | 0.2 | 0.2 | 1 | 0.17 | 12.9° | 50 | 4 | 2 | ● | 1 | 1.3 | 1.3 | 1.5 | 1.6 |
| R0010N010S06 | 0.1 | 0.2 | 0.2 | 1 | 0.17 | 13.6° | 50 | 6 | 2 | ● | 1 | 1.3 | 1.3 | 1.5 | 1.6 |
| R0010N013 | 0.1 | 0.2 | 0.2 | 1.25 | 0.17 | 12.5° | 50 | 4 | 2 | ● | 1 | 1.5 | 1.6 | 1.7 | 1.9 |
| R0010N013S06 | 0.1 | 0.2 | 0.2 | 1.25 | 0.17 | 13.3° | 50 | 6 | 2 | ● | 1 | 1.5 | 1.6 | 1.7 | 1.9 |
| R0010N015 | 0.1 | 0.2 | 0.2 | 1.5 | 0.17 | 12.2° | 50 | 4 | 2 | ● | 1 | 1.8 | 1.9 | 2 | 2.2 |
| R0010N015S06 | 0.1 | 0.2 | 0.2 | 1.5 | 0.17 | 13.1° | 50 | 6 | 2 | ● | 1 | 1.8 | 1.9 | 2 | 2.2 |
| R0010N018 | 0.1 | 0.2 | 0.2 | 1.75 | 0.17 | 11.9° | 50 | 4 | 2 | ● | 1 | 2.1 | 2.2 | 2.3 | 2.5 |
| R0010N018S06 | 0.1 | 0.2 | 0.2 | 1.75 | 0.17 | 12.8° | 50 | 6 | 2 | ● | 1 | 2.1 | 2.2 | 2.3 | 2.5 |
| R0010N020 | 0.1 | 0.2 | 0.2 | 2 | 0.17 | 11.6° | 50 | 4 | 2 | ● | 1 | 2.3 | 2.4 | 2.6 | 2.8 |
| R0010N020S06 | 0.1 | 0.2 | 0.2 | 2 | 0.17 | 12.6° | 50 | 6 | 2 | ● | 1 | 2.3 | 2.4 | 2.6 | 2.8 |
| R0010N025 | 0.1 | 0.2 | 0.2 | 2.5 | 0.17 | 11° | 50 | 4 | 2 | ● | 1 | 2.8 | 3 | 3.2 | 3.4 |
| R0010N030 | 0.1 | 0.2 | 0.2 | 3 | 0.17 | 10.5° | 50 | 4 | 2 | ● | 1 | 3.4 | 3.5 | 3.8 | 4.1 |
| R0015N008S06 | 0.15 | 0.3 | 0.3 | 0.8 | 0.27 | 13.8° | 50 | 6 | 2 | ● | 1 | 1.1 | 1.1 | 1.2 | 1.3 |
| R0015N010 | 0.15 | 0.3 | 0.3 | 1 | 0.27 | 12.9° | 50 | 4 | 2 | ● | 1 | 1.3 | 1.3 | 1.4 | 1.6 |
| R0015N010S06 | 0.15 | 0.3 | 0.3 | 1 | 0.27 | 13.6° | 50 | 6 | 2 | ● | 1 | 1.3 | 1.3 | 1.4 | 1.6 |
| R0015N012S06 | 0.15 | 0.3 | 0.3 | 1.2 | 0.27 | 13.4° | 50 | 6 | 2 | ● | 1 | 1.5 | 1.5 | 1.7 | 1.8 |
| R0015N015 | 0.15 | 0.3 | 0.3 | 1.5 | 0.27 | 12.2° | 50 | 4 | 2 | ● | 1 | 1.8 | 1.9 | 2 | 2.2 |
| R0015N015S06 | 0.15 | 0.3 | 0.3 | 1.5 | 0.27 | 13.1° | 50 | 6 | 2 | ● | 1 | 1.8 | 1.9 | 2 | 2.2 |
| R0015N020 | 0.15 | 0.3 | 0.3 | 2 | 0.27 | 11.5° | 50 | 4 | 2 | ● | 1 | 2.3 | 2.4 | 2.6 | 2.8 |
| R0015N020S06 | 0.15 | 0.3 | 0.3 | 2 | 0.27 | 12.6° | 50 | 6 | 2 | ● | 1 | 2.3 | 2.4 | 2.6 | 2.8 |
| R0015N025 | 0.15 | 0.3 | 0.3 | 2.5 | 0.27 | 11° | 50 | 4 | 2 | ● | 1 | 2.8 | 3 | 3.2 | 3.4 |
| R0015N030 | 0.15 | 0.3 | 0.3 | 3 | 0.27 | 10.4° | 50 | 4 | 2 | ● | 1 | 3.4 | 3.5 | 3.7 | 4 |
| R0015N040 | 0.15 | 0.3 | 0.3 | 4 | 0.27 | 9.5° | 50 | 4 | 2 | ● | 1 | 4.4 | 4.6 | 4.9 | 5.3 |
| R0020N010 | 0.2 | 0.4 | 0.4 | 1 | 0.36 | 12.9° | 50 | 4 | 2 | ● | 1 | 1.3 | 1.4 | 1.5 | 1.6 |
| R0020N010S06 | 0.2 | 0.4 | 0.4 | 1 | 0.36 | 13.6° | 50 | 6 | 2 | ● | 1 | 1.3 | 1.4 | 1.5 | 1.6 |
| R0020N012S06 | 0.2 | 0.4 | 0.4 | 1.2 | 0.36 | 13.4° | 50 | 6 | 2 | ● | 1 | 1.5 | 1.6 | 1.7 | 1.8 |
| R0020N015 | 0.2 | 0.4 | 0.4 | 1.5 | 0.36 | 12.2° | 50 | 4 | 2 | ● | 1 | 1.8 | 1.9 | 2 | 2.2 |
| R0020N015S06 | 0.2 | 0.4 | 0.4 | 1.5 | 0.36 | 13.1° | 50 | 6 | 2 | ● | 1 | 1.8 | 1.9 | 2 | 2.2 |
| R0020N020 | 0.2 | 0.4 | 0.4 | 2 | 0.36 | 11.5° | 50 | 4 | 2 | ● | 1 | 2.3 | 2.4 | 2.6 | 2.8 |
| R0020N020S06 | 0.2 | 0.4 | 0.4 | 2 | 0.36 | 12.6° | 50 | 6 | 2 | ● | 1 | 2.3 | 2.4 | 2.6 | 2.8 |
| R0020N025 | 0.2 | 0.4 | 0.4 | 2.5 | 0.36 | 10.9° | 50 | 4 | 2 | ● | 1 | 2.9 | 3 | 3.2 | 3.4 |
| R0020N025S06 | 0.2 | 0.4 | 0.4 | 2.5 | 0.36 | 12.1° | 50 | 6 | 2 | ● | 1 | 2.9 | 3 | 3.2 | 3.4 |
| R0020N030 | 0.2 | 0.4 | 0.4 | 3 | 0.36 | 10.4° | 50 | 4 | 2 | ● | 1 | 3.4 | 3.5 | 3.8 | 4.1 |
| R0020N030S06 | 0.2 | 0.4 | 0.4 | 3 | 0.36 | 11.7° | 50 | 6 | 2 | ● | 1 | 3.4 | 3.5 | 3.8 | 4.1 |
| R0020N035 | 0.2 | 0.4 | 0.4 | 3.5 | 0.36 | 9.9° | 50 | 4 | 2 | ● | 1 | 3.9 | 4 | 4.3 | 4.7 |

● : Inventory maintained.

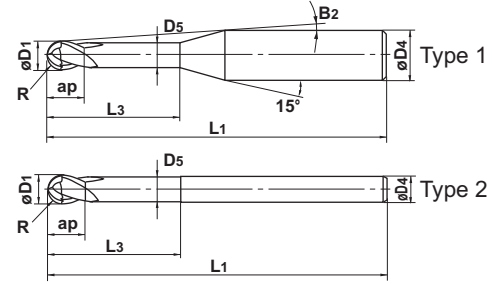
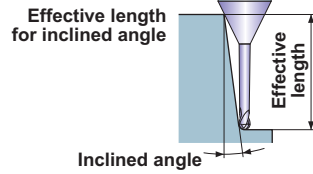
| Order Number | Radius of Ball Nose | Dia. | Length of Cut | Neck Length | Neck Dia. | Cutting Edge to Shank Angle | Overall Length | Shank Dia. | No. of Flutes | Stock | Type | Effective length for inclined angle | | | |
|------------------------|---------------------|------|---------------|-------------|-----------|-----------------------------|----------------|------------|---------------|-------|------|-------------------------------------|-----|------|------|
| | R | D1 | ap | L3 | D5 | B2 | L1 | D4 | N | | | 30° | 1° | 2° | 3° |
| MS2XLBR0020N040 | 0.2 | 0.4 | 0.4 | 4 | 0.36 | 9.5° | 50 | 4 | 2 | ● | 1 | 4.4 | 4.6 | 4.9 | 5.3 |
| R0020N045 | 0.2 | 0.4 | 0.4 | 4.5 | 0.36 | 9° | 50 | 4 | 2 | ● | 1 | 4.9 | 5.1 | 5.5 | 5.9 |
| R0020N050 | 0.2 | 0.4 | 0.4 | 5 | 0.36 | 8.7° | 50 | 4 | 2 | ● | 1 | 5.5 | 5.6 | 6.1 | 6.5 |
| R0020N055 | 0.2 | 0.4 | 0.4 | 5.5 | 0.36 | 8.3° | 50 | 4 | 2 | ● | 1 | 6 | 6.2 | 6.6 | 7.2 |
| R0020N060 | 0.2 | 0.4 | 0.4 | 6 | 0.36 | 8° | 50 | 4 | 2 | ● | 1 | 6.5 | 6.7 | 7.2 | 7.8 |
| R0025N015 | 0.25 | 0.5 | 0.5 | 1.5 | 0.46 | 12.2° | 50 | 4 | 2 | ● | 1 | 1.8 | 1.9 | 2 | 2.2 |
| R0025N015S06 | 0.25 | 0.5 | 0.5 | 1.5 | 0.46 | 13.1° | 50 | 6 | 2 | ● | 1 | 1.8 | 1.9 | 2 | 2.2 |
| R0025N020 | 0.25 | 0.5 | 0.5 | 2 | 0.46 | 11.5° | 50 | 4 | 2 | ● | 1 | 2.3 | 2.4 | 2.6 | 2.8 |
| R0025N020S06 | 0.25 | 0.5 | 0.5 | 2 | 0.46 | 12.6° | 50 | 6 | 2 | ● | 1 | 2.3 | 2.4 | 2.6 | 2.8 |
| R0025N025 | 0.25 | 0.5 | 0.5 | 2.5 | 0.46 | 10.9° | 50 | 4 | 2 | ● | 1 | 2.9 | 3 | 3.2 | 3.4 |
| R0025N025S06 | 0.25 | 0.5 | 0.5 | 2.5 | 0.46 | 12.1° | 50 | 6 | 2 | ● | 1 | 2.9 | 3 | 3.2 | 3.4 |
| R0025N030 | 0.25 | 0.5 | 0.5 | 3 | 0.46 | 10.3° | 50 | 4 | 2 | ● | 1 | 3.4 | 3.5 | 3.8 | 4 |
| R0025N030S06 | 0.25 | 0.5 | 0.5 | 3 | 0.46 | 11.7° | 50 | 6 | 2 | ● | 1 | 3.4 | 3.5 | 3.8 | 4 |
| R0025N035 | 0.25 | 0.5 | 0.5 | 3.5 | 0.46 | 9.8° | 50 | 4 | 2 | ● | 1 | 3.9 | 4 | 4.3 | 4.7 |
| R0025N035S06 | 0.25 | 0.5 | 0.5 | 3.5 | 0.46 | 11.3° | 50 | 6 | 2 | ● | 1 | 3.9 | 4 | 4.3 | 4.7 |
| R0025N040 | 0.25 | 0.5 | 0.5 | 4 | 0.46 | 9.4° | 50 | 4 | 2 | ● | 1 | 4.4 | 4.6 | 4.9 | 5.3 |
| R0025N040S06 | 0.25 | 0.5 | 0.5 | 4 | 0.46 | 10.9° | 50 | 6 | 2 | ● | 1 | 4.4 | 4.6 | 4.9 | 5.3 |
| R0025N045 | 0.25 | 0.5 | 0.5 | 4.5 | 0.46 | 9° | 50 | 4 | 2 | ● | 1 | 4.9 | 5.1 | 5.5 | 5.9 |
| R0025N045S06 | 0.25 | 0.5 | 0.5 | 4.5 | 0.46 | 10.5° | 50 | 6 | 2 | ● | 1 | 4.9 | 5.1 | 5.5 | 5.9 |
| R0025N050 | 0.25 | 0.5 | 0.5 | 5 | 0.46 | 8.6° | 50 | 4 | 2 | ● | 1 | 5.5 | 5.6 | 6.1 | 6.5 |
| R0025N050S06 | 0.25 | 0.5 | 0.5 | 5 | 0.46 | 10.2° | 50 | 6 | 2 | ● | 1 | 5.5 | 5.6 | 6.1 | 6.5 |
| R0025N055 | 0.25 | 0.5 | 0.5 | 5.5 | 0.46 | 8.3° | 50 | 4 | 2 | ● | 1 | 6 | 6.2 | 6.6 | 7.1 |
| R0025N055S06 | 0.25 | 0.5 | 0.5 | 5.5 | 0.46 | 9.9° | 50 | 6 | 2 | ● | 1 | 6 | 6.2 | 6.6 | 7.1 |
| R0025N060 | 0.25 | 0.5 | 0.5 | 6 | 0.46 | 7.9° | 50 | 4 | 2 | ● | 1 | 6.5 | 6.7 | 7.2 | 7.8 |
| R0025N060S06 | 0.25 | 0.5 | 0.5 | 6 | 0.46 | 9.6° | 50 | 6 | 2 | ● | 1 | 6.5 | 6.7 | 7.2 | 7.8 |
| R0025N070 | 0.25 | 0.5 | 0.5 | 7 | 0.46 | 7.4° | 50 | 4 | 2 | ● | 1 | 7.5 | 7.8 | 8.4 | 9 |
| R0025N070S06 | 0.25 | 0.5 | 0.5 | 7 | 0.46 | 9° | 50 | 6 | 2 | ● | 1 | 7.5 | 7.8 | 8.4 | 9 |
| R0025N080 | 0.25 | 0.5 | 0.5 | 8 | 0.46 | 6.9° | 50 | 4 | 2 | ● | 1 | 8.6 | 8.9 | 9.5 | 10.3 |
| R0025N080S06 | 0.25 | 0.5 | 0.5 | 8 | 0.46 | 8.6° | 50 | 6 | 2 | ● | 1 | 8.6 | 8.9 | 9.5 | 10.3 |
| R0025N100 | 0.25 | 0.5 | 0.5 | 10 | 0.46 | 6.1° | 50 | 4 | 2 | ● | 1 | 10.6 | 11 | 11.8 | 12.7 |
| R0025N100S06 | 0.25 | 0.5 | 0.5 | 10 | 0.46 | 7.7° | 50 | 6 | 2 | ● | 1 | 10.6 | 11 | 11.8 | 12.7 |
| R0030N018S06 | 0.3 | 0.6 | 0.6 | 1.8 | 0.56 | 12.8° | 50 | 6 | 2 | ● | 1 | 2.1 | 2.2 | 2.4 | 2.5 |
| R0030N020 | 0.3 | 0.6 | 0.6 | 2 | 0.56 | 11.5° | 50 | 4 | 2 | ● | 1 | 2.3 | 2.4 | 2.6 | 2.8 |
| R0030N020S06 | 0.3 | 0.6 | 0.6 | 2 | 0.56 | 12.6° | 50 | 6 | 2 | ● | 1 | 2.3 | 2.4 | 2.6 | 2.8 |
| R0030N025 | 0.3 | 0.6 | 0.6 | 2.5 | 0.56 | 10.9° | 50 | 4 | 2 | ● | 1 | 2.9 | 3 | 3.2 | 3.4 |
| R0030N025S06 | 0.3 | 0.6 | 0.6 | 2.5 | 0.56 | 12.1° | 50 | 6 | 2 | ● | 1 | 2.9 | 3 | 3.2 | 3.4 |
| R0030N030 | 0.3 | 0.6 | 0.6 | 3 | 0.56 | 10.3° | 50 | 4 | 2 | ● | 1 | 3.4 | 3.5 | 3.7 | 4 |
| R0030N030S06 | 0.3 | 0.6 | 0.6 | 3 | 0.56 | 11.7° | 50 | 6 | 2 | ● | 1 | 3.4 | 3.5 | 3.7 | 4 |
| R0030N035 | 0.3 | 0.6 | 0.6 | 3.5 | 0.56 | 9.8° | 50 | 4 | 2 | ● | 1 | 3.9 | 4 | 4.3 | 4.7 |
| R0030N035S06 | 0.3 | 0.6 | 0.6 | 3.5 | 0.56 | 11.2° | 50 | 6 | 2 | ● | 1 | 3.9 | 4 | 4.3 | 4.7 |
| R0030N040 | 0.3 | 0.6 | 0.6 | 4 | 0.56 | 9.3° | 50 | 4 | 2 | ● | 1 | 4.4 | 4.6 | 4.9 | 5.3 |
| R0030N040S06 | 0.3 | 0.6 | 0.6 | 4 | 0.56 | 10.9° | 50 | 6 | 2 | ● | 1 | 4.4 | 4.6 | 4.9 | 5.3 |
| R0030N045 | 0.3 | 0.6 | 0.6 | 4.5 | 0.56 | 8.9° | 50 | 4 | 2 | ● | 1 | 4.9 | 5.1 | 5.5 | 5.9 |
| R0030N045S06 | 0.3 | 0.6 | 0.6 | 4.5 | 0.56 | 10.5° | 50 | 6 | 2 | ● | 1 | 4.9 | 5.1 | 5.5 | 5.9 |
| R0030N050 | 0.3 | 0.6 | 0.6 | 5 | 0.56 | 8.5° | 50 | 4 | 2 | ● | 1 | 5.5 | 5.6 | 6 | 6.5 |
| R0030N050S06 | 0.3 | 0.6 | 0.6 | 5 | 0.56 | 10.2° | 50 | 6 | 2 | ● | 1 | 5.5 | 5.6 | 6 | 6.5 |
| R0030N060 | 0.3 | 0.6 | 0.6 | 6 | 0.56 | 7.9° | 50 | 4 | 2 | ● | 1 | 6.5 | 6.7 | 7.2 | 7.8 |
| R0030N060S06 | 0.3 | 0.6 | 0.6 | 6 | 0.56 | 9.5° | 50 | 6 | 2 | ● | 1 | 6.5 | 6.7 | 7.2 | 7.8 |

SQUARE
 Long Neck
 High Helix
 For Small Automatic Lathe
BALL
 Taper Long Neck
 General Use
RADIUS
 High Helix
 General Use
TAPER
 Ball Processing

MSTAR END MILLS

MS2XLB

Ball nose end mill, Short cut length, 2 flute, Long neck



● 2 flute long neck ball nose end mill.

Unit : mm

| Order Number | Radius of Ball Nose R | Dia. D1 | Length of Cut ap | Neck Length L3 | Neck Dia. D5 | Cutting Edge to Shank Angle B2 | Overall Length L1 | Shank Dia. D4 | No. of Flutes N | Stock | Type | Effective length for inclined angle | | | |
|------------------|--------------------------|------------|---------------------|-------------------|-----------------|-----------------------------------|----------------------|------------------|--------------------|-------|------|-------------------------------------|------|------|------|
| | | | | | | | | | | | | 30° | 1° | 2° | 3° |
| MS2XLB R0030N070 | 0.3 | 0.6 | 0.6 | 7 | 0.56 | 7.3° | 50 | 4 | 2 | ● | 1 | 7.5 | 7.8 | 8.3 | 9 |
| R0030N080 | 0.3 | 0.6 | 0.6 | 8 | 0.56 | 6.8° | 50 | 4 | 2 | ● | 1 | 8.6 | 8.8 | 9.5 | 10.2 |
| R0030N080S06 | 0.3 | 0.6 | 0.6 | 8 | 0.56 | 8.5° | 50 | 6 | 2 | ● | 1 | 8.6 | 8.8 | 9.5 | 10.2 |
| R0030N090 | 0.3 | 0.6 | 0.6 | 9 | 0.56 | 6.3° | 50 | 4 | 2 | ● | 1 | 9.6 | 9.9 | 10.6 | 11.5 |
| R0030N100 | 0.3 | 0.6 | 0.6 | 10 | 0.56 | 6° | 50 | 4 | 2 | ● | 1 | 10.6 | 11 | 11.8 | 12.7 |
| R0030N100S06 | 0.3 | 0.6 | 0.6 | 10 | 0.56 | 7.7° | 50 | 6 | 2 | ● | 1 | 10.6 | 11 | 11.8 | 12.7 |
| R0030N110 | 0.3 | 0.6 | 0.6 | 11 | 0.56 | 5.6° | 50 | 4 | 2 | ● | 1 | 11.7 | 12.1 | 12.9 | 14 |
| R0030N120 | 0.3 | 0.6 | 0.6 | 12 | 0.56 | 5.3° | 50 | 4 | 2 | ● | 1 | 12.7 | 13.1 | 14.1 | 15.2 |
| R0040N020 | 0.4 | 0.8 | 0.8 | 2 | 0.76 | 11.4° | 50 | 4 | 2 | ● | 1 | 2.3 | 2.4 | 2.6 | 2.8 |
| R0040N020S06 | 0.4 | 0.8 | 0.8 | 2 | 0.76 | 12.6° | 50 | 6 | 2 | ● | 1 | 2.3 | 2.4 | 2.6 | 2.8 |
| R0040N024S06 | 0.4 | 0.8 | 0.8 | 2.4 | 0.76 | 12.2° | 50 | 6 | 2 | ● | 1 | 2.8 | 2.9 | 3 | 3.3 |
| R0040N030 | 0.4 | 0.8 | 0.8 | 3 | 0.76 | 10.2° | 50 | 4 | 2 | ● | 1 | 3.4 | 3.5 | 3.7 | 4 |
| R0040N030S06 | 0.4 | 0.8 | 0.8 | 3 | 0.76 | 11.6° | 50 | 6 | 2 | ● | 1 | 3.4 | 3.5 | 3.7 | 4 |
| R0040N040 | 0.4 | 0.8 | 0.8 | 4 | 0.76 | 9.2° | 50 | 4 | 2 | ● | 1 | 4.4 | 4.6 | 4.9 | 5.2 |
| R0040N040S06 | 0.4 | 0.8 | 0.8 | 4 | 0.76 | 10.8° | 50 | 6 | 2 | ● | 1 | 4.4 | 4.6 | 4.9 | 5.2 |
| R0040N050 | 0.4 | 0.8 | 0.8 | 5 | 0.76 | 8.4° | 50 | 4 | 2 | ● | 1 | 5.5 | 5.6 | 6 | 6.5 |
| R0040N060 | 0.4 | 0.8 | 0.8 | 6 | 0.76 | 7.7° | 50 | 4 | 2 | ● | 1 | 6.5 | 6.7 | 7.2 | 7.7 |
| R0040N060S06 | 0.4 | 0.8 | 0.8 | 6 | 0.76 | 9.5° | 50 | 6 | 2 | ● | 1 | 6.5 | 6.7 | 7.2 | 7.7 |
| R0040N070 | 0.4 | 0.8 | 0.8 | 7 | 0.76 | 7.1° | 50 | 4 | 2 | ● | 1 | 7.5 | 7.8 | 8.3 | 9 |
| R0040N080 | 0.4 | 0.8 | 0.8 | 8 | 0.76 | 6.6° | 50 | 4 | 2 | ● | 1 | 8.6 | 8.8 | 9.5 | 10.2 |
| R0040N080S06 | 0.4 | 0.8 | 0.8 | 8 | 0.76 | 8.4° | 50 | 6 | 2 | ● | 1 | 8.6 | 8.8 | 9.5 | 10.2 |
| R0040N100 | 0.4 | 0.8 | 0.8 | 10 | 0.76 | 5.8° | 50 | 4 | 2 | ● | 1 | 10.6 | 11 | 11.8 | 12.7 |
| R0040N100S06 | 0.4 | 0.8 | 0.8 | 10 | 0.76 | 7.6° | 50 | 6 | 2 | ● | 1 | 10.6 | 11 | 11.8 | 12.7 |
| R0040N120 | 0.4 | 0.8 | 0.8 | 12 | 0.76 | 5.2° | 50 | 4 | 2 | ● | 1 | 12.7 | 13.1 | 14.1 | 15.2 |
| R0050N030 | 0.5 | 1 | 1 | 3 | 0.94 | 9.9° | 50 | 4 | 2 | ● | 1 | 3.5 | 3.7 | 3.9 | 4.2 |
| R0050N030S06 | 0.5 | 1 | 1 | 3 | 0.94 | 11.5° | 50 | 6 | 2 | ● | 1 | 3.5 | 3.7 | 3.9 | 4.2 |
| R0050N040 | 0.5 | 1 | 1 | 4 | 0.94 | 8.9° | 50 | 4 | 2 | ● | 1 | 4.6 | 4.7 | 5.1 | 5.4 |
| R0050N040S06 | 0.5 | 1 | 1 | 4 | 0.94 | 10.6° | 50 | 6 | 2 | ● | 1 | 4.6 | 4.7 | 5.1 | 5.4 |
| R0050N050 | 0.5 | 1 | 1 | 5 | 0.94 | 8.1° | 50 | 4 | 2 | ● | 1 | 5.6 | 5.8 | 6.2 | 6.7 |
| R0050N050S06 | 0.5 | 1 | 1 | 5 | 0.94 | 9.9° | 50 | 6 | 2 | ● | 1 | 5.6 | 5.8 | 6.2 | 6.7 |
| R0050N060 | 0.5 | 1 | 1 | 6 | 0.94 | 7.4° | 50 | 4 | 2 | ● | 1 | 6.7 | 6.9 | 7.4 | 7.9 |
| R0050N060S06 | 0.5 | 1 | 1 | 6 | 0.94 | 9.3° | 50 | 6 | 2 | ● | 1 | 6.7 | 6.9 | 7.4 | 7.9 |
| R0050N070 | 0.5 | 1 | 1 | 7 | 0.94 | 6.8° | 50 | 4 | 2 | ● | 1 | 7.7 | 7.9 | 8.5 | 9.2 |
| R0050N080 | 0.5 | 1 | 1 | 8 | 0.94 | 6.3° | 50 | 4 | 2 | ● | 1 | 8.7 | 9 | 9.7 | 10.4 |
| R0050N080S06 | 0.5 | 1 | 1 | 8 | 0.94 | 8.2° | 50 | 6 | 2 | ● | 1 | 8.7 | 9 | 9.7 | 10.4 |
| R0050N090 | 0.5 | 1 | 1 | 9 | 0.94 | 5.9° | 50 | 4 | 2 | ● | 1 | 9.8 | 10.1 | 10.8 | 11.7 |
| R0050N100 | 0.5 | 1 | 1 | 10 | 0.94 | 5.5° | 50 | 4 | 2 | ● | 1 | 10.8 | 11.2 | 12 | 12.9 |
| R0050N100S06 | 0.5 | 1 | 1 | 10 | 0.94 | 7.4° | 50 | 6 | 2 | ● | 1 | 10.8 | 11.2 | 12 | 12.9 |

● : Inventory maintained.

| Order Number | Radius of Ball Nose | Dia. | Length of Cut | Neck Length | Neck Dia. | Cutting Edge to Shank Angle | Overall Length | Shank Dia. | No. of Flutes | Stock | Type | Effective length for inclined angle | | | |
|-----------------|---------------------|------|---------------|-------------|-----------|-----------------------------|----------------|------------|---------------|-------|------|-------------------------------------|------|------|-----------------|
| | R | D1 | ap | L3 | D5 | B2 | L1 | D4 | N | | | 30° | 1° | 2° | 3° |
| MS2XLBR0050N120 | 0.5 | 1 | 1 | 12 | 0.94 | 4.9° | 50 | 4 | 2 | ● | 1 | 12.9 | 13.3 | 14.3 | 15.4 |
| R0050N120S06 | 0.5 | 1 | 1 | 12 | 0.94 | 6.7° | 55 | 6 | 2 | ● | 1 | 12.9 | 13.3 | 14.3 | 15.4 |
| R0050N140 | 0.5 | 1 | 1 | 14 | 0.94 | 4.4° | 50 | 4 | 2 | ● | 1 | 14.9 | 15.4 | 16.6 | 17.9 |
| R0050N160 | 0.5 | 1 | 1 | 16 | 0.94 | 4° | 55 | 4 | 2 | ● | 1 | 17 | 17.6 | 18.9 | 20.4 |
| R0050N160S06 | 0.5 | 1 | 1 | 16 | 0.94 | 5.7° | 60 | 6 | 2 | ● | 1 | 17 | 17.6 | 18.9 | 20.4 |
| R0050N180 | 0.5 | 1 | 1 | 18 | 0.94 | 3.7° | 55 | 4 | 2 | ● | 1 | 19.1 | 19.7 | 21.2 | 22.8 |
| R0050N200 | 0.5 | 1 | 1 | 20 | 0.94 | 3.4° | 55 | 4 | 2 | ● | 1 | 21.1 | 21.9 | 23.5 | 25.3 |
| R0050N200S06 | 0.5 | 1 | 1 | 20 | 0.94 | 4.9° | 60 | 6 | 2 | ● | 1 | 21.1 | 21.9 | 23.5 | 25.3 |
| R0060N036S06 | 0.6 | 1.2 | 1.2 | 3.6 | 1.14 | 10.9° | 50 | 6 | 2 | ● | 1 | 4.2 | 4.3 | 4.6 | 4.9 |
| R0060N060 | 0.6 | 1.2 | 1.2 | 6 | 1.14 | 7.2° | 50 | 4 | 2 | ● | 1 | 6.7 | 6.9 | 7.3 | 7.9 |
| R0060N060S06 | 0.6 | 1.2 | 1.2 | 6 | 1.14 | 9.2° | 50 | 6 | 2 | ● | 1 | 6.7 | 6.9 | 7.3 | 7.9 |
| R0060N080 | 0.6 | 1.2 | 1.2 | 8 | 1.14 | 6.1° | 50 | 4 | 2 | ● | 1 | 8.7 | 9 | 9.6 | 10.4 |
| R0060N080S06 | 0.6 | 1.2 | 1.2 | 8 | 1.14 | 8.1° | 50 | 6 | 2 | ● | 1 | 8.7 | 9 | 9.6 | 10.4 |
| R0060N100 | 0.6 | 1.2 | 1.2 | 10 | 1.14 | 5.3° | 50 | 4 | 2 | ● | 1 | 10.8 | 11.1 | 11.9 | 12.9 |
| R0060N100S06 | 0.6 | 1.2 | 1.2 | 10 | 1.14 | 7.3° | 50 | 6 | 2 | ● | 1 | 10.8 | 11.1 | 11.9 | 12.9 |
| R0060N120 | 0.6 | 1.2 | 1.2 | 12 | 1.14 | 4.7° | 50 | 4 | 2 | ● | 1 | 12.9 | 13.3 | 14.2 | 15.4 |
| R0060N120S06 | 0.6 | 1.2 | 1.2 | 12 | 1.14 | 6.6° | 55 | 6 | 2 | ● | 1 | 12.9 | 13.3 | 14.2 | 15.4 |
| R0060N140 | 0.6 | 1.2 | 1.2 | 14 | 1.14 | 4.2° | 50 | 4 | 2 | ● | 1 | 14.9 | 15.4 | 16.5 | 17.8 |
| R0060N160 | 0.6 | 1.2 | 1.2 | 16 | 1.14 | 3.8° | 55 | 4 | 2 | ● | 1 | 17 | 17.6 | 18.8 | 20.3 |
| R0060N160S06 | 0.6 | 1.2 | 1.2 | 16 | 1.14 | 5.6° | 60 | 6 | 2 | ● | 1 | 17 | 17.6 | 18.8 | 20.3 |
| R0060N180 | 0.6 | 1.2 | 1.2 | 18 | 1.14 | 3.5° | 55 | 4 | 2 | ● | 1 | 19.1 | 19.7 | 21.1 | 22.8 |
| R0060N240 | 0.6 | 1.2 | 1.2 | 24 | 1.14 | 2.8° | 65 | 4 | 2 | ● | 1 | 25.3 | 26.1 | 28 | No interference |
| R0070N080 | 0.7 | 1.4 | 1.4 | 8 | 1.34 | 5.9° | 50 | 4 | 2 | ● | 1 | 8.7 | 9 | 9.6 | 10.4 |
| R0070N120 | 0.7 | 1.4 | 1.4 | 12 | 1.34 | 4.5° | 50 | 4 | 2 | ● | 1 | 12.9 | 13.3 | 14.2 | 15.3 |
| R0070N160 | 0.7 | 1.4 | 1.4 | 16 | 1.34 | 3.6° | 55 | 4 | 2 | ● | 1 | 17 | 17.6 | 18.8 | 20.3 |
| R0075N045S06 | 0.75 | 1.5 | 1.5 | 4.5 | 1.44 | 10.1° | 50 | 6 | 2 | ● | 1 | 5.1 | 5.3 | 5.6 | 6 |
| R0075N060 | 0.75 | 1.5 | 1.5 | 6 | 1.44 | 6.9° | 50 | 4 | 2 | ● | 1 | 6.6 | 6.9 | 7.3 | 7.9 |
| R0075N060S06 | 0.75 | 1.5 | 1.5 | 6 | 1.44 | 9° | 50 | 6 | 2 | ● | 1 | 6.6 | 6.9 | 7.3 | 7.9 |
| R0075N075S06 | 0.75 | 1.5 | 1.5 | 7.5 | 1.44 | 8.2° | 50 | 6 | 2 | ● | 1 | 8.2 | 8.5 | 9 | 9.7 |
| R0075N080 | 0.75 | 1.5 | 1.5 | 8 | 1.44 | 5.8° | 50 | 4 | 2 | ● | 1 | 8.7 | 9 | 9.6 | 10.3 |
| R0075N080S06 | 0.75 | 1.5 | 1.5 | 8 | 1.44 | 8° | 50 | 6 | 2 | ● | 1 | 8.7 | 9 | 9.6 | 10.3 |
| R0075N100 | 0.75 | 1.5 | 1.5 | 10 | 1.44 | 5° | 50 | 4 | 2 | ● | 1 | 10.8 | 11.1 | 11.9 | 12.8 |
| R0075N100S06 | 0.75 | 1.5 | 1.5 | 10 | 1.44 | 7.1° | 50 | 6 | 2 | ● | 1 | 10.8 | 11.1 | 11.9 | 12.8 |
| R0075N120 | 0.75 | 1.5 | 1.5 | 12 | 1.44 | 4.4° | 50 | 4 | 2 | ● | 1 | 12.9 | 13.3 | 14.2 | 15.3 |
| R0075N120S06 | 0.75 | 1.5 | 1.5 | 12 | 1.44 | 6.4° | 55 | 6 | 2 | ● | 1 | 12.9 | 13.3 | 14.2 | 15.3 |
| R0075N140 | 0.75 | 1.5 | 1.5 | 14 | 1.44 | 3.9° | 50 | 4 | 2 | ● | 1 | 14.9 | 15.4 | 16.5 | 17.8 |
| R0075N140S06 | 0.75 | 1.5 | 1.5 | 14 | 1.44 | 5.8° | 55 | 6 | 2 | ● | 1 | 14.9 | 15.4 | 16.5 | 17.8 |
| R0075N160 | 0.75 | 1.5 | 1.5 | 16 | 1.44 | 3.5° | 55 | 4 | 2 | ● | 1 | 17 | 17.6 | 18.8 | 20.3 |
| R0075N160S06 | 0.75 | 1.5 | 1.5 | 16 | 1.44 | 5.4° | 60 | 6 | 2 | ● | 1 | 17 | 17.6 | 18.8 | 20.3 |
| R0075N180 | 0.75 | 1.5 | 1.5 | 18 | 1.44 | 3.2° | 55 | 4 | 2 | ● | 1 | 19.1 | 19.7 | 21.1 | 22.8 |
| R0075N200 | 0.75 | 1.5 | 1.5 | 20 | 1.44 | 3° | 55 | 4 | 2 | ● | 1 | 21.1 | 21.8 | 23.4 | No interference |
| R0075N200S06 | 0.75 | 1.5 | 1.5 | 20 | 1.44 | 4.6° | 60 | 6 | 2 | ● | 1 | 21.1 | 21.8 | 23.4 | 25.3 |
| R0075N220 | 0.75 | 1.5 | 1.5 | 22 | 1.44 | 2.8° | 60 | 4 | 2 | ● | 1 | 23.2 | 24 | 25.7 | No interference |
| R0075N300 | 0.75 | 1.5 | 1.5 | 30 | 1.44 | 2.1° | 70 | 4 | 2 | ● | 1 | 31.5 | 32.5 | 34.9 | No interference |
| R0080N080 | 0.8 | 1.6 | 1.6 | 8 | 1.54 | 5.7° | 50 | 4 | 2 | ● | 1 | 8.7 | 9 | 9.6 | 10.3 |
| R0080N120 | 0.8 | 1.6 | 1.6 | 12 | 1.54 | 4.3° | 50 | 4 | 2 | ● | 1 | 12.9 | 13.3 | 14.2 | 15.3 |
| R0080N160 | 0.8 | 1.6 | 1.6 | 16 | 1.54 | 3.4° | 55 | 4 | 2 | ● | 1 | 17 | 17.6 | 18.8 | 20.3 |
| R0080N200 | 0.8 | 1.6 | 1.6 | 20 | 1.54 | 2.9° | 55 | 4 | 2 | ● | 1 | 21.1 | 21.8 | 23.4 | No interference |

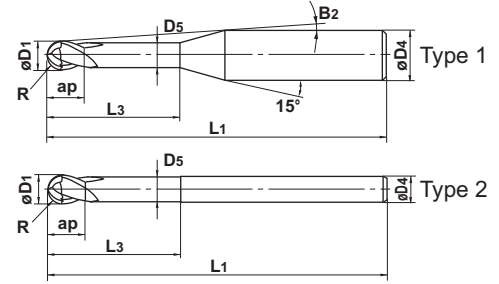
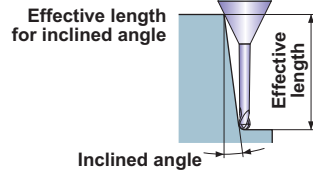
SQUARE
 Long Neck
 High Helix
 For Small Automatic Lathe
 BALL
 Taper Long Neck
 RADIUS
 High Helix Neck
 TAPER
 For Rib Processing

General Use
 Long Neck
 High Helix
 For Small Automatic Lathe
 General Use
 High Helix Neck
 General Use

MSTAR END MILLS

MS2XLB

Ball nose end mill, Short cut length, 2 flute, Long neck



● 2 flute long neck ball nose end mill.

Unit : mm

| Order Number | Radius of Ball Nose R | Dia. D1 | Length of Cut ap | Neck Length L3 | Neck Dia. D5 | Cutting Edge to Shank Angle B2 | Overall Length L1 | Shank Dia. D4 | No. of Flutes N | Stock | Type | Effective length for inclined angle | | | |
|------------------|--------------------------|------------|---------------------|-------------------|-----------------|-----------------------------------|----------------------|------------------|--------------------|-------|------|-------------------------------------|------|-----------------|-----------------|
| | | | | | | | | | | | | 30° | 1° | 2° | 3° |
| MS2XLB R0090N080 | 0.9 | 1.8 | 1.8 | 8 | 1.74 | 5.4° | 50 | 4 | 2 | ● | 1 | 8.7 | 9 | 9.6 | 10.3 |
| R0090N120 | 0.9 | 1.8 | 1.8 | 12 | 1.74 | 4° | 50 | 4 | 2 | ● | 1 | 12.8 | 13.3 | 14.2 | 15.3 |
| R0090N160 | 0.9 | 1.8 | 1.8 | 16 | 1.74 | 3.2° | 55 | 4 | 2 | ● | 1 | 17 | 17.5 | 18.8 | 20.3 |
| R0090N200 | 0.9 | 1.8 | 1.8 | 20 | 1.74 | 2.7° | 55 | 4 | 2 | ● | 1 | 21.1 | 21.8 | 23.4 | No interference |
| R0100N040 | 1 | 2 | 2 | 4 | 1.9 | 7.8° | 50 | 4 | 2 | ● | 1 | 4.6 | 4.8 | 5.1 | 5.4 |
| R0100N040S06 | 1 | 2 | 2 | 4 | 1.9 | 10.2° | 50 | 6 | 2 | ● | 1 | 4.6 | 4.8 | 5.1 | 5.4 |
| R0100N060 | 1 | 2 | 2 | 6 | 1.9 | 6.1° | 50 | 4 | 2 | ● | 1 | 6.7 | 6.9 | 7.4 | 7.9 |
| R0100N060S06 | 1 | 2 | 2 | 6 | 1.9 | 8.7° | 50 | 6 | 2 | ● | 1 | 6.7 | 6.9 | 7.4 | 7.9 |
| R0100N080 | 1 | 2 | 2 | 8 | 1.9 | 5.1° | 50 | 4 | 2 | ● | 1 | 8.8 | 9.1 | 9.7 | 10.4 |
| R0100N080S06 | 1 | 2 | 2 | 8 | 1.9 | 7.6° | 50 | 6 | 2 | ● | 1 | 8.8 | 9.1 | 9.7 | 10.4 |
| R0100N100 | 1 | 2 | 2 | 10 | 1.9 | 4.3° | 50 | 4 | 2 | ● | 1 | 10.9 | 11.2 | 12.0 | 12.9 |
| R0100N100S06 | 1 | 2 | 2 | 10 | 1.9 | 6.7° | 50 | 6 | 2 | ● | 1 | 10.9 | 11.2 | 12.0 | 12.9 |
| R0100N120 | 1 | 2 | 2 | 12 | 1.9 | 3.8° | 50 | 4 | 2 | ● | 1 | 12.9 | 13.3 | 14.3 | 15.4 |
| R0100N120S06 | 1 | 2 | 2 | 12 | 1.9 | 6° | 55 | 6 | 2 | ● | 1 | 12.9 | 13.3 | 14.3 | 15.4 |
| R0100N140 | 1 | 2 | 2 | 14 | 1.9 | 3.4° | 50 | 4 | 2 | ● | 1 | 15 | 15.5 | 16.6 | 17.8 |
| R0100N140S06 | 1 | 2 | 2 | 14 | 1.9 | 5.5° | 55 | 6 | 2 | ● | 1 | 15 | 15.5 | 16.6 | 17.8 |
| R0100N160 | 1 | 2 | 2 | 16 | 1.9 | 3° | 55 | 4 | 2 | ● | 1 | 17.1 | 17.6 | 18.9 | No interference |
| R0100N160S06 | 1 | 2 | 2 | 16 | 1.9 | 5° | 60 | 6 | 2 | ● | 1 | 17.1 | 17.6 | 18.9 | 20.3 |
| R0100N180 | 1 | 2 | 2 | 18 | 1.9 | 2.7° | 55 | 4 | 2 | ● | 1 | 19.1 | 19.8 | 21.2 | No interference |
| R0100N180S06 | 1 | 2 | 2 | 18 | 1.9 | 4.6° | 60 | 6 | 2 | ● | 1 | 19.1 | 19.8 | 21.2 | 22.8 |
| R0100N200 | 1 | 2 | 2 | 20 | 1.9 | 2.5° | 60 | 4 | 2 | ● | 1 | 21.2 | 21.9 | 23.5 | No interference |
| R0100N200S06 | 1 | 2 | 2 | 20 | 1.9 | 4.3° | 60 | 6 | 2 | ● | 1 | 21.2 | 21.9 | 23.5 | 25.3 |
| R0100N220 | 1 | 2 | 2 | 22 | 1.9 | 2.3° | 60 | 4 | 2 | ● | 1 | 23.3 | 24 | 25.8 | No interference |
| R0100N250 | 1 | 2 | 2 | 25 | 1.9 | 2.1° | 65 | 4 | 2 | ● | 1 | 26.4 | 27.2 | 29.3 | No interference |
| R0100N250S06 | 1 | 2 | 2 | 25 | 1.9 | 3.6° | 65 | 6 | 2 | ● | 1 | 26.4 | 27.2 | 29.2 | 31.5 |
| R0100N300 | 1 | 2 | 2 | 30 | 1.9 | 1.8° | 70 | 4 | 2 | ● | 1 | 31.5 | 32.6 | No interference | No interference |
| R0100N300S06 | 1 | 2 | 2 | 30 | 1.9 | 3.1° | 70 | 6 | 2 | ● | 1 | 31.5 | 32.6 | 35.0 | 37.7 |
| R0100N350 | 1 | 2 | 2 | 35 | 1.9 | 1.5° | 70 | 4 | 2 | ● | 1 | 36.7 | 37.9 | No interference | No interference |
| R0100N350S06 | 1 | 2 | 2 | 35 | 1.9 | 2.8° | 80 | 6 | 2 | ● | 1 | 36.7 | 37.9 | 40.7 | No interference |
| R0125N060S06 | 1.25 | 2.5 | 2.5 | 6 | 2.4 | 8.4° | 50 | 6 | 2 | ● | 1 | 6.7 | 6.9 | 7.3 | 7.8 |
| R0125N075S06 | 1.25 | 2.5 | 2.5 | 7.5 | 2.4 | 7.5° | 50 | 6 | 2 | ● | 1 | 8.3 | 8.5 | 9.1 | 9.7 |
| R0125N100S06 | 1.25 | 2.5 | 2.5 | 10 | 2.4 | 6.3° | 50 | 6 | 2 | ● | 1 | 10.8 | 11.2 | 11.9 | 12.8 |
| R0125N125S06 | 1.25 | 2.5 | 2.5 | 12.5 | 2.4 | 5.5° | 50 | 6 | 2 | ● | 1 | 13.4 | 13.9 | 14.8 | 15.9 |
| R0125N160S06 | 1.25 | 2.5 | 2.5 | 16 | 2.4 | 4.6° | 60 | 6 | 2 | ● | 1 | 17 | 17.6 | 18.8 | 20.3 |
| R0125N200S06 | 1.25 | 2.5 | 2.5 | 20 | 2.4 | 3.9° | 60 | 6 | 2 | ● | 1 | 21.2 | 21.9 | 23.4 | 25.2 |
| R0125N250S06 | 1.25 | 2.5 | 2.5 | 25 | 2.4 | 3.3° | 65 | 6 | 2 | ● | 1 | 26.4 | 27.2 | 29.2 | 31.5 |
| R0125N300S06 | 1.25 | 2.5 | 2.5 | 30 | 2.4 | 2.8° | 70 | 6 | 2 | ● | 1 | 31.5 | 32.6 | 34.9 | No interference |
| R0125N350S06 | 1.25 | 2.5 | 2.5 | 35 | 2.4 | 2.5° | 80 | 6 | 2 | ● | 1 | 36.7 | 37.9 | 40.7 | No interference |

● : Inventory maintained.

| Order Number | Radius of Ball Nose | Dia. | Length of Cut | Neck Length | Neck Dia. | Cutting Edge to Shank Angle | Overall Length | Shank Dia. | No. of Flutes | Stock | Type | Effective length for inclined angle | | | |
|------------------------|---------------------|------|---------------|-------------|-----------|-----------------------------|----------------|------------|---------------|-------|------|-------------------------------------|-----------------|-----------------|-----------------|
| | R | D1 | ap | L3 | D5 | B2 | L1 | D4 | N | | | 30° | 1° | 2° | 3° |
| MS2XLBR0150N080 | 1.5 | 3 | 3 | 8 | 2.9 | 6.8° | 60 | 6 | 2 | ● | 1 | 8.8 | 9 | 9.6 | 10.3 |
| R0150N100 | 1.5 | 3 | 3 | 10 | 2.9 | 5.9° | 60 | 6 | 2 | ● | 1 | 10.8 | 11.2 | 11.9 | 12.7 |
| R0150N120 | 1.5 | 3 | 3 | 12 | 2.9 | 5.2° | 60 | 6 | 2 | ● | 1 | 12.9 | 13.3 | 14.2 | 15.2 |
| R0150N140 | 1.5 | 3 | 3 | 14 | 2.9 | 4.6° | 60 | 6 | 2 | ● | 1 | 15 | 15.4 | 16.5 | 17.7 |
| R0150N160 | 1.5 | 3 | 3 | 16 | 2.9 | 4.2° | 60 | 6 | 2 | ● | 1 | 17 | 17.6 | 18.8 | 20.2 |
| R0150N200 | 1.5 | 3 | 3 | 20 | 2.9 | 3.5° | 70 | 6 | 2 | ● | 1 | 21.2 | 21.9 | 23.4 | 25.2 |
| R0150N250 | 1.5 | 3 | 3 | 25 | 2.9 | 2.9° | 70 | 6 | 2 | ● | 1 | 26.3 | 27.2 | 29.1 | No interference |
| R0150N300 | 1.5 | 3 | 3 | 30 | 2.9 | 2.5° | 70 | 6 | 2 | ● | 1 | 31.5 | 32.6 | 34.9 | No interference |
| R0150N350 | 1.5 | 3 | 3 | 35 | 2.9 | 2.2° | 80 | 6 | 2 | ● | 1 | 36.7 | 37.9 | 40.6 | No interference |
| R0150N400 | 1.5 | 3 | 3 | 40 | 2.9 | 2° | 90 | 6 | 2 | ● | 1 | 41.8 | 43.3 | No interference | No interference |
| R0200N100 | 2 | 4 | 4 | 10 | 3.9 | 4.7° | 70 | 6 | 2 | ● | 1 | 10.8 | 11.1 | 11.8 | 12.6 |
| R0200N120 | 2 | 4 | 4 | 12 | 3.9 | 4° | 70 | 6 | 2 | ● | 1 | 12.9 | 13.3 | 14.1 | 15.1 |
| R0200N140 | 2 | 4 | 4 | 14 | 3.9 | 3.5° | 70 | 6 | 2 | ● | 1 | 15 | 15.4 | 16.4 | 17.6 |
| R0200N160 | 2 | 4 | 4 | 16 | 3.9 | 3.2° | 70 | 6 | 2 | ● | 1 | 17 | 17.5 | 18.7 | 20.1 |
| R0200N200 | 2 | 4 | 4 | 20 | 3.9 | 2.6° | 70 | 6 | 2 | ● | 1 | 21.2 | 21.8 | 23.3 | No interference |
| R0200N250 | 2 | 4 | 4 | 25 | 3.9 | 2.1° | 70 | 6 | 2 | ● | 1 | 26.3 | 27.2 | 29.1 | No interference |
| R0200N300 | 2 | 4 | 4 | 30 | 3.9 | 1.8° | 70 | 6 | 2 | ● | 1 | 31.5 | 32.5 | No interference | No interference |
| R0200N350 | 2 | 4 | 4 | 35 | 3.9 | 1.6° | 80 | 6 | 2 | ● | 1 | 36.7 | 37.9 | No interference | No interference |
| R0200N400 | 2 | 4 | 4 | 40 | 3.9 | 1.4° | 90 | 6 | 2 | ● | 1 | 41.8 | 43.2 | No interference | No interference |
| R0200N450 | 2 | 4 | 4 | 45 | 3.9 | 1.3° | 90 | 6 | 2 | ● | 1 | 47 | 48.6 | No interference | No interference |
| R0200N500 | 2 | 4 | 4 | 50 | 3.9 | 1.1° | 100 | 6 | 2 | ● | 1 | 52.2 | 53.9 | No interference | No interference |
| R0250N200 | 2.5 | 5 | 5 | 20 | 4.9 | 1.5° | 70 | 6 | 2 | ● | 1 | 21.1 | 21.8 | No interference | No interference |
| R0250N250 | 2.5 | 5 | 5 | 25 | 4.9 | 1.2° | 70 | 6 | 2 | ● | 1 | 26.3 | 27.1 | No interference | No interference |
| R0250N300 | 2.5 | 5 | 5 | 30 | 4.9 | 1° | 80 | 6 | 2 | ● | 1 | 31.5 | No interference | No interference | No interference |
| R0250N350 | 2.5 | 5 | 5 | 35 | 4.9 | 0.9° | 80 | 6 | 2 | ● | 1 | 36.6 | No interference | No interference | No interference |
| R0300N300 | 3 | 6 | 6 | 30 | 5.85 | — | 80 | 6 | 2 | ● | 2 | No interference | No interference | No interference | No interference |
| R0300N500 | 3 | 6 | 6 | 50 | 5.85 | — | 120 | 6 | 2 | ● | 2 | No interference | No interference | No interference | No interference |

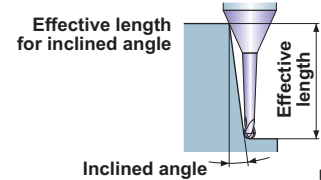
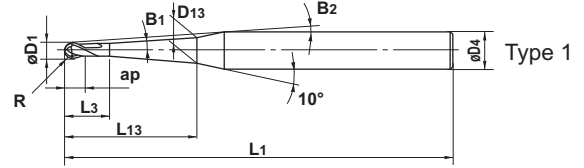
The diameter tolerance is only applied to items produced after July 2006.

SQUARE
 Long Neck
 High Helix
 For Small Automatic Lathe
 BALL
 Taper Neck
 Long Neck
 General Use
 RADIUS
 Long Neck
 High Helix
 General Use
 TAPER
 Ball
 For Rib Processing

MSTAR END MILLS

MS2XB

Ball nose end mill, 2 flute, Taper neck



Inclined angle Unit : mm

● 2 flute taper neck ball nose end mill.

| Order Number | Radius of Ball Nose | Dia. D1 | Taper Angle One Side B1 | Length of Cut ap | Neck Length L13 | Length of Straight Neck L3 | Cutting Edge to Shank Angle B2 | Neck Dia. D13 | Overall Length L1 | Shank Dia. D4 | No. of Flutes N | Stock | Type | Effective length for inclined angle | | | |
|---------------------|---------------------|---------|-------------------------|------------------|-----------------|----------------------------|--------------------------------|---------------|-------------------|---------------|-----------------|-------|------|-------------------------------------|-----|-----|-----|
| | R | | | | | | | | | | | | | 30° | 1° | 2° | 3° |
| MS2XBR0010T0030L015 | 0.1 | 0.2 | 30' | 0.2 | 1.5 | 0.6 | 8.8° | 0.19 | 50 | 4 | 2 | ● | 1 | 1.7 | 1.8 | 2.0 | 2.3 |
| R0010T0030L020 | 0.1 | 0.2 | 30' | 0.2 | 2 | 0.6 | 8.5° | 0.20 | 50 | 4 | 2 | ● | 1 | 2.2 | 2.4 | 2.6 | 3.0 |
| R0010T0100L015 | 0.1 | 0.2 | 1° | 0.2 | 1.5 | 0.6 | 8.8° | 0.21 | 50 | 4 | 2 | ● | 1 | — | 1.8 | 2.0 | 2.2 |
| R0010T0100L020 | 0.1 | 0.2 | 1° | 0.2 | 2 | 0.6 | 8.5° | 0.22 | 50 | 4 | 2 | ● | 1 | — | 2.3 | 2.5 | 2.9 |
| R0010T0130L015 | 0.1 | 0.2 | 1°30' | 0.2 | 1.5 | 0.6 | 8.9° | 0.22 | 50 | 4 | 2 | ● | 1 | — | — | 1.9 | 2.2 |
| R0010T0130L020 | 0.1 | 0.2 | 1°30' | 0.2 | 2 | 0.6 | 8.6° | 0.25 | 50 | 4 | 2 | ● | 1 | — | — | 2.4 | 2.8 |
| R0010T0200L015 | 0.1 | 0.2 | 2° | 0.2 | 1.5 | 0.6 | 8.9° | 0.24 | 50 | 4 | 2 | ● | 1 | — | — | 1.8 | 2.1 |
| R0010T0200L020 | 0.1 | 0.2 | 2° | 0.2 | 2 | 0.6 | 8.6° | 0.27 | 50 | 4 | 2 | ● | 1 | — | — | 2.3 | 2.6 |
| R0010T0300L015 | 0.1 | 0.2 | 3° | 0.2 | 1.5 | 0.6 | 9.0° | 0.27 | 50 | 4 | 2 | ● | 1 | — | — | — | 1.9 |
| R0010T0300L020 | 0.1 | 0.2 | 3° | 0.2 | 2 | 0.6 | 8.7° | 0.32 | 50 | 4 | 2 | ● | 1 | — | — | — | 2.4 |
| R0010T0500L020 | 0.1 | 0.2 | 5° | 0.2 | 2 | 0.6 | 9.0° | 0.42 | 50 | 4 | 2 | ● | 1 | — | — | — | — |
| R0015T0030L030 | 0.15 | 0.3 | 30' | 0.3 | 3 | 0.7 | 7.9° | 0.32 | 50 | 4 | 2 | ● | 1 | 3.2 | 3.4 | 3.8 | 4.3 |
| R0015T0100L030 | 0.15 | 0.3 | 1° | 0.3 | 3 | 0.7 | 7.9° | 0.36 | 50 | 4 | 2 | ● | 1 | — | 3.3 | 3.7 | 4.2 |
| R0015T0130L030 | 0.15 | 0.3 | 1°30' | 0.3 | 3 | 0.7 | 8.0° | 0.40 | 50 | 4 | 2 | ● | 1 | — | — | 3.5 | 4.0 |
| R0015T0200L030 | 0.15 | 0.3 | 2° | 0.3 | 3 | 0.7 | 8.1° | 0.44 | 50 | 4 | 2 | ● | 1 | — | — | 3.3 | 3.8 |
| R0015T0300L030 | 0.15 | 0.3 | 3° | 0.3 | 3 | 0.7 | 8.2° | 0.52 | 50 | 4 | 2 | ● | 1 | — | — | — | 3.4 |
| R0015T0500L030 | 0.15 | 0.3 | 5° | 0.3 | 3 | 0.7 | 8.6° | 0.68 | 50 | 4 | 2 | ● | 1 | — | — | — | — |
| R0020T0030L020 | 0.2 | 0.4 | 30' | 0.4 | 2 | 1.2 | 8.4° | 0.38 | 50 | 4 | 2 | ● | 1 | 2.3 | 2.4 | 2.7 | 3.0 |
| R0020T0030L030 | 0.2 | 0.4 | 30' | 0.4 | 3 | 1.2 | 7.8° | 0.40 | 50 | 4 | 2 | ● | 1 | 3.3 | 3.5 | 3.9 | 4.4 |
| R0020T0030L040 | 0.2 | 0.4 | 30' | 0.4 | 4 | 1.2 | 7.3° | 0.41 | 50 | 4 | 2 | ● | 1 | 4.3 | 4.5 | 5.1 | 5.7 |
| R0020T0030L050 | 0.2 | 0.4 | 30' | 0.4 | 5 | 1.2 | 6.8° | 0.43 | 50 | 4 | 2 | ● | 1 | 5.3 | 5.6 | 6.2 | 7.1 |
| R0020T0100L020 | 0.2 | 0.4 | 1° | 0.4 | 2 | 1.2 | 8.4° | 0.39 | 50 | 4 | 2 | ● | 1 | — | 2.3 | 2.6 | 3.0 |
| R0020T0100L030 | 0.2 | 0.4 | 1° | 0.4 | 3 | 1.2 | 7.9° | 0.43 | 50 | 4 | 2 | ● | 1 | — | 3.3 | 3.7 | 4.2 |
| R0020T0100L040 | 0.2 | 0.4 | 1° | 0.4 | 4 | 1.2 | 7.4° | 0.46 | 50 | 4 | 2 | ● | 1 | — | 4.3 | 4.9 | 5.5 |
| R0020T0100L050 | 0.2 | 0.4 | 1° | 0.4 | 5 | 1.2 | 6.9° | 0.50 | 50 | 4 | 2 | ● | 1 | — | 5.3 | 6.0 | 6.8 |
| R0020T0130L020 | 0.2 | 0.4 | 1°30' | 0.4 | 2 | 1.2 | 8.5° | 0.41 | 50 | 4 | 2 | ● | 1 | — | — | 2.5 | 2.9 |
| R0020T0130L030 | 0.2 | 0.4 | 1°30' | 0.4 | 3 | 1.2 | 7.9° | 0.46 | 50 | 4 | 2 | ● | 1 | — | — | 3.6 | 4.1 |
| R0020T0130L040 | 0.2 | 0.4 | 1°30' | 0.4 | 4 | 1.2 | 7.5° | 0.51 | 50 | 4 | 2 | ● | 1 | — | — | 4.7 | 5.3 |
| R0020T0130L050 | 0.2 | 0.4 | 1°30' | 0.4 | 5 | 1.2 | 7.0° | 0.56 | 50 | 4 | 2 | ● | 1 | — | — | 5.7 | 6.5 |
| R0020T0200L020 | 0.2 | 0.4 | 2° | 0.4 | 2 | 1.2 | 8.5° | 0.42 | 50 | 4 | 2 | ● | 1 | — | — | 2.5 | 2.8 |
| R0020T0200L030 | 0.2 | 0.4 | 2° | 0.4 | 3 | 1.2 | 8.0° | 0.49 | 50 | 4 | 2 | ● | 1 | — | — | 3.5 | 4.0 |
| R0020T0200L040 | 0.2 | 0.4 | 2° | 0.4 | 4 | 1.2 | 7.5° | 0.56 | 50 | 4 | 2 | ● | 1 | — | — | 4.5 | 5.1 |
| R0020T0200L050 | 0.2 | 0.4 | 2° | 0.4 | 5 | 1.2 | 7.1° | 0.63 | 50 | 4 | 2 | ● | 1 | — | — | 5.5 | 6.2 |
| R0025T0030L030 | 0.25 | 0.5 | 30' | 0.5 | 3 | 1.5 | 7.8° | 0.49 | 50 | 4 | 2 | ● | 1 | 3.3 | 3.5 | 3.9 | 4.4 |
| R0025T0030L050 | 0.25 | 0.5 | 30' | 0.5 | 5 | 1.5 | 6.8° | 0.53 | 50 | 4 | 2 | ● | 1 | 5.3 | 5.6 | 6.2 | 7.1 |
| R0025T0100L030 | 0.25 | 0.5 | 1° | 0.5 | 3 | 1.5 | 7.8° | 0.52 | 50 | 4 | 2 | ● | 1 | — | 3.4 | 3.8 | 4.3 |
| R0025T0100L050 | 0.25 | 0.5 | 1° | 0.5 | 5 | 1.5 | 6.9° | 0.59 | 50 | 4 | 2 | ● | 1 | — | 5.4 | 6.0 | 6.8 |
| R0025T0130L030 | 0.25 | 0.5 | 1°30' | 0.5 | 3 | 1.5 | 7.9° | 0.54 | 50 | 4 | 2 | ● | 1 | — | — | 3.7 | 4.1 |

● : Inventory maintained.

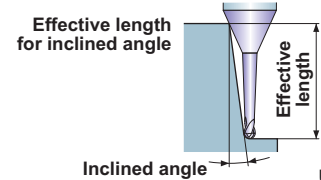
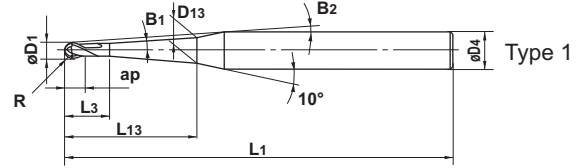
| Order Number | Radius of Ball Nose | Dia. | Taper Angle One Side | Length of Cut | Neck Length | Length of Straight Neck | Cutting Edge to Shank Angle | Neck Dia. | Overall Length | Shank Dia. | No. of Flutes | Stock | Type | Effective length for inclined angle | | | |
|---------------------|---------------------|------|----------------------|---------------|-------------|-------------------------|-----------------------------|-----------|----------------|------------|---------------|-------|------|-------------------------------------|------|------|------|
| | R | D1 | B1 | ap | L13 | L3 | B2 | D13 | L1 | D4 | N | | | 30° | 1° | 2° | 3° |
| MS2XBR0025T0130L050 | 0.25 | 0.5 | 1°30' | 0.5 | 5 | 1.5 | 7.0° | 0.65 | 50 | 4 | 2 | ● | 1 | — | — | 5.8 | 6.6 |
| R0025T0200L030 | 0.25 | 0.5 | 2° | 0.5 | 3 | 1.5 | 7.9° | 0.57 | 50 | 4 | 2 | ● | 1 | — | — | 3.5 | 4.0 |
| R0025T0200L050 | 0.25 | 0.5 | 2° | 0.5 | 5 | 1.5 | 7.1° | 0.71 | 50 | 4 | 2 | ● | 1 | — | — | 5.5 | 6.3 |
| R0030T0030L050 | 0.3 | 0.6 | 30' | 0.6 | 5 | 1.6 | 6.8° | 0.62 | 50 | 4 | 2 | ● | 1 | 5.3 | 5.6 | 6.2 | 7.1 |
| R0030T0030L080 | 0.3 | 0.6 | 30' | 0.6 | 8 | 1.6 | 5.7° | 0.68 | 50 | 4 | 2 | ● | 1 | 8.3 | 8.7 | 9.8 | 11.1 |
| R0030T0100L050 | 0.3 | 0.6 | 1° | 0.6 | 5 | 1.6 | 6.8° | 0.68 | 50 | 4 | 2 | ● | 1 | — | 5.4 | 6.0 | 6.8 |
| R0030T0100L080 | 0.3 | 0.6 | 1° | 0.6 | 8 | 1.6 | 5.8° | 0.79 | 50 | 4 | 2 | ● | 1 | — | 8.4 | 9.4 | 10.7 |
| R0030T0100L100 | 0.3 | 0.6 | 1° | 0.6 | 10 | 1.6 | 5.2° | 0.86 | 50 | 4 | 2 | ● | 1 | — | 10.4 | 11.6 | 13.2 |
| R0030T0100L120 | 0.3 | 0.6 | 1° | 0.6 | 12 | 1.6 | 4.8° | 0.93 | 50 | 4 | 2 | ● | 1 | — | 12.4 | 13.9 | 15.8 |
| R0030T0100L150 | 0.3 | 0.6 | 1° | 0.6 | 15 | 1.6 | 4.2° | 1.03 | 50 | 4 | 2 | ● | 1 | — | 15.4 | 17.2 | 19.6 |
| R0030T0130L050 | 0.3 | 0.6 | 1°30' | 0.6 | 5 | 1.6 | 6.9° | 0.74 | 50 | 4 | 2 | ● | 1 | — | — | 5.8 | 6.6 |
| R0030T0130L080 | 0.3 | 0.6 | 1°30' | 0.6 | 8 | 1.6 | 5.9° | 0.90 | 50 | 4 | 2 | ● | 1 | — | — | 9.0 | 10.2 |
| R0030T0200L060 | 0.3 | 0.6 | 2° | 0.6 | 6 | 1.6 | 6.6° | 0.87 | 50 | 4 | 2 | ● | 1 | — | — | 6.6 | 7.4 |
| R0030T0200L080 | 0.3 | 0.6 | 2° | 0.6 | 8 | 1.6 | 6.0° | 1.01 | 50 | 4 | 2 | ● | 1 | — | — | 8.6 | 9.7 |
| R0040T0030L080 | 0.4 | 0.8 | 30' | 0.8 | 8 | 1.8 | 5.5° | 0.87 | 50 | 4 | 2 | ● | 1 | 8.3 | 8.7 | 9.8 | 11.1 |
| R0040T0030L120 | 0.4 | 0.8 | 30' | 0.8 | 12 | 1.8 | 4.5° | 0.94 | 60 | 4 | 2 | ● | 1 | 12.3 | 13.0 | 14.5 | 16.5 |
| R0040T0100L080 | 0.4 | 0.8 | 1° | 0.8 | 8 | 1.8 | 5.6° | 0.98 | 50 | 4 | 2 | ● | 1 | — | 8.4 | 9.4 | 10.7 |
| R0040T0100L120 | 0.4 | 0.8 | 1° | 0.8 | 12 | 1.8 | 4.6° | 1.12 | 60 | 4 | 2 | ● | 1 | — | 12.4 | 13.9 | 15.8 |
| R0040T0130L080 | 0.4 | 0.8 | 1°30' | 0.8 | 8 | 1.8 | 5.8° | 1.09 | 50 | 4 | 2 | ● | 1 | — | — | 9.0 | 10.2 |
| R0040T0130L120 | 0.4 | 0.8 | 1°30' | 0.8 | 12 | 1.8 | 4.8° | 1.30 | 60 | 4 | 2 | ● | 1 | — | — | 13.2 | 15.0 |
| R0040T0200L080 | 0.4 | 0.8 | 2° | 0.8 | 8 | 1.8 | 5.9° | 1.20 | 60 | 4 | 2 | ● | 1 | — | — | 8.6 | 9.7 |
| R0040T0300L120 | 0.4 | 0.8 | 3° | 0.8 | 12 | 1.8 | 5.2° | 1.83 | 60 | 4 | 2 | ● | 1 | — | — | — | 12.8 |
| R0050T0030L100 | 0.5 | 1 | 30' | 1 | 10 | 2.5 | 6.1° | 1.08 | 60 | 6 | 2 | ● | 1 | 10.4 | 10.9 | 12.2 | 13.9 |
| R0050T0030L150 | 0.5 | 1 | 30' | 1 | 15 | 2.5 | 5.1° | 1.16 | 60 | 6 | 2 | ● | 1 | 15.4 | 16.2 | 18.2 | 20.7 |
| R0050T0030L200 | 0.5 | 1 | 30' | 1 | 20 | 2.5 | 4.4° | 1.25 | 70 | 6 | 2 | ● | 1 | 20.4 | 21.5 | 24.1 | 27.4 |
| R0050T0030L250 | 0.5 | 1 | 30' | 1 | 25 | 2.5 | 3.8° | 1.34 | 70 | 6 | 2 | ● | 1 | 25.4 | 26.8 | 30.0 | 34.2 |
| R0050T0030L300 | 0.5 | 1 | 30' | 1 | 30 | 2.5 | 3.4° | 1.42 | 70 | 6 | 2 | ● | 1 | 30.4 | 32.0 | 35.9 | 41.0 |
| R0050T0100L100 | 0.5 | 1 | 1° | 1 | 10 | 2.5 | 6.2° | 1.21 | 60 | 6 | 2 | ● | 1 | — | 10.5 | 11.8 | 13.4 |
| R0050T0100L150 | 0.5 | 1 | 1° | 1 | 15 | 2.5 | 5.2° | 1.38 | 60 | 6 | 2 | ● | 1 | — | 15.5 | 17.4 | 19.8 |
| R0050T0100L200 | 0.5 | 1 | 1° | 1 | 20 | 2.5 | 4.5° | 1.56 | 70 | 6 | 2 | ● | 1 | — | 20.5 | 23.0 | 26.2 |
| R0050T0100L250 | 0.5 | 1 | 1° | 1 | 25 | 2.5 | 3.9° | 1.73 | 70 | 6 | 2 | ● | 1 | — | 25.5 | 28.6 | 32.6 |
| R0050T0100L300 | 0.5 | 1 | 1° | 1 | 30 | 2.5 | 3.5° | 1.91 | 70 | 6 | 2 | ● | 1 | — | 30.5 | 34.2 | 39.0 |
| R0050T0100L350 | 0.5 | 1 | 1° | 1 | 35 | 2.5 | 3.2° | 2.08 | 80 | 6 | 2 | ● | 1 | — | 35.5 | 39.8 | 45.4 |
| R0050T0130L100 | 0.5 | 1 | 1°30' | 1 | 10 | 2.5 | 6.3° | 1.34 | 60 | 6 | 2 | ● | 1 | — | — | 11.3 | 12.8 |
| R0050T0130L150 | 0.5 | 1 | 1°30' | 1 | 15 | 2.5 | 5.3° | 1.60 | 60 | 6 | 2 | ● | 1 | — | — | 16.6 | 18.9 |
| R0050T0130L200 | 0.5 | 1 | 1°30' | 1 | 20 | 2.5 | 4.6° | 1.86 | 70 | 6 | 2 | ● | 1 | — | — | 21.9 | 24.9 |
| R0050T0200L150 | 0.5 | 1 | 2° | 1 | 15 | 2.5 | 5.4° | 1.82 | 60 | 6 | 2 | ● | 1 | — | — | 15.8 | 18.0 |
| R0050T0200L200 | 0.5 | 1 | 2° | 1 | 20 | 2.5 | 4.7° | 2.17 | 70 | 6 | 2 | ● | 1 | — | — | 20.8 | 23.7 |
| R0050T0300L200 | 0.5 | 1 | 3° | 1 | 20 | 2.5 | 5.0° | 2.78 | 70 | 6 | 2 | ● | 1 | — | — | — | 21.2 |
| R0050T0300L400 | 0.5 | 1 | 3° | 1 | 40 | 2.5 | 3.4° | 4.88 | 80 | 6 | 2 | ● | 1 | — | — | — | 41.2 |
| R0050T0500L200 | 0.5 | 1 | 5° | 1 | 20 | 2.5 | 5.7° | 4.01 | 70 | 6 | 2 | ● | 1 | — | — | — | — |
| R0060T0030L120 | 0.6 | 1.2 | 30' | 1.2 | 12 | 2.7 | 5.6° | 1.31 | 60 | 6 | 2 | ● | 1 | 12.4 | 13.1 | 14.6 | 16.6 |
| R0060T0030L240 | 0.6 | 1.2 | 30' | 1.2 | 24 | 2.7 | 3.8° | 1.52 | 70 | 6 | 2 | ● | 1 | 24.4 | 25.7 | 28.8 | 32.8 |
| R0060T0100L120 | 0.6 | 1.2 | 1° | 1.2 | 12 | 2.7 | 5.7° | 1.47 | 60 | 6 | 2 | ● | 1 | — | 12.5 | 14.0 | 15.9 |
| R0060T0100L240 | 0.6 | 1.2 | 1° | 1.2 | 24 | 2.7 | 3.9° | 1.89 | 70 | 6 | 2 | ● | 1 | — | 24.5 | 27.5 | 31.3 |
| R0060T0130L120 | 0.6 | 1.2 | 1°30' | 1.2 | 12 | 2.7 | 5.8° | 1.63 | 60 | 6 | 2 | ● | 1 | — | — | 13.4 | 15.2 |
| R0060T0130L240 | 0.6 | 1.2 | 1°30' | 1.2 | 24 | 2.7 | 4.1° | 2.26 | 70 | 6 | 2 | ● | 1 | — | — | 26.2 | 29.8 |
| R0060T0200L120 | 0.6 | 1.2 | 2° | 1.2 | 12 | 2.7 | 5.9° | 1.79 | 60 | 6 | 2 | ● | 1 | — | — | 12.8 | 14.6 |

SQUARE Long Neck
 High Helix
 For Small Automatic Lathe
 BALL Taper Long Neck
 RADIUS Long Neck
 TAPER Ball Processing

MSTAR END MILLS

MS2XB

Ball nose end mill, 2 flute, Taper neck



Inclined angle Unit : mm

● 2 flute taper neck ball nose end mill.

| Order Number | Radius of Ball Nose | Dia. | Taper Angle One Side | Length of Cut | Neck Length | Length of Straight Neck | Cutting Edge to Shank Angle | Neck Dia. | Overall Length | Shank Dia. | No. of Flutes | Stock | Type | Effective length for inclined angle | | | |
|---------------------|---------------------|------|----------------------|---------------|-------------|-------------------------|-----------------------------|-----------|----------------|------------|---------------|-------|------|-------------------------------------|------|-----------------|-----------------|
| | R | D1 | B1 | ap | L13 | L3 | B2 | D13 | L1 | D4 | N | | | 30' | 1° | 2° | 3° |
| MS2XBR0060T0200L240 | 0.6 | 1.2 | 2° | 1.2 | 24 | 2.7 | 4.2° | 2.63 | 70 | 6 | 2 | ● | 1 | — | — | 24.8 | 28.3 |
| R0075T0030L100 | 0.75 | 1.5 | 30' | 1.5 | 10 | 3 | 5.9° | 1.57 | 60 | 6 | 2 | ● | 1 | 10.4 | 10.9 | 12.2 | 13.8 |
| R0075T0030L150 | 0.75 | 1.5 | 30' | 1.5 | 15 | 3 | 4.9° | 1.65 | 60 | 6 | 2 | ● | 1 | 15.4 | 16.2 | 18.1 | 20.6 |
| R0075T0030L300 | 0.75 | 1.5 | 30' | 1.5 | 30 | 3 | 3.2° | 1.92 | 70 | 6 | 2 | ● | 1 | 30.4 | 32.0 | 35.9 | 40.9 |
| R0075T0100L100 | 0.75 | 1.5 | 1° | 1.5 | 10 | 3 | 6.0° | 1.69 | 60 | 6 | 2 | ● | 1 | — | 10.5 | 11.8 | 13.3 |
| R0075T0100L150 | 0.75 | 1.5 | 1° | 1.5 | 15 | 3 | 5.0° | 1.86 | 60 | 6 | 2 | ● | 1 | — | 15.5 | 17.4 | 19.7 |
| R0075T0100L200 | 0.75 | 1.5 | 1° | 1.5 | 20 | 3 | 4.2° | 2.04 | 70 | 6 | 2 | ● | 1 | — | 20.5 | 23.0 | 26.1 |
| R0075T0100L300 | 0.75 | 1.5 | 1° | 1.5 | 30 | 3 | 3.3° | 2.39 | 70 | 6 | 2 | ● | 1 | — | 30.5 | 34.2 | 39.0 |
| R0075T0130L100 | 0.75 | 1.5 | 1°30' | 1.5 | 10 | 3 | 6.1° | 1.81 | 60 | 6 | 2 | ● | 1 | — | — | 11.3 | 12.8 |
| R0075T0130L150 | 0.75 | 1.5 | 1°30' | 1.5 | 15 | 3 | 5.1° | 2.07 | 60 | 6 | 2 | ● | 1 | — | — | 16.6 | 18.9 |
| R0075T0130L300 | 0.75 | 1.5 | 1°30' | 1.5 | 30 | 3 | 3.4° | 2.86 | 70 | 6 | 2 | ● | 1 | — | — | 32.5 | 37.0 |
| R0075T0200L100 | 0.75 | 1.5 | 2° | 1.5 | 10 | 3 | 6.2° | 1.93 | 60 | 6 | 2 | ● | 1 | — | — | 10.9 | 12.3 |
| R0075T0200L150 | 0.75 | 1.5 | 2° | 1.5 | 15 | 3 | 5.2° | 2.28 | 60 | 6 | 2 | ● | 1 | — | — | 15.9 | 18.0 |
| R0075T0200L300 | 0.75 | 1.5 | 2° | 1.5 | 30 | 3 | 3.5° | 3.33 | 70 | 6 | 2 | ● | 1 | — | — | 30.9 | 35.1 |
| R0100T0030L200 | 1 | 2 | 30' | 2 | 20 | 4 | 3.9° | 2.18 | 60 | 6 | 2 | ● | 1 | 20.7 | 21.7 | 24.3 | 27.6 |
| R0100T0030L300 | 1 | 2 | 30' | 2 | 30 | 4 | 2.9° | 2.36 | 70 | 6 | 2 | ● | 1 | 30.7 | 32.3 | 36.2 | No interference |
| R0100T0030L400 | 1 | 2 | 30' | 2 | 40 | 4 | 2.4° | 2.53 | 80 | 6 | 2 | ● | 1 | 40.7 | 42.8 | 48.0 | No interference |
| R0100T0100L200 | 1 | 2 | 1° | 2 | 20 | 4 | 4.0° | 2.46 | 60 | 6 | 2 | ● | 1 | — | 20.8 | 23.3 | 26.4 |
| R0100T0100L250 | 1 | 2 | 1° | 2 | 25 | 4 | 3.4° | 2.64 | 60 | 6 | 2 | ● | 1 | — | 25.8 | 28.9 | 32.9 |
| R0100T0100L300 | 1 | 2 | 1° | 2 | 30 | 4 | 3.0° | 2.81 | 70 | 6 | 2 | ● | 1 | — | 30.8 | 34.5 | 39.3 |
| R0100T0100L350 | 1 | 2 | 1° | 2 | 35 | 4 | 2.7° | 2.99 | 80 | 6 | 2 | ● | 1 | — | 35.8 | 40.1 | No interference |
| R0100T0100L400 | 1 | 2 | 1° | 2 | 40 | 4 | 2.5° | 3.16 | 80 | 6 | 2 | ● | 1 | — | 40.8 | 45.8 | No interference |
| R0100T0100L500 | 1 | 2 | 1° | 2 | 50 | 4 | 2.1° | 3.51 | 90 | 6 | 2 | ● | 1 | — | 50.8 | 57.0 | No interference |
| R0100T0130L200 | 1 | 2 | 1°30' | 2 | 20 | 4 | 4.1° | 2.74 | 60 | 6 | 2 | ● | 1 | — | — | 22.3 | 25.3 |
| R0100T0130L300 | 1 | 2 | 1°30' | 2 | 30 | 4 | 3.1° | 3.27 | 70 | 6 | 2 | ● | 1 | — | — | 32.9 | 37.4 |
| R0100T0130L400 | 1 | 2 | 1°30' | 2 | 40 | 4 | 2.6° | 3.79 | 80 | 6 | 2 | ● | 1 | — | — | 43.5 | No interference |
| R0100T0200L300 | 1 | 2 | 2° | 2 | 30 | 4 | 3.3° | 3.72 | 70 | 6 | 2 | ● | 1 | — | — | 31.3 | 35.5 |
| R0100T0200L400 | 1 | 2 | 2° | 2 | 40 | 4 | 2.7° | 4.42 | 80 | 6 | 2 | ● | 1 | — | — | 41.3 | No interference |
| R0100T0300L300 | 1 | 2 | 3° | 2 | 30 | 4 | 3.5° | 4.63 | 70 | 6 | 2 | ● | 1 | — | — | — | 31.8 |
| R0100T0300L400 | 1 | 2 | 3° | 2 | 40 | 4 | 2.9° | 5.68 | 80 | 6 | 2 | ● | 1 | — | — | — | No interference |
| R0100T0500L200 | 1 | 2 | 5° | 2 | 20 | 4 | 5.1° | 4.70 | 60 | 6 | 2 | ● | 1 | — | — | — | — |
| R0100T0500L380 | 1 | 2 | 5° | 2 | 38 | 4 | 4.6° | 7.85 | 80 | 8 | 2 | ● | 1 | — | — | — | — |
| R0150T0030L300 | 1.5 | 3 | 30' | 3 | 30 | 6 | 2.4° | 3.32 | 70 | 6 | 2 | ● | 1 | 30.7 | 32.3 | 36.2 | No interference |
| R0150T0030L400 | 1.5 | 3 | 30' | 3 | 40 | 6 | 1.9° | 3.50 | 80 | 6 | 2 | ● | 1 | 40.7 | 42.9 | No interference | No interference |
| R0150T0030L500 | 1.5 | 3 | 30' | 3 | 50 | 6 | 1.6° | 3.67 | 90 | 6 | 2 | ● | 1 | 50.7 | 53.4 | No interference | No interference |
| R0150T0100L300 | 1.5 | 3 | 1° | 3 | 30 | 6 | 2.5° | 3.74 | 70 | 6 | 2 | ● | 1 | — | 31.0 | 34.7 | No interference |
| R0150T0100L400 | 1.5 | 3 | 1° | 3 | 40 | 6 | 2.0° | 4.09 | 80 | 6 | 2 | ● | 1 | — | 41.0 | 45.9 | No interference |
| R0150T0100L500 | 1.5 | 3 | 1° | 3 | 50 | 6 | 1.7° | 4.44 | 90 | 6 | 2 | ● | 1 | — | 51.0 | No interference | No interference |

● : Inventory maintained.

Unit : mm

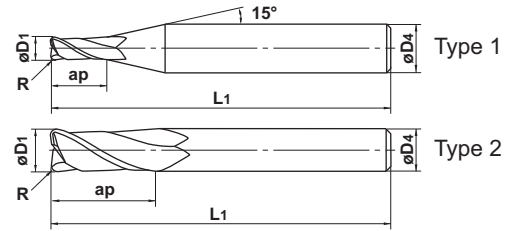
| Order Number | Radius of Ball Nose | Dia. | Taper Angle One Side | Length of Cut | Neck Length | Length of Straight Neck | Cutting Edge to Shank Angle | Neck Dia. | Overall Length | Shank Dia. | No. of Flutes | Stock | Type | Effective length for inclined angle | | | |
|----------------------------|---------------------|------|----------------------|---------------|-------------|-------------------------|-----------------------------|-----------|----------------|------------|---------------|-------|------|-------------------------------------|------|------|-----------------|
| | R | D1 | B1 | ap | L13 | L3 | B2 | D13 | L1 | D4 | N | | | 30° | 1° | 2° | 3° |
| MS2XBR0150T0130L300 | 1.5 | 3 | 1°30' | 3 | 30 | 6 | 2.6° | 4.16 | 70 | 6 | 2 | ● | 1 | — | — | 33.1 | No interference |
| R0150T0130L400 | 1.5 | 3 | 1°30' | 3 | 40 | 6 | 2.1° | 4.69 | 80 | 6 | 2 | ● | 1 | — | — | 43.8 | No interference |
| R0150T0130L500 | 1.5 | 3 | 1°30' | 3 | 50 | 6 | 1.7° | 5.21 | 90 | 6 | 2 | ● | 1 | — | — | — | No interference |
| R0150T0200L300 | 1.5 | 3 | 2° | 3 | 30 | 6 | 2.7° | 4.58 | 70 | 6 | 2 | ● | 1 | — | — | 31.6 | No interference |
| R0150T0200L480 | 1.5 | 3 | 2° | 3 | 48 | 6 | 1.9° | 5.84 | 90 | 6 | 2 | ● | 1 | — | — | — | No interference |
| R0150T0300L300 | 1.5 | 3 | 3° | 3 | 30 | 6 | 2.9° | 5.42 | 70 | 6 | 2 | ● | 1 | — | — | — | No interference |
| R0150T0300L500 | 1.5 | 3 | 3° | 3 | 50 | 6 | 2.9° | 7.52 | 90 | 8 | 2 | ● | 1 | — | — | — | No interference |
| R0200T0030L600 | 2 | 4 | 30' | 4 | 60 | 7 | 1.0° | 4.83 | 110 | 6 | 2 | ● | 1 | 60.8 | 64.0 | — | No interference |
| R0200T0100L600 | 2 | 4 | 1° | 4 | 60 | 7 | 1.0° | 5.76 | 110 | 6 | 2 | ● | 1 | — | 61.1 | — | No interference |

TAPER For Rib Processing
 BALL For Small Automatic Lathe
 SQUARE Long Neck
 General Use

MSTAR END MILLS

MS2MRB

Corner radius end mill, Medium cut length, 2 flute



$D_1 < 3$

$3 \leq D_1$

● 2 flute corner radius end mill for general use.

Unit : mm

| Order Number | Dia. | Length of Cut | Overall Length | Shank Dia. | Corner R | No. of Flutes | Stock | Type |
|-----------------|------|---------------|----------------|------------|----------|---------------|-------|------|
| | D1 | ap | L1 | D4 | R | N | | |
| MS2MRBD0100R010 | 1 | 2 | 40 | 4 | 0.1 | 2 | ● | 1 |
| D0100R020 | 1 | 2 | 40 | 4 | 0.2 | 2 | ● | 1 |
| D0100R030 | 1 | 2 | 40 | 4 | 0.3 | 2 | ● | 1 |
| D0150R010 | 1.5 | 3 | 40 | 4 | 0.1 | 2 | ● | 1 |
| D0150R020 | 1.5 | 3 | 40 | 4 | 0.2 | 2 | ● | 1 |
| D0150R030 | 1.5 | 3 | 40 | 4 | 0.3 | 2 | ● | 1 |
| D0150R050 | 1.5 | 3 | 40 | 4 | 0.5 | 2 | ● | 1 |
| D0200R010 | 2 | 4 | 40 | 4 | 0.1 | 2 | ● | 1 |
| D0200R020 | 2 | 4 | 40 | 4 | 0.2 | 2 | ● | 1 |
| D0200R030 | 2 | 4 | 40 | 4 | 0.3 | 2 | ● | 1 |
| D0200R050 | 2 | 4 | 40 | 4 | 0.5 | 2 | ● | 1 |
| D0250R010 | 2.5 | 5 | 40 | 4 | 0.1 | 2 | ● | 1 |
| D0250R020 | 2.5 | 5 | 40 | 4 | 0.2 | 2 | ● | 1 |
| D0250R030 | 2.5 | 5 | 40 | 4 | 0.3 | 2 | ● | 1 |
| D0250R050 | 2.5 | 5 | 40 | 4 | 0.5 | 2 | ● | 1 |
| D0300R010 | 3 | 6 | 50 | 6 | 0.1 | 2 | ● | 1 |
| D0300R020 | 3 | 6 | 50 | 6 | 0.2 | 2 | ● | 1 |
| D0300R030 | 3 | 6 | 50 | 6 | 0.3 | 2 | ● | 1 |
| D0300R050 | 3 | 6 | 50 | 6 | 0.5 | 2 | ● | 1 |
| D0300R100 | 3 | 6 | 50 | 6 | 1 | 2 | ● | 1 |
| D0400R010 | 4 | 8 | 50 | 6 | 0.1 | 2 | ● | 1 |
| D0400R020 | 4 | 8 | 50 | 6 | 0.2 | 2 | ● | 1 |
| D0400R030 | 4 | 8 | 50 | 6 | 0.3 | 2 | ● | 1 |
| D0400R050 | 4 | 8 | 50 | 6 | 0.5 | 2 | ● | 1 |
| D0400R100 | 4 | 8 | 50 | 6 | 1 | 2 | ● | 1 |
| D0500R010 | 5 | 10 | 50 | 6 | 0.1 | 2 | ● | 1 |
| D0500R020 | 5 | 10 | 50 | 6 | 0.2 | 2 | ● | 1 |
| D0500R030 | 5 | 10 | 50 | 6 | 0.3 | 2 | ● | 1 |
| D0500R050 | 5 | 10 | 50 | 6 | 0.5 | 2 | ● | 1 |
| D0500R100 | 5 | 10 | 50 | 6 | 1 | 2 | ● | 1 |
| D0600R010 | 6 | 12 | 50 | 6 | 0.1 | 2 | ● | 2 |
| D0600R020 | 6 | 12 | 50 | 6 | 0.2 | 2 | ● | 2 |
| D0600R030 | 6 | 12 | 50 | 6 | 0.3 | 2 | ● | 2 |
| D0600R050 | 6 | 12 | 50 | 6 | 0.5 | 2 | ● | 2 |
| D0600R100 | 6 | 12 | 50 | 6 | 1 | 2 | ● | 2 |
| D0600R150 | 6 | 12 | 50 | 6 | 1.5 | 2 | ● | 2 |
| D0600R200 | 6 | 12 | 50 | 6 | 2 | 2 | ● | 2 |
| D0800R020 | 8 | 16 | 60 | 8 | 0.2 | 2 | ● | 2 |

● : Inventory maintained.

| Order Number | Dia. D1 | Length of Cut ap | Overall Length L1 | Shank Dia. D4 | Corner R R | No. of Flutes N | Stock | Type |
|-----------------|------------|------------------------|-------------------------|------------------|---------------|-----------------------|-------|------|
| MS2MRBD0800R030 | 8 | 16 | 60 | 8 | 0.3 | 2 | ● | 2 |
| D0800R050 | 8 | 16 | 60 | 8 | 0.5 | 2 | ● | 2 |
| D0800R100 | 8 | 16 | 60 | 8 | 1 | 2 | ● | 2 |
| D0800R150 | 8 | 16 | 60 | 8 | 1.5 | 2 | ● | 2 |
| D0800R200 | 8 | 16 | 60 | 8 | 2 | 2 | ● | 2 |
| D0800R250 | 8 | 16 | 60 | 8 | 2.5 | 2 | ● | 2 |
| D0800R300 | 8 | 16 | 60 | 8 | 3 | 2 | ● | 2 |
| D1000R020 | 10 | 20 | 70 | 10 | 0.2 | 2 | ● | 2 |
| D1000R030 | 10 | 20 | 70 | 10 | 0.3 | 2 | ● | 2 |
| D1000R050 | 10 | 20 | 70 | 10 | 0.5 | 2 | ● | 2 |
| D1000R100 | 10 | 20 | 70 | 10 | 1 | 2 | ● | 2 |
| D1000R150 | 10 | 20 | 70 | 10 | 1.5 | 2 | ● | 2 |
| D1000R200 | 10 | 20 | 70 | 10 | 2 | 2 | ● | 2 |
| D1000R250 | 10 | 20 | 70 | 10 | 2.5 | 2 | ● | 2 |
| D1000R300 | 10 | 20 | 70 | 10 | 3 | 2 | ● | 2 |
| D1200R020 | 12 | 24 | 75 | 12 | 0.2 | 2 | ● | 2 |
| D1200R030 | 12 | 24 | 75 | 12 | 0.3 | 2 | ● | 2 |
| D1200R050 | 12 | 24 | 75 | 12 | 0.5 | 2 | ● | 2 |
| D1200R100 | 12 | 24 | 75 | 12 | 1 | 2 | ● | 2 |
| D1200R150 | 12 | 24 | 75 | 12 | 1.5 | 2 | ● | 2 |
| D1200R200 | 12 | 24 | 75 | 12 | 2 | 2 | ● | 2 |
| D1200R250 | 12 | 24 | 75 | 12 | 2.5 | 2 | ● | 2 |
| D1200R300 | 12 | 24 | 75 | 12 | 3 | 2 | ● | 2 |

The diameter tolerance is only applied to items produced after July 2006.

| | |
|--------|-----------------|
| SQUARE | General Use |
| | Long Neck |
| BALL | General Use |
| | Long Neck |
| RADIUS | General Use |
| | Long Neck |
| TAPER | General Use |
| | Ball Processing |

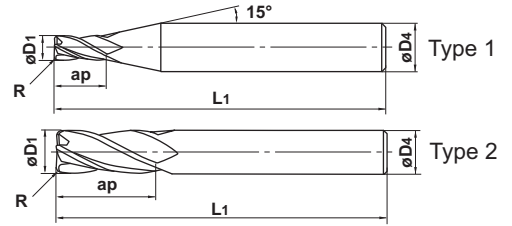
MSTAR END MILLS

MS4MRB

Corner radius end mill, Medium cut length, 4 flute



$D_1 \leq 12$ 0 – 0.020
 $12 < D_1$ 0 – 0.030



● 4 flute corner radius end mill for general use.

Unit : mm

| Order Number | Dia. | Length of Cut | Overall Length | Shank Dia. | Corner R | No. of Flutes | Stock | Type |
|-----------------|------|---------------|----------------|------------|----------|---------------|-------|------|
| | D1 | ap | L1 | D4 | R | N | | |
| MS4MRBD0300R010 | 3 | 8 | 45 | 6 | 0.1 | 4 | ● | 1 |
| D0300R020 | 3 | 8 | 45 | 6 | 0.2 | 4 | ● | 1 |
| D0300R030 | 3 | 8 | 45 | 6 | 0.3 | 4 | ● | 1 |
| D0300R050 | 3 | 8 | 45 | 6 | 0.5 | 4 | ● | 1 |
| D0300R100 | 3 | 8 | 45 | 6 | 1 | 4 | ● | 1 |
| D0400R010 | 4 | 11 | 45 | 6 | 0.1 | 4 | ● | 1 |
| D0400R020 | 4 | 11 | 45 | 6 | 0.2 | 4 | ● | 1 |
| D0400R030 | 4 | 11 | 45 | 6 | 0.3 | 4 | ● | 1 |
| D0400R050 | 4 | 11 | 45 | 6 | 0.5 | 4 | ● | 1 |
| D0400R100 | 4 | 11 | 45 | 6 | 1 | 4 | ● | 1 |
| D0500R010 | 5 | 13 | 50 | 6 | 0.1 | 4 | ● | 1 |
| D0500R020 | 5 | 13 | 50 | 6 | 0.2 | 4 | ● | 1 |
| D0500R030 | 5 | 13 | 50 | 6 | 0.3 | 4 | ● | 1 |
| D0500R050 | 5 | 13 | 50 | 6 | 0.5 | 4 | ● | 1 |
| D0500R100 | 5 | 13 | 50 | 6 | 1 | 4 | ● | 1 |
| D0600R010 | 6 | 13 | 50 | 6 | 0.1 | 4 | ● | 2 |
| D0600R020 | 6 | 13 | 50 | 6 | 0.2 | 4 | ● | 2 |
| D0600R030 | 6 | 13 | 50 | 6 | 0.3 | 4 | ● | 2 |
| D0600R050 | 6 | 13 | 50 | 6 | 0.5 | 4 | ● | 2 |
| D0600R100 | 6 | 13 | 50 | 6 | 1 | 4 | ● | 2 |
| D0600R150 | 6 | 13 | 50 | 6 | 1.5 | 4 | ● | 2 |
| D0600R200 | 6 | 13 | 50 | 6 | 2 | 4 | ● | 2 |
| D0800R020 | 8 | 19 | 60 | 8 | 0.2 | 4 | ● | 2 |
| D0800R030 | 8 | 19 | 60 | 8 | 0.3 | 4 | ● | 2 |
| D0800R050 | 8 | 19 | 60 | 8 | 0.5 | 4 | ● | 2 |
| D0800R100 | 8 | 19 | 60 | 8 | 1 | 4 | ● | 2 |
| D0800R150 | 8 | 19 | 60 | 8 | 1.5 | 4 | ● | 2 |
| D0800R200 | 8 | 19 | 60 | 8 | 2 | 4 | ● | 2 |
| D0800R250 | 8 | 19 | 60 | 8 | 2.5 | 4 | ● | 2 |
| D0800R300 | 8 | 19 | 60 | 8 | 3 | 4 | ● | 2 |
| D1000R020 | 10 | 22 | 70 | 10 | 0.2 | 4 | ● | 2 |
| D1000R030 | 10 | 22 | 70 | 10 | 0.3 | 4 | ● | 2 |
| D1000R050 | 10 | 22 | 70 | 10 | 0.5 | 4 | ● | 2 |
| D1000R100 | 10 | 22 | 70 | 10 | 1 | 4 | ● | 2 |
| D1000R150 | 10 | 22 | 70 | 10 | 1.5 | 4 | ● | 2 |
| D1000R200 | 10 | 22 | 70 | 10 | 2 | 4 | ● | 2 |
| D1000R250 | 10 | 22 | 70 | 10 | 2.5 | 4 | ● | 2 |
| D1000R300 | 10 | 22 | 70 | 10 | 3 | 4 | ● | 2 |

General Use

Long Neck

High Helix

For Small Automatic Lathe

General Use

Long Neck

High Helix

General Use

For Rib Processing

Ball

TAPER

SQUARE

BALL

RADIUS

41

● : Inventory maintained.

Unit : mm

| Order Number | Dia. D1 | Length of Cut ap | Overall Length L1 | Shank Dia. D4 | Corner R R | No. of Flutes N | Stock | Type |
|------------------------|------------|------------------------|-------------------------|------------------|---------------|-----------------------|-------|------|
| MS4MRBD1200R020 | 12 | 26 | 75 | 12 | 0.2 | 4 | ● | 2 |
| D1200R030 | 12 | 26 | 75 | 12 | 0.3 | 4 | ● | 2 |
| D1200R050 | 12 | 26 | 75 | 12 | 0.5 | 4 | ● | 2 |
| D1200R100 | 12 | 26 | 75 | 12 | 1 | 4 | ● | 2 |
| D1200R150 | 12 | 26 | 75 | 12 | 1.5 | 4 | ● | 2 |
| D1200R200 | 12 | 26 | 75 | 12 | 2 | 4 | ● | 2 |
| D1200R250 | 12 | 26 | 75 | 12 | 2.5 | 4 | ● | 2 |
| D1200R300 | 12 | 26 | 75 | 12 | 3 | 4 | ● | 2 |
| D1600R050 | 16 | 32 | 90 | 16 | 0.5 | 4 | ● | 2 |
| D1600R100 | 16 | 32 | 90 | 16 | 1 | 4 | ● | 2 |
| D1600R150 | 16 | 32 | 90 | 16 | 1.5 | 4 | ● | 2 |
| D1600R200 | 16 | 32 | 90 | 16 | 2 | 4 | ● | 2 |
| D1600R250 | 16 | 32 | 90 | 16 | 2.5 | 4 | ● | 2 |
| D1600R300 | 16 | 32 | 90 | 16 | 3 | 4 | ● | 2 |
| D2000R050 | 20 | 38 | 100 | 20 | 0.5 | 4 | ● | 2 |
| D2000R100 | 20 | 38 | 100 | 20 | 1 | 4 | ● | 2 |
| D2000R150 | 20 | 38 | 100 | 20 | 1.5 | 4 | ● | 2 |
| D2000R200 | 20 | 38 | 100 | 20 | 2 | 4 | ● | 2 |
| D2000R250 | 20 | 38 | 100 | 20 | 2.5 | 4 | ● | 2 |
| D2000R300 | 20 | 38 | 100 | 20 | 3 | 4 | ● | 2 |

SQUARE
Long Neck
General Use

High Helix
For Small Automatic Lathe

BALL
Long Neck
General Use
Taper Neck

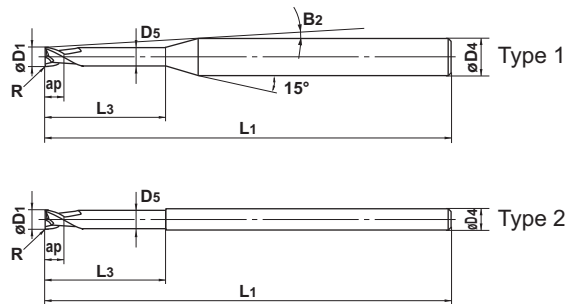
RADIUS
Long Neck
General Use
High Helix

TAPER
Ball
General Use
For Rib Processing

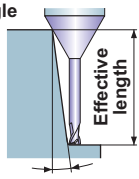
MSTAR END MILLS

MS2XLRB

Corner radius end mill, Short cut length, 2 flute, Long neck



Effective length for inclined angle



Inclined angle

● 2 flute long neck corner radius end mill.

Unit : mm

| Order Number | Dia. D1 | Corner R R | Length of Cut ap | Neck Length L3 | Neck Dia. D5 | Cutting Edge to Shank Angle B2 | Overall Length L1 | Shank Dia. D4 | No. of Flutes N | Stock | Type | Effective length for inclined angle | | | |
|----------------------|------------|---------------|---------------------|-------------------|-----------------|-----------------------------------|----------------------|------------------|--------------------|-------|------|-------------------------------------|-----------------|-----------------|-----------------|
| | | | | | | | | | | | | 30° | 1° | 2° | 3° |
| MS2XLRBD0100R010N020 | 1 | 0.1 | 1 | 2 | 0.94 | 12.1 | 60 | 6 | 2 | ● | 1 | 2.5 | 2.6 | 2.8 | 3 |
| D0100R010N050 | 1 | 0.1 | 1 | 5 | 0.94 | 9.7 | 60 | 6 | 2 | ● | 1 | 5.6 | 5.8 | 6.3 | 6.8 |
| D0200R010N040 | 2 | 0.1 | 2 | 4 | 1.9 | 9.5 | 60 | 6 | 2 | ● | 1 | 4.7 | 4.8 | 5.2 | 5.6 |
| D0200R010N100 | 2 | 0.1 | 2 | 10 | 1.9 | 6.4 | 60 | 6 | 2 | ● | 1 | 10.9 | 11.3 | 12.1 | 13.1 |
| D0200R030N040 | 2 | 0.3 | 2 | 4 | 1.9 | 9.7 | 60 | 6 | 2 | ● | 1 | 4.7 | 4.8 | 5.2 | 5.6 |
| D0200R030N100 | 2 | 0.3 | 2 | 10 | 1.9 | 6.5 | 60 | 6 | 2 | ● | 1 | 10.9 | 11.2 | 12.1 | 13 |
| D0300R010N060 | 3 | 0.1 | 3 | 6 | 2.9 | 7.1 | 50 | 6 | 2 | ● | 1 | 6.7 | 7 | 7.5 | 8.1 |
| D0300R010N150 | 3 | 0.1 | 3 | 15 | 2.9 | 4.1 | 60 | 6 | 2 | ● | 1 | 16.1 | 16.6 | 17.9 | 19.3 |
| D0300R030N060 | 3 | 0.3 | 3 | 6 | 2.9 | 7.2 | 50 | 6 | 2 | ● | 1 | 6.7 | 7 | 7.5 | 8.1 |
| D0300R030N150 | 3 | 0.3 | 3 | 15 | 2.9 | 4.2 | 60 | 6 | 2 | ● | 1 | 16 | 16.6 | 17.8 | 19.2 |
| D0400R010N080 | 4 | 0.1 | 4 | 8 | 3.9 | 4.7 | 50 | 6 | 2 | ● | 1 | 8.8 | 9.1 | 9.8 | 10.6 |
| D0400R010N200 | 4 | 0.1 | 4 | 20 | 3.9 | 2.4 | 60 | 6 | 2 | ● | 1 | 21.2 | 22 | 23.6 | No interference |
| D0400R030N080 | 4 | 0.3 | 4 | 8 | 3.9 | 4.8 | 50 | 6 | 2 | ● | 1 | 8.8 | 9.1 | 9.8 | 10.5 |
| D0400R030N200 | 4 | 0.3 | 4 | 20 | 3.9 | 2.4 | 60 | 6 | 2 | ● | 1 | 21.2 | 21.9 | 23.6 | No interference |
| D0400R050N080 | 4 | 0.5 | 4 | 8 | 3.9 | 4.9 | 50 | 6 | 2 | ● | 1 | 8.8 | 9.1 | 9.7 | 10.5 |
| D0400R050N200 | 4 | 0.5 | 4 | 20 | 3.9 | 2.5 | 60 | 6 | 2 | ● | 1 | 21.2 | 21.9 | 23.5 | No interference |
| D0600R010N120 | 6 | 0.1 | 6 | 12 | 5.85 | — | 50 | 6 | 2 | ● | 1 | No interference | No interference | No interference | No interference |
| D0600R010N300 | 6 | 0.1 | 6 | 30 | 5.85 | — | 70 | 6 | 2 | ● | 1 | No interference | No interference | No interference | No interference |
| D0600R030N120 | 6 | 0.3 | 6 | 12 | 5.85 | — | 50 | 6 | 2 | ● | 1 | No interference | No interference | No interference | No interference |
| D0600R030N300 | 6 | 0.3 | 6 | 30 | 5.85 | — | 70 | 6 | 2 | ● | 1 | No interference | No interference | No interference | No interference |
| D0600R050N120 | 6 | 0.5 | 6 | 12 | 5.85 | — | 50 | 6 | 2 | ● | 2 | No interference | No interference | No interference | No interference |
| D0600R050N300 | 6 | 0.5 | 6 | 30 | 5.85 | — | 70 | 6 | 2 | ● | 2 | No interference | No interference | No interference | No interference |

The diameter tolerance is only applied to items produced after July 2006.

General Use

Long Neck

High Helix

For Small Automatic Lathe

General Use

Long Neck

General Use

High Helix

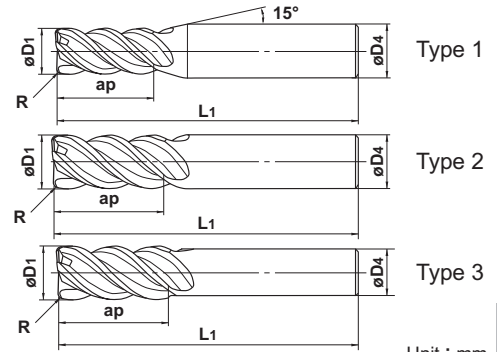
General Use

For Rib Processing





● 4 flute high power corner radius end mill.



Unit : mm

| Order Number | Dia. | Length of Cut | Overall Length | Shank Dia. | Corner R | No. of Flutes | Stock | Type |
|------------------|------|---------------|----------------|------------|----------|---------------|-------|------|
| | D1 | ap | L1 | D4 | R | N | | |
| MSMHDRBD0200R020 | 2 | 4 | 45 | 4 | 0.2 | 4 | ● | 1 |
| D0200R030 | 2 | 4 | 45 | 4 | 0.3 | 4 | ● | 1 |
| D0300R020 | 3 | 8 | 45 | 6 | 0.2 | 4 | ● | 1 |
| D0300R030 | 3 | 8 | 45 | 6 | 0.3 | 4 | ● | 1 |
| D0300R050 | 3 | 8 | 45 | 6 | 0.5 | 4 | ● | 1 |
| D0400R020 | 4 | 11 | 45 | 6 | 0.2 | 4 | ● | 1 |
| D0400R030 | 4 | 11 | 45 | 6 | 0.3 | 4 | ● | 1 |
| D0400R050 | 4 | 11 | 45 | 6 | 0.5 | 4 | ● | 1 |
| D0500R020 | 5 | 13 | 50 | 6 | 0.2 | 4 | ● | 1 |
| D0500R030 | 5 | 13 | 50 | 6 | 0.3 | 4 | ● | 1 |
| D0500R050 | 5 | 13 | 50 | 6 | 0.5 | 4 | ● | 1 |
| D0500R100 | 5 | 13 | 50 | 6 | 1 | 4 | ● | 1 |
| D0600R030 | 6 | 13 | 50 | 6 | 0.3 | 4 | ● | 2 |
| D0600R050 | 6 | 13 | 50 | 6 | 0.5 | 4 | ● | 2 |
| D0600R100 | 6 | 13 | 50 | 6 | 1 | 4 | ● | 2 |
| D0800R030 | 8 | 19 | 60 | 8 | 0.3 | 4 | ● | 2 |
| D0800R050 | 8 | 19 | 60 | 8 | 0.5 | 4 | ● | 2 |
| D0800R100 | 8 | 19 | 60 | 8 | 1 | 4 | ● | 2 |
| D0800R150 | 8 | 19 | 60 | 8 | 1.5 | 4 | ● | 2 |
| D1000R030 | 10 | 22 | 70 | 10 | 0.3 | 4 | ● | 2 |
| D1000R050 | 10 | 22 | 70 | 10 | 0.5 | 4 | ● | 2 |
| D1000R100 | 10 | 22 | 70 | 10 | 1 | 4 | ● | 2 |
| D1000R150 | 10 | 22 | 70 | 10 | 1.5 | 4 | ● | 2 |
| D1000R200 | 10 | 22 | 70 | 10 | 2 | 4 | ● | 2 |
| D1200R050S10 | 12 | 26 | 75 | 10 | 0.5 | 4 | ● | 3 |
| D1200R100S10 | 12 | 26 | 75 | 10 | 1 | 4 | ● | 3 |
| D1200R150S10 | 12 | 26 | 75 | 10 | 1.5 | 4 | ● | 3 |
| D1200R200S10 | 12 | 26 | 75 | 10 | 2 | 4 | ● | 3 |
| D1200R300S10 | 12 | 26 | 75 | 10 | 3 | 4 | ● | 3 |
| D1200R050 | 12 | 26 | 75 | 12 | 0.5 | 4 | ● | 2 |
| D1200R100 | 12 | 26 | 75 | 12 | 1 | 4 | ● | 2 |
| D1200R150 | 12 | 26 | 75 | 12 | 1.5 | 4 | ● | 2 |
| D1200R200 | 12 | 26 | 75 | 12 | 2 | 4 | ● | 2 |
| D1200R300 | 12 | 26 | 75 | 12 | 3 | 4 | ● | 2 |
| D1600R100 | 16 | 35 | 90 | 16 | 1 | 4 | ● | 2 |
| D1600R150 | 16 | 35 | 90 | 16 | 1.5 | 4 | ● | 2 |
| D1600R200 | 16 | 35 | 90 | 16 | 2 | 4 | ● | 2 |
| D1600R300 | 16 | 35 | 90 | 16 | 3 | 4 | ● | 2 |

General Use
 SQUARE Long Neck
 High Helix
 For Small Automatic Lathe
 BALL Taper Neck
 RADIUS General Use
 High Helix
 TAPER Ball Processing

MSTAR END MILLS

MSMHDRB

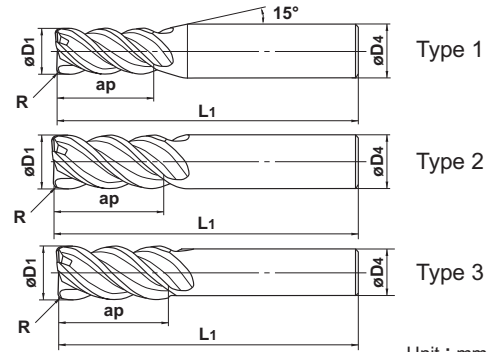
High power, Corner radius, Medium cut length, 4 flute



$D_1 \leq 12$ 0 - -0.020
 $12 < D_1$ 0 - -0.030



● 4 flute high power corner radius end mill.



Unit : mm

| Order Number | Dia. | Length of Cut | Overall Length | Shank Dia. | Corner R | No. of Flutes | Stock | Type |
|-------------------------|------|---------------|----------------|------------|----------|---------------|-------|------|
| | D1 | ap | L1 | D4 | R | N | | |
| MSMHDRBD1800R100 | 18 | 40 | 100 | 16 | 1 | 4 | ● | 3 |
| D1800R150 | 18 | 40 | 100 | 16 | 1.5 | 4 | ● | 3 |
| D1800R200 | 18 | 40 | 100 | 16 | 2 | 4 | ● | 3 |
| D1800R300 | 18 | 40 | 100 | 16 | 3 | 4 | ● | 3 |
| D2000R100 | 20 | 45 | 110 | 20 | 1 | 4 | ● | 2 |
| D2000R150 | 20 | 45 | 110 | 20 | 1.5 | 4 | ● | 2 |
| D2000R200 | 20 | 45 | 110 | 20 | 2 | 4 | ● | 2 |
| D2000R300 | 20 | 45 | 110 | 20 | 3 | 4 | ● | 2 |

General Use

Long Neck

High Helix

For Small Automatic Lathe

General Use

Long Neck

General Use

High Helix

General Use

Ball

Radius

Taper

SQUARE

BALL

RADIUS

TAPER



$D1 < 0.5$
 $0.5 \leq D1$

0 - -0.020
0 - -0.030



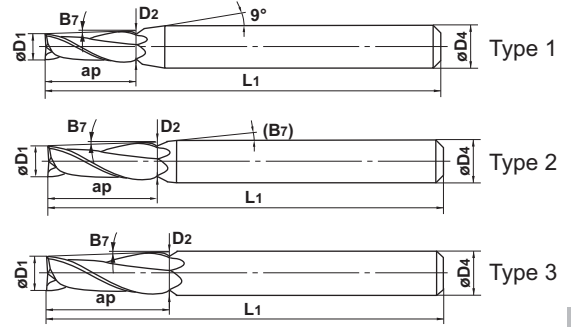
$\pm 5'$



$D1 < 0.4$

$0.4 \leq D1$

● 2 flute taper end mill for general use.



Unit : mm

| Order Number | Small Mill Dia. | Taper Angle One Side | Large Mill Dia. | Length of Cut | Overall Length | Shank Dia. | No. of Flutes | Stock | Type |
|-----------------|-----------------|----------------------|-----------------|---------------|----------------|------------|---------------|-------|------|
| | D1 | B7 | D2 | ap | L1 | D4 | N | | |
| MS2MTD0020T0030 | 0.2 | 30' | 0.21 | 0.8 | 45 | 4 | 2 | ● | 1 |
| D0020T0100 | 0.2 | 1° | 0.23 | 0.8 | 45 | 4 | 2 | ● | 1 |
| D0020T0130 | 0.2 | 1°30' | 0.24 | 0.8 | 45 | 4 | 2 | ● | 1 |
| D0020T0200 | 0.2 | 2° | 0.26 | 0.8 | 45 | 4 | 2 | ● | 1 |
| D0020T0300 | 0.2 | 3° | 0.28 | 0.8 | 45 | 4 | 2 | ● | 1 |
| D0020T0400 | 0.2 | 4° | 0.31 | 0.8 | 45 | 4 | 2 | ● | 1 |
| D0020T0500 | 0.2 | 5° | 0.34 | 0.8 | 45 | 4 | 2 | ● | 1 |
| D0020T0700 | 0.2 | 7° | 0.4 | 0.8 | 45 | 4 | 2 | ● | 1 |
| D0020T1000 | 0.2 | 10° | 0.48 | 0.8 | 45 | 4 | 2 | ● | 2 |
| D0030T0030 | 0.3 | 30' | 0.32 | 1.2 | 45 | 4 | 2 | ● | 1 |
| D0030T0100 | 0.3 | 1° | 0.34 | 1.2 | 45 | 4 | 2 | ● | 1 |
| D0030T0130 | 0.3 | 1°30' | 0.36 | 1.2 | 45 | 4 | 2 | ● | 1 |
| D0030T0200 | 0.3 | 2° | 0.38 | 1.2 | 45 | 4 | 2 | ● | 1 |
| D0030T0300 | 0.3 | 3° | 0.43 | 1.2 | 45 | 4 | 2 | ● | 1 |
| D0030T0400 | 0.3 | 4° | 0.47 | 1.2 | 45 | 4 | 2 | ● | 1 |
| D0030T0500 | 0.3 | 5° | 0.51 | 1.2 | 45 | 4 | 2 | ● | 1 |
| D0030T0700 | 0.3 | 7° | 0.59 | 1.2 | 45 | 4 | 2 | ● | 1 |
| D0030T1000 | 0.3 | 10° | 0.72 | 1.2 | 45 | 4 | 2 | ● | 2 |
| D0040T0030 | 0.4 | 30' | 0.43 | 1.6 | 45 | 4 | 2 | ● | 1 |
| D0040T0100 | 0.4 | 1° | 0.46 | 1.6 | 45 | 4 | 2 | ● | 1 |
| D0040T0130 | 0.4 | 1°30' | 0.48 | 1.6 | 45 | 4 | 2 | ● | 1 |
| D0040T0200 | 0.4 | 2° | 0.51 | 1.6 | 45 | 4 | 2 | ● | 1 |
| D0040T0300 | 0.4 | 3° | 0.57 | 1.6 | 45 | 4 | 2 | ● | 1 |
| D0040T0400 | 0.4 | 4° | 0.62 | 1.6 | 45 | 4 | 2 | ● | 1 |
| D0040T0500 | 0.4 | 5° | 0.68 | 1.6 | 45 | 4 | 2 | ● | 1 |
| D0040T0700 | 0.4 | 7° | 0.79 | 1.6 | 45 | 4 | 2 | ● | 1 |
| D0040T1000 | 0.4 | 10° | 0.96 | 1.6 | 45 | 4 | 2 | ● | 2 |
| D0050T0030 | 0.5 | 30' | 0.53 | 2 | 45 | 4 | 2 | ● | 1 |
| D0050T0100 | 0.5 | 1° | 0.57 | 2 | 45 | 4 | 2 | ● | 1 |
| D0050T0130 | 0.5 | 1°30' | 0.6 | 2 | 45 | 4 | 2 | ● | 1 |
| D0050T0200 | 0.5 | 2° | 0.64 | 2 | 45 | 4 | 2 | ● | 1 |
| D0050T0300 | 0.5 | 3° | 0.71 | 2 | 45 | 4 | 2 | ● | 1 |
| D0050T0400 | 0.5 | 4° | 0.78 | 2 | 45 | 4 | 2 | ● | 1 |
| D0050T0500 | 0.5 | 5° | 0.85 | 2 | 45 | 4 | 2 | ● | 1 |
| D0050T0700 | 0.5 | 7° | 0.99 | 2 | 45 | 4 | 2 | ● | 1 |
| D0050T1000 | 0.5 | 10° | 1.21 | 2 | 45 | 4 | 2 | ● | 2 |
| D0060T0030 | 0.6 | 30' | 0.63 | 2 | 45 | 4 | 2 | ● | 1 |
| D0060T0100 | 0.6 | 1° | 0.67 | 2 | 45 | 4 | 2 | ● | 1 |

General Use

SQUARE
Long Neck

High Helix

For Small Automatic Lathe

BALL
Long Neck

RADIUS
Long Neck

High Helix

TAPER
Ball Processing

MSTAR END MILLS

MS2MT

Taper end mill, Medium cut length, 2 flute



$D1 < 0.5$
 $0.5 \leq D1$

$0 - -0.020$
 $0 - -0.030$



±5°

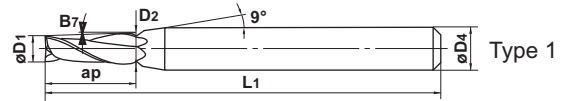


$D1 < 0.4$

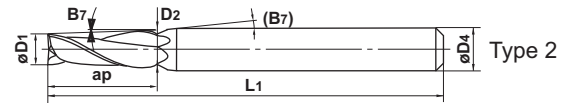


$0.4 \leq D1$

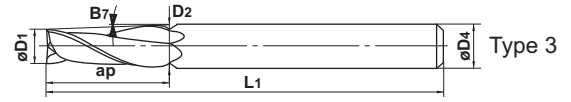
● 2 flute taper end mill for general use.



Type 1



Type 2



Type 3

Unit : mm

| Order Number | Small Mill Dia. | Taper Angle One Side | Large Mill Dia. | Length of Cut | Overall Length | Shank Dia. | No. of Flutes | Stock | Type |
|-----------------|-----------------|----------------------|-----------------|---------------|----------------|------------|---------------|-------|------|
| | D1 | B7 | D2 | ap | L1 | D4 | N | | |
| MS2MTD0060T0130 | 0.6 | 1°30' | 0.7 | 2 | 45 | 4 | 2 | ● | 1 |
| D0060T0200 | 0.6 | 2° | 0.74 | 2 | 45 | 4 | 2 | ● | 1 |
| D0060T0230 | 0.6 | 2°30' | 0.77 | 2 | 45 | 4 | 2 | ● | 1 |
| D0060T0300 | 0.6 | 3° | 0.81 | 2 | 45 | 4 | 2 | ● | 1 |
| D0060T0400 | 0.6 | 4° | 0.88 | 2 | 45 | 4 | 2 | ● | 1 |
| D0060T0500 | 0.6 | 5° | 0.95 | 2 | 45 | 4 | 2 | ● | 1 |
| D0060T0700 | 0.6 | 7° | 1.09 | 2 | 45 | 4 | 2 | ● | 1 |
| D0060T1000 | 0.6 | 10° | 1.31 | 2 | 45 | 4 | 2 | ● | 2 |
| D0070T0030 | 0.7 | 30' | 0.73 | 2 | 45 | 4 | 2 | ● | 1 |
| D0070T0100 | 0.7 | 1° | 0.77 | 2 | 45 | 4 | 2 | ● | 1 |
| D0070T0130 | 0.7 | 1°30' | 0.8 | 2 | 45 | 4 | 2 | ● | 1 |
| D0070T0200 | 0.7 | 2° | 0.84 | 2 | 45 | 4 | 2 | ● | 1 |
| D0070T0300 | 0.7 | 3° | 0.91 | 2 | 45 | 4 | 2 | ● | 1 |
| D0070T0400 | 0.7 | 4° | 0.98 | 2 | 45 | 4 | 2 | ● | 1 |
| D0070T0500 | 0.7 | 5° | 1.05 | 2 | 45 | 4 | 2 | ● | 1 |
| D0070T0700 | 0.7 | 7° | 1.19 | 2 | 45 | 4 | 2 | ● | 1 |
| D0070T1000 | 0.7 | 10° | 1.41 | 2 | 45 | 4 | 2 | ● | 2 |
| D0080T0030 | 0.8 | 30' | 0.85 | 3 | 45 | 4 | 2 | ● | 1 |
| D0080T0100 | 0.8 | 1° | 0.9 | 3 | 45 | 4 | 2 | ● | 1 |
| D0080T0130 | 0.8 | 1°30' | 0.96 | 3 | 45 | 4 | 2 | ● | 1 |
| D0080T0200 | 0.8 | 2° | 1.01 | 3 | 45 | 4 | 2 | ● | 1 |
| D0080T0230 | 0.8 | 2°30' | 1.06 | 3 | 45 | 4 | 2 | ● | 1 |
| D0080T0300 | 0.8 | 3° | 1.11 | 3 | 45 | 4 | 2 | ● | 1 |
| D0080T0400 | 0.8 | 4° | 1.22 | 3 | 45 | 4 | 2 | ● | 1 |
| D0080T0500 | 0.8 | 5° | 1.32 | 3 | 45 | 4 | 2 | ● | 1 |
| D0080T0700 | 0.8 | 7° | 1.54 | 3 | 45 | 4 | 2 | ● | 1 |
| D0080T1000 | 0.8 | 10° | 1.86 | 3 | 45 | 4 | 2 | ● | 2 |
| D0090T0030 | 0.9 | 30' | 0.95 | 3 | 45 | 4 | 2 | ● | 1 |
| D0090T0100 | 0.9 | 1° | 1 | 3 | 45 | 4 | 2 | ● | 1 |
| D0090T0130 | 0.9 | 1°30' | 1.06 | 3 | 45 | 4 | 2 | ● | 1 |
| D0090T0200 | 0.9 | 2° | 1.11 | 3 | 45 | 4 | 2 | ● | 1 |
| D0090T0300 | 0.9 | 3° | 1.21 | 3 | 45 | 4 | 2 | ● | 1 |
| D0090T0400 | 0.9 | 4° | 1.32 | 3 | 45 | 4 | 2 | ● | 1 |
| D0090T0500 | 0.9 | 5° | 1.42 | 3 | 45 | 4 | 2 | ● | 1 |
| D0090T0700 | 0.9 | 7° | 1.64 | 3 | 45 | 4 | 2 | ● | 1 |
| D0090T1000 | 0.9 | 10° | 1.96 | 3 | 45 | 4 | 2 | ● | 2 |
| D0100T0030 | 1 | 30' | 1.07 | 4 | 45 | 4 | 2 | ● | 1 |
| D0100T0100 | 1 | 1° | 1.14 | 4 | 45 | 4 | 2 | ● | 1 |

● : Inventory maintained.

| Order Number | Small Mill Dia. D1 | Taper Angle One Side B7 | Large Mill Dia. D2 | Length of Cut ap | Overall Length L1 | Shank Dia. D4 | No. of Flutes N | Stock | Type |
|-----------------|-----------------------|----------------------------|-----------------------|---------------------|----------------------|------------------|--------------------|-------|------|
| MS2MTD0100T0130 | 1 | 1°30' | 1.21 | 4 | 45 | 4 | 2 | ● | 1 |
| D0100T0200 | 1 | 2° | 1.28 | 4 | 45 | 4 | 2 | ● | 1 |
| D0100T0230 | 1 | 2°30' | 1.35 | 4 | 45 | 4 | 2 | ● | 1 |
| D0100T0300 | 1 | 3° | 1.42 | 4 | 45 | 4 | 2 | ● | 1 |
| D0100T0400 | 1 | 4° | 1.56 | 4 | 45 | 4 | 2 | ● | 1 |
| D0100T0500 | 1 | 5° | 1.7 | 4 | 45 | 4 | 2 | ● | 1 |
| D0100T0700 | 1 | 7° | 1.98 | 4 | 45 | 4 | 2 | ● | 1 |
| D0100T1000 | 1 | 10° | 2.41 | 4 | 45 | 4 | 2 | ● | 2 |
| D0150T0030 | 1.5 | 30' | 1.59 | 5 | 45 | 4 | 2 | ● | 1 |
| D0150T0100 | 1.5 | 1° | 1.67 | 5 | 45 | 4 | 2 | ● | 1 |
| D0150T0130 | 1.5 | 1°30' | 1.76 | 5 | 45 | 4 | 2 | ● | 1 |
| D0150T0200 | 1.5 | 2° | 1.85 | 5 | 45 | 4 | 2 | ● | 1 |
| D0150T0230 | 1.5 | 2°30' | 1.94 | 5 | 45 | 4 | 2 | ● | 1 |
| D0150T0300 | 1.5 | 3° | 2.02 | 5 | 45 | 4 | 2 | ● | 1 |
| D0150T0400 | 1.5 | 4° | 2.2 | 5 | 45 | 4 | 2 | ● | 1 |
| D0150T0500 | 1.5 | 5° | 2.37 | 5 | 45 | 4 | 2 | ● | 1 |
| D0150T0700 | 1.5 | 7° | 2.73 | 5 | 45 | 4 | 2 | ● | 1 |
| D0150T1000 | 1.5 | 10° | 3.26 | 5 | 45 | 4 | 2 | ● | 2 |
| D0200T0030 | 2 | 30' | 2.1 | 6 | 45 | 4 | 2 | ● | 1 |
| D0200T0100 | 2 | 1° | 2.21 | 6 | 45 | 4 | 2 | ● | 1 |
| D0200T0130 | 2 | 1°30' | 2.31 | 6 | 45 | 4 | 2 | ● | 1 |
| D0200T0200 | 2 | 2° | 2.42 | 6 | 45 | 4 | 2 | ● | 1 |
| D0200T0230 | 2 | 2°30' | 2.52 | 6 | 45 | 4 | 2 | ● | 1 |
| D0200T0300 | 2 | 3° | 2.63 | 6 | 45 | 4 | 2 | ● | 1 |
| D0200T0400 | 2 | 4° | 2.84 | 6 | 45 | 4 | 2 | ● | 1 |
| D0200T0500 | 2 | 5° | 3.05 | 6 | 45 | 4 | 2 | ● | 1 |
| D0200T0700 | 2 | 7° | 3.47 | 6 | 45 | 4 | 2 | ● | 2 |
| D0200T1000 | 2 | 10° | 4.12 | 6 | 50 | 6 | 2 | ● | 2 |
| D0250T0030 | 2.5 | 30' | 2.64 | 8 | 45 | 4 | 2 | ● | 1 |
| D0250T0100 | 2.5 | 1° | 2.78 | 8 | 45 | 4 | 2 | ● | 1 |
| D0250T0130 | 2.5 | 1°30' | 2.92 | 8 | 45 | 4 | 2 | ● | 1 |
| D0250T0200 | 2.5 | 2° | 3.06 | 8 | 45 | 4 | 2 | ● | 1 |
| D0250T0230 | 2.5 | 2°30' | 3.2 | 8 | 45 | 4 | 2 | ● | 1 |
| D0250T0300 | 2.5 | 3° | 3.34 | 8 | 45 | 4 | 2 | ● | 1 |
| D0250T0400 | 2.5 | 4° | 3.62 | 8 | 45 | 4 | 2 | ● | 2 |
| D0250T0500 | 2.5 | 5° | 3.9 | 8 | 45 | 4 | 2 | ● | 2 |
| D0250T0700 | 2.5 | 7° | 4.46 | 8 | 50 | 4 | 2 | ● | 3 |
| D0250T1000 | 2.5 | 10° | 5.32 | 8 | 50 | 6 | 2 | ● | 2 |
| D0300T0030 | 3 | 30' | 3.17 | 10 | 50 | 6 | 2 | ● | 1 |
| D0300T0100 | 3 | 1° | 3.35 | 10 | 50 | 6 | 2 | ● | 1 |
| D0300T0130 | 3 | 1°30' | 3.52 | 10 | 50 | 6 | 2 | ● | 1 |
| D0300T0200 | 3 | 2° | 3.7 | 10 | 50 | 6 | 2 | ● | 1 |
| D0300T0300 | 3 | 3° | 4.05 | 10 | 50 | 6 | 2 | ● | 1 |
| D0300T0400 | 3 | 4° | 4.4 | 10 | 50 | 6 | 2 | ● | 1 |
| D0300T0500 | 3 | 5° | 4.75 | 10 | 50 | 6 | 2 | ● | 1 |
| D0300T0700 | 3 | 7° | 5.46 | 10 | 50 | 6 | 2 | ● | 2 |
| D0300T1000 | 3 | 10° | 6.53 | 10 | 50 | 6 | 2 | ● | 3 |
| D0400T0030 | 4 | 30' | 4.26 | 15 | 50 | 6 | 2 | ● | 1 |

SQUARE
Long Neck

High Helix

For Small Automatic Lathe

BALL
Long Neck

Taper Neck

RADIUS
High Helix

TAPER
Ball

For Rib Processing

MSTAR END MILLS

MS2MT

Taper end mill, Medium cut length, 2 flute



$D1 < 0.5$ 0 - -0.020
 $0.5 \leq D1$ 0 - -0.030



±5'

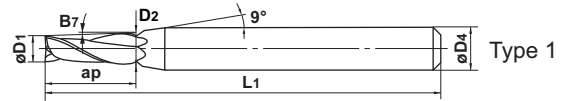


$D1 < 0.4$

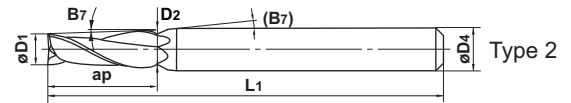


$0.4 \leq D1$

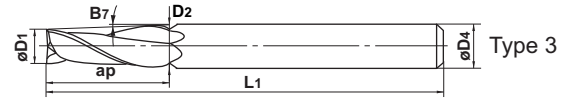
● 2 flute taper end mill for general use.



Type 1



Type 2



Type 3

Unit : mm

| Order Number | Small Mill Dia. D1 | Taper Angle One Side B7 | Large Mill Dia. D2 | Length of Cut ap | Overall Length L1 | Shank Dia. D4 | No. of Flutes N | Stock | Type |
|-----------------|-----------------------|----------------------------|-----------------------|---------------------|----------------------|------------------|--------------------|-------|------|
| MS2MTD0400T0100 | 4 | 1° | 4.52 | 15 | 50 | 6 | 2 | ● | 1 |
| D0400T0130 | 4 | 1°30' | 4.79 | 15 | 50 | 6 | 2 | ● | 1 |
| D0400T0200 | 4 | 2° | 5.05 | 15 | 50 | 6 | 2 | ● | 1 |
| D0400T0300 | 4 | 3° | 5.57 | 15 | 50 | 6 | 2 | ● | 1 |
| D0400T0400 | 4 | 4° | 6.1 | 15 | 55 | 6 | 2 | ● | 3 |
| D0400T0500 | 4 | 5° | 6.62 | 15 | 55 | 6 | 2 | ● | 3 |
| D0400T0700 | 4 | 7° | 7.68 | 15 | 55 | 6 | 2 | ● | 3 |
| D0400T1000 | 4 | 10° | 9.29 | 15 | 60 | 8 | 2 | ● | 3 |
| D0500T0030 | 5 | 30' | 5.35 | 20 | 55 | 6 | 2 | ● | 1 |
| D0500T0100 | 5 | 1° | 5.7 | 20 | 55 | 6 | 2 | ● | 1 |
| D0500T0130 | 5 | 1°30' | 6.05 | 20 | 55 | 6 | 2 | ● | 3 |
| D0500T0200 | 5 | 2° | 6.4 | 20 | 55 | 6 | 2 | ● | 3 |
| D0500T0300 | 5 | 3° | 7.1 | 20 | 55 | 6 | 2 | ● | 3 |
| D0500T0400 | 5 | 4° | 7.8 | 20 | 60 | 6 | 2 | ● | 3 |
| D0500T0500 | 5 | 5° | 8.5 | 20 | 60 | 8 | 2 | ● | 3 |
| D0500T0700 | 5 | 7° | 9.91 | 20 | 70 | 10 | 2 | ● | 2 |
| D0500T1000 | 5 | 10° | 12.05 | 20 | 80 | 12 | 2 | ● | 3 |
| D0600T0030 | 6 | 30' | 6.35 | 20 | 60 | 6 | 2 | ● | 3 |
| D0600T0100 | 6 | 1° | 6.7 | 20 | 60 | 6 | 2 | ● | 3 |
| D0600T0130 | 6 | 1°30' | 7.05 | 20 | 60 | 6 | 2 | ● | 3 |
| D0600T0200 | 6 | 2° | 7.4 | 20 | 60 | 6 | 2 | ● | 3 |
| D0600T0300 | 6 | 3° | 8.1 | 20 | 65 | 8 | 2 | ● | 3 |
| D0600T0500 | 6 | 5° | 9.5 | 20 | 70 | 8 | 2 | ● | 3 |
| D0800T0030 | 8 | 30' | 8.44 | 25 | 70 | 8 | 2 | ● | 3 |
| D0800T0100 | 8 | 1° | 8.87 | 25 | 70 | 8 | 2 | ● | 3 |
| D0800T0130 | 8 | 1°30' | 9.31 | 25 | 70 | 8 | 2 | ● | 3 |
| D0800T0200 | 8 | 2° | 9.75 | 25 | 70 | 8 | 2 | ● | 3 |
| D0800T0300 | 8 | 3° | 10.62 | 25 | 75 | 10 | 2 | ● | 3 |
| D0800T0500 | 8 | 5° | 12.37 | 25 | 95 | 12 | 2 | ● | 3 |
| D1000T0030 | 10 | 30' | 10.61 | 35 | 90 | 10 | 2 | ● | 3 |
| D1000T0100 | 10 | 1° | 11.22 | 35 | 90 | 10 | 2 | ● | 3 |
| D1000T0130 | 10 | 1°30' | 11.83 | 35 | 90 | 10 | 2 | ● | 3 |
| D1000T0200 | 10 | 2° | 12.44 | 35 | 95 | 12 | 2 | ● | 3 |
| D1000T0300 | 10 | 3° | 13.67 | 35 | 95 | 12 | 2 | ● | 3 |
| D1000T0500 | 10 | 5° | 16.12 | 35 | 95 | 16 | 2 | ● | 3 |

General Use

Long Neck

High Helix

For Small Automatic Lathe

General Use

Long Neck

High Helix

General Use

For Rib Processing

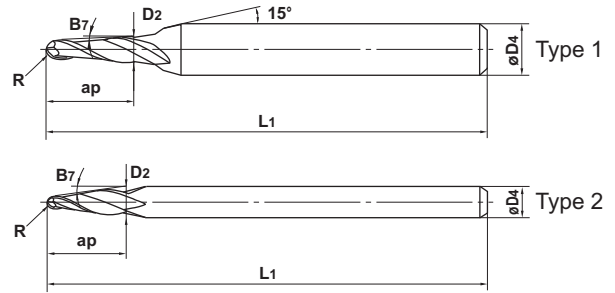
SQUARE

BALL

RADIUS

TAPER





● 2 flute taper ball nose end mill.

Unit : mm

| Order Number | Radius of Ball Nose R | Taper Angle One Side B7 | Large Mill Dia. D2 | Length of Cut ap | Overall Length L1 | Shank Dia. D4 | No. of Flutes N | Stock | Type |
|------------------|--------------------------|----------------------------|-----------------------|---------------------|----------------------|------------------|--------------------|-------|------|
| MS2MTBR0020T0300 | 0.2 | 3° | 0.69 | 3 | 40 | 4 | 2 | ● | 1 |
| R0020T0500 | 0.2 | 5° | 0.89 | 3 | 40 | 4 | 2 | ● | 1 |
| R0020T0700 | 0.2 | 7° | 1.09 | 3 | 40 | 4 | 2 | ● | 1 |
| R0020T1000 | 0.2 | 10° | 1.39 | 3 | 40 | 4 | 2 | ● | 1 |
| R0030T0300 | 0.3 | 3° | 0.88 | 3 | 40 | 4 | 2 | ● | 1 |
| R0030T0500 | 0.3 | 5° | 1.07 | 3 | 40 | 4 | 2 | ● | 1 |
| R0030T0700 | 0.3 | 7° | 1.27 | 3 | 40 | 4 | 2 | ● | 1 |
| R0030T1000 | 0.3 | 10° | 1.56 | 3 | 40 | 4 | 2 | ● | 1 |
| R0050T0030 | 0.5 | 30' | 1.04 | 3 | 40 | 4 | 2 | ● | 1 |
| R0050T0100 | 0.5 | 1° | 1.09 | 3 | 40 | 4 | 2 | ● | 1 |
| R0050T0130 | 0.5 | 1°30' | 1.13 | 3 | 40 | 4 | 2 | ● | 1 |
| R0050T0200 | 0.5 | 2° | 1.18 | 3 | 40 | 4 | 2 | ● | 1 |
| R0050T0300 | 0.5 | 3° | 1.26 | 3 | 40 | 4 | 2 | ● | 1 |
| R0050T0500 | 0.5 | 5° | 1.44 | 3 | 40 | 4 | 2 | ● | 1 |
| R0050T0700 | 0.5 | 7° | 2.36 | 6 | 45 | 4 | 2 | ● | 1 |
| R0075T0030 | 0.75 | 30' | 1.59 | 6 | 40 | 4 | 2 | ● | 1 |
| R0075T0100 | 0.75 | 1° | 1.68 | 6 | 40 | 4 | 2 | ● | 1 |
| R0075T0130 | 0.75 | 1°30' | 1.78 | 6 | 40 | 4 | 2 | ● | 1 |
| R0075T0200 | 0.75 | 2° | 1.87 | 6 | 40 | 4 | 2 | ● | 1 |
| R0075T0300 | 0.75 | 3° | 2.05 | 6 | 40 | 4 | 2 | ● | 1 |
| R0075T0700 | 0.75 | 7° | 2.8 | 6 | 40 | 4 | 2 | ● | 1 |
| R0100T0030 | 1 | 30' | 2.12 | 8 | 45 | 4 | 2 | ● | 1 |
| R0100T0100 | 1 | 1° | 2.24 | 8 | 45 | 4 | 2 | ● | 1 |
| R0100T0130 | 1 | 1°30' | 2.37 | 8 | 45 | 4 | 2 | ● | 1 |
| R0100T0200 | 1 | 2° | 2.49 | 8 | 45 | 4 | 2 | ● | 1 |
| R0100T0300 | 1 | 3° | 2.74 | 8 | 45 | 4 | 2 | ● | 1 |
| R0100T0400 | 1 | 4° | 2.98 | 8 | 45 | 4 | 2 | ● | 1 |
| R0100T0500 | 1 | 5° | 3.23 | 8 | 45 | 4 | 2 | ● | 1 |
| R0100T0700 | 1 | 7° | 3.73 | 8 | 50 | 6 | 2 | ● | 1 |
| R0125T0030 | 1.25 | 30' | 2.65 | 10 | 45 | 4 | 2 | ● | 1 |
| R0125T0100 | 1.25 | 1° | 2.81 | 10 | 45 | 4 | 2 | ● | 1 |
| R0125T0130 | 1.25 | 1°30' | 2.96 | 10 | 45 | 4 | 2 | ● | 1 |
| R0125T0200 | 1.25 | 2° | 3.11 | 10 | 45 | 4 | 2 | ● | 1 |
| R0125T0300 | 1.25 | 3° | 3.42 | 10 | 45 | 4 | 2 | ● | 1 |
| R0125T0400 | 1.25 | 4° | 3.73 | 10 | 50 | 6 | 2 | ● | 1 |
| R0125T0500 | 1.25 | 5° | 4.04 | 10 | 50 | 6 | 2 | ● | 1 |
| R0125T0700 | 1.25 | 7° | 5.77 | 14.5 | 60 | 6 | 2 | ● | 2 |
| R0150T0700 | 1.5 | 7° | 5.72 | 12.5 | 60 | 6 | 2 | ● | 2 |

SQUARE Long Neck
 High Helix
 For Small Automatic Lathe
 BALL Long Neck
 Taper Neck
 RADIUS High Helix Neck
 TAPER Ball Processing

MSTAR END MILLS

MS4LT

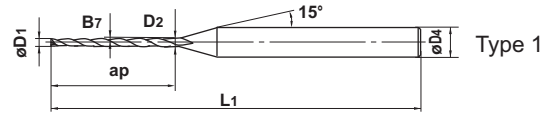
Taper end mill, Long cut length, 4 flute



$D_1 < 0.5$ 0 - -0.020
 $0.5 \leq D_1$ 0 - -0.040



$\pm 5'$



$D_1 < 3$

$3 \leq D_1$

● 4 flute taper end mill for rib milling.

Unit : mm

| Order Number | Small Mill Dia. | Taper Angle One Side | Large Mill Dia. | Length of Cut | Overall Length | Shank Dia. | No. of Flutes | Stock | Type |
|--------------------|-----------------|----------------------|-----------------|---------------|----------------|------------|---------------|-------|------|
| | D1 | B7 | D2 | ap | L1 | D4 | N | | |
| MS4LTD0020T0030L02 | 0.2 | 30' | 0.23 | 2 | 40 | 3 | 4 | ● | 1 |
| D0020T0100L02 | 0.2 | 1° | 0.27 | 2 | 40 | 3 | 4 | ● | 1 |
| D0020T0130L02 | 0.2 | 1°30' | 0.3 | 2 | 40 | 3 | 4 | ● | 1 |
| D0020T0200L02 | 0.2 | 2° | 0.34 | 2 | 40 | 3 | 4 | ● | 1 |
| D0030T0030L03 | 0.3 | 30' | 0.35 | 3 | 40 | 3 | 4 | ● | 1 |
| D0030T0100L03 | 0.3 | 1° | 0.4 | 3 | 40 | 3 | 4 | ● | 1 |
| D0030T0130L03 | 0.3 | 1°30' | 0.46 | 3 | 40 | 3 | 4 | ● | 1 |
| D0030T0200L03 | 0.3 | 2° | 0.51 | 3 | 40 | 3 | 4 | ● | 1 |
| D0040T0030L04 | 0.4 | 30' | 0.47 | 4 | 40 | 3 | 4 | ● | 1 |
| D0040T0100L04 | 0.4 | 1° | 0.54 | 4 | 40 | 3 | 4 | ● | 1 |
| D0040T0130L04 | 0.4 | 1°30' | 0.61 | 4 | 40 | 3 | 4 | ● | 1 |
| D0040T0200L04 | 0.4 | 2° | 0.68 | 4 | 40 | 3 | 4 | ● | 1 |
| D0050T0030L04 | 0.5 | 30' | 0.57 | 4 | 40 | 3 | 4 | ● | 1 |
| D0050T0030L06 | 0.5 | 30' | 0.6 | 6 | 40 | 3 | 4 | ● | 1 |
| D0050T0100L04 | 0.5 | 1° | 0.64 | 4 | 40 | 3 | 4 | ● | 1 |
| D0050T0100L06 | 0.5 | 1° | 0.71 | 6 | 40 | 3 | 4 | ● | 1 |
| D0050T0130L04 | 0.5 | 1°30' | 0.71 | 4 | 40 | 3 | 4 | ● | 1 |
| D0050T0130L06 | 0.5 | 1°30' | 0.81 | 6 | 40 | 3 | 4 | ● | 1 |
| D0050T0200L04 | 0.5 | 2° | 0.78 | 4 | 40 | 3 | 4 | ● | 1 |
| D0050T0200L06 | 0.5 | 2° | 0.92 | 6 | 40 | 3 | 4 | ● | 1 |
| D0060T0030L04 | 0.6 | 30' | 0.67 | 4 | 40 | 3 | 4 | ● | 1 |
| D0060T0030L06 | 0.6 | 30' | 0.7 | 6 | 40 | 3 | 4 | ● | 1 |
| D0060T0100L04 | 0.6 | 1° | 0.74 | 4 | 40 | 3 | 4 | ● | 1 |
| D0060T0100L06 | 0.6 | 1° | 0.81 | 6 | 40 | 3 | 4 | ● | 1 |
| D0060T0130L04 | 0.6 | 1°30' | 0.81 | 4 | 40 | 3 | 4 | ● | 1 |
| D0060T0130L06 | 0.6 | 1°30' | 0.91 | 6 | 40 | 3 | 4 | ● | 1 |
| D0060T0200L04 | 0.6 | 2° | 0.88 | 4 | 40 | 3 | 4 | ● | 1 |
| D0060T0200L06 | 0.6 | 2° | 1.02 | 6 | 40 | 3 | 4 | ● | 1 |
| D0070T0030L06 | 0.7 | 30' | 0.8 | 6 | 40 | 3 | 4 | ● | 1 |
| D0070T0030L08 | 0.7 | 30' | 0.84 | 8 | 45 | 3 | 4 | ● | 1 |
| D0070T0100L06 | 0.7 | 1° | 0.91 | 6 | 40 | 3 | 4 | ● | 1 |
| D0070T0100L08 | 0.7 | 1° | 0.98 | 8 | 45 | 3 | 4 | ● | 1 |
| D0070T0130L06 | 0.7 | 1°30' | 1.01 | 6 | 40 | 3 | 4 | ● | 1 |
| D0070T0130L08 | 0.7 | 1°30' | 1.12 | 8 | 45 | 3 | 4 | ● | 1 |
| D0070T0200L06 | 0.7 | 2° | 1.12 | 6 | 40 | 3 | 4 | ● | 1 |
| D0070T0200L08 | 0.7 | 2° | 1.26 | 8 | 45 | 3 | 4 | ● | 1 |
| D0080T0015L04 | 0.8 | 15' | 0.83 | 4 | 45 | 4 | 4 | ● | 1 |
| D0080T0015L06 | 0.8 | 15' | 0.85 | 6 | 45 | 4 | 4 | ● | 1 |

● : Inventory maintained.

| Order Number | Small Mill Dia. D1 | Taper Angle One Side B7 | Large Mill Dia. D2 | Length of Cut ap | Overall Length L1 | Shank Dia. D4 | No. of Flutes N | Stock | Type |
|--------------------|-----------------------|----------------------------|-----------------------|---------------------|----------------------|------------------|--------------------|-------|------|
| MS4LTD0080T0015L08 | 0.8 | 15' | 0.87 | 8 | 45 | 4 | 4 | ● | 1 |
| D0080T0015L10 | 0.8 | 15' | 0.89 | 10 | 45 | 4 | 4 | ● | 1 |
| D0080T0030L04 | 0.8 | 30' | 0.87 | 4 | 45 | 4 | 4 | ● | 1 |
| D0080T0030L06 | 0.8 | 30' | 0.9 | 6 | 45 | 4 | 4 | ● | 1 |
| D0080T0030L08 | 0.8 | 30' | 0.94 | 8 | 45 | 4 | 4 | ● | 1 |
| D0080T0030L10 | 0.8 | 30' | 0.97 | 10 | 45 | 4 | 4 | ● | 1 |
| D0080T0030L12 | 0.8 | 30' | 1.01 | 12 | 50 | 4 | 4 | ● | 1 |
| D0080T0100L04 | 0.8 | 1° | 0.94 | 4 | 45 | 4 | 4 | ● | 1 |
| D0080T0100L06 | 0.8 | 1° | 1.01 | 6 | 45 | 4 | 4 | ● | 1 |
| D0080T0100L08 | 0.8 | 1° | 1.08 | 8 | 45 | 4 | 4 | ● | 1 |
| D0080T0100L10 | 0.8 | 1° | 1.15 | 10 | 45 | 4 | 4 | ● | 1 |
| D0080T0100L12 | 0.8 | 1° | 1.22 | 12 | 50 | 4 | 4 | ● | 1 |
| D0080T0130L04 | 0.8 | 1°30' | 1.01 | 4 | 45 | 4 | 4 | ● | 1 |
| D0080T0130L06 | 0.8 | 1°30' | 1.11 | 6 | 45 | 4 | 4 | ● | 1 |
| D0080T0130L08 | 0.8 | 1°30' | 1.22 | 8 | 45 | 4 | 4 | ● | 1 |
| D0080T0130L10 | 0.8 | 1°30' | 1.32 | 10 | 45 | 4 | 4 | ● | 1 |
| D0080T0130L12 | 0.8 | 1°30' | 1.43 | 12 | 50 | 4 | 4 | ● | 1 |
| D0080T0200L04 | 0.8 | 2° | 1.08 | 4 | 45 | 4 | 4 | ● | 1 |
| D0080T0200L06 | 0.8 | 2° | 1.22 | 6 | 45 | 4 | 4 | ● | 1 |
| D0080T0200L08 | 0.8 | 2° | 1.36 | 8 | 45 | 4 | 4 | ● | 1 |
| D0080T0200L10 | 0.8 | 2° | 1.5 | 10 | 45 | 4 | 4 | ● | 1 |
| D0080T0200L12 | 0.8 | 2° | 1.64 | 12 | 50 | 4 | 4 | ● | 1 |
| D0100T0015L06 | 1 | 15' | 1.05 | 6 | 45 | 4 | 4 | ● | 1 |
| D0100T0015L08 | 1 | 15' | 1.07 | 8 | 45 | 4 | 4 | ● | 1 |
| D0100T0015L10 | 1 | 15' | 1.09 | 10 | 45 | 4 | 4 | ● | 1 |
| D0100T0015L12 | 1 | 15' | 1.1 | 12 | 50 | 4 | 4 | ● | 1 |
| D0100T0030L06 | 1 | 30' | 1.1 | 6 | 45 | 4 | 4 | ● | 1 |
| D0100T0030L08 | 1 | 30' | 1.14 | 8 | 45 | 4 | 4 | ● | 1 |
| D0100T0030L10 | 1 | 30' | 1.17 | 10 | 45 | 4 | 4 | ● | 1 |
| D0100T0030L12 | 1 | 30' | 1.21 | 12 | 50 | 4 | 4 | ● | 1 |
| D0100T0100L06 | 1 | 1° | 1.21 | 6 | 45 | 4 | 4 | ● | 1 |
| D0100T0100L08 | 1 | 1° | 1.28 | 8 | 45 | 4 | 4 | ● | 1 |
| D0100T0100L10 | 1 | 1° | 1.35 | 10 | 45 | 4 | 4 | ● | 1 |
| D0100T0100L12 | 1 | 1° | 1.42 | 12 | 50 | 4 | 4 | ● | 1 |
| D0100T0100L16 | 1 | 1° | 1.56 | 16 | 55 | 4 | 4 | ● | 1 |
| D0100T0130L06 | 1 | 1°30' | 1.31 | 6 | 45 | 4 | 4 | ● | 1 |
| D0100T0130L08 | 1 | 1°30' | 1.42 | 8 | 45 | 4 | 4 | ● | 1 |
| D0100T0130L10 | 1 | 1°30' | 1.52 | 10 | 45 | 4 | 4 | ● | 1 |
| D0100T0130L12 | 1 | 1°30' | 1.63 | 12 | 50 | 4 | 4 | ● | 1 |
| D0100T0130L16 | 1 | 1°30' | 1.84 | 16 | 55 | 4 | 4 | ● | 1 |
| D0100T0200L06 | 1 | 2° | 1.42 | 6 | 45 | 4 | 4 | ● | 1 |
| D0100T0200L08 | 1 | 2° | 1.56 | 8 | 45 | 4 | 4 | ● | 1 |
| D0100T0200L10 | 1 | 2° | 1.7 | 10 | 45 | 4 | 4 | ● | 1 |
| D0100T0200L12 | 1 | 2° | 1.84 | 12 | 50 | 4 | 4 | ● | 1 |
| D0100T0200L16 | 1 | 2° | 2.12 | 16 | 55 | 4 | 4 | ● | 1 |
| D0120T0015L06 | 1.2 | 15' | 1.25 | 6 | 45 | 4 | 4 | ● | 1 |
| D0120T0015L10 | 1.2 | 15' | 1.29 | 10 | 45 | 4 | 4 | ● | 1 |
| D0120T0015L12 | 1.2 | 15' | 1.3 | 12 | 50 | 4 | 4 | ● | 1 |

General Use

SQUARE
Long Neck

High Helix

For Small
Automatic LatheBALL
Long NeckRADIUS
General Use

High Helix

TAPER
Ball Processing

MSTAR END MILLS

MS4LT

Taper end mill, Long cut length, 4 flute

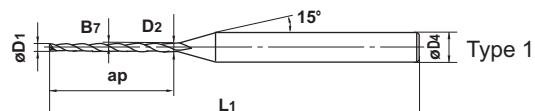


$D_1 < 0.5$
 $0.5 \leq D_1$

0 - -0.020
0 - -0.040



±5°



$D_1 < 3$



$3 \leq D_1$

● 4 flute taper end mill for rib milling.

Unit : mm

| Order Number | Small Mill Dia. | Taper Angle One Side | Large Mill Dia. | Length of Cut | Overall Length | Shank Dia. | No. of Flutes | Stock | Type |
|--------------------|-----------------|----------------------|-----------------|---------------|----------------|------------|---------------|-------|------|
| | D1 | B7 | D2 | ap | L1 | D4 | N | | |
| MS4LTD0120T0015L16 | 1.2 | 15° | 1.34 | 16 | 55 | 4 | 4 | ● | 1 |
| D0120T0030L06 | 1.2 | 30° | 1.3 | 6 | 45 | 4 | 4 | ● | 1 |
| D0120T0030L10 | 1.2 | 30° | 1.37 | 10 | 45 | 4 | 4 | ● | 1 |
| D0120T0030L12 | 1.2 | 30° | 1.41 | 12 | 50 | 4 | 4 | ● | 1 |
| D0120T0030L16 | 1.2 | 30° | 1.48 | 16 | 55 | 4 | 4 | ● | 1 |
| D0120T0100L06 | 1.2 | 1° | 1.41 | 6 | 45 | 4 | 4 | ● | 1 |
| D0120T0100L10 | 1.2 | 1° | 1.55 | 10 | 45 | 4 | 4 | ● | 1 |
| D0120T0100L12 | 1.2 | 1° | 1.62 | 12 | 50 | 4 | 4 | ● | 1 |
| D0120T0100L16 | 1.2 | 1° | 1.76 | 16 | 55 | 4 | 4 | ● | 1 |
| D0120T0100L20 | 1.2 | 1° | 1.9 | 20 | 55 | 4 | 4 | ● | 1 |
| D0120T0130L06 | 1.2 | 1°30' | 1.51 | 6 | 45 | 4 | 4 | ● | 1 |
| D0120T0130L10 | 1.2 | 1°30' | 1.72 | 10 | 45 | 4 | 4 | ● | 1 |
| D0120T0130L12 | 1.2 | 1°30' | 1.83 | 12 | 50 | 4 | 4 | ● | 1 |
| D0120T0130L16 | 1.2 | 1°30' | 2.04 | 16 | 55 | 4 | 4 | ● | 1 |
| D0120T0130L20 | 1.2 | 1°30' | 2.25 | 20 | 55 | 4 | 4 | ● | 1 |
| D0120T0200L06 | 1.2 | 2° | 1.62 | 6 | 45 | 4 | 4 | ● | 1 |
| D0120T0200L10 | 1.2 | 2° | 1.9 | 10 | 45 | 4 | 4 | ● | 1 |
| D0120T0200L12 | 1.2 | 2° | 2.04 | 12 | 50 | 4 | 4 | ● | 1 |
| D0120T0200L16 | 1.2 | 2° | 2.32 | 16 | 55 | 4 | 4 | ● | 1 |
| D0120T0200L20 | 1.2 | 2° | 2.6 | 20 | 55 | 4 | 4 | ● | 1 |
| D0130T0030L12 | 1.3 | 30° | 1.51 | 12 | 50 | 4 | 4 | ● | 1 |
| D0130T0100L12 | 1.3 | 1° | 1.72 | 12 | 50 | 4 | 4 | ● | 1 |
| D0130T0130L12 | 1.3 | 1°30' | 1.93 | 12 | 50 | 4 | 4 | ● | 1 |
| D0130T0200L12 | 1.3 | 2° | 2.14 | 12 | 50 | 4 | 4 | ● | 1 |
| D0140T0030L12 | 1.4 | 30° | 1.61 | 12 | 50 | 4 | 4 | ● | 1 |
| D0140T0100L12 | 1.4 | 1° | 1.82 | 12 | 50 | 4 | 4 | ● | 1 |
| D0140T0130L12 | 1.4 | 1°30' | 2.03 | 12 | 50 | 4 | 4 | ● | 1 |
| D0140T0200L12 | 1.4 | 2° | 2.24 | 12 | 50 | 4 | 4 | ● | 1 |
| D0150T0015L06 | 1.5 | 15° | 1.55 | 6 | 45 | 4 | 4 | ● | 1 |
| D0150T0015L08 | 1.5 | 15° | 1.57 | 8 | 45 | 4 | 4 | ● | 1 |
| D0150T0015L10 | 1.5 | 15° | 1.59 | 10 | 45 | 4 | 4 | ● | 1 |
| D0150T0015L12 | 1.5 | 15° | 1.6 | 12 | 50 | 4 | 4 | ● | 1 |
| D0150T0015L16 | 1.5 | 15° | 1.64 | 16 | 55 | 4 | 4 | ● | 1 |
| D0150T0015L20 | 1.5 | 15° | 1.67 | 20 | 55 | 4 | 4 | ● | 1 |
| D0150T0030L06 | 1.5 | 30° | 1.6 | 6 | 45 | 4 | 4 | ● | 1 |
| D0150T0030L08 | 1.5 | 30° | 1.64 | 8 | 45 | 4 | 4 | ● | 1 |
| D0150T0030L10 | 1.5 | 30° | 1.67 | 10 | 45 | 4 | 4 | ● | 1 |
| D0150T0030L12 | 1.5 | 30° | 1.71 | 12 | 50 | 4 | 4 | ● | 1 |

● : Inventory maintained.

| Order Number | Small Mill Dia. D1 | Taper Angle One Side B7 | Large Mill Dia. D2 | Length of Cut ap | Overall Length L1 | Shank Dia. D4 | No. of Flutes N | Stock | Type |
|--------------------|-----------------------|----------------------------|-----------------------|---------------------|----------------------|------------------|--------------------|-------|------|
| MS4LTD0150T0030L16 | 1.5 | 30' | 1.78 | 16 | 55 | 4 | 4 | ● | 1 |
| D0150T0030L20 | 1.5 | 30' | 1.85 | 20 | 55 | 4 | 4 | ● | 1 |
| D0150T0100L06 | 1.5 | 1° | 1.71 | 6 | 45 | 4 | 4 | ● | 1 |
| D0150T0100L08 | 1.5 | 1° | 1.78 | 8 | 45 | 4 | 4 | ● | 1 |
| D0150T0100L10 | 1.5 | 1° | 1.85 | 10 | 45 | 4 | 4 | ● | 1 |
| D0150T0100L12 | 1.5 | 1° | 1.92 | 12 | 50 | 4 | 4 | ● | 1 |
| D0150T0100L16 | 1.5 | 1° | 2.06 | 16 | 55 | 4 | 4 | ● | 1 |
| D0150T0100L20 | 1.5 | 1° | 2.2 | 20 | 55 | 4 | 4 | ● | 1 |
| D0150T0100L25 | 1.5 | 1° | 2.37 | 25 | 60 | 4 | 4 | ● | 1 |
| D0150T0130L06 | 1.5 | 1°30' | 1.81 | 6 | 45 | 4 | 4 | ● | 1 |
| D0150T0130L08 | 1.5 | 1°30' | 1.92 | 8 | 45 | 4 | 4 | ● | 1 |
| D0150T0130L10 | 1.5 | 1°30' | 2.02 | 10 | 45 | 4 | 4 | ● | 1 |
| D0150T0130L12 | 1.5 | 1°30' | 2.13 | 12 | 50 | 4 | 4 | ● | 1 |
| D0150T0130L16 | 1.5 | 1°30' | 2.34 | 16 | 55 | 4 | 4 | ● | 1 |
| D0150T0130L20 | 1.5 | 1°30' | 2.55 | 20 | 55 | 4 | 4 | ● | 1 |
| D0150T0130L25 | 1.5 | 1°30' | 2.81 | 25 | 60 | 4 | 4 | ● | 1 |
| D0150T0200L06 | 1.5 | 2° | 1.92 | 6 | 45 | 4 | 4 | ● | 1 |
| D0150T0200L08 | 1.5 | 2° | 2.06 | 8 | 45 | 4 | 4 | ● | 1 |
| D0150T0200L10 | 1.5 | 2° | 2.2 | 10 | 45 | 4 | 4 | ● | 1 |
| D0150T0200L12 | 1.5 | 2° | 2.34 | 12 | 50 | 4 | 4 | ● | 1 |
| D0150T0200L16 | 1.5 | 2° | 2.62 | 16 | 55 | 4 | 4 | ● | 1 |
| D0150T0200L20 | 1.5 | 2° | 2.9 | 20 | 55 | 4 | 4 | ● | 1 |
| D0150T0200L25 | 1.5 | 2° | 3.25 | 25 | 60 | 4 | 4 | ● | 1 |
| D0160T0030L08 | 1.6 | 30' | 1.74 | 8 | 45 | 4 | 4 | ● | 1 |
| D0160T0030L12 | 1.6 | 30' | 1.81 | 12 | 50 | 4 | 4 | ● | 1 |
| D0160T0030L16 | 1.6 | 30' | 1.88 | 16 | 55 | 4 | 4 | ● | 1 |
| D0160T0030L20 | 1.6 | 30' | 1.95 | 20 | 55 | 4 | 4 | ● | 1 |
| D0160T0100L08 | 1.6 | 1° | 1.88 | 8 | 45 | 4 | 4 | ● | 1 |
| D0160T0100L12 | 1.6 | 1° | 2.02 | 12 | 50 | 4 | 4 | ● | 1 |
| D0160T0100L16 | 1.6 | 1° | 2.16 | 16 | 55 | 4 | 4 | ● | 1 |
| D0160T0100L20 | 1.6 | 1° | 2.3 | 20 | 55 | 4 | 4 | ● | 1 |
| D0160T0130L08 | 1.6 | 1°30' | 2.02 | 8 | 45 | 4 | 4 | ● | 1 |
| D0160T0130L12 | 1.6 | 1°30' | 2.23 | 12 | 50 | 4 | 4 | ● | 1 |
| D0160T0130L16 | 1.6 | 1°30' | 2.44 | 16 | 55 | 4 | 4 | ● | 1 |
| D0160T0130L20 | 1.6 | 1°30' | 2.65 | 20 | 55 | 4 | 4 | ● | 1 |
| D0160T0200L08 | 1.6 | 2° | 2.16 | 8 | 45 | 4 | 4 | ● | 1 |
| D0160T0200L12 | 1.6 | 2° | 2.44 | 12 | 50 | 4 | 4 | ● | 1 |
| D0160T0200L16 | 1.6 | 2° | 2.72 | 16 | 55 | 4 | 4 | ● | 1 |
| D0160T0200L20 | 1.6 | 2° | 3 | 20 | 55 | 4 | 4 | ● | 1 |
| D0180T0015L08 | 1.8 | 15' | 1.87 | 8 | 45 | 4 | 4 | ● | 1 |
| D0180T0015L16 | 1.8 | 15' | 1.94 | 16 | 55 | 4 | 4 | ● | 1 |
| D0180T0015L24 | 1.8 | 15' | 2.01 | 24 | 60 | 4 | 4 | ● | 1 |
| D0180T0030L08 | 1.8 | 30' | 1.94 | 8 | 45 | 4 | 4 | ● | 1 |
| D0180T0030L16 | 1.8 | 30' | 2.08 | 16 | 55 | 4 | 4 | ● | 1 |
| D0180T0030L24 | 1.8 | 30' | 2.22 | 24 | 60 | 4 | 4 | ● | 1 |
| D0180T0100L08 | 1.8 | 1° | 2.08 | 8 | 45 | 4 | 4 | ● | 1 |
| D0180T0100L16 | 1.8 | 1° | 2.36 | 16 | 55 | 4 | 4 | ● | 1 |
| D0180T0100L24 | 1.8 | 1° | 2.64 | 24 | 60 | 4 | 4 | ● | 1 |

General Use

SQUARE
Long Neck

High Helix

For Small Automatic Lathe

BALL
Long NeckRADIUS
General Use

High Helix

TAPER
Ball Processing

MSTAR END MILLS

MS4LT

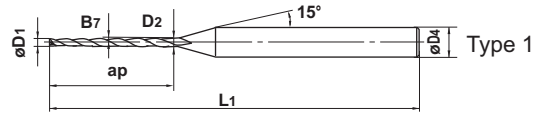
Taper end mill, Long cut length, 4 flute



$D_1 < 0.5$ 0 - -0.020
 $0.5 \leq D_1$ 0 - -0.040



$\pm 5'$



$D_1 < 3$



$3 \leq D_1$

● 4 flute taper end mill for rib milling.

Unit : mm

| Order Number | Small Mill Dia. | Taper Angle One Side | Large Mill Dia. | Length of Cut | Overall Length | Shank Dia. | No. of Flutes | Stock | Type |
|--------------------|-----------------|----------------------|-----------------|---------------|----------------|------------|---------------|-------|------|
| | D1 | B7 | D2 | ap | L1 | D4 | N | | |
| MS4LTD0180T0130L08 | 1.8 | 1°30' | 2.22 | 8 | 45 | 4 | 4 | ● | 1 |
| D0180T0130L16 | 1.8 | 1°30' | 2.64 | 16 | 55 | 4 | 4 | ● | 1 |
| D0180T0130L24 | 1.8 | 1°30' | 3.06 | 24 | 60 | 4 | 4 | ● | 1 |
| D0180T0200L08 | 1.8 | 2° | 2.36 | 8 | 45 | 4 | 4 | ● | 1 |
| D0180T0200L16 | 1.8 | 2° | 2.92 | 16 | 55 | 4 | 4 | ● | 1 |
| D0180T0200L24 | 1.8 | 2° | 3.48 | 24 | 60 | 4 | 4 | ● | 1 |
| D0200T0015L08 | 2 | 15' | 2.07 | 8 | 45 | 4 | 4 | ● | 1 |
| D0200T0015L10 | 2 | 15' | 2.09 | 10 | 45 | 4 | 4 | ● | 1 |
| D0200T0015L12 | 2 | 15' | 2.1 | 12 | 50 | 4 | 4 | ● | 1 |
| D0200T0015L16 | 2 | 15' | 2.14 | 16 | 55 | 4 | 4 | ● | 1 |
| D0200T0015L20 | 2 | 15' | 2.17 | 20 | 55 | 4 | 4 | ● | 1 |
| D0200T0015L25 | 2 | 15' | 2.22 | 25 | 60 | 4 | 4 | ● | 1 |
| D0200T0030L08 | 2 | 30' | 2.14 | 8 | 45 | 4 | 4 | ● | 1 |
| D0200T0030L10 | 2 | 30' | 2.17 | 10 | 45 | 4 | 4 | ● | 1 |
| D0200T0030L12 | 2 | 30' | 2.21 | 12 | 50 | 4 | 4 | ● | 1 |
| D0200T0030L16 | 2 | 30' | 2.28 | 16 | 55 | 4 | 4 | ● | 1 |
| D0200T0030L20 | 2 | 30' | 2.35 | 20 | 55 | 4 | 4 | ● | 1 |
| D0200T0030L25 | 2 | 30' | 2.44 | 25 | 60 | 4 | 4 | ● | 1 |
| D0200T0030L30 | 2 | 30' | 2.52 | 30 | 65 | 4 | 4 | ● | 1 |
| D0200T0100L08 | 2 | 1° | 2.28 | 8 | 45 | 4 | 4 | ● | 1 |
| D0200T0100L10 | 2 | 1° | 2.35 | 10 | 45 | 4 | 4 | ● | 1 |
| D0200T0100L12 | 2 | 1° | 2.42 | 12 | 50 | 4 | 4 | ● | 1 |
| D0200T0100L16 | 2 | 1° | 2.56 | 16 | 55 | 4 | 4 | ● | 1 |
| D0200T0100L20 | 2 | 1° | 2.7 | 20 | 55 | 4 | 4 | ● | 1 |
| D0200T0100L25 | 2 | 1° | 2.87 | 25 | 60 | 4 | 4 | ● | 1 |
| D0200T0100L30 | 2 | 1° | 3.05 | 30 | 65 | 4 | 4 | ● | 1 |
| D0200T0130L08 | 2 | 1°30' | 2.42 | 8 | 45 | 4 | 4 | ● | 1 |
| D0200T0130L10 | 2 | 1°30' | 2.52 | 10 | 45 | 4 | 4 | ● | 1 |
| D0200T0130L12 | 2 | 1°30' | 2.63 | 12 | 50 | 4 | 4 | ● | 1 |
| D0200T0130L16 | 2 | 1°30' | 2.84 | 16 | 55 | 4 | 4 | ● | 1 |
| D0200T0130L20 | 2 | 1°30' | 3.05 | 20 | 55 | 4 | 4 | ● | 1 |
| D0200T0130L25 | 2 | 1°30' | 3.31 | 25 | 60 | 4 | 4 | ● | 1 |
| D0200T0130L30 | 2 | 1°30' | 3.57 | 30 | 65 | 4 | 4 | ● | 1 |
| D0200T0200L08 | 2 | 2° | 2.56 | 8 | 45 | 4 | 4 | ● | 1 |
| D0200T0200L10 | 2 | 2° | 2.7 | 10 | 45 | 4 | 4 | ● | 1 |
| D0200T0200L12 | 2 | 2° | 2.84 | 12 | 50 | 4 | 4 | ● | 1 |
| D0200T0200L16 | 2 | 2° | 3.12 | 16 | 55 | 4 | 4 | ● | 1 |
| D0200T0200L20 | 2 | 2° | 3.4 | 20 | 55 | 4 | 4 | ● | 1 |

● : Inventory maintained.

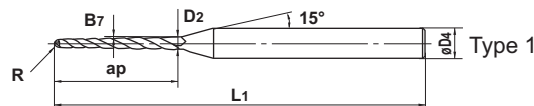
| Order Number | Small Mill Dia. D1 | Taper Angle One Side B7 | Large Mill Dia. D2 | Length of Cut ap | Overall Length L1 | Shank Dia. D4 | No. of Flutes N | Stock | Type |
|--------------------|-----------------------|----------------------------|-----------------------|---------------------|----------------------|------------------|--------------------|-------|------|
| MS4LTD0200T0200L25 | 2 | 2° | 3.75 | 25 | 60 | 4 | 4 | ● | 1 |
| D0200T0200L30 | 2 | 2° | 4.1 | 30 | 65 | 6 | 4 | ● | 1 |
| D0200T0300L12 | 2 | 3° | 3.26 | 12 | 50 | 4 | 4 | ● | 1 |
| D0200T0300L16 | 2 | 3° | 3.68 | 16 | 55 | 4 | 4 | ● | 1 |
| D0200T0300L20 | 2 | 3° | 4.1 | 20 | 55 | 6 | 4 | ● | 1 |
| D0200T0300L25 | 2 | 3° | 4.62 | 25 | 60 | 6 | 4 | ● | 1 |
| D0200T0300L30 | 2 | 3° | 5.14 | 30 | 65 | 6 | 4 | ● | 1 |
| D0250T0030L10 | 2.5 | 30' | 2.67 | 10 | 45 | 4 | 4 | ● | 1 |
| D0250T0030L16 | 2.5 | 30' | 2.78 | 16 | 50 | 4 | 4 | ● | 1 |
| D0250T0030L20 | 2.5 | 30' | 2.85 | 20 | 55 | 4 | 4 | ● | 1 |
| D0250T0030L25 | 2.5 | 30' | 2.94 | 25 | 60 | 4 | 4 | ● | 1 |
| D0250T0030L30 | 2.5 | 30' | 3.02 | 30 | 65 | 4 | 4 | ● | 1 |
| D0250T0100L10 | 2.5 | 1° | 2.85 | 10 | 45 | 4 | 4 | ● | 1 |
| D0250T0100L16 | 2.5 | 1° | 3.06 | 16 | 50 | 4 | 4 | ● | 1 |
| D0250T0100L20 | 2.5 | 1° | 3.2 | 20 | 55 | 4 | 4 | ● | 1 |
| D0250T0100L25 | 2.5 | 1° | 3.37 | 25 | 60 | 4 | 4 | ● | 1 |
| D0250T0100L30 | 2.5 | 1° | 3.55 | 30 | 65 | 4 | 4 | ● | 1 |
| D0250T0130L10 | 2.5 | 1°30' | 3.02 | 10 | 45 | 4 | 4 | ● | 1 |
| D0250T0130L16 | 2.5 | 1°30' | 3.34 | 16 | 50 | 4 | 4 | ● | 1 |
| D0250T0130L20 | 2.5 | 1°30' | 3.55 | 20 | 55 | 4 | 4 | ● | 1 |
| D0250T0130L25 | 2.5 | 1°30' | 3.81 | 25 | 60 | 4 | 4 | ● | 1 |
| D0250T0130L30 | 2.5 | 1°30' | 4.07 | 30 | 65 | 6 | 4 | ● | 1 |
| D0250T0200L10 | 2.5 | 2° | 3.2 | 10 | 45 | 4 | 4 | ● | 1 |
| D0250T0200L16 | 2.5 | 2° | 3.62 | 16 | 50 | 4 | 4 | ● | 1 |
| D0250T0200L20 | 2.5 | 2° | 3.9 | 20 | 55 | 4 | 4 | ● | 1 |
| D0250T0200L25 | 2.5 | 2° | 4.25 | 25 | 60 | 6 | 4 | ● | 1 |
| D0250T0200L30 | 2.5 | 2° | 4.6 | 30 | 65 | 6 | 4 | ● | 1 |
| D0300T0030L25 | 3 | 30' | 3.44 | 25 | 65 | 6 | 4 | ● | 1 |
| D0300T0030L40 | 3 | 30' | 3.7 | 40 | 80 | 6 | 4 | ● | 1 |
| D0300T0100L25 | 3 | 1° | 3.87 | 25 | 65 | 6 | 4 | ● | 1 |
| D0300T0100L40 | 3 | 1° | 4.4 | 40 | 80 | 6 | 4 | ● | 1 |
| D0300T0130L25 | 3 | 1°30' | 4.31 | 25 | 65 | 6 | 4 | ● | 1 |
| D0300T0130L40 | 3 | 1°30' | 5.09 | 40 | 80 | 6 | 4 | ● | 1 |
| D0300T0200L25 | 3 | 2° | 4.75 | 25 | 65 | 6 | 4 | ● | 1 |
| D0300T0200L40 | 3 | 2° | 5.79 | 40 | 80 | 6 | 4 | ● | 1 |

| | | |
|--------|---------------------------|--------------------|
| SQUARE | General Use | |
| | Long Neck | |
| | High Helix | |
| | For Small Automatic Lathe | |
| | BALL | General Use |
| | | Long Neck |
| | | Taper Neck |
| | RADIUS | General Use |
| | | High Helix |
| | | Long Neck |
| | TAPER | For Rib Processing |

MSTAR END MILLS

MS4LTB

Ball nose, 4 flute, Taper, For rib milling



● 4 flute taper ball nose end mill for rib milling.

Unit : mm

| Order Number | Radius of Ball Nose | Taper Angle One Side | Large Mill Dia. | Length of Cut | Overall Length | Shank Dia. | No. of Flutes | Stock | Type |
|---------------------|---------------------|----------------------|-----------------|---------------|----------------|------------|---------------|-------|------|
| | R | B7 | D2 | ap | L1 | D4 | N | | |
| MS4LTBR0030T0030L04 | 0.3 | 30' | 0.66 | 4 | 45 | 4 | 4 | ● | 1 |
| R0030T0030L06 | 0.3 | 30' | 0.70 | 6 | 45 | 4 | 4 | ● | 1 |
| R0030T0100L04 | 0.3 | 1° | 0.73 | 4 | 45 | 4 | 4 | ● | 1 |
| R0030T0100L06 | 0.3 | 1° | 0.80 | 6 | 45 | 4 | 4 | ● | 1 |
| R0030T0130L04 | 0.3 | 1°30' | 0.79 | 4 | 45 | 4 | 4 | ● | 1 |
| R0030T0130L06 | 0.3 | 1°30' | 0.90 | 6 | 45 | 4 | 4 | ● | 1 |
| R0030T0200L04 | 0.3 | 2° | 0.86 | 4 | 45 | 4 | 4 | ● | 1 |
| R0030T0200L06 | 0.3 | 2° | 1.00 | 6 | 45 | 4 | 4 | ● | 1 |
| R0040T0030L06 | 0.4 | 30' | 0.90 | 6 | 50 | 4 | 4 | ● | 1 |
| R0040T0030L08 | 0.4 | 30' | 0.93 | 8 | 50 | 4 | 4 | ● | 1 |
| R0040T0030L10 | 0.4 | 30' | 0.97 | 10 | 50 | 4 | 4 | ● | 1 |
| R0040T0100L06 | 0.4 | 1° | 1.00 | 6 | 50 | 4 | 4 | ● | 1 |
| R0040T0100L08 | 0.4 | 1° | 1.07 | 8 | 50 | 4 | 4 | ● | 1 |
| R0040T0100L10 | 0.4 | 1° | 1.14 | 10 | 50 | 4 | 4 | ● | 1 |
| R0040T0130L06 | 0.4 | 1°30' | 1.09 | 6 | 50 | 4 | 4 | ● | 1 |
| R0040T0130L08 | 0.4 | 1°30' | 1.20 | 8 | 50 | 4 | 4 | ● | 1 |
| R0040T0130L10 | 0.4 | 1°30' | 1.30 | 10 | 50 | 4 | 4 | ● | 1 |
| R0040T0200L06 | 0.4 | 2° | 1.19 | 6 | 50 | 4 | 4 | ● | 1 |
| R0040T0200L08 | 0.4 | 2° | 1.33 | 8 | 50 | 4 | 4 | ● | 1 |
| R0040T0200L10 | 0.4 | 2° | 1.47 | 10 | 50 | 4 | 4 | ● | 1 |
| R0050T0030L08 | 0.5 | 30' | 1.13 | 8 | 50 | 4 | 4 | ● | 1 |
| R0050T0030L10 | 0.5 | 30' | 1.17 | 10 | 50 | 4 | 4 | ● | 1 |
| R0050T0030L12 | 0.5 | 30' | 1.20 | 12 | 50 | 4 | 4 | ● | 1 |
| R0050T0030L16 | 0.5 | 30' | 1.27 | 16 | 55 | 4 | 4 | ● | 1 |
| R0050T0100L08 | 0.5 | 1° | 1.26 | 8 | 50 | 4 | 4 | ● | 1 |
| R0050T0100L10 | 0.5 | 1° | 1.33 | 10 | 50 | 4 | 4 | ● | 1 |
| R0050T0100L12 | 0.5 | 1° | 1.40 | 12 | 50 | 4 | 4 | ● | 1 |
| R0050T0100L16 | 0.5 | 1° | 1.54 | 16 | 55 | 4 | 4 | ● | 1 |
| R0050T0130L08 | 0.5 | 1°30' | 1.39 | 8 | 50 | 4 | 4 | ● | 1 |
| R0050T0130L10 | 0.5 | 1°30' | 1.50 | 10 | 50 | 4 | 4 | ● | 1 |
| R0050T0130L12 | 0.5 | 1°30' | 1.60 | 12 | 50 | 4 | 4 | ● | 1 |
| R0050T0130L16 | 0.5 | 1°30' | 1.81 | 16 | 55 | 4 | 4 | ● | 1 |
| R0050T0200L08 | 0.5 | 2° | 1.52 | 8 | 50 | 4 | 4 | ● | 1 |
| R0050T0200L10 | 0.5 | 2° | 1.66 | 10 | 50 | 4 | 4 | ● | 1 |
| R0050T0200L12 | 0.5 | 2° | 1.80 | 12 | 50 | 4 | 4 | ● | 1 |
| R0050T0200L16 | 0.5 | 2° | 2.08 | 16 | 55 | 4 | 4 | ● | 1 |
| R0060T0030L08 | 0.6 | 30' | 1.33 | 8 | 50 | 4 | 4 | ● | 1 |
| R0060T0030L10 | 0.6 | 30' | 1.36 | 10 | 50 | 4 | 4 | ● | 1 |

● : Inventory maintained.

| Order Number | Radius of Ball Nose R | Taper Angle One Side B7 | Large Mill Dia. D2 | Length of Cut ap | Overall Length L1 | Shank Dia. D4 | No. of Flutes N | Stock | Type |
|---------------------|--------------------------|----------------------------|-----------------------|---------------------|----------------------|------------------|--------------------|-------|------|
| MS4LTBR0060T0030L12 | 0.6 | 30' | 1.40 | 12 | 50 | 4 | 4 | ● | 1 |
| R0060T0030L16 | 0.6 | 30' | 1.47 | 16 | 55 | 4 | 4 | ● | 1 |
| R0060T0100L08 | 0.6 | 1° | 1.46 | 8 | 50 | 4 | 4 | ● | 1 |
| R0060T0100L10 | 0.6 | 1° | 1.53 | 10 | 50 | 4 | 4 | ● | 1 |
| R0060T0100L12 | 0.6 | 1° | 1.60 | 12 | 50 | 4 | 4 | ● | 1 |
| R0060T0100L16 | 0.6 | 1° | 1.74 | 16 | 55 | 4 | 4 | ● | 1 |
| R0060T0130L08 | 0.6 | 1°30' | 1.59 | 8 | 50 | 4 | 4 | ● | 1 |
| R0060T0130L10 | 0.6 | 1°30' | 1.69 | 10 | 50 | 4 | 4 | ● | 1 |
| R0060T0130L12 | 0.6 | 1°30' | 1.80 | 12 | 50 | 4 | 4 | ● | 1 |
| R0060T0130L16 | 0.6 | 1°30' | 2.01 | 16 | 55 | 4 | 4 | ● | 1 |
| R0060T0200L08 | 0.6 | 2° | 1.72 | 8 | 50 | 4 | 4 | ● | 1 |
| R0060T0200L10 | 0.6 | 2° | 1.86 | 10 | 50 | 4 | 4 | ● | 1 |
| R0060T0200L12 | 0.6 | 2° | 2.00 | 12 | 50 | 4 | 4 | ● | 1 |
| R0060T0200L16 | 0.6 | 2° | 2.28 | 16 | 55 | 4 | 4 | ● | 1 |
| R0075T0030L08 | 0.75 | 30' | 1.63 | 8 | 50 | 4 | 4 | ● | 1 |
| R0075T0030L10 | 0.75 | 30' | 1.66 | 10 | 50 | 4 | 4 | ● | 1 |
| R0075T0030L12 | 0.75 | 30' | 1.70 | 12 | 50 | 4 | 4 | ● | 1 |
| R0075T0030L16 | 0.75 | 30' | 1.77 | 16 | 55 | 4 | 4 | ● | 1 |
| R0075T0030L20 | 0.75 | 30' | 1.84 | 20 | 60 | 4 | 4 | ● | 1 |
| R0075T0100L08 | 0.75 | 1° | 1.75 | 8 | 50 | 4 | 4 | ● | 1 |
| R0075T0100L10 | 0.75 | 1° | 1.82 | 10 | 50 | 4 | 4 | ● | 1 |
| R0075T0100L12 | 0.75 | 1° | 1.89 | 12 | 50 | 4 | 4 | ● | 1 |
| R0075T0100L16 | 0.75 | 1° | 2.03 | 16 | 55 | 4 | 4 | ● | 1 |
| R0075T0100L20 | 0.75 | 1° | 2.17 | 20 | 60 | 4 | 4 | ● | 1 |
| R0075T0130L08 | 0.75 | 1°30' | 1.88 | 8 | 50 | 4 | 4 | ● | 1 |
| R0075T0130L10 | 0.75 | 1°30' | 1.98 | 10 | 50 | 4 | 4 | ● | 1 |
| R0075T0130L12 | 0.75 | 1°30' | 2.09 | 12 | 50 | 4 | 4 | ● | 1 |
| R0075T0130L16 | 0.75 | 1°30' | 2.30 | 16 | 55 | 4 | 4 | ● | 1 |
| R0075T0130L20 | 0.75 | 1°30' | 2.51 | 20 | 60 | 4 | 4 | ● | 1 |
| R0075T0200L08 | 0.75 | 2° | 2.01 | 8 | 50 | 4 | 4 | ● | 1 |
| R0075T0200L10 | 0.75 | 2° | 2.15 | 10 | 50 | 4 | 4 | ● | 1 |
| R0075T0200L12 | 0.75 | 2° | 2.29 | 12 | 50 | 4 | 4 | ● | 1 |
| R0075T0200L16 | 0.75 | 2° | 2.57 | 16 | 55 | 4 | 4 | ● | 1 |
| R0075T0200L20 | 0.75 | 2° | 2.84 | 20 | 60 | 4 | 4 | ● | 1 |
| R0090T0030L08 | 0.9 | 30' | 1.92 | 8 | 50 | 4 | 4 | ● | 1 |
| R0090T0030L10 | 0.9 | 30' | 1.96 | 10 | 50 | 4 | 4 | ● | 1 |
| R0090T0030L12 | 0.9 | 30' | 1.99 | 12 | 50 | 4 | 4 | ● | 1 |
| R0090T0030L16 | 0.9 | 30' | 2.06 | 16 | 55 | 4 | 4 | ● | 1 |
| R0090T0030L20 | 0.9 | 30' | 2.13 | 20 | 60 | 4 | 4 | ● | 1 |
| R0090T0100L08 | 0.9 | 1° | 2.05 | 8 | 50 | 4 | 4 | ● | 1 |
| R0090T0100L10 | 0.9 | 1° | 2.12 | 10 | 50 | 4 | 4 | ● | 1 |
| R0090T0100L12 | 0.9 | 1° | 2.19 | 12 | 50 | 4 | 4 | ● | 1 |
| R0090T0100L16 | 0.9 | 1° | 2.33 | 16 | 55 | 4 | 4 | ● | 1 |
| R0090T0100L20 | 0.9 | 1° | 2.47 | 20 | 60 | 4 | 4 | ● | 1 |
| R0090T0130L08 | 0.9 | 1°30' | 2.17 | 8 | 50 | 4 | 4 | ● | 1 |
| R0090T0130L10 | 0.9 | 1°30' | 2.28 | 10 | 50 | 4 | 4 | ● | 1 |
| R0090T0130L12 | 0.9 | 1°30' | 2.38 | 12 | 50 | 4 | 4 | ● | 1 |
| R0090T0130L16 | 0.9 | 1°30' | 2.59 | 16 | 55 | 4 | 4 | ● | 1 |

General Use

SQUARE
Long Neck

High Helix

For Small
Automatic LatheBALL
Long NeckRADIUS
General Use

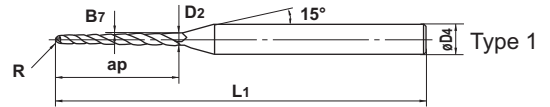
High Helix

TAPER
Ball Processing

MSTAR END MILLS

MS4LTB

Ball nose, 4 flute, Taper, For rib milling



● 4 flute taper ball nose end mill for rib milling.

Unit : mm

| Order Number | Radius of Ball Nose R | Taper Angle One Side B7 | Large Mill Dia. D2 | Length of Cut ap | Overall Length L1 | Shank Dia. D4 | No. of Flutes N | Stock | Type |
|---------------------|--------------------------|----------------------------|-----------------------|---------------------|----------------------|------------------|--------------------|-------|------|
| MS4LTBR0090T0130L20 | 0.9 | 1°30' | 2.80 | 20 | 60 | 4 | 4 | ● | 1 |
| R0090T0200L08 | 0.9 | 2° | 2.30 | 8 | 50 | 4 | 4 | ● | 1 |
| R0090T0200L10 | 0.9 | 2° | 2.44 | 10 | 50 | 4 | 4 | ● | 1 |
| R0090T0200L12 | 0.9 | 2° | 2.58 | 12 | 50 | 4 | 4 | ● | 1 |
| R0090T0200L16 | 0.9 | 2° | 2.86 | 16 | 55 | 4 | 4 | ● | 1 |
| R0090T0200L20 | 0.9 | 2° | 3.13 | 20 | 60 | 4 | 4 | ● | 1 |
| R0100T0030L10 | 1 | 30° | 2.16 | 10 | 50 | 4 | 4 | ● | 1 |
| R0100T0030L12 | 1 | 30° | 2.19 | 12 | 50 | 4 | 4 | ● | 1 |
| R0100T0030L16 | 1 | 30° | 2.26 | 16 | 55 | 4 | 4 | ● | 1 |
| R0100T0030L20 | 1 | 30° | 2.33 | 20 | 60 | 4 | 4 | ● | 1 |
| R0100T0030L25 | 1 | 30° | 2.42 | 25 | 65 | 4 | 4 | ● | 1 |
| R0100T0030L30 | 1 | 30° | 2.51 | 30 | 65 | 4 | 4 | ● | 1 |
| R0100T0100L10 | 1 | 1° | 2.31 | 10 | 50 | 4 | 4 | ● | 1 |
| R0100T0100L12 | 1 | 1° | 2.38 | 12 | 50 | 4 | 4 | ● | 1 |
| R0100T0100L16 | 1 | 1° | 2.52 | 16 | 55 | 4 | 4 | ● | 1 |
| R0100T0100L20 | 1 | 1° | 2.66 | 20 | 60 | 4 | 4 | ● | 1 |
| R0100T0100L25 | 1 | 1° | 2.84 | 25 | 65 | 4 | 4 | ● | 1 |
| R0100T0100L30 | 1 | 1° | 3.01 | 30 | 65 | 4 | 4 | ● | 1 |
| R0100T0130L10 | 1 | 1°30' | 2.47 | 10 | 50 | 4 | 4 | ● | 1 |
| R0100T0130L12 | 1 | 1°30' | 2.58 | 12 | 50 | 4 | 4 | ● | 1 |
| R0100T0130L16 | 1 | 1°30' | 2.79 | 16 | 55 | 4 | 4 | ● | 1 |
| R0100T0130L20 | 1 | 1°30' | 3.00 | 20 | 60 | 4 | 4 | ● | 1 |
| R0100T0130L25 | 1 | 1°30' | 3.26 | 25 | 65 | 6 | 4 | ● | 1 |
| R0100T0130L30 | 1 | 1°30' | 3.52 | 30 | 65 | 6 | 4 | ● | 1 |
| R0100T0200L10 | 1 | 2° | 2.63 | 10 | 50 | 4 | 4 | ● | 1 |
| R0100T0200L12 | 1 | 2° | 2.77 | 12 | 50 | 4 | 4 | ● | 1 |
| R0100T0200L16 | 1 | 2° | 3.05 | 16 | 55 | 4 | 4 | ● | 1 |
| R0100T0200L20 | 1 | 2° | 3.33 | 20 | 60 | 4 | 4 | ● | 1 |
| R0100T0200L25 | 1 | 2° | 3.68 | 25 | 65 | 6 | 4 | ● | 1 |
| R0100T0200L30 | 1 | 2° | 4.03 | 30 | 65 | 6 | 4 | ● | 1 |

General Use

Long Neck
SQUARE

High Helix

For Small Automatic Lathe

General Use
BALL

Taper Neck
RADIUS

Long Neck
RADIUS

High Helix
TAPER

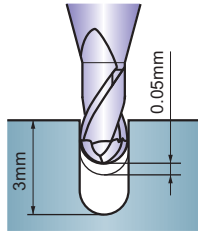
Tool: **MS2SB** : Tool life comparative trial

Double Tool Life !
2.5 times cutting efficiency.
 Less burrs and faster finishing time.

<Shape>

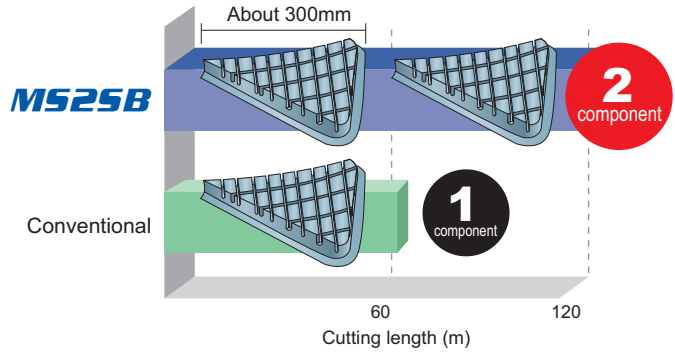


<Depth of cut>



Axial depth of cut
 MS2SB : 0.05mm
 Conventional : 0.015mm

<Machining data>



| | |
|------------------|--|
| End mill | MS2SB R1 |
| Workpiece | PX5 |
| Revolution | 30,000min ⁻¹ (188m/min) |
| Feed rate | 1,500mm/min (0.025mm/tooth) (Conventional : 1,000mm/min) |
| Machining method | Air blow |

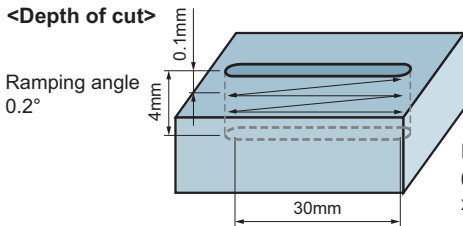
Tool: **MS2MS** : Ramping and slotting

Compared with conventional end mill, MS2MS shows excellent chipping resistance.

<Shape>



<Depth of cut>

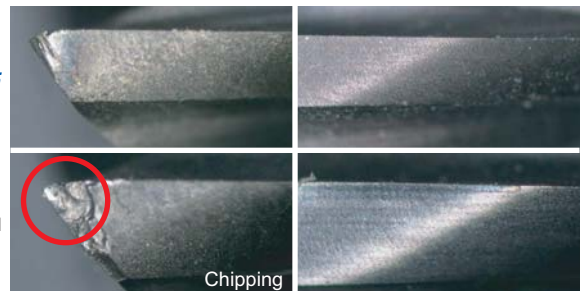


Depth of cut
 0.1mm (ramping)
 x40 lap

<Machining data>

20 slot (Cutting length 60m)

MS2MS



Conventional

Chipping

| | |
|------------------|------------------------------------|
| End mill | MS2MS $\phi 3$ |
| Workpiece | NAK80 (40HRC) |
| Revolution | 20,000min ⁻¹ (188m/min) |
| Feed rate | 2,300mm/min (0.057mm/tooth) |
| Machining method | Air blow |

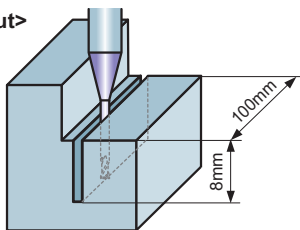
Tool: **MS2XL** : Tool life comparative trial

Excelent long tool life !

<Shape>



<Depth of cut>

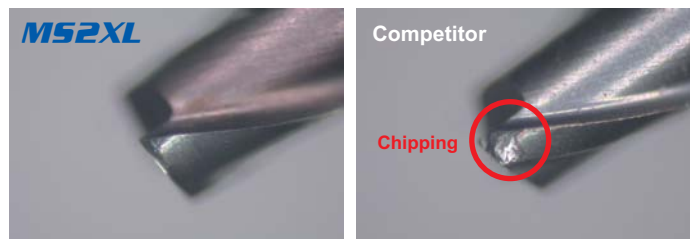


Depth of cut
 0.02mm x 400 times
 (Slotting)

<Machining data>

MS2XL

Competitor



Chipping

| | |
|------------------|-----------------------------------|
| End mill | MS2XL $\phi 1 \times 12$ |
| Workpiece | NAK80 (38HRC) |
| Revolution | 20,000min ⁻¹ (62m/min) |
| Feed rate | 500mm/min (0.01mm/tooth) |
| Machining method | Oil |

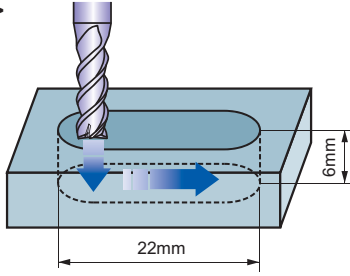
Tool: **MSMHZD** : Slotting

Compared with conventional end mill, MSMHZD shows 5 times longer tool life!

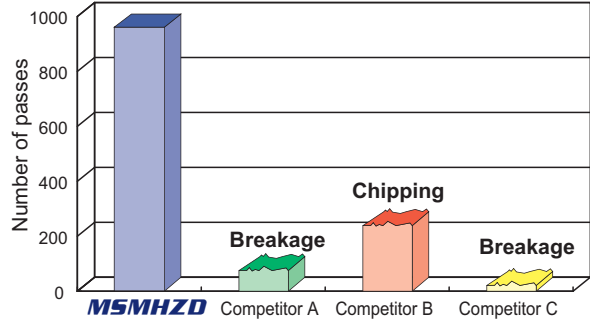
<Shape>



<Depth of cut>



<Machining data>



| | |
|------------------|--|
| End mill | MSMHZD $\phi 6$ |
| Workpiece | JIS S55C |
| Revolution | 4,800min ⁻¹ |
| Feed rate | Plunging 300mm/min, Slotting 720mm/min |
| Machining method | Air blow |

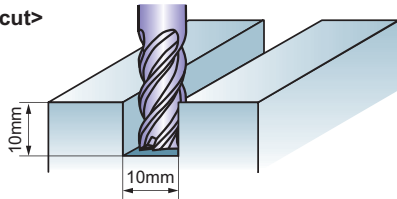
Tool: **MSMHD** : Slotting

Newly designed geometry for excellent chip disposability during slotting.

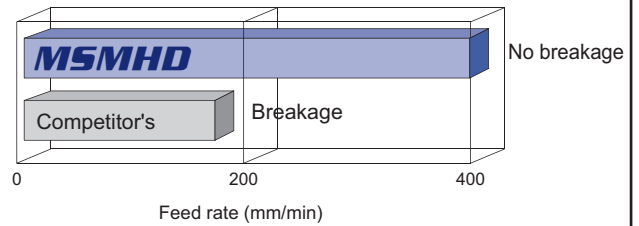
<Shape>



<Depth of cut>



<Machining data>



| | |
|------------------|----------------------------------|
| End mill | MSMHD $\phi 10$ |
| Workpiece | Stainless steel (JIS SUS304) |
| Revolution | 1,600min ⁻¹ (50m/min) |
| Feed rate | 50–400mm/min |
| Machining method | Slotting, Air blow |

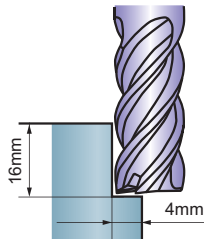
Tool: **MSMHD** : Side milling of aircraft component

Higher efficiency than conventional end mills.

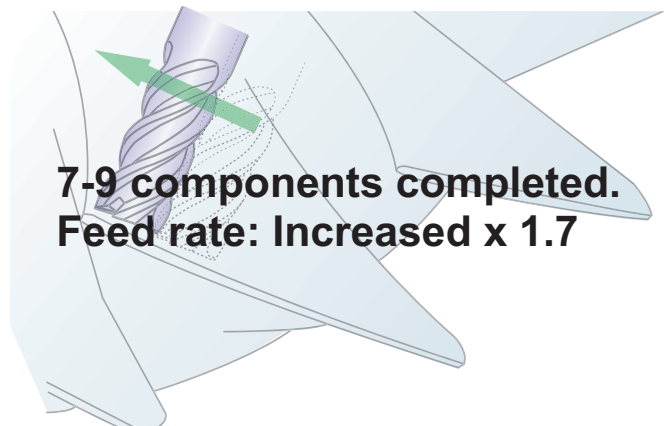
<Shape>



<Depth of cut>



<Machining data>



| | | |
|------------------|------------------------------------|------------------------------------|
| End mill | MSMHD $\phi 16$ | Competitor |
| Workpiece | Stainless steel (JIS SUS304) | |
| Revolution | 600min ⁻¹ (30m/min) | 360min ⁻¹ (18m/min) |
| Feed rate | 85mm/min (0.035mm/tooth) | 50mm/min (0.035mm/tooth) |
| Machining method | Climb cut, Emulsion | |

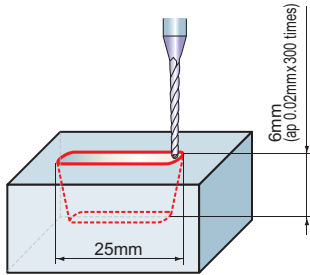
Tool: **MS4LTB**: Compare surface finish and tool wear

Realize ideal surface finish!

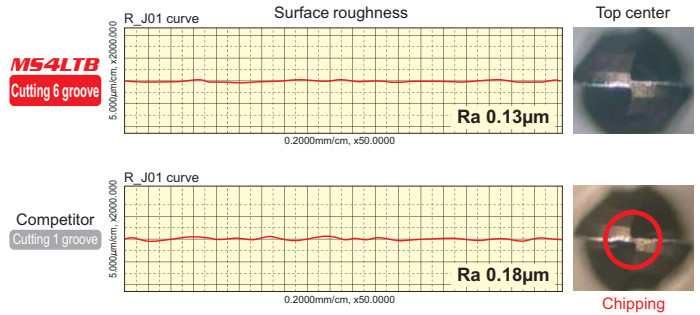
<Shape>



<Depth of cut>



<Machining data>



| | |
|------------------|--|
| End mill | MS4LTB R0.4 x 30' x 8 |
| Workpiece | JIS SKD61 (50HRC) |
| Revolution | 20,000min ⁻¹ (50m/min) |
| Feed rate | 500mm/min (0.013mm/tooth) |
| Machining method | Blind rib (Flute length 25mm), Non water soluble cutting fluid |

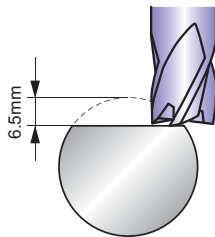
Tool: **MS4EC**: Stainless steel (SUS303)

Long tool life without burrs.

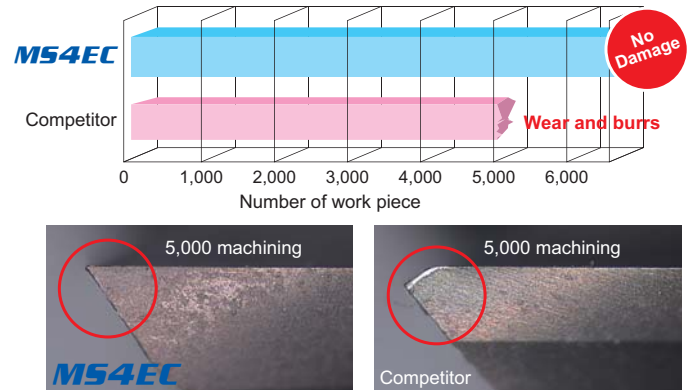
<Shape>



<Depth of cut>



<Machining data>



| | |
|------------------|----------------------------------|
| End mill | MS4EC ø6 |
| Workpiece | JIS SUS303 |
| Revolution | 2,900min ⁻¹ (55m/min) |
| Feed rate | 140mm/min (0.01mm/tooth) |
| Machining method | Emulsion |

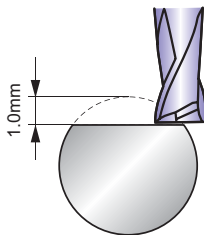
Tool: **MS3ES**: Carbon steel (S45C)

Controlling vibrating with 3 flute geometry of individual development!

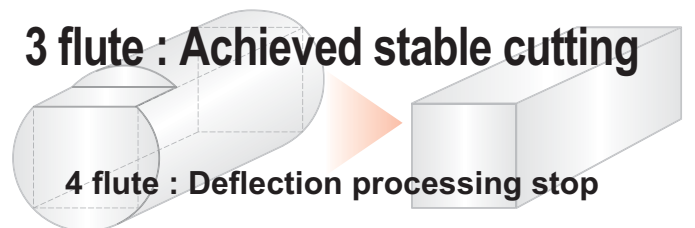
<Shape>



<Depth of cut>



<Machining data>



| | |
|------------------|----------------------------------|
| End mill | MS3ES ø8 |
| Workpiece | JIS S45C |
| Revolution | 2,000min ⁻¹ (50m/min) |
| Feed rate | 150mm/min (0.025mm/tooth) |
| Machining method | Coolant |

MSTAR END MILLS

End mill, Short cut length, 2 flute **MS2SS**

End mill, Medium cut length, 2 flute **MS2MS**

Corner radius end mill, Medium cut length, 2 flute **MS2MRB**

| Work Material | Carbon steel, Alloy steel, Tool steel Pre-hardened steel (-45HRC) JIS S50C, JIS SCM, JIS SKD | | | Alloy steel, Tool steel (45-55HRC) JIS SKD61, STAVAX | | |
|---------------|---|---------------------------------|--------------------|--|---------------------------------|--------------------|
| | Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Depth of Cut ap (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) |
| 0.1 | 40,000 | 40 | 0.001 | 40,000 | 40 | 0.001 |
| 0.2 | 40,000 | 100 | 0.002 | 40,000 | 100 | 0.002 |
| 0.3 | 40,000 | 200 | 0.005 | 40,000 | 200 | 0.005 |
| 0.4 | 40,000 | 600 | 0.01 | 40,000 | 600 | 0.01 |
| 0.5 | 40,000 | 1,000 | 0.015 | 40,000 | 960 | 0.015 |
| 0.6 | 40,000 | 1,200 | 0.02 | 40,000 | 1,200 | 0.02 |
| 0.7 | 40,000 | 1,400 | 0.02 | 40,000 | 1,400 | 0.02 |
| 0.8 | 40,000 | 1,600 | 0.03 | 40,000 | 1,600 | 0.03 |
| 0.9 | 40,000 | 1,800 | 0.04 | 40,000 | 1,600 | 0.04 |
| 1 | 40,000 | 2,000 | 0.06 | 32,000 | 1,600 | 0.06 |
| 1.5 | 40,000 | 3,000 | 0.12 | 32,000 | 1,900 | 0.08 |
| 2 | 30,000 | 3,000 | 0.18 | 24,000 | 1,900 | 0.10 |
| 2.5 | 24,000 | 2,600 | 0.25 | 19,000 | 1,600 | 0.13 |
| 3 | 20,000 | 2,300 | 0.30 | 16,000 | 1,400 | 0.15 |
| 4 | 15,000 | 2,000 | 0.40 | 12,000 | 1,200 | 0.20 |
| 5 | 12,000 | 1,600 | 0.50 | 9,000 | 900 | 0.25 |
| 6 | 10,000 | 1,400 | 0.60 | 7,000 | 700 | 0.30 |
| 8 | 8,000 | 1,000 | 0.80 | 5,600 | 550 | 0.40 |
| 10 | 6,400 | 900 | 1.00 | 4,500 | 500 | 0.50 |
| 12 | 5,400 | 820 | 1.00 | 3,800 | 450 | 0.50 |
| 16 | 2,400 | 380 | ≤3 | 1,200 | 100 | ≤0.8 |
| 20 | 1,900 | 320 | ≤4 | 1,000 | 80 | ≤1 |

| | | | | | |
|--------------|---|--|---|--|---------|
| Depth of Cut | <p>≤ Please refer to the list above for depth of cut.</p> | | <p>≤ Please refer to the list above for depth of cut.</p> | | D: Dia. |
| | | | | | |

- 1) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.
- 2) When slotting with end mills with $\phi 3$ or larger, reduce the revolution to 50-70% and the feed rate to 40-60%.
- 3) When drilling, reduce the feed rate by 70%.

| Work Material | Carbon steel (-30HRC) JIS S50C, JIS SCM Cast iron, JIS FC250 | | Alloy steel, Tool steel Pre-hardened steel (30-45HRC) JIS SKD61, NAK | | Austenitic stainless steel JIS SUS304, JIS SUS316 | | Hardened steel (45-55HRC) JIS SKD61 | |
|---------------|---|------------------------------------|---|------------------------------------|--|------------------------------------|---|------------------------------------|
| | Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) |
| 0.1 | 40,000 | — (40) | 40,000 | — (40) | 40,000 | — (35) | 40,000 | — (25) |
| 0.2 | 40,000 | — (45) | 40,000 | — (45) | 40,000 | — (35) | 32,000 | — (25) |
| 0.3 | 40,000 | — (55) | 32,000 | — (45) | 27,000 | — (35) | 21,000 | — (25) |
| 0.4 | 32,000 | — (60) | 24,000 | — (45) | 20,000 | — (35) | 16,000 | — (25) |
| 0.5 | 25,000 | — (60) | 19,000 | — (45) | 16,000 | — (35) | 13,000 | — (25) |
| 0.6 | 21,000 | — (60) | 16,000 | — (45) | 13,000 | — (35) | 11,000 | — (25) |
| 0.7 | 18,000 | — (60) | 14,000 | — (45) | 11,000 | — (35) | 9,100 | — (25) |
| 0.8 | 16,000 | — (60) | 12,000 | — (45) | 9,900 | — (35) | 8,000 | — (25) |
| 0.9 | 14,000 | — (60) | 11,000 | — (45) | 8,800 | — (35) | 7,100 | — (25) |
| 1 | 13,000 | 60 (60) | 9,500 | 45 (45) | 8,000 | 35 (35) | 6,400 | 25 (25) |
| 1.5 | 8,500 | 60 (60) | 6,400 | 45 (45) | 5,300 | 35 (35) | 4,200 | 25 (25) |
| 2 | 6,400 | 60 (60) | 4,800 | 45 (45) | 4,000 | 35 (35) | 3,200 | 25 (25) |
| 2.5 | 5,100 | 60 (60) | 3,800 | 45 (45) | 3,200 | 40 (40) | 2,500 | 25 (25) |
| 3 | 4,200 | 65 (60) | 3,400 | 55 (45) | 2,600 | 40 (40) | 2,100 | 25 (25) |
| 4 | 3,400 | 80 (60) | 2,700 | 65 (45) | 2,100 (1,600) | 50 (30) | 1,700 | 35 (25) |
| 5 | 2,900 | 100 (60) | 2,300 | 80 (45) | 1,800 (1,350) | 60 (30) | 1,500 | 40 (25) |
| 6 | 2,500 | 120 (60) | 2,000 | 100 (50) | 1,500 (1,100) | 75 (30) | 1,300 | 50 (25) |
| 8 | 1,900 | 130 (60) | 1,500 | 100 (50) | 1,200 (900) | 80 (30) | 1,000 | 50 (25) |
| 10 | 1,600 | 130 (60) | 1,300 | 100 (50) | 950 (710) | 75 (30) | 800 | 50 (25) |
| 12 | 1,300 | 120 (60) | 1,100 | 100 (50) | 800 (600) | 75 (30) | 670 | 50 (25) |

| Depth of Cut | Standard | | Slotting | |
|--------------|-----------------------|-------------------------|--------------------|--------------------|
| | Dia. (mm) | Depth (mm) | Dia. (mm) | Depth (mm) |
| D ≥ φ1 | ≤ 0.05D (MAX. 0.5mm) | ≤ 2.5D | ≤ 0.02D | ≤ 2D |
| | ≤ 0.02D (D < φ0.5) | ≤ 0.05D (φ0.5 ≤ D < φ1) | ≤ 0.02D (D < φ0.5) | ≤ 0.05D (D ≤ φ0.5) |
| D < φ1 | ≤ 0.1D (φ1 ≤ D < φ2) | ≤ 0.2D (D ≥ φ2) | ≤ 0.02D (D < φ0.5) | ≤ 0.05D (D ≤ φ0.5) |
| | ≤ 0.05D (φ1 ≤ D < φ2) | ≤ 0.1D (D ≥ φ2) | ≤ 0.02D (D < φ0.5) | ≤ 0.05D (D ≤ φ0.5) |

() : Indicates standard revolution and feed rate for slotting.

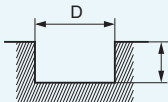
D: Dia.

- 1) Please use 4 fluted end mills for workpiece of 55-60HRC.
- 2) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
- 3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.
- 4) When drilling, reduce the feed rate by 70%.

Slotting

| Work Material | Carbon steel (-30HRC) JIS S50C, JIS SCM Cast iron, JIS FC250 | | | Alloy steel, Tool steel Pre-hardened steel (30-45HRC) JIS SKD61, NAK, HPM | | |
|---------------|--|---------------------------------|--------------------|---|---------------------------------|--------------------|
| | Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Depth of Cut (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) |
| 0.2 | 40,000 | 400 | 0.001 | 30,000 | 250 | 0.001 |
| 0.3 | 40,000 | 600 | 0.005 | 35,000 | 420 | 0.005 |
| 0.4 | 40,000 | 700 | 0.007 | 30,000 | 420 | 0.007 |
| 0.5 | 40,000 | 800 | 0.01 | 24,000 | 380 | 0.01 |
| 0.6 | 33,000 | 800 | 0.015 | 21,000 | 480 | 0.01 |
| 0.7 | 28,000 | 800 | 0.015 | 18,000 | 480 | 0.015 |
| 0.8 | 25,000 | 800 | 0.02 | 16,000 | 480 | 0.02 |
| 0.9 | 22,000 | 800 | 0.03 | 15,000 | 500 | 0.03 |
| 1 | 20,000 | 800 | 0.04 | 13,000 | 500 | 0.04 |
| 1.5 | 13,000 | 800 | 0.10 | 9,000 | 500 | 0.10 |
| 2 | 10,000 | 800 | 0.15 | 6,700 | 500 | 0.15 |
| 2.5 | 9,000 | 800 | 0.20 | 6,000 | 500 | 0.20 |
| 3 | 8,000 | 800 | 0.20 | 5,200 | 460 | 0.20 |
| 4 | 6,000 | 600 | 0.20 | 4,000 | 340 | 0.20 |
| 5 | 4,800 | 480 | 0.30 | 3,200 | 280 | 0.20 |
| 6 | 4,000 | 400 | 0.30 | 2,600 | 210 | 0.20 |
| 8 | 3,000 | 300 | 0.30 | 2,000 | 170 | 0.30 |
| 10 | 2,400 | 240 | 0.30 | 1,600 | 140 | 0.30 |
| 12 | 2,000 | 200 | 0.30 | 1,300 | 110 | 0.30 |

Depth of Cut



≤ Please refer to the list above for depth of cut.

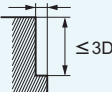
D: Dia.

Side milling

| Work Material | Carbon steel (-30HRC) JIS S50C, JIS SCM Cast iron, JIS FC250 | | | Alloy steel, Tool steel Pre-hardened steel (30-45HRC) JIS SKD61, NAK, HPM | | |
|---------------|--|---------------------------------|--------------------|---|---------------------------------|--------------------|
| | Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Depth of Cut (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) |
| 3 | 3,500 | 370 | 0.05 | 2,600 | 250 | 0.03 |
| 4 | 2,800 | 370 | 0.06 | 2,100 | 200 | 0.03 |
| 5 | 2,200 | 330 | 0.06 | 1,700 | 160 | 0.03 |
| 6 | 1,800 | 300 | 0.06 | 1,500 | 140 | 0.03 |
| 8 | 1,600 | 270 | 0.08 | 1,100 | 140 | 0.04 |
| 10 | 1,400 | 240 | 0.10 | 900 | 140 | 0.05 |
| 12 | 1,200 | 200 | 0.10 | 750 | 120 | 0.06 |

Depth of Cut

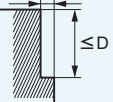
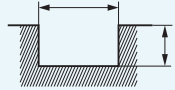
≤ Please refer to the list above for depth of cut.



D: Dia.

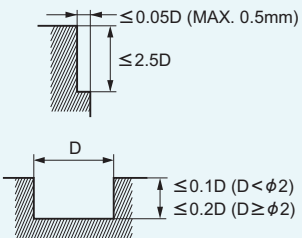
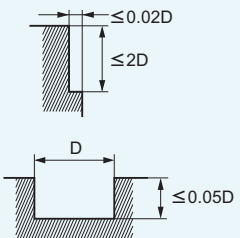
- 1) Please use VC-LD for workpiece of 45HRC.
- 2) Vibration is liable to occur in the initial stages of machining, but after machining 1-2m the machining becomes stable and vibration could disappear.
- 3) Side milling with large depth of cuts with end mills less than $\phi 3$ is not recommended. When side milling, divide the cutting depth into several times paths.
- 4) If chattering occurs, reduce the revolution and the feed rate proportionately and also reduce the depth of cut.
- 5) When drilling, reduce the feed rate by 70%.

| Work Material | Carbon steel, Alloy steel, Tool steel Pre-hardened steel (-45HRC) JIS S50C, JIS SCM, JIS SKD | | | Alloy steel, Tool steel (45-55HRC) JIS SKD61, STAVAX | | |
|---------------|---|--------------------|----------------------|--|--------------------|----------------------|
| Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Depth of Cut ap (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Depth of Cut ap (mm) |
| 1 | 40,000 | 3,000 | 0.06 | 32,000 | 2,400 | 0.06 |
| 1.5 | 40,000 | 4,500 | 0.12 | 32,000 | 3,600 | 0.08 |
| 2 | 30,000 | 4,500 | 0.18 | 24,000 | 3,600 | 0.10 |
| 2.5 | 24,000 | 3,900 | 0.25 | 19,000 | 3,000 | 0.13 |
| 3 | 20,000 | 3,500 | 0.30 | 16,000 | 2,700 | 0.15 |
| 4 | 15,000 | 3,000 | 0.40 | 12,000 | 2,400 | 0.20 |
| 5 | 12,000 | 2,400 | 0.50 | 9,000 | 1,800 | 0.25 |
| 6 | 10,000 | 2,100 | 0.60 | 7,000 | 1,400 | 0.30 |
| 8 | 8,000 | 1,500 | 0.80 | 5,600 | 1,100 | 0.40 |
| 10 | 6,400 | 1,400 | 1.00 | 4,500 | 950 | 0.50 |
| 12 | 5,400 | 1,200 | 1.00 | 3,800 | 860 | 0.50 |
| 16 | 2,400 | 550 | ≤3 | 1,200 | 120 | ≤0.8 |
| 20 | 1,900 | 480 | ≤4 | 1,000 | 100 | ≤1 |

| | | | |
|--------------|---|---|---------|
| Depth of Cut | <p>≤Please refer to the list above for depth of cut.</p>  <p>≤D</p> | <p>≤Please refer to the list above for depth of cut.</p>  <p>≤Please refer to the list above for depth of cut.</p> | D: Dia. |
|--------------|---|---|---------|

- 1) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.
- 2) When slotting with end mills with ø3 or larger, reduce the revolution to 50-70% and the feed rate to 40-60%.
- 3) When drilling, reduce the feed rate by 70%.

| Work Material | Carbon steel (-30HRC) JIS S50C, JIS SCM Cast iron, JIS FC250 | | Alloy steel, Tool steel Pre-hardened steel (30-45HRC) JIS SKD61, NAK | | Austenitic stainless steel JIS SUS304, JIS SUS316 | | Hardened steel (45-55HRC) JIS SKD61 | |
|---------------|---|------------------------------------|---|------------------------------------|--|------------------------------------|---|------------------------------------|
| | Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) |
| 1 | 11,100 | 85 | 9,500 | 65 | 8,000 | 50 | 6,400 | 35 |
| 1.5 | 7,400 | 85 | 6,400 | 90 | 5,300 | 50 | 4,200 | 35 |
| 2 | 5,600 | 85 | 4,800 | 90 | 4,000 | 50 | 3,200 | 35 |
| 2.5 | 4,500 | 85 | 3,800 | 90 | 3,200 | 55 | 2,500 | 35 |
| 3 | 3,700 | 90 | 3,400 | 90 | 2,600 | 60 | 2,100 | 35 |
| 4 | 3,000 | 110 | 2,700 | 90 | 2,100 | 70 | 1,700 | 50 |
| 5 | 2,600 | 140 | 2,300 | 110 | 1,800 | 85 | 1,500 | 55 |
| 6 | 2,300 | 170 | 2,000 | 140 | 1,500 | 110 | 1,300 | 70 |
| 8 | 1,700 | 180 | 1,500 | 140 | 1,200 | 110 | 1,000 | 70 |
| 10 | 1,400 | 180 | 1,300 | 140 | 950 | 110 | 800 | 70 |
| 12 | 1,200 | 170 | 1,100 | 140 | 800 | 110 | 670 | 70 |

| Depth of Cut | Standard Side Milling | | Slotting | |
|--------------|--|--|----------|--|
| |  |  | | |

D: Dia.

- 1) The above table shows cutting conditions for standard side milling. For slotting, please reduce the feed rate only to 50% of the table figure. Please set the revolution at 80% and the feed rate 40% when slotting austenitic stainless steels.
- 2) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
- 3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.
- 4) When drilling, reduce the feed rate by 70%.

| Work Material | | Carbon steel Pre-hardened steel (-HRC45) JIS S55C, NAK, HAP | | |
|---------------|------------------|--|--------------------|----------------------|
| Dia. (mm) | Neck Length (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Depth of Cut ap (mm) |
| 0.2 | 0.5 | 40,000 | 600 | 0.004 |
| | 1 | 40,000 | 400 | 0.001 |
| 0.3 | 1 | 40,000 | 650 | 0.007 |
| | 3 | 40,000 | 500 | 0.002 |
| | 9 | 22,000 | 150 | 0.001 |
| 0.4 | 2 | 40,000 | 800 | 0.007 |
| | 4 | 40,000 | 800 | 0.003 |
| | 12 | 17,000 | 150 | 0.001 |
| 0.5 | 2 | 40,000 | 950 | 0.01 |
| | 6 | 40,000 | 700 | 0.003 |
| | 10 | 25,000 | 400 | 0.002 |
| | 15 | 14,000 | 150 | 0.001 |
| 0.6 | 2 | 40,000 | 950 | 0.01 |
| | 6 | 40,000 | 800 | 0.005 |
| | 10 | 25,000 | 450 | 0.003 |
| | 18 | 12,000 | 150 | 0.001 |
| 0.7 | 2 | 40,000 | 1,000 | 0.02 |
| | 6 | 40,000 | 900 | 0.01 |
| | 10 | 11,000 | 300 | 0.005 |
| 0.8 | 4 | 40,000 | 1,200 | 0.02 |
| | 8 | 40,000 | 1,000 | 0.01 |
| | 12 | 25,000 | 400 | 0.003 |
| | 24 | 10,000 | 150 | 0.001 |
| 0.9 | 6 | 40,000 | 1,300 | 0.02 |
| | 10 | 35,000 | 1,000 | 0.01 |
| | 15 | 9,000 | 400 | 0.003 |
| 1 | 6 | 40,000 | 1,600 | 0.04 |
| | 8 | 40,000 | 1,600 | 0.03 |
| | 12 | 30,000 | 1,000 | 0.02 |
| | 20 | 15,000 | 400 | 0.005 |
| | 30 | 8,000 | 150 | 0.001 |
| 1.2 | 6 | 40,000 | 1,900 | 0.06 |
| | 8 | 40,000 | 1,900 | 0.04 |
| | 12 | 25,000 | 1,000 | 0.03 |
| | 20 | 6,500 | 150 | 0.01 |

| Work Material | | Carbon steel Pre-hardened steel (-HRC45) JIS S55C, NAK, HAP | | |
|---------------|------------------|--|--------------------|----------------------|
| Dia. (mm) | Neck Length (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Depth of Cut ap (mm) |
| 1.5 | 6 | 40,000 | 2,400 | 0.10 |
| | 10 | 30,000 | 1,800 | 0.05 |
| | 20 | 15,000 | 600 | 0.02 |
| | 30 | 7,500 | 300 | 0.005 |
| 1.6 | 45 | 5,000 | 150 | 0.001 |
| | 6 | 40,000 | 2,400 | 0.12 |
| | 10 | 30,000 | 1,800 | 0.07 |
| | 16 | 20,000 | 1,000 | 0.04 |
| 2 | 6 | 40,000 | 2,400 | 0.18 |
| | 10 | 30,000 | 1,800 | 0.10 |
| | 16 | 20,000 | 1,000 | 0.06 |
| | 30 | 8,000 | 500 | 0.04 |
| | 40 | 6,000 | 250 | 0.01 |
| 2.5 | 60 | 4,200 | 150 | 0.003 |
| | 8 | 25,000 | 2,500 | 0.20 |
| | 16 | 18,000 | 1,700 | 0.10 |
| | 20 | 12,000 | 1,000 | 0.08 |
| | 40 | 8,000 | 400 | 0.03 |
| 3 | 50 | 4,000 | 150 | 0.015 |
| | 8 | 20,000 | 2,000 | 0.30 |
| | 16 | 15,000 | 1,400 | 0.15 |
| | 20 | 10,000 | 800 | 0.10 |
| | 40 | 5,000 | 250 | 0.02 |
| 4 | 50 | 3,700 | 150 | 0.010 |
| | 12 | 15,000 | 3,000 | 0.30 |
| | 20 | 11,000 | 2,200 | 0.22 |
| | 30 | 6,400 | 1,200 | 0.12 |
| | 40 | 4,500 | 400 | 0.05 |
| 5 | 50 | 2,800 | 150 | 0.018 |
| | 16 | 12,000 | 2,500 | 0.35 |
| | 35 | 5,100 | 750 | 0.15 |
| 6 | 60 | 2,200 | 150 | 0.02 |
| | 20 | 10,000 | 2,000 | 0.40 |
| | 40 | 4,200 | 800 | 0.20 |
| | 60 | 1,900 | 150 | 0.10 |

- 1) The above table shows the revolution and feed rate for each neck length. Please reduce the revolution and feed rate when using end mills with a longer neck length.
- 2) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately. Please reduce the feed rate when the surface finish is important.

MS2XL6

End mill, Short cut length, 2 flute, 6mm shank

| Work Material | | Carbon steel, Alloy steel Tool steel, Pre-hardened steel JIS SS400, JIS S50C, JIS S55C JIS SCM, JIS SK, NAK, HPM | | | Pre-hardened steel (40-45HRC) JIS SKD61, STAVAX, JIS SUS420 | | |
|---------------|------------------|---|--------------------|----------------------|---|--------------------|----------------------|
| Dia. (mm) | Neck Length (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Depth of Cut ap (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Depth of Cut ap (mm) |
| 0.3 | 0.8 | 40,000 | 500-1,000 | 0.01 | 30,000 | 300-800 | 0.01 |
| | 1.5 | | | 0.007 | | | 0.007 |
| 0.4 | 1 | 40,000 | 500-1,000 | 0.015 | 30,000 | 300-800 | 0.015 |
| | 2 | | | 0.01 | | | 0.01 |
| 0.5 | 1.3 | 40,000 | 500-1,000 | 0.02 | 30,000 | 300-800 | 0.02 |
| | 2.5 | | | 0.013 | | | 0.013 |
| 0.6 | 1.5 | 33,000 | 500-1,000 | 0.03 | 25,000 | 300-800 | 0.03 |
| | 3 | | | 0.018 | | | 0.018 |
| 0.7 | 1.8 | 29,000 | 500-1,000 | 0.04 | 22,000 | 300-800 | 0.04 |
| | 3.5 | | | 0.025 | | | 0.025 |
| 0.8 | 2 | 25,000 | 500-1,000 | 0.06 | 20,000 | 300-800 | 0.06 |
| | 4 | | | 0.03 | | | 0.03 |
| 0.9 | 2.3 | 22,000 | 500-1,000 | 0.08 | 18,000 | 300-800 | 0.08 |
| | 4.5 | | | 0.05 | | | 0.05 |
| 1 | 2.5 | 20,000 | 500-1,000 | 0.1 | 16,000 | 300-800 | 0.1 |
| | 5 | | | 0.07 | | | 0.07 |
| 1.1 | 2.8 | 18,000 | 500-1,000 | 0.12 | 14,000 | 300-800 | 0.12 |
| | 5.5 | | | 0.08 | | | 0.08 |
| 1.2 | 3 | 16,000 | 500-1,000 | 0.12 | 13,000 | 300-800 | 0.12 |
| | 6 | | | 0.08 | | | 0.08 |
| 1.3 | 3.3 | 15,000 | 500-1,000 | 0.12 | 12,000 | 300-800 | 0.12 |
| | 6.5 | | | 0.08 | | | 0.08 |
| 1.4 | 3.5 | 14,000 | 500-1,000 | 0.12 | 11,000 | 300-800 | 0.12 |
| | 7 | | | 0.08 | | | 0.08 |
| 1.5 | 3.8 | 13,000 | 500-1,000 | 0.15 | 10,000 | 300-800 | 0.15 |
| | 7.5 | | | 0.1 | | | 0.1 |
| 1.6 | 4 | 12,000 | 500-1,000 | 0.15 | 10,000 | 300-800 | 0.15 |
| | 8 | | | 0.1 | | | 0.1 |
| 1.7 | 4.3 | 12,000 | 500-1,000 | 0.17 | 9,500 | 300-800 | 0.17 |
| | 8.5 | | | 0.12 | | | 0.12 |
| 1.8 | 4.5 | 11,000 | 500-1,000 | 0.17 | 9,000 | 300-800 | 0.17 |
| | 9 | | | 0.12 | | | 0.12 |
| 1.9 | 4.8 | 10,000 | 500-1,000 | 0.17 | 9,000 | 300-800 | 0.17 |
| | 9.5 | | | 0.12 | | | 0.12 |
| 2 | 5 | 10,000 | 500-1,000 | 0.2 | 9,000 | 300-800 | 0.2 |
| | 10 | | | 0.15 | | | 0.15 |
| 2.1 | 5.3 | 9,800 | 500-1,000 | 0.2 | 9,000 | 300-800 | 0.2 |
| | 10.5 | | | 0.15 | | | 0.15 |
| 2.2 | 5.5 | 9,600 | 500-1,000 | 0.2 | 9,000 | 300-800 | 0.2 |
| | 11 | | | 0.15 | | | 0.15 |
| 2.3 | 5.8 | 9,400 | 500-1,000 | 0.2 | 8,800 | 300-800 | 0.2 |
| | 11.5 | | | 0.15 | | | 0.15 |
| 2.4 | 6 | 9,200 | 500-1,000 | 0.25 | 8,700 | 300-800 | 0.25 |
| | 12 | | | 0.2 | | | 0.2 |
| 2.5 | 6.3 | 9,000 | 500-1,000 | 0.25 | 8,500 | 300-800 | 0.25 |
| | 12.5 | | | 0.2 | | | 0.2 |

- 1) The above table shows the revolution and feed rate for each neck length. Please reduce the feed rate when using end mills with a longer neck length.
- 2) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately. Please reduce the feed rate when the surface finish is important.
- 3) If the depth of cut is shallow or when rib milling, the revolution and feed rate can be increased.

MS4XL

End mill, Short cut length, 4 flute, Long neck

| Work Material | | Carbon steel Alloy steel, Tool steel Pre-hardened steel JIS SS400, JIS S50C, JIS S55C JIS SCM, JIS SK, NAK, HPM | | |
|---------------|------------------|---|--------------------|-------------------|
| Dia. (mm) | Neck Length (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Depth of Cut (mm) |
| 1 | 4 | 40,000 | 3,000 | 0.04 |
| | 8 | 36,000 | 2,400 | 0.03 |
| | 12 | 20,000 | 1,000 | 0.02 |
| | 16 | 10,000 | 500 | 0.005 |
| 1.2 | 6 | 40,000 | 3,000 | 0.05 |
| | 10 | 36,000 | 2,400 | 0.04 |
| | 12 | 20,000 | 1,200 | 0.03 |
| | 16 | 12,000 | 600 | 0.01 |
| 1.5 | 6 | 40,000 | 3,200 | 0.06 |
| | 12 | 32,000 | 2,400 | 0.05 |
| | 16 | 16,000 | 1,100 | 0.03 |
| | 20 | 10,000 | 600 | 0.01 |
| 1.8 | 6 | 40,000 | 3,600 | 0.08 |
| | 12 | 32,000 | 2,800 | 0.06 |
| | 20 | 12,000 | 1,000 | 0.02 |
| | 25 | 7,000 | 600 | 0.01 |
| 2 | 6 | 40,000 | 4,000 | 0.1 |
| | 12 | 32,000 | 3,200 | 0.07 |
| | 16 | 24,000 | 2,400 | 0.05 |
| | 20 | 12,000 | 1,200 | 0.03 |
| | 30 | 5,000 | 500 | 0.01 |
| 2.5 | 8 | 32,000 | 4,000 | 0.2 |
| | 25 | 9,000 | 1,100 | 0.04 |
| | 50 | 2,500 | 300 | 0.005 |
| 3 | 8 | 25,000 | 3,600 | 0.4 |
| | 16 | 18,000 | 2,500 | 0.2 |
| | 25 | 12,000 | 1,700 | 0.1 |
| | 30 | 7,000 | 800 | 0.05 |

| Work Material | | Carbon steel Alloy steel, Tool steel Pre-hardened steel JIS SS400, JIS S50C, JIS S55C JIS SCM, JIS SK, NAK, HPM | | |
|---------------|------------------|---|--------------------|-------------------|
| Dia. (mm) | Neck Length (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Depth of Cut (mm) |
| 3.5 | 15 | 20,000 | 3,000 | 0.6 |
| | 25 | 11,000 | 1,600 | 0.15 |
| | 35 | 5,500 | 800 | 0.06 |
| 4 | 12 | 18,000 | 3,000 | 1 |
| | 20 | 12,000 | 2,000 | 0.5 |
| | 30 | 8,000 | 1,300 | 0.2 |
| | 40 | 4,200 | 700 | 0.08 |
| | 50 | 2,400 | 400 | 0.03 |
| 5 | 16 | 14,000 | 2,700 | 1 |
| | 25 | 9,500 | 1,800 | 0.5 |
| | 35 | 6,400 | 1,200 | 0.2 |
| | 50 | 3,200 | 600 | 0.05 |
| 6 | 20 | 11,000 | 2,200 | 1.2 |
| | 30 | 8,000 | 1,600 | 0.6 |
| | 40 | 5,400 | 1,100 | 0.25 |
| | 50 | 3,200 | 640 | 0.15 |
| 8 | 30 | 8,000 | 1,600 | 1.6 |
| | 50 | 4,000 | 800 | 0.5 |
| | 70 | 2,000 | 400 | 0.2 |
| 10 | 40 | 6,400 | 1,300 | 2 |
| | 60 | 3,200 | 640 | 0.6 |
| | 80 | 1,600 | 320 | 0.3 |
| | | | | |

1) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately. Please reduce the feed rate when the surface finish is important.

Side milling

| Work Material | Carbon steel, Alloy steel (-30HRC) JIS S50C JIS SCM, JIS SS | | Hardened steel (30-45HRC) JIS SKD61 | | Stainless steel JIS SUS304 JIS SUS316 Titanium alloy | |
|---------------|--|---------------------------------|---|---------------------------------|---|---------------------------------|
| | Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) |
| 1 | 19,000 | 600 | 13,000 | 310 | 10,000 | 200 |
| 1.5 | 14,000 | 600 | 9,000 | 310 | 7,500 | 210 |
| 2 | 11,000 | 600 | 7,200 | 310 | 6,000 | 210 |
| 3 | 8,500 | 770 | 5,300 | 380 | 4,400 | 220 |
| 4 | 7,200 | 850 | 4,400 | 480 | 3,700 | 250 |
| 6 | 5,300 | 940 | 3,200 | 490 | 2,700 | 270 |
| 8 | 4,000 | 1,010 | 2,400 | 560 | 2,000 | 280 |
| 10 | 3,200 | 1,000 | 1,900 | 480 | 1,600 | 300 |
| 12 | 2,700 | 950 | 1,600 | 440 | 1,300 | 300 |
| 16 | 2,000 | 720 | 1,200 | 350 | 1,000 | 260 |
| 20 | 1,600 | 600 | 1,000 | 290 | 800 | 240 |

Depth of Cut

$\leq 0.2D$ ($D > \phi 3$)
 $\leq 0.1D$ ($D \leq \phi 3$)

Depth of Cut

$\leq 0.2D$ ($D > \phi 3$)
 $\leq 0.1D$ ($D \leq \phi 3$)

D:Dia.

Slotting

| Work Material | Carbon steel, Alloy steel (-30HRC) JIS S50C JIS SCM, JIS SS | | Hardened steel (30-45HRC) JIS SKD61 | | Stainless steel JIS SUS304 JIS SUS316 Titanium alloy | |
|---------------|--|---------------------------------|---|---------------------------------|---|---------------------------------|
| | Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) |
| 1 | 13,000 | 130 | 10,000 | 80 | 6,000 | 30 |
| 1.5 | 12,000 | 250 | 8,000 | 150 | 6,000 | 60 |
| 2 | 11,000 | 500 | 7,200 | 260 | 6,000 | 130 |
| 3 | 8,500 | 640 | 5,300 | 320 | 4,200 | 130 |
| 4 | 7,200 | 650 | 4,400 | 370 | 3,300 | 140 |
| 6 | 5,300 | 720 | 3,200 | 380 | 2,200 | 140 |
| 8 | 4,000 | 780 | 2,400 | 430 | 1,600 | 140 |
| 10 | 3,200 | 770 | 1,900 | 370 | 1,300 | 150 |
| 12 | 2,700 | 730 | 1,600 | 340 | 1,100 | 150 |
| 16 | 2,000 | 600 | 1,200 | 290 | 800 | 130 |
| 20 | 1,600 | 500 | 1,000 | 240 | 640 | 120 |

Depth of cut

$\leq 1D$ ($D \geq \phi 2$)
 $\leq 0.5D$ ($D < \phi 2$)

Depth of cut

$\leq 0.5D$ ($D \geq \phi 2$)
 $\leq 0.2D$ ($D < \phi 2$)

D:Dia.

Plunging

| Work Material | Carbon steel, Alloy steel (-30HRC) JIS S50C JIS SCM, JIS SS | | Hardened steel (30-45HRC) JIS SKD61 | | Stainless steel JIS SUS304 JIS SUS316 Titanium alloy | |
|---------------|--|---------------------------------|---|---------------------------------|---|---------------------------------|
| | Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) |
| 1 | 13,000 | 80 | 10,000 | 50 | 6,000 | 10 |
| 1.5 | 12,000 | 120 | 8,000 | 80 | 6,000 | 20 |
| 2 | 11,000 | 200 | 7,200 | 140 | 6,000 | 30 |
| 3 | 8,500 | 250 | 5,300 | 180 | 4,200 | 50 |
| 4 | 7,200 | 300 | 4,400 | 210 | 3,300 | 60 |
| 6 | 5,300 | 300 | 3,200 | 210 | 2,200 | 70 |
| 8 | 4,000 | 320 | 2,400 | 220 | 1,600 | 80 |
| 10 | 3,200 | 340 | 1,900 | 240 | 1,300 | 70 |
| 12 | 2,700 | 320 | 1,600 | 220 | 1,100 | 70 |
| 16 | 2,000 | 250 | 1,200 | 180 | 800 | 55 |
| 20 | 1,600 | 200 | 1,000 | 140 | 640 | 55 |

Depth of Cut

$\leq 1D$ ($D \geq \phi 2$)
 $\leq 0.5D$ ($D < \phi 2$)

Depth of Cut

$\leq 0.5D$ ($D \geq \phi 2$)
 $\leq 0.2D$ ($D < \phi 2$)

D:Dia.

- 1) The above table shows the standard recommended cutting conditions. Adjustments may be needed according to the condition of the machine.
- 2) When slotting, plunging and cutting stainless steels, water-soluble cutting fluid is recommended.
- 3) When plunging of materials such as austenitic stainless steels and titanium alloys, it is recommended to peck feed. (0.1D)

Side milling

| Work Material | Carbon steel, Alloy steel (-30HRC) JIS SS400, JIS S50C, JIS SCM Cast iron, JIS FC250 | | Alloy steel, Tool steel Pre-hardened steel (30-45HRC) JIS SKD61, NAK | | Austenitic stainless steel JIS SUS304, JIS SUS316 | | Hardened steel (45-55HRC) JIS SKD61 | |
|---------------|--|---------------------------------|--|---------------------------------|--|---------------------------------|--|---------------------------------|
| | Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) |
| 2 | 15,000 | 550 | 10,000 | 340 | 10,000 | 320 | 6,400 | 160 |
| 3 | 11,000 | 800 | 7,400 | 500 | 7,400 | 480 | 4,800 | 250 |
| 4 | 8,000 | 900 | 5,600 | 540 | 5,600 | 520 | 3,600 | 270 |
| 5 | 6,400 | 1,000 | 4,500 | 600 | 4,500 | 580 | 2,900 | 300 |
| 6 | 5,800 | 1,100 | 3,700 | 640 | 3,700 | 600 | 2,400 | 320 |
| 8 | 4,400 | 1,100 | 2,800 | 660 | 2,800 | 600 | 1,800 | 330 |
| 10 | 3,500 | 1,000 | 2,200 | 640 | 2,200 | 560 | 1,400 | 320 |
| 12 | 2,900 | 1,000 | 1,900 | 640 | 1,900 | 530 | 1,200 | 320 |
| 16 | 2,200 | 800 | 1,400 | 500 | 1,400 | 450 | 900 | 250 |
| 20 | 1,800 | 750 | 1,100 | 460 | 1,100 | 440 | 720 | 230 |
| 25 | 1,400 | 600 | 900 | 400 | 900 | 380 | 570 | 200 |
| Depth of Cut | | | | | | | | |

D:Dia.

Slotting

| Work Material | Carbon steel, Alloy steel (-30HRC) JIS SS400, JIS S50C, JIS SCM Cast iron, JIS FC250 | | Alloy steel, Tool steel Pre-hardened steel (30-45HRC) JIS SKD61, NAK | | Austenitic stainless steel JIS SUS304, JIS SUS316 | | Hardened steel (45-55HRC) JIS SKD61 | |
|---------------|--|---------------------------------|--|---------------------------------|--|---------------------------------|--|---------------------------------|
| | Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) |
| 2 | 12,000 | 400 | 7,000 | 200 | 7,000 | 100 | 4,200 | 80 |
| 3 | 9,000 | 600 | 5,300 | 300 | 5,300 | 150 | 3,200 | 130 |
| 4 | 7,200 | 720 | 4,000 | 360 | 4,000 | 180 | 2,400 | 140 |
| 5 | 5,800 | 720 | 3,200 | 360 | 3,200 | 180 | 1,900 | 150 |
| 6 | 5,000 | 800 | 2,700 | 400 | 2,700 | 200 | 1,600 | 160 |
| 8 | 3,700 | 800 | 2,000 | 400 | 2,000 | 200 | 1,200 | 170 |
| 10 | 3,000 | 720 | 1,600 | 360 | 1,600 | 180 | 960 | 160 |
| 12 | 2,500 | 720 | 1,300 | 360 | 1,300 | 180 | 800 | 160 |
| 16 | 2,000 | 600 | 1,000 | 280 | 1,000 | 150 | 600 | 130 |
| 20 | 1,600 | 540 | 800 | 250 | 800 | 130 | 480 | 120 |
| 25 | 1,300 | 480 | 640 | 220 | 640 | 120 | 380 | 100 |
| Depth of Cut | | | | | | | | |

D:Dia.

- 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
- 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
- 3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and feed rate proportionately, or set the depth of cut smaller.
- 4) Climb cutting is recommended for side milling.

Side milling

| Work Material | Carbon steel, Alloy steel (-30HRC) JIS SS400, JIS S50C, JIS SCM Cast iron, JIS FC250 | | Alloy steel, Tool steel Pre-hardened steel (30-45HRC) JIS SKD61, NAK | | Austenitic stainless steel JIS SUS304, JIS SUS316 | | Hardened steel (45-55HRC) JIS SKD61 | |
|---------------|--|---------------------------------|--|---------------------------------|--|---------------------------------|--|---------------------------------|
| | Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) |
| 2 | 11,000 | 370 | 7,000 | 230 | 7,000 | 210 | 5,000 | 100 |
| 3 | 8,000 | 550 | 5,100 | 320 | 5,100 | 300 | 3,800 | 190 |
| 4 | 6,200 | 620 | 4,000 | 350 | 4,000 | 340 | 3,000 | 210 |
| 5 | 5,000 | 670 | 3,200 | 370 | 3,200 | 360 | 2,400 | 220 |
| 6 | 4,200 | 750 | 2,600 | 400 | 2,600 | 390 | 2,000 | 220 |
| 8 | 3,200 | 780 | 2,000 | 420 | 2,000 | 400 | 1,500 | 230 |
| 10 | 2,500 | 690 | 1,600 | 410 | 1,600 | 380 | 1,200 | 210 |
| 12 | 2,100 | 670 | 1,300 | 380 | 1,300 | 340 | 1,000 | 190 |
| 16 | 1,600 | 570 | 1,000 | 320 | 1,000 | 280 | 750 | 170 |
| 20 | 1,200 | 470 | 800 | 290 | 800 | 260 | 600 | 150 |
| Depth of Cut | | | | | | | | |

D:Dia.

- 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
- 2) If the rigidity of the machine or the workpiece set up is very low, or when chattering occurs, reduce the revolution and the feed rate proportionately. Note however if the quality of the workpiece surface is poor, chattering may occur even under the same cutting conditions.
- 3) Climb cutting is recommended.

MS2ES

End mill, 2 flute, For small automatic lathes

MS3ES

End mill, 3 flute, For small automatic lathes

| Work Material | Carbon steel (-30HRC) JIS S50C, JIS SCM, Cast iron JIS FC250, Brass | | Alloy steel, Tool steel Pre-hardened steel (30-45HRC) JIS SKD, JIS SCM, JIS SKD61 | | Austenitic stainless steel JIS SUS304, JIS SUS316 | | Hardened steel (45-55HRC) JIS SKD61 | |
|---------------|---|---------------------------------|---|---------------------------------|--|---------------------------------|--|---------------------------------|
| | Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) |
| 3 | 10,000 | 600 | 7,000 | 400 | 6,000 | 300 | 5,000 | 120 |
| 4 | 7,500 | 600 | 5,200 | 400 | 4,500 | 300 | 4,000 | 120 |
| 5 | 6,000 | 600 | 4,200 | 400 | 3,600 | 300 | 3,200 | 120 |
| 6 | 5,000 | 600 | 3,500 | 400 | 3,000 | 300 | 2,700 | 120 |
| 7 | 4,500 | 560 | 3,000 | 360 | 2,700 | 280 | 2,300 | 110 |
| 8 | 4,000 | 520 | 2,800 | 350 | 2,400 | 260 | 2,000 | 110 |
| 10 | 3,200 | 450 | 2,200 | 300 | 1,900 | 230 | 1,600 | 100 |
| 12 | 2,700 | 410 | 1,900 | 270 | 1,600 | 210 | 1,300 | 100 |

| Depth of Cut | D: Dia. | | D: Dia. | |
|--------------|-----------|-----------|-----------|-----------|
| | Diagram 1 | Diagram 2 | Diagram 1 | Diagram 2 |
| | | | | |

D: Dia.

- 1) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.
- 2) When drilling, reduce the feed rate by 70%.

MS4EC

End mill, 4 flute, For small automatic lathes

| Work Material | Carbon steel (-30HRC) S50C, SCM, Cast iron FC250, Brass | | Alloy steel, Tool steel Pre-hardened steel (30-45HRC) JIS SCM, JIS SKD61 | | Austenitic stainless steel JIS SUS304, JIS SUS316 | | Hardened steel (45-55HRC) JIS SKD61 | |
|---------------|---|---------------------------------|--|---------------------------------|--|---------------------------------|--|---------------------------------|
| | Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) |
| 3 | 10,000 | 900 | 7,000 | 600 | 6,000 | 450 | 5,000 | 180 |
| 4 | 7,500 | 900 | 5,200 | 600 | 4,500 | 450 | 4,000 | 180 |
| 5 | 6,000 | 900 | 4,200 | 600 | 3,600 | 450 | 3,200 | 180 |
| 6 | 5,000 | 900 | 3,500 | 600 | 3,000 | 450 | 2,700 | 180 |
| 7 | 4,500 | 840 | 3,000 | 540 | 2,700 | 420 | 2,300 | 160 |
| 8 | 4,000 | 780 | 2,800 | 520 | 2,400 | 390 | 2,000 | 160 |
| 10 | 3,200 | 680 | 2,200 | 450 | 1,900 | 340 | 1,600 | 140 |
| 12 | 2,700 | 620 | 1,900 | 410 | 1,600 | 310 | 1,300 | 120 |
| 14 | 2,300 | 550 | 1,600 | 350 | 1,400 | 280 | 1,200 | 120 |

| Depth of Cut | D: Dia. | | D: Dia. | |
|--------------|-----------|-----------|-----------|-----------|
| | Diagram 1 | Diagram 2 | Diagram 1 | Diagram 2 |
| | | | | |

D: Dia.

- 1) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.
- 2) When drilling, reduce the feed rate by 70%.

MSTAR END MILLS

Ball nose end mill, Short cut length, 2 flute **MS2SB**

Ball nose end mill, Medium cut length, 2 flute **MS2MB**

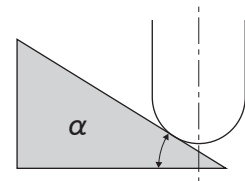
Ball nose taper end mill, Medium cut length, 2 flute **MS2MTB**

| Work Material | Alloy steel, Tool steel, Pre-hardened steel (-45HRC) JIS SCM, JIS SKD61, JIS SKD11 | | | | | Hardened steel (45-55HRC) JIS SKD61 | | | | |
|---------------|--|-----------------------|------------------------------------|-----------------------|-------------------------|---|-----------------------|------------------------------------|-----------------------|-------------------------|
| | $\alpha \leq 15^\circ$ | | $\alpha > 15^\circ$ | | Depth of Cut ap (mm) | $\alpha \leq 15^\circ$ | | $\alpha > 15^\circ$ | | Depth of Cut ap (mm) |
| | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | |
| R 0.1 | 40,000 | 300 | 40,000 | 250 | 0.003 | 40,000 | 300 | 40,000 | 250 | 0.003 |
| R 0.15 | 40,000 | 500 | 40,000 | 350 | 0.007 | 40,000 | 500 | 40,000 | 350 | 0.007 |
| R 0.2 | 40,000 | 1,600 | 40,000 | 1,200 | 0.02 | 40,000 | 1,300 | 40,000 | 950 | 0.015 |
| R 0.25 | 40,000 | 2,400 | 40,000 | 1,400 | 0.025 | 40,000 | 1,900 | 40,000 | 1,100 | 0.020 |
| R 0.3 | 40,000 | 3,200 | 40,000 | 1,600 | 0.03 | 40,000 | 2,500 | 40,000 | 1,300 | 0.025 |
| R 0.4 | 40,000 | 4,800 | 40,000 | 2,400 | 0.05 | 40,000 | 4,000 | 40,000 | 1,900 | 0.04 |
| R 0.5 | 40,000 | 5,600 | 40,000 | 3,200 | 0.06 | 40,000 | 5,600 | 40,000 | 3,000 | 0.05 |
| R 0.75 | 40,000 | 6,500 | 40,000 | 4,000 | 0.09 | 40,000 | 6,500 | 32,000 | 3,200 | 0.08 |
| R 1 | 40,000 | 6,500 | 39,000 | 4,700 | 0.11 | 40,000 | 6,500 | 31,000 | 3,500 | 0.11 |
| R 1.25 | 40,000 | 7,000 | 33,000 | 4,500 | 0.12 | 36,000 | 6,500 | 26,000 | 3,500 | 0.12 |
| R 1.5 | 40,000 | 7,500 | 27,000 | 4,300 | 0.13 | 32,000 | 6,000 | 22,000 | 3,400 | 0.13 |
| R 2 | 32,000 | 7,500 | 20,000 | 3,600 | 0.15 | 25,000 | 6,000 | 16,000 | 2,700 | 0.15 |
| R 2.5 | 25,000 | 6,000 | 16,000 | 2,900 | 0.20 | 20,000 | 5,400 | 13,000 | 2,300 | 0.20 |
| R 3 | 21,000 | 5,800 | 13,000 | 2,600 | 0.25 | 17,000 | 4,700 | 10,000 | 2,000 | 0.25 |
| R 4 | 16,000 | 4,500 | 10,000 | 2,000 | 0.30 | 13,000 | 3,600 | 8,000 | 1,500 | 0.30 |
| R 5 | 13,000 | 3,600 | 8,000 | 1,700 | 0.50 | 10,000 | 2,900 | 6,400 | 1,200 | 0.50 |
| R 6 | 9,000 | 2,500 | 6,000 | 1,300 | 0.50 | 7,200 | 2,000 | 4,800 | 1,000 | 0.50 |

Depth of Cut: Please select a pick feed based on the required surface finishes in reference to "Pitch Selection of Pick Feed" on page F023.

R:Radius

- 1) α is the inclination of machining surface.
- 2) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately. Please reduce the feed rate when the surface finish is important.
- 3) Cutting conditions may differ considerably due to the overhang (milling depth and neck length), depth of cut, and machine tool condition. Please use the above table as a standard starting point.
- 4) If the depth of cut is shallow, the revolution and feed rate can be increased.



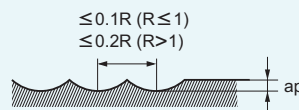
MS2XLB

Ball nose end mill, Short cut length, 2 flute, Long neck

| Work Material | | Carbon steel Pre-hardened steel (-45HRC) JIS S55C, NAK, HPM | | | Hardened steel (-52HRC) JIS SKD61, STAVAX | | |
|---------------|--------------|--|-----------------------|-------------------------|---|-----------------------|-------------------------|
| | | Revolution (min ⁻¹) | Feed Rate (mm/min) | Depth of Cut ap (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Depth of Cut ap (mm) |
| R 0.1 | 0.5 | 50,000 | 400 | 0.003 | 50,000 | 320 | 0.003 |
| | 1 | 50,000 | 400 | 0.002 | 50,000 | 320 | 0.002 |
| | 1.5 | 40,000 | 300 | 0.001 | 40,000 | 240 | 0.001 |
| | 2 | 40,000 | 200 | 0.001 | 40,000 | 160 | 0.001 |
| | 2.5 | 40,000 | 100 | 0.001 | 40,000 | 80 | 0.001 |
| | 3 | 30,000 | 50 | 0.001 | 30,000 | 40 | 0.001 |
| R 0.15 | 1 | 50,000 | 600 | 0.007 | 50,000 | 480 | 0.007 |
| | 1.5 | 50,000 | 600 | 0.005 | 50,000 | 480 | 0.005 |
| | 2 | 50,000 | 600 | 0.003 | 50,000 | 480 | 0.003 |
| | 2.5 | 40,000 | 400 | 0.003 | 40,000 | 320 | 0.003 |
| | 3 | 40,000 | 300 | 0.002 | 40,000 | 240 | 0.002 |
| | 4 | 30,000 | 200 | 0.002 | 30,000 | 160 | 0.002 |
| R 0.2 | 1 | 50,000 | 1,800 | 0.015 | 50,000 | 1,400 | 0.015 |
| | 2 | 50,000 | 1,300 | 0.01 | 50,000 | 1,000 | 0.01 |
| | 3 | 50,000 | 900 | 0.005 | 50,000 | 700 | 0.005 |
| | 4 | 40,000 | 600 | 0.004 | 40,000 | 480 | 0.004 |
| | 5 | 40,000 | 400 | 0.003 | 40,000 | 320 | 0.003 |
| | 6 | 30,000 | 200 | 0.002 | 30,000 | 160 | 0.002 |
| R 0.25 | 2 | 50,000 | 2,500 | 0.02 | 50,000 | 2,000 | 0.02 |
| | 3 | 50,000 | 1,500 | 0.015 | 50,000 | 1,200 | 0.015 |
| | 4 | 45,000 | 1,200 | 0.01 | 45,000 | 950 | 0.01 |
| | 5 | 45,000 | 900 | 0.007 | 45,000 | 700 | 0.007 |
| | 6 | 36,000 | 600 | 0.006 | 36,000 | 480 | 0.006 |
| | 7 | 32,000 | 400 | 0.005 | 32,000 | 320 | 0.005 |
| | 8 | 32,000 | 300 | 0.003 | 32,000 | 240 | 0.003 |
| | 10 | 26,000 | 200 | 0.002 | 26,000 | 160 | 0.002 |
| R 0.3 | 2 | 50,000 | 3,500 | 0.03 | 50,000 | 2,800 | 0.03 |
| | 3 | 50,000 | 3,500 | 0.03 | 50,000 | 2,800 | 0.03 |
| | 4 | 44,000 | 2,500 | 0.02 | 44,000 | 2,000 | 0.02 |
| | 5 | 37,000 | 1,200 | 0.01 | 37,000 | 950 | 0.01 |
| | 6 | 37,000 | 1,000 | 0.008 | 37,000 | 800 | 0.008 |
| | 7 | 35,000 | 750 | 0.008 | 35,000 | 600 | 0.008 |
| | 8 | 35,000 | 600 | 0.006 | 35,000 | 480 | 0.006 |
| | 9 | 30,000 | 500 | 0.004 | 30,000 | 400 | 0.004 |
| | 10 | 30,000 | 500 | 0.003 | 30,000 | 400 | 0.003 |
| | 11 | 22,000 | 300 | 0.002 | 22,000 | 240 | 0.002 |
| | 12 | 22,000 | 200 | 0.002 | 22,000 | 160 | 0.002 |
| | R 0.4 | 2 | 50,000 | 4,400 | 0.04 | 50,000 | 3,500 |
| 3 | | 50,000 | 4,000 | 0.04 | 50,000 | 3,200 | 0.04 |
| 4 | | 50,000 | 4,000 | 0.02 | 50,000 | 3,200 | 0.02 |
| 5 | | 35,000 | 2,400 | 0.02 | 35,000 | 1,900 | 0.02 |
| 6 | | 35,000 | 2,400 | 0.02 | 35,000 | 1,900 | 0.02 |
| 7 | | 30,000 | 1,500 | 0.015 | 30,000 | 1,200 | 0.015 |
| 8 | | 30,000 | 1,500 | 0.01 | 30,000 | 1,200 | 0.01 |
| 10 | | 30,000 | 700 | 0.008 | 30,000 | 560 | 0.008 |
| 12 | | 22,000 | 500 | 0.006 | 22,000 | 400 | 0.006 |
| R 0.5 | | 3 | 40,000 | 4,000 | 0.05 | 40,000 | 3,200 |
| | 4 | 40,000 | 4,000 | 0.05 | 40,000 | 3,200 | 0.05 |
| | 6 | 35,000 | 3,000 | 0.03 | 35,000 | 2,400 | 0.03 |
| | 8 | 30,000 | 2,000 | 0.02 | 30,000 | 1,600 | 0.02 |

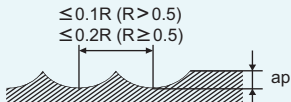
| Work Material | | Carbon steel Pre-hardened steel (-45HRC) JIS S55C, NAK, HPM | | | Hardened steel (-52HRC) JIS SKD61, STAVAX | | | |
|---------------|---------------|--|-----------------------|-------------------------|---|-----------------------|-------------------------|------|
| | | Revolution (min ⁻¹) | Feed Rate (mm/min) | Depth of Cut ap (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Depth of Cut ap (mm) | |
| R 0.5 | 10 | 20,000 | 1,000 | 0.01 | 20,000 | 800 | 0.01 | |
| | 12 | 20,000 | 1,000 | 0.01 | 20,000 | 800 | 0.01 | |
| | 14 | 18,000 | 600 | 0.008 | 18,000 | 480 | 0.008 | |
| | 16 | 18,000 | 500 | 0.008 | 18,000 | 400 | 0.008 | |
| | 18 | 13,000 | 300 | 0.005 | 13,000 | 240 | 0.005 | |
| | 20 | 13,000 | 250 | 0.005 | 13,000 | 200 | 0.005 | |
| R 0.6 | 3.6 | 40,000 | 4,400 | 0.06 | 40,000 | 3,500 | 0.06 | |
| | 6 | 40,000 | 4,400 | 0.04 | 40,000 | 3,500 | 0.04 | |
| | 8 | 40,000 | 4,000 | 0.04 | 40,000 | 3,200 | 0.04 | |
| | 10 | 27,000 | 1,900 | 0.02 | 27,000 | 1,500 | 0.02 | |
| | 12 | 16,000 | 1,400 | 0.02 | 16,000 | 1,100 | 0.02 | |
| | 18 | 15,000 | 700 | 0.008 | 15,000 | 560 | 0.008 | |
| | 24 | 11,000 | 300 | 0.006 | 11,000 | 240 | 0.006 | |
| | R 0.75 | 6 | 40,000 | 6,000 | 0.07 | 36,000 | 4,300 | 0.07 |
| 8 | | 40,000 | 6,000 | 0.07 | 36,000 | 4,300 | 0.07 | |
| 10 | | 40,000 | 5,000 | 0.06 | 36,000 | 3,600 | 0.06 | |
| 12 | | 32,000 | 3,400 | 0.04 | 29,000 | 2,400 | 0.04 | |
| 16 | | 15,000 | 1,400 | 0.03 | 15,000 | 1,100 | 0.03 | |
| 20 | | 12,000 | 900 | 0.02 | 12,000 | 720 | 0.02 | |
| 30 | | 9,000 | 400 | 0.01 | 9,000 | 320 | 0.01 | |
| R 1 | 4 | 40,000 | 8,000 | 0.1 | 32,000 | 5,000 | 0.1 | |
| | 6 | 40,000 | 8,000 | 0.1 | 32,000 | 5,000 | 0.1 | |
| | 8 | 40,000 | 6,000 | 0.1 | 32,000 | 3,800 | 0.1 | |
| | 10 | 40,000 | 5,000 | 0.08 | 32,000 | 3,200 | 0.08 | |
| | 12 | 40,000 | 5,000 | 0.08 | 32,000 | 3,200 | 0.08 | |
| | 16 | 32,000 | 3,500 | 0.05 | 26,000 | 2,200 | 0.05 | |
| | 20 | 10,000 | 1,000 | 0.04 | 10,000 | 800 | 0.04 | |
| | 25 | 10,000 | 1,000 | 0.04 | 10,000 | 800 | 0.04 | |
| | 30 | 10,000 | 800 | 0.02 | 10,000 | 640 | 0.02 | |
| | 35 | 10,000 | 600 | 0.02 | 10,000 | 480 | 0.02 | |
| R 1.5 | 8 | 32,000 | 7,000 | 0.15 | 26,000 | 4,500 | 0.15 | |
| | 10 | 32,000 | 7,000 | 0.15 | 26,000 | 4,500 | 0.15 | |
| | 16 | 32,000 | 5,000 | 0.1 | 26,000 | 3,200 | 0.1 | |
| | 20 | 27,000 | 3,800 | 0.1 | 22,000 | 2,400 | 0.1 | |
| | 25 | 21,000 | 2,700 | 0.08 | 17,000 | 1,700 | 0.08 | |
| | 30 | 6,000 | 700 | 0.08 | 6,000 | 560 | 0.08 | |
| | 35 | 6,000 | 700 | 0.06 | 6,000 | 560 | 0.06 | |
| | 40 | 6,000 | 600 | 0.04 | 6,000 | 480 | 0.04 | |
| | R 2 | 10 | 24,000 | 6,000 | 0.2 | 19,000 | 3,800 | 0.2 |
| | | 20 | 24,000 | 3,800 | 0.15 | 19,000 | 2,400 | 0.15 |
| 30 | | 20,000 | 3,000 | 0.1 | 16,000 | 1,900 | 0.1 | |
| 40 | | 12,000 | 1,700 | 0.1 | 12,000 | 1,400 | 0.1 | |
| 50 | | 8,000 | 1,000 | 0.05 | 8,000 | 800 | 0.05 | |
| R 2.5 | 20 | 22,000 | 6,000 | 0.2 | 18,000 | 3,800 | 0.2 | |
| | 25 | 22,000 | 4,400 | 0.2 | 18,000 | 2,800 | 0.2 | |
| | 30 | 22,000 | 3,800 | 0.15 | 18,000 | 2,400 | 0.15 | |
| | 35 | 22,000 | 3,600 | 0.1 | 18,000 | 2,300 | 0.1 | |
| R 3 | 30 | 20,000 | 6,000 | 0.2 | 16,000 | 3,800 | 0.2 | |
| | 50 | 20,000 | 3,000 | 0.15 | 16,000 | 1,900 | 0.15 | |

Depth of Cut



R:Radius

- 1) If the inclination of machining surface, cutting load is big, please reduce the revolution and feed rate proportionately.
- 2) When using the minimum diameter, we recommend coolant mist.
- 3) If the depth of cut is shallow, the feed rate can be increased.
- 4) Please use VF-2XLB for work materials of 55HRC or above.

| Work Material | | | | Alloy steel, Tool steel Pre-hardened steel (-45HRC) JIS SKD61, JIS SKD11, NAK | |
|---------------|----------------------|------------------|-------------------|--|--------------------|
| R (mm) | Taper Angle One Side | Neck Length (mm) | Depth of Cut (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) |
| R0.1 | 30' | 1.5 | 0.005 | 30,000 | 300 |
| | 30' | 2 | 0.005 | | |
| | 1° | 1.5 | 0.005 | | |
| | 1° | 2 | 0.005 | | |
| | 2° | 1.5 | 0.01 | | |
| | 2° | 2 | 0.01 | | |
| | 3° | 1.5 | 0.01 | | |
| | 3° | 2 | 0.01 | | |
| | 5° | 2 | 0.01 | | |
| R0.15 | 30' | 3 | 0.005 | 30,000 | 300 |
| | 1° | 3 | 0.005 | | |
| | 2° | 3 | 0.01 | | |
| | 3° | 3 | 0.01 | | |
| | 5° | 3 | 0.01 | | |
| R0.2 | 30' | 2 | 0.02 | 30,000 | 300 |
| | 30' | 5 | 0.01 | | |
| | 1° | 2 | 0.02 | | |
| | 1° | 5 | 0.01 | | |
| | 2° | 5 | 0.01 | | |
| R0.25 | 30' | 3 | 0.03 | 30,000 | 300 |
| | 30' | 5 | 0.02 | | |
| | 1° | 3 | 0.03 | | |
| | 1° | 5 | 0.02 | | |
| | 2° | 3 | 0.03 | | |
| R0.3 | 30' | 5 | 0.03 | 30,000 | 400 |
| | 30' | 8 | 0.02 | | |
| | 1° | 5 | 0.03 | | |
| | 1° | 10 | 0.02 | | |
| | 1° | 15 | 0.01 | | |
| | 2° | 6 | 0.03 | | |
| R0.4 | 30' | 8 | 0.05 | 30,000 | 500 |
| | 30' | 12 | 0.04 | | |
| | 1° | 8 | 0.05 | | |
| | 1° | 12 | 0.04 | | |
| | 2° | 8 | 0.08 | | |
| | 3° | 12 | 0.06 | | |
| Depth of Cut | | | | $\leq 0.1R$ ($R > 0.5$) $\leq 0.2R$ ($R \geq 0.5$)  | |

- 1) Please reduce the cutting depth (especially ap) if chattering and noise are generated, and reduce the feed rate proportionately.
- 2) When high machining accuracy is needed, we recommend reducing the feed rate.

MS4MRB

Corner radius end mill, Medium cut length, 4 flute

| Work Material | Carbon steel (-30HRC) JIS S50C, SCM Cast iron, JIS FC250 | | Alloy steel, Tool steel Pre-hardened steel (30-45HRC) JIS SKD61, NAK | | Austenitic stainless steel JIS SUS304, JIS SUS316 | | Hardened steel (45-55HRC) JIS SKD61 | | |
|---------------|---|------------------------------------|---|------------------------------------|--|------------------------------------|---|------------------------------------|-----------------------|
| | Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) |
| 1 | 40,000 | 1,500 | 30,000 | 800 | 22,000 | 480 | 24,000 | 240 | |
| 1.5 | 32,000 | 1,500 | 20,000 | 800 | 15,000 | 480 | 16,000 | 240 | |
| 2 | 24,000 | 1,500 | 15,000 | 800 | 11,000 | 480 | 12,000 | 240 | |
| 2.5 | 19,000 | 1,500 | 12,000 | 800 | 8,800 | 480 | 9,600 | 240 | |
| 3 | 16,000 | 1,500 | 10,000 | 800 | 7,400 | 480 | 8,000 | 240 | |
| 4 | 12,000 | 1,800 | 8,000 | 1,000 | 5,600 | 600 | 6,000 | 240 | |
| 5 | 9,600 | 1,800 | 6,400 | 1,000 | 4,400 | 600 | 4,800 | 240 | |
| 6 | 8,000 | 1,800 | 5,300 | 1,000 | 3,700 | 600 | 4,000 | 240 | |
| 8 | 6,000 | 1,600 | 4,000 | 900 | 2,800 | 560 | 3,000 | 240 | |
| 10 | 4,800 | 1,400 | 3,200 | 800 | 2,200 | 500 | 2,400 | 240 | |
| 12 | 4,000 | 1,200 | 2,700 | 700 | 1,800 | 430 | 2,000 | 230 | |
| 16 | 3,000 | 960 | 2,000 | 560 | 1,400 | 360 | 1,500 | 190 | |
| 20 | 2,400 | 800 | 1,600 | 480 | 1,100 | 300 | 1,200 | 170 | |
| Depth of Cut | | | | | | | | | |
| | | | | | | | | | |

D: Dia.

- 1) The above table shows cutting conditions for standard side milling. For slotting, please reduce the feed rate only to 80% of the table figure. Please set the revolution at 70% and the feed rate 60% when slotting austenitic stainless steels.
- 2) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
- 3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.
- 4) When drilling, reduce the feed rate by 70%.

| Work Material | | Carbon steel (-30HRC) JIS S50C, JIS SCM Cast iron, JIS FC250 | | Alloy steel, Tool steel Pre-hardened steel (30-45HRC) JIS SKD61, NAK | | Austenitic stainless steel JIS SUS304, JIS SUS316 | | Hardened steel (45-55HRC) JIS SKD61 | | |
|---------------|---------------------|---|-----------------------|---|-----------------------|--|-----------------------|---|-----------------------|-----|
| Dia. (mm) | Neck Length (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | |
| 1 | 2 | (2D) | 30,000 | 600 | 20,000 | 400 | 18,000 | 300 | 15,000 | 120 |
| 2 | 4 | | 15,000 | 600 | 10,000 | 400 | 9,100 | 300 | 8,000 | 120 |
| 3 | 6 | | 10,000 | 600 | 7,000 | 400 | 6,000 | 300 | 5,000 | 120 |
| 4 | 8 | | 7,500 | 600 | 5,200 | 400 | 4,500 | 300 | 4,000 | 120 |
| 6 | 12 | | 5,000 | 600 | 3,500 | 400 | 3,000 | 300 | 2,700 | 120 |
| 1 | 5 | (5D) | 22,000 | 350 | 17,000 | 280 | 14,000 | 200 | 12,000 | 100 |
| 2 | 10 | | 11,000 | 350 | 8,800 | 280 | 7,200 | 200 | 6,400 | 100 |
| 3 | 15 | | 7,400 | 350 | 5,800 | 280 | 4,800 | 200 | 4,200 | 100 |
| 4 | 20 | | 5,600 | 350 | 4,400 | 280 | 3,600 | 200 | 3,200 | 100 |
| 6 | 30 | | 3,700 | 350 | 2,900 | 280 | 2,400 | 200 | 2,100 | 100 |

| Depth of Cut | (Neck length=2D) | | (Neck length=2D) | | |
|--------------|---|---------------------------|--|---------------------------|---------------------------|
| | $\leq 0.1D$ ($D \leq \phi 3$) $\leq 0.2D$ ($D > \phi 3$) | | | $\leq 0.05D$ $\leq 1D$ | |
| | | $\leq 0.05D$ $\leq 1D$ | $\leq 0.05D$ ($D \leq \phi 2$) $\leq 0.1D$ ($D > \phi 2$) | | $\leq 0.02D$ $\leq 1D$ |
| | | $\leq 0.05D$ $\leq 1D$ | $\leq 0.05D$ | | $\leq 0.02D$ $\leq 1D$ |

D:Dia.

- 1) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.
- 2) Please reduce the feed rate when precision is important.
- 3) Cutting conditions may differ considerably due to the overhang (milling depth), depth of cut, and machine tools. Please use the above table as a start reference point.
- 4) If the depth of cut is shallow, the feed rate can be increased.

Side milling

| Work Material | Carbon steel, Alloy steel (-30HRC) JIS SS400, JIS S50C, JIS SCM Cast iron, JIS FC250 | | Alloy steel, Tool steel Pre-hardened steel (30-45HRC) JIS SKD61, NAK | | Austenitic stainless steel SUS304, SUS316 | | Hardened steel (45-55HRC) SKD61 | |
|---------------|--|---------------------------------|--|---------------------------------|--|---------------------------------|------------------------------------|---------------------------------|
| | Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) |
| 2 | 15,000 | 550 | 10,000 | 340 | 10,000 | 320 | 6,400 | 160 |
| 3 | 11,000 | 800 | 7,400 | 500 | 7,400 | 480 | 4,800 | 250 |
| 4 | 8,000 | 900 | 5,600 | 540 | 5,600 | 520 | 3,600 | 270 |
| 5 | 6,400 | 1,000 | 4,500 | 600 | 4,500 | 580 | 2,900 | 300 |
| 6 | 5,900 | 1,100 | 3,700 | 640 | 3,700 | 600 | 2,400 | 320 |
| 8 | 4,400 | 1,100 | 2,800 | 660 | 2,800 | 600 | 1,800 | 330 |
| 10 | 3,500 | 1,000 | 2,300 | 640 | 2,300 | 560 | 1,400 | 320 |
| 12 | 2,900 | 1,000 | 1,900 | 640 | 1,900 | 530 | 1,200 | 320 |
| 16 | 2,200 | 800 | 1,400 | 500 | 1,400 | 450 | 900 | 250 |
| 18 | 2,000 | 800 | 1,250 | 480 | 1,250 | 450 | 800 | 240 |
| 20 | 1,800 | 750 | 1,100 | 460 | 1,100 | 440 | 720 | 230 |
| Depth of Cut | | | | | | | | |

D:Dia.

Slotting

| Work Material | Carbon steel, Alloy steel (-30HRC) JIS SS400, JIS S50C, JIS SCM Cast iron, JIS FC250 | | Alloy steel, Tool steel Pre-hardened steel (30-45HRC) JIS SKD61, NAK | | Austenitic stainless steel JIS SUS304, JIS SUS316 | | Hardened steel (45-55HRC) JIS SKD61 | |
|---------------|--|---------------------------------|--|---------------------------------|--|---------------------------------|--|---------------------------------|
| | Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) |
| 2 | 12,000 | 400 | 7,000 | 200 | 7,000 | 100 | 4,200 | 80 |
| 3 | 9,000 | 600 | 5,300 | 300 | 5,300 | 150 | 3,200 | 130 |
| 4 | 7,200 | 720 | 4,000 | 360 | 4,000 | 180 | 2,400 | 140 |
| 5 | 5,800 | 720 | 3,200 | 360 | 3,200 | 180 | 1,900 | 150 |
| 6 | 5,000 | 800 | 2,700 | 400 | 2,700 | 200 | 1,600 | 160 |
| 8 | 3,700 | 800 | 2,000 | 400 | 2,000 | 200 | 1,200 | 170 |
| 10 | 3,000 | 720 | 1,600 | 360 | 1,600 | 180 | 960 | 160 |
| 12 | 2,500 | 600 | 1,300 | 290 | 1,300 | 150 | 800 | 140 |
| 16 | 2,000 | 480 | 1,000 | 230 | 1,000 | 120 | 600 | 110 |
| 18 | 1,800 | 460 | 900 | 210 | 900 | 110 | 550 | 110 |
| 20 | 1,600 | 430 | 800 | 200 | 800 | 100 | 480 | 100 |
| Depth of Cut | | | | | | | | |


D:Dia.

- 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
- 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
- 3) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and feed rate proportionately, or set the depth of cut smaller.
- 4) Climb cutting is recommended for side milling.

Slotting

| Work Material | Carbon steel (-30HRC) JIS S50C, JIS SCM Cast iron, JIS FC250 | | | Alloy steel, Tool steel Pre-hardened steel (30-45HRC) JIS SKD61, NAK | | | Hardened steel (45-55HRC) JIS SKD61 | | | |
|---------------|---|---------------------------------|--------------------|---|---------------------------------|--------------------|---|---------------------------------|--------------------|-------------------|
| | Small Mill Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Depth of Cut (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Depth of Cut (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Depth of Cut (mm) |
| 0.2 | | 40,000 | 320 | 0.005 | 40,000 | 180 | 0.004 | 40,000 | 100 | 0.002 |
| 0.3 | | 40,000 | 400 | 0.006 | 40,000 | 220 | 0.005 | 35,000 | 130 | 0.003 |
| 0.4 | | 40,000 | 450 | 0.008 | 40,000 | 270 | 0.006 | 31,000 | 150 | 0.004 |
| 0.5 | | 37,000 | 500 | 0.010 | 32,000 | 320 | 0.008 | 25,000 | 160 | 0.005 |
| 0.6 | | 32,000 | 530 | 0.013 | 26,000 | 340 | 0.010 | 21,000 | 170 | 0.006 |
| 0.7 | | 27,000 | 560 | 0.015 | 23,000 | 380 | 0.011 | 18,000 | 180 | 0.007 |
| 0.8 | | 24,000 | 610 | 0.018 | 20,000 | 410 | 0.013 | 16,000 | 210 | 0.008 |
| 0.9 | | 21,000 | 610 | 0.020 | 18,000 | 450 | 0.015 | 14,000 | 210 | 0.009 |
| 1 | | 19,000 | 610 | 0.025 | 16,000 | 450 | 0.020 | 13,000 | 210 | 0.010 |
| 1.5 | | 13,000 | 720 | 0.040 | 11,000 | 540 | 0.030 | 8,500 | 270 | 0.015 |

Depth of Cut

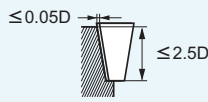


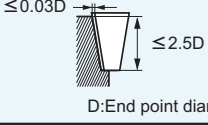
Pease refer to the list.

Side milling

| Work material | Carbon steel (-30HRC) JIS S50C, JIS SCM Cast iron, JIS FC250 | | Alloy steel, Tool steel Pre-hardened steel (30-45HRC) JIS SKD61, NAK | | Hardened steel (45-55HRC) JIS SKD61 | | |
|---------------|---|---------------------------------|---|---------------------------------|---|---------------------------------|--------------------|
| | Small Mill Dia. (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Revolution (min ⁻¹) | Feed Rate (mm/min) |
| 2 | | 9,500 | 720 | 8,000 | 540 | 6,400 | 300 |
| 2.5 | | 7,800 | 800 | 6,300 | 540 | 5,000 | 300 |
| 3 | | 6,400 | 800 | 5,300 | 540 | 4,200 | 300 |
| 4 | | 4,800 | 800 | 4,000 | 540 | 3,200 | 300 |
| 5 | | 3,800 | 800 | 3,200 | 540 | 2,500 | 300 |
| 6 | | 3,200 | 800 | 2,600 | 540 | 2,100 | 300 |
| 8 | | 2,400 | 700 | 2,000 | 480 | 1,600 | 270 |
| 10 | | 1,900 | 600 | 1,600 | 410 | 1,300 | 240 |

Depth of Cut





D: End point diameter

- 1) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately. Please reduce the feed rate when the surface finish is important.
- 2) Cutting conditions may differ considerably due to the taper angle, depth of cut and machine tool condition. Please use the above table as a start reference point.
- 3) When slotting, please use cutting fluid.

MS4LT

Taper end mill, Long cut length, 4 flute

| Work Material | | Carbon steel, Alloy steel, Pre-hardened steel (-45HRC) JIS S50C, JIS SCM, JIS SK, JIS SKD61 STAVAX, JIS SUS420, NAK, HPM | | | Hardened steel (45-52HRC) STAVAX, JIS SKD61 | | |
|-------------------------|-----------------------|---|-----------------------|-------------------------|---|-----------------------|-------------------------|
| Small Mill Dia. (mm) | Length of Cut (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Depth of Cut ap (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Depth of Cut ap (mm) |
| 0.2 | 2 | 20,000-40,000 | 200-500 | 0.001 | 20,000-40,000 | 150-300 | 0.001 |
| 0.3 | 3 | 20,000-40,000 | 200-500 | 0.002 | 20,000-40,000 | 150-300 | 0.001 |
| 0.4 | 4 | 20,000-40,000 | 200-500 | 0.003 | 20,000-36,000 | 150-300 | 0.002 |
| 0.5 | 4 | 20,000-38,000 | 200-500 | 0.01 | 16,000-29,000 | 200-400 | 0.005 |
| | 6 | | | 0.005 | | | 0.003 |
| 0.6 | 4 | 18,000-32,000 | 250-600 | 0.01 | 13,000-24,000 | 200-400 | 0.005 |
| | 6 | | | 0.007 | | | 0.004 |
| 0.7 | 6 | 16,000-27,000 | 250-600 | 0.015 | 11,000-20,000 | 200-400 | 0.008 |
| | 8 | | | 0.01 | | | 0.005 |
| 0.8 | 4 | 14,000-24,000 | 250-600 | 0.03 | 10,000-18,000 | 200-400 | 0.015 |
| | 8 | | | 0.02 | | | 0.01 |
| | 12 | | | 0.013 | | | 0.007 |
| 1.0 | 6 | 11,000-19,000 | 300-800 | 0.03 | 8,000-14,000 | 200-500 | 0.015 |
| | 10 | | | 0.02 | | | 0.01 |
| | 16 | | | 0.015 | | | 0.008 |
| 1.2 | 6 | 9,200-16,000 | 300-800 | 0.04 | 6,600-12,000 | 200-500 | 0.02 |
| | 10 | | | 0.03 | | | 0.015 |
| | 16 | | | 0.02 | | | 0.01 |
| | 20 | | | 0.01 | | | 0.007 |
| 1.3 | 12 | 8,500-15,000 | 300-800 | 0.03 | 6,100-11,000 | 200-500 | 0.015 |
| 1.4 | 12 | 8,000-14,000 | 300-800 | 0.035 | 5,700-10,000 | 200-500 | 0.018 |
| 1.5 | 6 | 7,500-13,000 | 300-800 | 0.06 | 5,300-9,500 | 200-500 | 0.03 |
| | 10 | | | 0.04 | | | 0.02 |
| | 16 | | | 0.03 | | | 0.015 |
| | 25 | | | 0.015 | | | 0.008 |
| 1.6 | 8 | 7,000-12,000 | 300-800 | 0.06 | 5,000-9,000 | 200-500 | 0.03 |
| | 12 | | | 0.045 | | | 0.025 |
| | 16 | | | 0.035 | | | 0.02 |
| | 20 | | | 0.025 | | | 0.015 |
| 1.8 | 8 | 6,200-11,000 | 300-800 | 0.08 | 4,400-8,000 | 200-500 | 0.04 |
| | 16 | | | 0.05 | | | 0.03 |
| | 24 | | | 0.03 | | | 0.015 |
| 2.0 | 8 | 5,500-9,500 | 300-800 | 0.1 | 4,000-7,200 | 200-500 | 0.05 |
| | 12 | | | 0.07 | | | 0.04 |
| | 20 | | | 0.04 | | | 0.02 |
| | 30 | | | 0.02 | | | 0.01 |
| 2.5 | 10 | 4,400-7,600 | 300-800 | 0.1 | 3,200-5,700 | 200-500 | 0.05 |
| | 20 | | | 0.06 | | | 0.03 |
| | 30 | | | 0.03 | | | 0.015 |
| 3.0 | 25 | 3,700-6,400 | 300-800 | 0.08 | 2,700-4,800 | 200-500 | 0.04 |
| | 40 | | | 0.04 | | | 0.02 |

- 1) The above table shows the revolution and feed rate for each neck length. Please reduce the feed rate when using end mills with a longer neck length.
- 2) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately. Please reduce the feed rate when the surface finish is important.

| Work Material | | Carbon steel, Alloy steel, Pre-hardened steel (-45HRC) S50C, JIS SCM, JIS SK, JIS SKD61 STAVAX, JIS SUS420, NAK, HPM | | | Hardened steel (45-52HRC) STAVAX, JIS SKD61 | | |
|---------------|-----------------------|---|-----------------------|-------------------------|---|-----------------------|-------------------------|
| R (mm) | Length of Cut (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Depth of Cut ap (mm) | Revolution (min ⁻¹) | Feed Rate (mm/min) | Depth of Cut ap (mm) |
| R0.3 | 4 | 18,000-32,000 | 250-600 | 0.01 | 13,000-24,000 | 200-400 | 0.005 |
| | 6 | | | 0.007 | | | 0.004 |
| R0.4 | 6 | 14,000-24,000 | 250-600 | 0.025 | 10,000-18,000 | 200-400 | 0.013 |
| | 8 | | | 0.02 | | | 0.01 |
| | 10 | | | 0.015 | | | 0.008 |
| R0.5 | 8 | 11,000-19,000 | 300-800 | 0.025 | 8,000-14,000 | 200-500 | 0.013 |
| | 10 | | | 0.02 | | | 0.01 |
| | 12 | | | 0.018 | | | 0.009 |
| | 16 | | | 0.015 | | | 0.008 |
| R0.6 | 8 | 9,200-16,000 | 300-800 | 0.035 | 6,600-12,000 | 200-500 | 0.018 |
| | 10 | | | 0.03 | | | 0.015 |
| | 12 | | | 0.027 | | | 0.013 |
| | 16 | | | 0.02 | | | 0.01 |
| R0.75 | 8 | 7,500-13,000 | 300-800 | 0.05 | 5,300-9,500 | 200-500 | 0.025 |
| | 10 | | | 0.04 | | | 0.02 |
| | 12 | | | 0.035 | | | 0.018 |
| | 16 | | | 0.03 | | | 0.015 |
| | 20 | | | 0.02 | | | 0.01 |
| R0.9 | 8 | 6,200-11,000 | 300-800 | 0.08 | 4,400-8,000 | 200-500 | 0.04 |
| | 10 | | | 0.07 | | | 0.035 |
| | 12 | | | 0.06 | | | 0.035 |
| | 16 | | | 0.05 | | | 0.03 |
| | 20 | | | 0.04 | | | 0.02 |
| R1 | 10 | 5,500-9,500 | 300-800 | 0.08 | 4,000-7,200 | 200-500 | 0.045 |
| | 12 | | | 0.07 | | | 0.04 |
| | 16 | | | 0.05 | | | 0.03 |
| | 20 | | | 0.04 | | | 0.02 |
| | 25 | | | 0.03 | | | 0.015 |
| | 30 | | | 0.02 | | | 0.01 |

- 1) The above table shows the revolution and feed rate for each neck length. Please reduce the feed rate when using end mills with a longer neck length.
- 2) If the rigidity of the machine or the workpiece installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately. Please reduce the feed rate when the surface finish is important.



For Your Safety

●Don't handle inserts and chips without gloves. ●Please machine within the recommended application range and exchange expired tools with new ones in advance of breakage. ●Please use safety covers and wear safety glasses. ●When using compounded cutting oils, please take fire precautions. ●When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

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(Tools specifications subject to change without notice.)