



RIBMILL Program

RIF 2□□□



G98

- Square End, 2 Flutes, 30° Helix
- Rib Processing

RIB 2□□□



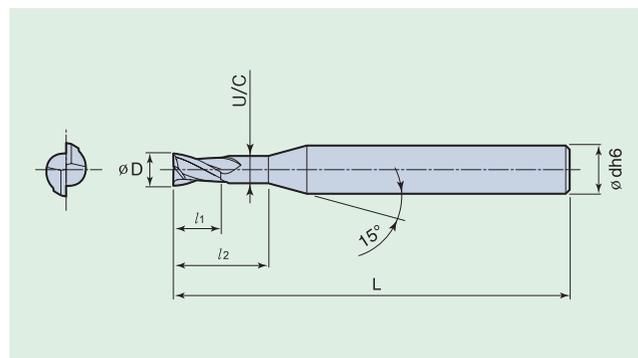
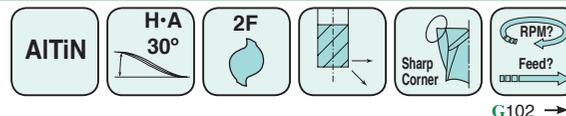
G100

- Ball Nose, 2 Flutes, 30° Helix
- Rib Processing



RIBMILL

RIF 2□□□

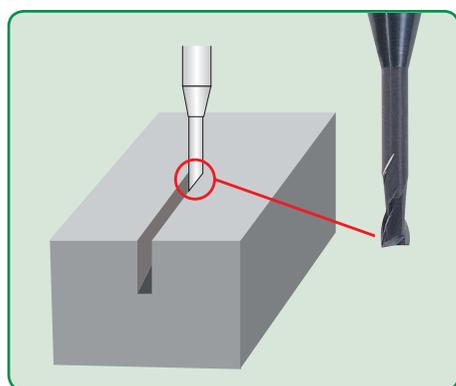


- End Mill for Rib Processing
- Grade: TT1040

| Tolerance | |
|-----------|------------|
| D | 0 - -0.015 |
| d | 0 - -0.006 |

| Designation | Dimension (mm) | | | | | |
|----------------|----------------|----|-------|-------|------|---|
| | D | L | l_1 | l_2 | u/c | d |
| RIF 2004-0.6×4 | 0.4 | 45 | 0.6 | 4 | 0.37 | 4 |
| RIF 2004-0.6×5 | 0.4 | 45 | 0.6 | 5 | 0.37 | 4 |
| RIF 2005-0.7×4 | 0.5 | 45 | 0.7 | 4 | 0.45 | 4 |
| RIF 2005-0.7×6 | 0.5 | 45 | 0.7 | 6 | 0.45 | 4 |
| RIF 2005-0.7×8 | 0.5 | 45 | 0.7 | 8 | 0.45 | 4 |
| RIF 2006-0.9×6 | 0.6 | 45 | 0.9 | 6 | 0.55 | 4 |
| RIF 2006-0.9×8 | 0.6 | 45 | 0.9 | 8 | 0.55 | 4 |

• KT8600 will be phased out and replaced with new TT1040



| Designation | Dimension (mm) | | | | | |
|------------------------|----------------|----|-------|-------|------|---|
| | D | L | l_1 | l_2 | u/c | d |
| RIF 2008-1.2×4 | 0.8 | 45 | 1.2 | 4 | 0.75 | 4 |
| RIF 2008-1.2×6 | 0.8 | 45 | 1.2 | 6 | 0.75 | 4 |
| RIF 2008-1.2×8 | 0.8 | 45 | 1.2 | 8 | 0.75 | 4 |
| RIF 2008-1.2×10 | 0.8 | 45 | 1.2 | 10 | 0.75 | 4 |
| RIF 2010-1.5×6 | 1.0 | 45 | 1.5 | 6 | 0.97 | 4 |
| RIF 2010-1.5×8 | 1.0 | 45 | 1.5 | 8 | 0.95 | 4 |
| RIF 2010-1.5×10 | 1.0 | 45 | 1.5 | 10 | 0.95 | 4 |
| RIF 2010-1.5×12 | 1.0 | 45 | 1.5 | 12 | 0.93 | 4 |
| RIF 2010-1.5×16 | 1.0 | 50 | 1.5 | 16 | 0.93 | 4 |
| RIF 2012-1.8×6 | 1.2 | 45 | 1.8 | 6 | 1.17 | 4 |
| RIF 2012-1.8×8 | 1.2 | 45 | 1.8 | 8 | 1.15 | 4 |
| RIF 2012-1.8×10 | 1.2 | 45 | 1.8 | 10 | 1.15 | 4 |
| RIF 2012-1.8×16 | 1.2 | 50 | 1.8 | 16 | 1.13 | 4 |
| RIF 2015-2.3×6 | 1.5 | 45 | 2.3 | 6 | 1.47 | 4 |
| RIF 2015-2.3×8 | 1.5 | 45 | 2.3 | 8 | 1.45 | 4 |
| RIF 2015-2.3×10 | 1.5 | 45 | 2.3 | 10 | 1.45 | 4 |
| RIF 2015-2.3×12 | 1.5 | 45 | 2.3 | 12 | 1.43 | 4 |
| RIF 2015-2.3×16 | 1.5 | 50 | 2.3 | 16 | 1.41 | 4 |
| RIF 2015-2.3×20 | 1.5 | 55 | 2.3 | 20 | 1.41 | 4 |
| RIF 2016-2.4×10 | 1.6 | 45 | 2.4 | 10 | 1.55 | 4 |
| RIF 2016-2.4×16 | 1.6 | 50 | 2.4 | 16 | 1.53 | 4 |
| RIF 2018-2.7×12 | 1.8 | 45 | 2.7 | 12 | 1.73 | 4 |
| RIF 2018-2.7×16 | 1.8 | 50 | 2.7 | 16 | 1.71 | 4 |
| RIF 2020-3.0×8 | 2.0 | 45 | 3.0 | 8 | 1.95 | 4 |
| RIF 2020-3.0×10 | 2.0 | 45 | 3.0 | 10 | 1.95 | 4 |
| RIF 2020-3.0×12 | 2.0 | 45 | 3.0 | 12 | 1.93 | 4 |
| RIF 2020-3.0×16 | 2.0 | 50 | 3.0 | 16 | 1.91 | 4 |
| RIF 2025-3.7×12 | 2.5 | 45 | 3.7 | 12 | 2.40 | 4 |
| RIF 2025-3.7×16 | 2.5 | 55 | 3.7 | 16 | 2.40 | 4 |
| RIF 2030-4.5×14 | 3.0 | 50 | 4.5 | 14 | 2.85 | 6 |
| RIF 2030-4.5×18 | 3.0 | 55 | 4.5 | 18 | 2.85 | 6 |
| RIF 2030-4.5×20 | 3.0 | 60 | 4.5 | 20 | 2.85 | 6 |
| RIF 2030-4.5×25 | 3.0 | 65 | 4.5 | 25 | 2.85 | 6 |

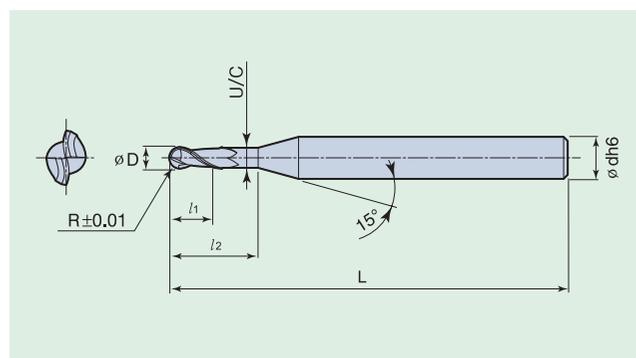
RIBMILL

RIB 2□□□



AITiN
H·A 30°
2F
RPM?
Feed?

G103 →

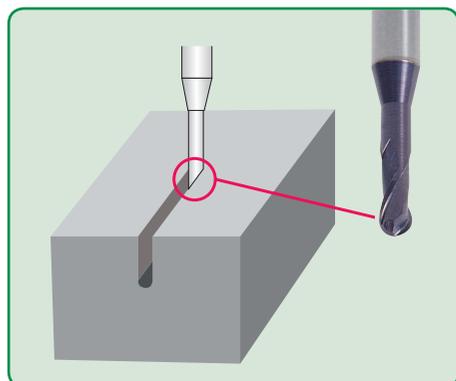


- End Mill for Rib Processing
- Grade: TT1040

| Tolerance | |
|------------|-----------------|
| $D \leq 3$ | -0.014 - -0.028 |
| $3 < D$ | -0.020 - -0.038 |

| Designation | Dimension (mm) | | | | | |
|-----------------|----------------|----|-------|-------|------|---|
| | D | L | l_1 | l_2 | u/c | d |
| RIB 2004-0.6×3 | 0.4 | 45 | 0.6 | 3 | 0.36 | 4 |
| RIB 2005-0.7×4 | 0.5 | 45 | 0.7 | 4 | 0.45 | 4 |
| RIB 2005-0.7×6 | 0.5 | 45 | 0.7 | 6 | 0.45 | 4 |
| RIB 2005-0.7×8 | 0.5 | 45 | 0.7 | 8 | 0.45 | 4 |
| RIB 2006-0.9×2 | 0.6 | 45 | 0.9 | 2 | 0.55 | 4 |
| RIB 2006-0.9×4 | 0.6 | 45 | 0.9 | 4 | 0.55 | 4 |
| RIB 2006-0.9×6 | 0.6 | 45 | 0.9 | 6 | 0.55 | 4 |
| RIB 2006-0.9×8 | 0.6 | 45 | 0.9 | 8 | 0.55 | 4 |
| RIB 2008-1.2×4 | 0.8 | 45 | 1.2 | 4 | 0.75 | 4 |
| RIB 2008-1.2×6 | 0.8 | 45 | 1.2 | 6 | 0.75 | 4 |
| RIB 2008-1.2×8 | 0.8 | 45 | 1.2 | 8 | 0.75 | 4 |
| RIB 2008-1.2×10 | 0.8 | 45 | 1.2 | 10 | 0.75 | 4 |

● KT8600 will be phased out and replaced with new TT1040



G100

Taegu Solid Mill

RIBMILL

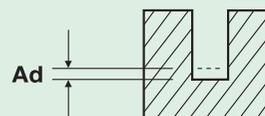
| Designation | Dimension (mm) | | | | | |
|------------------------|----------------|----|-------|-------|------|---|
| | D | L | l_1 | l_2 | u/c | d |
| RIB 2010-1.5×4 | 1.0 | 45 | 1.5 | 4 | 0.97 | 4 |
| RIB 2010-1.5×6 | 1.0 | 45 | 1.5 | 6 | 0.97 | 4 |
| RIB 2010-1.5×8 | 1.0 | 45 | 1.5 | 8 | 0.95 | 4 |
| RIB 2010-1.5×10 | 1.0 | 45 | 1.5 | 10 | 0.95 | 4 |
| RIB 2010-1.5×12 | 1.0 | 45 | 1.5 | 12 | 0.93 | 4 |
| RIB 2012-1.8×4 | 1.2 | 45 | 1.8 | 4 | 1.15 | 4 |
| RIB 2012-1.8×8 | 1.2 | 45 | 1.8 | 8 | 1.17 | 4 |
| RIB 2012-1.8×12 | 1.2 | 45 | 1.8 | 12 | 1.13 | 4 |
| RIB 2015-2.3×8 | 1.5 | 45 | 2.3 | 8 | 1.45 | 4 |
| RIB 2015-2.3×10 | 1.5 | 45 | 2.3 | 10 | 1.45 | 4 |
| RIB 2015-2.3×12 | 1.5 | 45 | 2.3 | 12 | 1.43 | 4 |
| RIB 2015-2.3×16 | 1.5 | 50 | 2.3 | 16 | 1.41 | 4 |
| RIB 2015-2.3×20 | 1.5 | 55 | 2.3 | 20 | 1.39 | 4 |
| RIB 2020-3.0×6 | 2.0 | 45 | 3.0 | 6 | 1.95 | 4 |
| RIB 2020-3.0×8 | 2.0 | 45 | 3.0 | 8 | 1.95 | 4 |
| RIB 2020-3.0×10 | 2.0 | 45 | 3.0 | 10 | 1.93 | 4 |
| RIB 2020-3.0×12 | 2.0 | 50 | 3.0 | 12 | 1.93 | 4 |
| RIB 2020-3.0×16 | 2.0 | 50 | 3.0 | 16 | 1.91 | 4 |
| RIB 2020-3.0×20 | 2.0 | 55 | 3.0 | 20 | 1.89 | 4 |
| RIB 2030-4.5×10 | 3.0 | 50 | 4.5 | 10 | 2.85 | 6 |
| RIB 2030-4.5×12 | 3.0 | 50 | 4.5 | 12 | 2.85 | 6 |
| RIB 2030-4.5×16 | 3.0 | 55 | 4.5 | 16 | 2.85 | 6 |
| RIB 2030-4.5×20 | 3.0 | 60 | 4.5 | 20 | 2.85 | 6 |

■ RIF 2 □ □ □ □

RPM: rev/min, Feed: mm/min

| Material | Non-Alloyed Steels Alloy Steels Cast Iron | | | Alloy Steels Heat Resistant Steels | | | Hardened Steels | | |
|------------|---|-----------|---------------|---------------------------------------|-----------|---------------|------------------------------|----------|---------------|
| Hardness | - HRC30 | | | HRC30 - HRC45 | | | HRC45 - HRC55 | | |
| Strength | - 850N/mm ² | | | 850 - 1600N/mm ² | | | 1600 - 2000N/mm ² | | |
| Diameter | RPM | Feed | Ad(mm) | RPM | Feed | Ad(mm) | RPM | Feed | Ad(mm) |
| 0.4 | 31000 - 40000 | 200 - 440 | 0.007 - 0.018 | 22500 - 28000 | 85 - 340 | 0.007 - 0.018 | 14300 - 17000 | 30 - 90 | 0.004 - 0.008 |
| 0.5 | 31000 - 40000 | 200 - 440 | 0.009 - 0.022 | 22500 - 28000 | 85 - 340 | 0.009 - 0.022 | 14300 - 17000 | 30 - 90 | 0.004 - 0.009 |
| 0.6 | 31000 - 40000 | 250 - 570 | 0.011 - 0.026 | 22500 - 28000 | 110 - 430 | 0.011 - 0.026 | 14300 - 17000 | 40 - 110 | 0.005 - 0.011 |
| 0.7 | 31000 - 40000 | 250 - 570 | 0.012 - 0.031 | 22500 - 28000 | 110 - 430 | 0.012 - 0.031 | 14300 - 17000 | 40 - 110 | 0.006 - 0.013 |
| 0.8 | 27000 - 35000 | 280 - 630 | 0.014 - 0.035 | 19500 - 24500 | 120 - 480 | 0.014 - 0.035 | 12500 - 14800 | 45 - 125 | 0.007 - 0.015 |
| 0.9 | 25000 - 31500 | 280 - 720 | 0.030 - 0.060 | 17500 - 22500 | 160 - 540 | 0.030 - 0.060 | 11000 - 12500 | 55 - 130 | 0.008 - 0.016 |
| 1 | 22500 - 28000 | 280 - 810 | 0.045 - 0.090 | 15700 - 20000 | 190 - 600 | 0.045 - 0.090 | 10000 - 12500 | 65 - 130 | 0.009 - 0.018 |
| 1.2 | 18500 - 22500 | 280 - 900 | 0.055 - 0.100 | 13000 - 16500 | 190 - 600 | 0.055 - 0.100 | 8300 - 10500 | 65 - 130 | 0.010 - 0.022 |
| 1.4 | 16000 - 20000 | 280 - 900 | 0.062 - 0.125 | 11500 - 14000 | 190 - 600 | 0.062 - 0.125 | 7200 - 9000 | 65 - 130 | 0.012 - 0.025 |
| 1.5 | 14500 - 18500 | 280 - 900 | 0.070 - 0.135 | 10500 - 13500 | 190 - 600 | 0.070 - 0.135 | 6700 - 8200 | 65 - 130 | 0.014 - 0.028 |
| 1.6 | 14000 - 18000 | 280 - 900 | 0.075 - 0.145 | 10200 - 12800 | 190 - 600 | 0.075 - 0.145 | 6400 - 8000 | 65 - 130 | 0.015 - 0.030 |
| 1.8 | 13000 - 16500 | 280 - 900 | 0.080 - 0.160 | 9200 - 11500 | 190 - 600 | 0.080 - 0.160 | 5700 - 7200 | 65 - 130 | 0.016 - 0.032 |
| 2 | 12000 - 14500 | 280 - 900 | 0.090 - 0.180 | 8300 - 10500 | 190 - 600 | 0.090 - 0.180 | 5300 - 6600 | 65 - 130 | 0.018 - 0.035 |
| 2.5 | 9500 - 12000 | 280 - 900 | 0.112 - 0.235 | 6700 - 8500 | 190 - 600 | 0.112 - 0.235 | 4300 - 5300 | 65 - 130 | 0.022 - 0.045 |
| 3 | 8000 - 10000 | 280 - 900 | 0.135 - 0.270 | 5500 - 7000 | 190 - 600 | 0.135 - 0.270 | 3500 - 4400 | 65 - 130 | 0.028 - 0.055 |

(Depth of cut per pass)

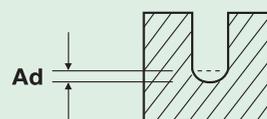


RIB 2

RPM: rev/min, Feed: mm/min

| Material | Non-Alloyed Steels Alloy Steels Cast Iron | | | Alloy Steels Heat Resistant Steels | | | Hardened Steels | | |
|------------|---|-----------|---------------|---------------------------------------|-----------|---------------|------------------------------|-----------|---------------|
| Hardness | - HRC30 | | | HRC30 - HRC45 | | | HRC45 - HRC55 | | |
| Strength | - 850N/mm ² | | | 850 - 1600N/mm ² | | | 1600 - 2000N/mm ² | | |
| Diameter | RPM | Feed | Ad(mm) | RPM | Feed | Ad(mm) | RPM | Feed | Ad(mm) |
| 0.4 | 31000 - 40000 | 175 - 490 | 0.018 - 0.036 | 22500 - 28500 | 88 - 270 | 0.018 - 0.036 | 14300 - 18000 | 88 - 175 | 0.004 - 0.007 |
| 0.5 | 31000 - 40000 | 175 - 490 | 0.023 - 0.045 | 22500 - 28500 | 88 - 270 | 0.023 - 0.045 | 14300 - 18000 | 88 - 175 | 0.005 - 0.009 |
| 0.6 | 31000 - 40000 | 225 - 630 | 0.027 - 0.054 | 22500 - 28500 | 110 - 350 | 0.027 - 0.054 | 14300 - 18000 | 110 - 225 | 0.005 - 0.011 |
| 0.8 | 31000 - 40000 | 225 - 630 | 0.036 - 0.072 | 22500 - 28500 | 110 - 350 | 0.036 - 0.072 | 14300 - 18000 | 110 - 225 | 0.007 - 0.014 |
| 1 | 29000 - 36500 | 250 - 700 | 0.045 - 0.090 | 20500 - 26000 | 125 - 390 | 0.045 - 0.090 | 13000 - 16300 | 125 - 250 | 0.009 - 0.018 |
| 1.2 | 24000 - 30500 | 250 - 780 | 0.055 - 0.100 | 17000 - 21500 | 125 - 390 | 0.055 - 0.100 | 10800 - 13700 | 125 - 250 | 0.010 - 0.022 |
| 1.4 | 21000 - 26000 | 250 - 780 | 0.062 - 0.125 | 15000 - 18000 | 125 - 390 | 0.062 - 0.125 | 9400 - 11700 | 125 - 250 | 0.012 - 0.025 |
| 1.5 | 19000 - 24000 | 250 - 780 | 0.070 - 0.135 | 13500 - 17500 | 125 - 390 | 0.070 - 0.135 | 8700 - 10700 | 125 - 250 | 0.014 - 0.028 |
| 1.6 | 18000 - 23500 | 250 - 780 | 0.075 - 0.145 | 13200 - 16500 | 125 - 390 | 0.075 - 0.145 | 8300 - 10400 | 125 - 250 | 0.015 - 0.030 |
| 1.8 | 17000 - 21500 | 250 - 780 | 0.080 - 0.160 | 12000 - 15000 | 125 - 390 | 0.080 - 0.160 | 7400 - 9400 | 125 - 250 | 0.016 - 0.032 |
| 2 | 15500 - 19000 | 250 - 780 | 0.090 - 0.180 | 11000 - 13500 | 125 - 390 | 0.090 - 0.180 | 6900 - 8600 | 125 - 250 | 0.018 - 0.035 |
| 3 | 10500 - 13000 | 250 - 780 | 0.135 - 0.270 | 7000 - 9000 | 125 - 390 | 0.135 - 0.270 | 4600 - 5700 | 125 - 250 | 0.028 - 0.055 |

(Depth of cut per pass)





ROUGHMILL

Roughing



G104

Taegu  Solid Mill



ROUGHMILL Program

RELO □□□□L



G106

- Roughing End Mill, 3 & 4 Flutes, 20° Helix
- For HSM of Hardened Steel
- Long length, AlTiN Coating

REB □□□□L



G107

- Ball Nose roughing, 3 & 4 Flutes, 20° Helix
- For HSM of Hardened Steel
- Long length, AlTiN Coating

REH □□□□S



G109

- Roughing End Mill, 4 & 6 Flutes, 45° Helix
- For roughing of Low Hardened Steel
- Short length, TiAlN Coating

REH □□□□M



G109

- Roughing End Mill, 4 & 6 Flutes, 45° Helix
- For roughing of Low Hardened Steel
- Medium length, TiAlN Coating

REH □□□□L



G110

- Roughing End Mill, 4 & 6 Flutes, 45° Helix
- For roughing of Low Hardened Steel
- Long length, TiAlN Coating

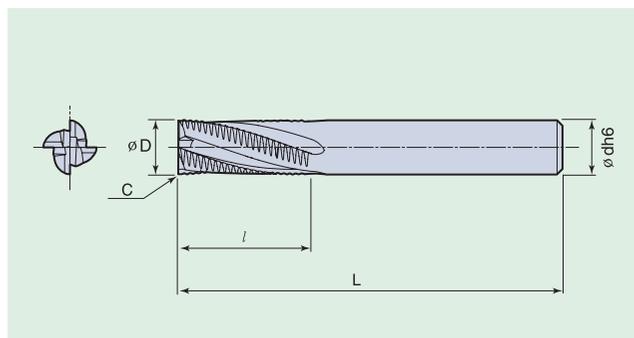
ROUGHMILL

■ REL □□□□L



Long Length
AlTiN
H·A 20°
3-4F
Corner Chamfer
RPM?
Feed?

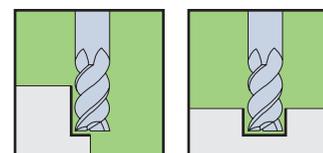
G108 →



- Roughing of High Hardened Steel, Mold Steel, Alloy Steel and Tool Steel
- High Speed Machining of Hardened Steel
- Optimum design for fast chip evacuation
- Grade: TT1040

DIN 7160

| D | Tolerance |
|------------------|------------|
| $D \leq 3$ | 0 - -0.040 |
| $3 < D \leq 6$ | 0 - -0.048 |
| $6 < D \leq 10$ | 0 - -0.058 |
| $10 < D \leq 18$ | 0 - -0.070 |
| $18 < D \leq 30$ | 0 - -0.084 |



| Designation | Dimension (mm) | | | | | |
|--------------|----------------|------|------|-----|----|----|
| | | D | C | L | l | d |
| REL 3060L | 3 | 6.0 | 0.38 | 57 | 16 | 6 |
| REL 3080L | 3 | 8.0 | 0.38 | 63 | 16 | 8 |
| REL 4100L | 4 | 10.0 | 0.61 | 72 | 22 | 10 |
| REL 4120L | 4 | 12.0 | 0.61 | 83 | 26 | 12 |
| REL 4140L-14 | 4 | 14.0 | 0.61 | 83 | 26 | 14 |
| REL 4160L | 4 | 16.0 | 0.61 | 92 | 32 | 16 |
| REL 4200L | 4 | 20.0 | 0.61 | 104 | 38 | 20 |

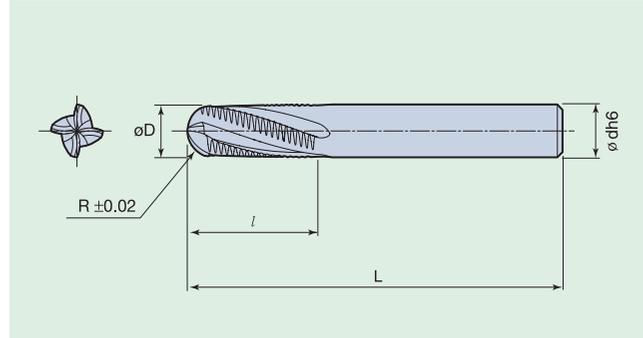
- Weldon shank is available on request (Ordering example: RELW □□□□L).
- KT8600 will be phased out and replaced with **new TT1040**

ROUGHMILL

REB □□□□L

Long Length
AlTiN
H·A 20°
3F,4F
RPM?
Feed?

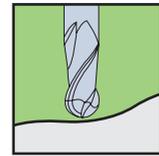
G108 →



- Roughing of High Hardened Steel, Mold Steel, Alloy Steel and Tool Steel
- High Speed Machining of Hardened Steel
- Optimum design for fast chip evacuation
- Grade: TT1040

DIN 7160

| D | Tolerance |
|------------------|------------|
| $D \leq 3$ | 0 - -0.040 |
| $3 < D \leq 6$ | 0 - -0.048 |
| $6 < D \leq 10$ | 0 - -0.058 |
| $10 < D \leq 18$ | 0 - -0.070 |
| $18 < D \leq 30$ | 0 - -0.084 |



| Designation | Dimension (mm) | | | | | |
|--------------|----------------|------|-------|-----|----|----|
| | | D | R | L | l | d |
| REB 3060L | 3 | 6.0 | R3.0 | 57 | 16 | 6 |
| REB 3080L | 3 | 8.0 | R4.0 | 63 | 16 | 8 |
| REB 4100L | 4 | 10.0 | R5.0 | 72 | 22 | 10 |
| REB 4120L | 4 | 12.0 | R6.0 | 83 | 26 | 12 |
| REB 4140L-14 | 4 | 14.0 | R7.0 | 83 | 26 | 14 |
| REB 4160L | 4 | 16.0 | R8.0 | 92 | 32 | 16 |
| REB 4180L-18 | 4 | 18.0 | R9.0 | 92 | 32 | 18 |
| REB 4200L | 4 | 20.0 | R10.0 | 104 | 38 | 20 |

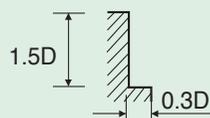
- Weldon shank is available on request (Ordering example: REBW □□□□L).
- KT8600 will be phased out and replaced with **new TT1040**

ROUGHMILL

REL □□□□L

RPM: rev/min, Feed: mm/min

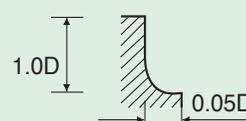
| Material | Carbon Steels Alloy Steels Tool Steels | | Carbon Steels Alloy Steels Tool Steels | | Carbon Steels Alloy Steels Tool Steels | | Stainless Steels Titanium Alloys | | Aluminum Alloys | |
|----------|--|------|--|------|--|------|-------------------------------------|------|-----------------|------|
| Hardness | - HRC20 | | HRC20 - HRC30 | | HRC30 - HRC40 | | | | | |
| Strength | 500 - 800N/mm ² | | 800 - 1000N/mm ² | | 1000 - 1300N/mm ² | | | | | |
| Diameter | RPM | Feed | RPM | Feed | RPM | Feed | RPM | Feed | RPM | Feed |
| 6 | 15600 | 2320 | 12400 | 840 | 8400 | 570 | 3400 | 260 | 2400 | 190 |
| 8 | 11600 | 2320 | 9200 | 840 | 6300 | 570 | 2400 | 240 | 1800 | 180 |
| 10 | 9200 | 2320 | 7600 | 840 | 5100 | 570 | 2000 | 290 | 1300 | 190 |
| 12 | 8000 | 2400 | 6000 | 800 | 4200 | 570 | 1680 | 260 | 1200 | 190 |
| 14 | 6800 | 2400 | 5200 | 840 | 3600 | 570 | 1400 | 200 | 900 | 130 |
| 16 | 6000 | 2400 | 4800 | 760 | 3300 | 510 | 1200 | 160 | 800 | 110 |
| 18 | 5200 | 2320 | 4400 | 720 | 2700 | 420 | 1100 | 150 | 700 | 100 |
| 20 | 4800 | 2160 | 3600 | 560 | 2400 | 360 | 1000 | 150 | 660 | 100 |



REB □□□□L

RPM: rev/min, Feed: mm/min

| Material | Carbon Steels Alloy Steels Tool Steels | | Carbon Steels Alloy Steels Tool Steels | | Carbon Steels Alloy Steels Tool Steels | | Stainless Steels Titanium Alloys | | Aluminum Alloys | |
|----------|--|------|--|------|--|------|-------------------------------------|------|-----------------|------|
| Hardness | - HRC20 | | HRC20 - HRC30 | | HRC30 - HRC40 | | | | | |
| Strength | 500 - 800N/mm ² | | 800 - 1000N/mm ² | | 1000 - 1300N/mm ² | | | | | |
| Diameter | RPM | Feed | RPM | Feed | RPM | Feed | RPM | Feed | RPM | Feed |
| 6 | 15600 | 2320 | 12400 | 840 | 8400 | 570 | 3400 | 260 | 2400 | 190 |
| 8 | 11600 | 2320 | 9200 | 840 | 6300 | 570 | 2400 | 240 | 1800 | 180 |
| 10 | 9200 | 2320 | 7600 | 840 | 5100 | 570 | 2000 | 290 | 1300 | 190 |
| 12 | 8000 | 2400 | 6000 | 800 | 4200 | 570 | 1680 | 260 | 1200 | 190 |
| 14 | 6800 | 2400 | 5200 | 840 | 3600 | 570 | 1400 | 200 | 900 | 130 |
| 16 | 6000 | 2400 | 4800 | 760 | 3300 | 510 | 1200 | 160 | 800 | 110 |
| 18 | 5200 | 2320 | 4400 | 720 | 2700 | 420 | 1100 | 150 | 700 | 100 |
| 20 | 4800 | 2160 | 3600 | 560 | 2400 | 360 | 1000 | 150 | 660 | 100 |



G108

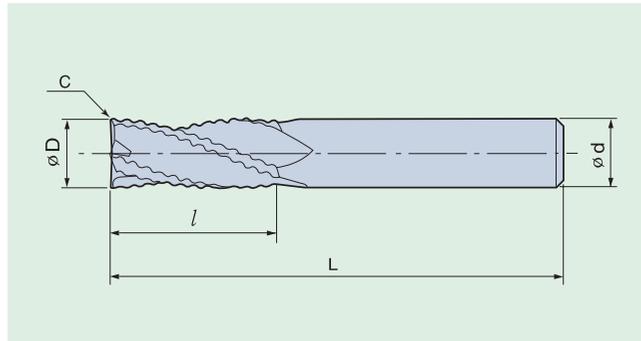
Taegu  Solid Mill

ROUGHMILL

REH



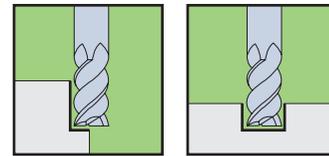
Short, Medium Length TiAlN H-A 45° 4-6F Corner Chamfer RPM? Feed? G111 →



- Roughing of Low Hardened Steel, Carbon Steel, Alloy Steel, Tool Steel and Stainless Steel
- Maximum metal removal rate due to higher helix with positive rake angle & wavy cutting edge
- Short and Medium length with 45° helix angle
- Grade: TT9030

DIN 7160

| D | Tolerance |
|------------------|------------|
| $D \leq 3$ | 0 - -0.040 |
| $3 < D \leq 6$ | 0 - -0.048 |
| $6 < D \leq 10$ | 0 - -0.058 |
| $10 < D \leq 18$ | 0 - -0.070 |
| $18 < D \leq 30$ | 0 - -0.084 |



REH S

| Designation | Dimension (mm) | | | | | |
|-------------|----------------|----|------|----|----|----|
| | | D | C | L | l | d |
| REH 4060S | 4 | 6 | 0.25 | 54 | 7 | 6 |
| REH 4080S | 4 | 8 | 0.30 | 58 | 9 | 8 |
| REH 4100S | 4 | 10 | 0.36 | 66 | 14 | 10 |
| REH 4120S | 4 | 12 | 0.36 | 73 | 16 | 12 |
| REH 5160S | 5 | 16 | 0.36 | 82 | 22 | 16 |
| REH 6200S | 6 | 20 | 0.36 | 92 | 26 | 20 |

- Weldon shank is available on request (Ordering example: REHW S).

REH M

| Designation | Dimension (mm) | | | | | |
|--------------|----------------|----|------|-----|----|----|
| | | D | C | L | l | d |
| REH 3040M | 3 | 4 | 0.15 | 57 | 11 | 6 |
| REH 4050M | 4 | 5 | 0.20 | 57 | 13 | 6 |
| REH 4060M | 4 | 6 | 0.25 | 57 | 16 | 6 |
| REH 4070M | 4 | 7 | 0.28 | 63 | 16 | 8 |
| REH 4080M | 4 | 8 | 0.30 | 63 | 16 | 8 |
| REH 4090M | 4 | 9 | 0.33 | 72 | 19 | 10 |
| REH 4100M | 4 | 10 | 0.36 | 72 | 22 | 10 |
| REH 4120M | 4 | 12 | 0.36 | 83 | 26 | 12 |
| REH 5140M-14 | 5 | 14 | 0.36 | 83 | 26 | 14 |
| REH 5160M | 5 | 16 | 0.36 | 92 | 32 | 16 |
| REH 6200M | 6 | 20 | 0.36 | 104 | 38 | 20 |
| REH 6250M | 6 | 25 | 0.36 | 121 | 45 | 25 |

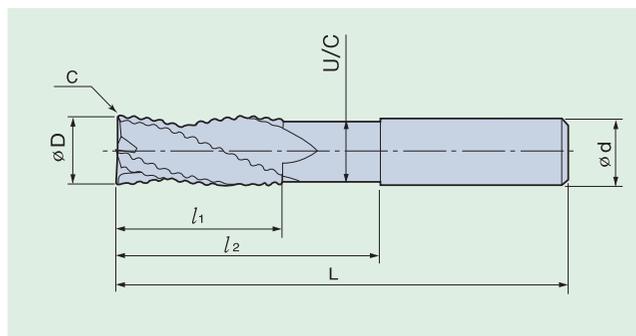
- Weldon shank is available on request (Ordering example: REHW M).

ROUGHMILL

REH □□□□L

Long Length
TiAlN
H·A 45°
4-6F
Corner Chamfer
RPM?
Feed?

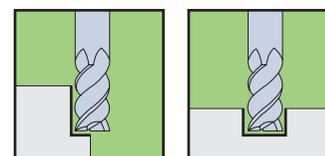
G111 →



- Roughing of Low Hardened Steel, Carbon Steel, Alloy Steel, Tool Steel and Stainless Steel
- Maximum metal removal rate from higher helix with positive rake angle & wavy cutting edge
- Long length with 45° Helix Angle
- Grade: TT9030

DIN 7160

| D | Tolerance |
|------------------|------------|
| $D \leq 3$ | 0 - -0.040 |
| $3 < D \leq 6$ | 0 - -0.048 |
| $6 < D \leq 10$ | 0 - -0.058 |
| $10 < D \leq 18$ | 0 - -0.070 |
| $18 < D \leq 30$ | 0 - -0.084 |



REH □□□□L (Long Type)

| Designation | Dimension (mm) | | | | | | | |
|-------------|----------------|----|------|-----|-------|-------|------|----|
| | | D | C | L | l_1 | l_2 | u/c | d |
| REH 4060L | 4 | 6 | 0.25 | 57 | 16 | 20 | 5.5 | 6 |
| REH 4080L | 4 | 8 | 0.30 | 63 | 16 | 26 | 7.5 | 8 |
| REH 4100L | 4 | 10 | 0.36 | 72 | 22 | 31 | 9.5 | 10 |
| REH 4120L | 4 | 12 | 0.36 | 83 | 26 | 37 | 11.5 | 12 |
| REH 5160L | 5 | 16 | 0.36 | 100 | 32 | 51 | 15.5 | 16 |
| REH 6200L | 6 | 20 | 0.36 | 110 | 38 | 59 | 19.2 | 20 |

- Weldon shank is available on request (Ordering example: REHW □□□□L).

G110

Taegu Solid Mill

ROUGHMILL

REH □□□S, M, L

| Workpiece Material | | Tensile Strength (N/mm ²) | Hardness (HB) | Vc (m/min) | D (mm) | f (mm/tooth) | Depth of cut | | | |
|--------------------|---------------------------------|---------------------------------------|---------------|------------|--------------------------|--|--|--------------------------|--|--|
| P | Carbon Steel | 350 - 850 | 100 - 250 | 160 - 250 | 6 8 10 12 16 | 0.04 - 0.12 0.05 - 0.16 0.06 - 0.18 0.06 - 0.2 0.08 - 0.22 | Shoulder Milling Ad: D Rd: 0.5D | | | |
| | Alloy Steel | 500 - 850 | 150 - 250 | 120 - 200 | | | | | | |
| | Alloy Steel Hardened & Tempered | 850 - 1200 | 250 - 350 | 100 - 180 | | | | | | |
| | Alloy Steel Hardened & Tempered | 1200 - 1600 | 350 - 450 | 80 - 150 | | | | | | |
| M | Stainless Steel - Austenitic | 450 - 850 | 130 - 250 | 120 - 200 | | | | | | |
| | Stainless Steel - Martensitic | 450 - 1100 | 130 - 320 | 150 - 250 | | | | | | |
| S | Titanium, Alloyed < 900 | 700 - 900 | 200 - 270 | 80 - 100 | | | | | | |
| | Titanium, Alloyed > 900-1400 | 900 - 1400 | 270 - 410 | 60 - 90 | | | | | | |
| | Nickel, Alloyed | 900 - 1600 | 240 - 470 | 40 - 70 | | | | | | |
| K | Cast Iron | 500 - 700 | 150 - 200 | 110 - 150 | | | | | | |
| N | Graphite | 100 | | 220 - 300 | | | | | | |
| P | Carbon Steel | 350 - 850 | 100 - 250 | 160 - 250 | | | | 6 8 10 12 16 | 0.04 - 0.1 0.05 - 0.14 0.05 - 0.16 0.06 - 0.18 0.08 - 0.20 | Slotting Ad: 0.5D Rd: D |
| | Alloy Steel | 500 - 850 | 150 - 250 | 120 - 200 | | | | | | |
| | Alloy Steel Hardened & Tempered | 850 - 1200 | 250 - 350 | 100 - 180 | | | | | | |
| | Alloy Steel Hardened & Tempered | 1200 - 1600 | 350 - 450 | 80 - 150 | | | | | | |
| M | Stainless Steel - Austenitic | 450 - 850 | 130 - 250 | 120 - 200 | | | | | | |
| | Stainless Steel - Martensitic | 450 - 1100 | 130 - 320 | 150 - 250 | | | | | | |
| S | Titanium, Alloyed < 900 | 700 - 900 | 200 - 270 | 80 - 100 | | | | | | |
| | Titanium, Alloyed > 900-1400 | 900 - 1400 | 270 - 410 | 60 - 90 | | | | | | |
| | Nickel, Alloyed | 900 - 1600 | 240 - 470 | 40 - 70 | | | | | | |
| K | cast Iron | 500 - 700 | 150 - 200 | 110 - 150 | | | | | | |
| N | Graphite | 100 | | 220 - 300 | | | | | | |

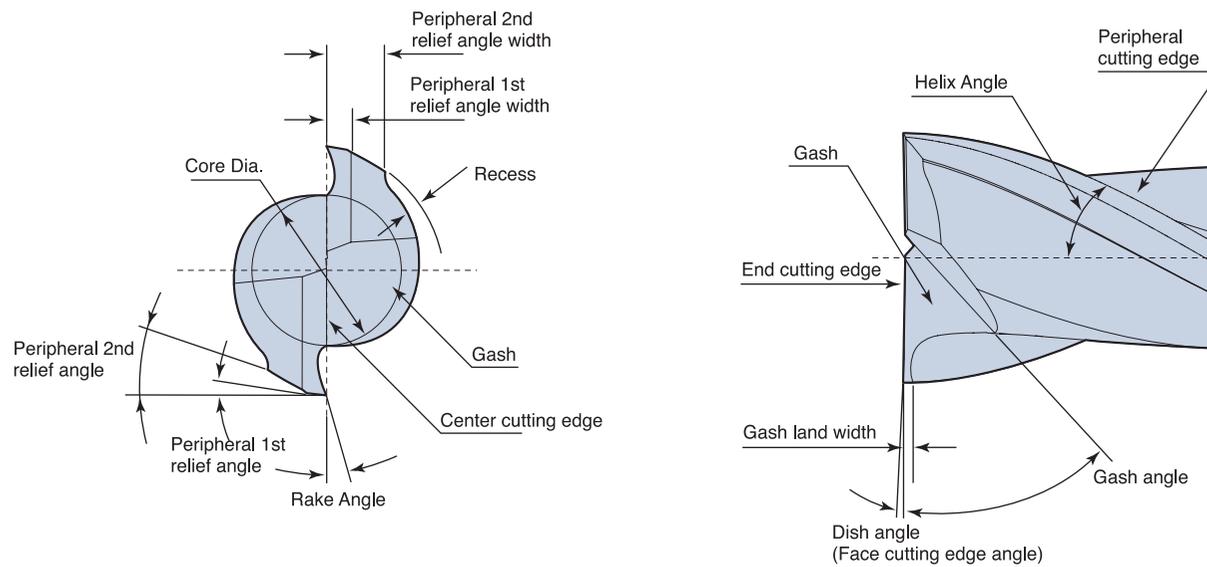
Adjusting Factors for other Machining Parameters

| Shoulder Milling | | | Slotting | | |
|------------------|------|------|----------|------|------|
| Rd | Vc | f | Ad | Vc | f |
| 0.6D | 0.95 | 0.8 | 0.5D | 1.25 | 2.50 |
| 0.5D | 1 | 1 | 1.0D | 1.12 | 1.75 |
| 0.4D | 1.05 | 1.3 | 1.5D | 1 | 1 |
| 0.3D | 1.1 | 1.6 | 2.0D | 0.65 | 0.65 |
| 0.2D | 1.2 | 2 | | | |
| 0.1D | 1.4 | 2.5 | | | |
| Ad | Vc | f | | | |
| 2.0D | 1 | 1 | | | |
| 1.5D | 1 | 1.35 | | | |
| 1.0D | 1 | 2 | | | |

D: Outer Diameter of Tool
 Rd: Radial Depth of Cut
 Ad: Axial Depth of Cut
 Vc: Cutting Speed (m/min)
 f: Feed (mm/tooth)

User Guide

■ End Mill Nomenclature



■ Selection of Grade by Materials

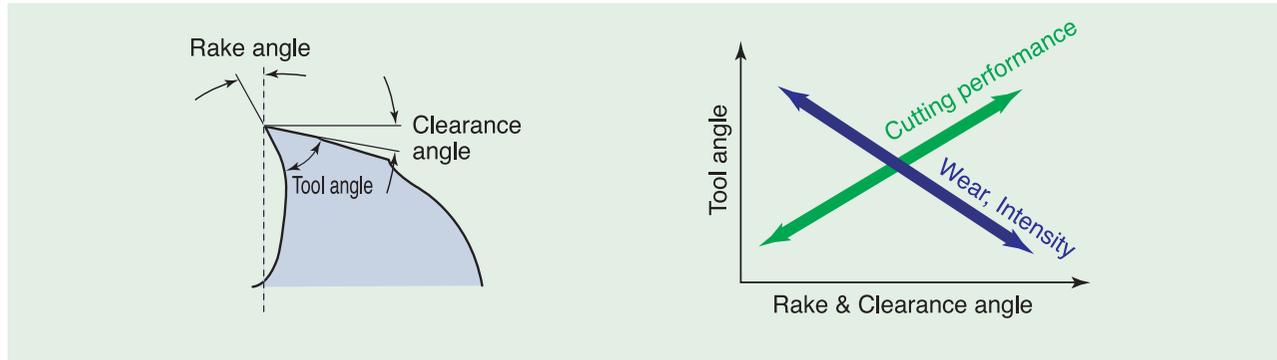
| Materials | Applications grade of End Mill |
|---|--|
| Carbon Steel, Alloy Steel, Tool & Die Steel | NEW UF10N, UF10, UF2, TT9030, NEW TT1040 |
| High Hardened Steel (HRC50 - 70) | TT1040 (up to HRC70) |
| Non Ferrous Material (Al-alloy, Cu-alloy) | UF10, TT9020, TT6050, PCD |

■ Calculation for Cutting speed, Spindle speed, and Feed

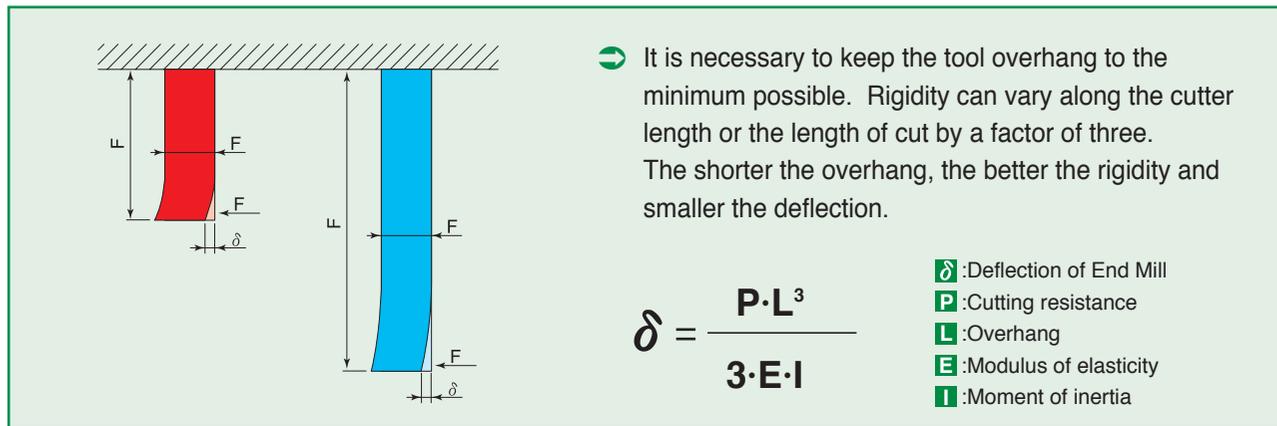
| | |
|--|---|
| Cutting speed (m/min) $V = \frac{\pi \times D \times N}{1000}$ | <ul style="list-style-type: none"> ● V: Cutting speed (m/min) ● D: Diameter of End Mill (mm) ● N: Spindle revolution (RPM) ● F: Table feed rate (mm/min) ● fz: Feed per tooth (mm/tooth) ● Z: Number of teeth ● Tc: Cutting time (min) ● L: Length of cut (material length + tool diameter + α) |
| Feed per tooth (mm/tooth) $f_z = \frac{F}{Z \times N}$ | |
| Table feed rate (mm/min) $F = f_z \times Z \times N$ | |
| Cutting time (min) $T_c = \frac{L}{F}$ | |

User Guide

■ Feature of Cutting Angle



■ Effect of Cutting Length



■ Feature of the end teeth type

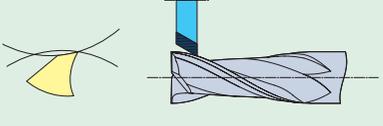
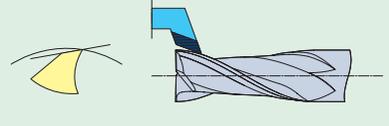
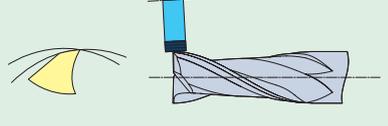
| Type | Shape | Feature |
|---------------------------------|-------|---|
| Square type without center hole | | Used for general machining including - slotting, side-milling, boring, plunging |
| Square type with center hole | | Used for general machining including - slotting, side-milling, boring |
| Square type with corner radius | | Used for high speed milling and radius shape milling |
| Ball type | | Used for contour or copy milling |

User Guide

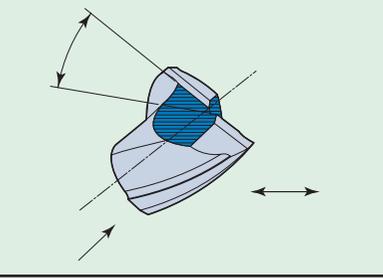
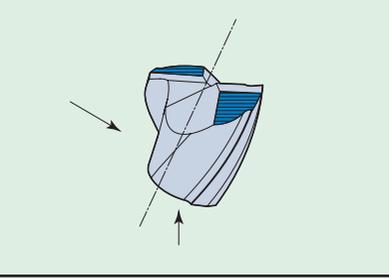
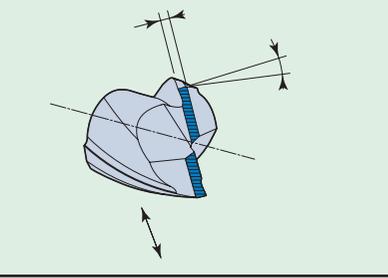
■ Evaluation Reference for Regrinding

| Application | Dia. of End Mill (mm) | Max. Flank Wear |
|-------------|-----------------------|-----------------|
| Finishing | - Ø10 | 0.05 - 0.1 |
| | Ø11 - Ø30 | 0.1 - 0.25 |
| | Ø31 - Ø50 | 0.2 - 0.35 |
| Roughing | - Ø10 | 0.08 - 0.15 |
| | Ø11 - Ø30 | 0.15 - 0.35 |
| | Ø31 - Ø50 | 0.3 - 0.45 |

■ Regrinding of Peripheral Relief Angle

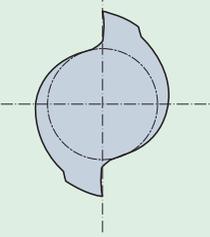
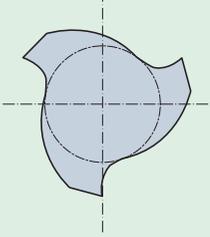
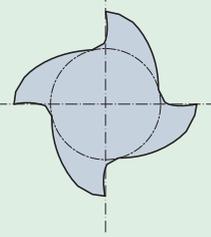
| Concave | Flat | Eccentric |
|--|---|--|
|  |  |  |
| <ul style="list-style-type: none"> • For precise outer diameter of End Mill • Use flat wheel | <ul style="list-style-type: none"> • Good machinability • 2nd relief angle required • For Taper of Ball End Mill | <ul style="list-style-type: none"> • Reliable cutting edge & excellent surface finish • Recommended method |

■ Regrinding of End Teeth

| Gash | 2nd Relief | 1st Relief |
|---|---|--|
|  |  |  |
| <ul style="list-style-type: none"> • Use plain wheel • Gash angle: 30 - 45° | <ul style="list-style-type: none"> • Use cup wheel • Relief angle: 15 - 25° | <ul style="list-style-type: none"> • Use cup wheel • Relief angle: 6 - 15° • Width: 0.5 - 2mm |

User Guide

■ Number of Flutes and Section Area (Based on $\varnothing 10$)

| End Mill | HES 2□□□T | SED 3□□□T | HES 4□□□T |
|----------------------|---|--|---|
| No. of cutting edges | 2 | 3 | 4 |
| Section shape |  |  |  |
| Core diameter | 60% | 60% | 60% |
| Cross section mass | 42mm ² | 44mm ² | 47mm ² |
| Section ratio | 53.50% | 56% | 60% |

2 Flute design

- Large chip gullet
- Easy chip evacuation
- Recommended for slot milling applications
- Strong design for heavy duty milling applications

3 Flute design

- Large section area - better rigidity than 2 flute cutters
- 3 flutes provide high quality surface finish

4 Flute design

- 4 flute and multi flute cutters provide highest rigidity
- Provides high quality surface finish
- Recommended for profiling, side milling and shallow slotting
- 4 flutes provide high quality surface finish

User Guide

■ Inspection of cutter run-outs & surface roughness

Solid Carbide cutters perform best when the cutting edge of each tooth runs true with the cutter axis.

When each tooth runs true the work load will be shared and this will optimize performance.

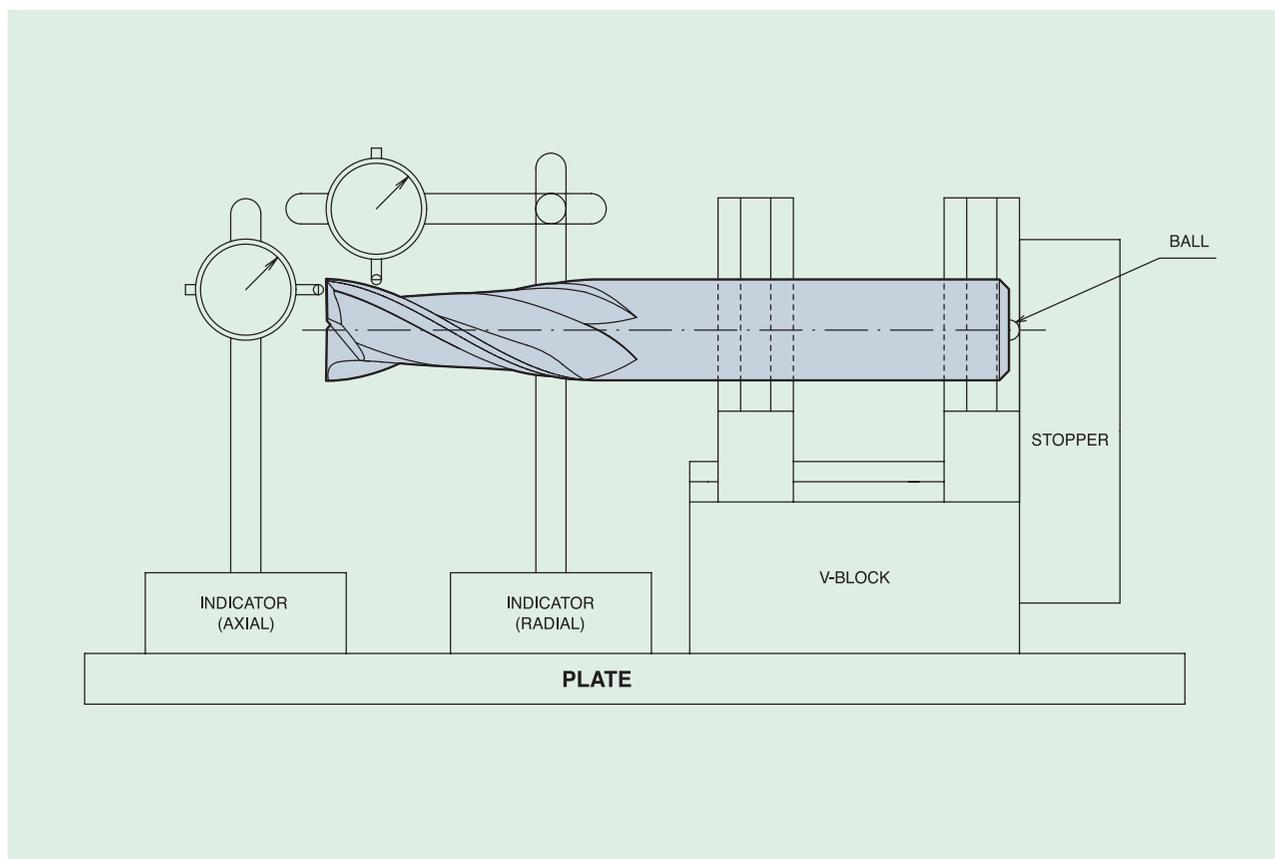
Radial and axial run out should be checked using a DTI after each regrind.

Put the cutter in a V-block and measure both the peripheral and end tooth run out,

also ensure that the cutter is rotated so that each tooth is checked in several positions.

If the cutter has centre holes, these can be used to check the cutter between centres.

Please refer to the tables on each page of this catalogue for tolerances and permissible run out.



Use a "Profilemeter" to check ground surface finish - maximum surface roughness permissible is $R_{max}6.3$. Rough or uneven surface finish of a ground cutter can effect the surface finish of the workpiece and cause premature failure and chipping of helical cutting edge.

User Guide

■ Parameters for End Mill Operation

| Factor | Instruction and Advice |
|---|--|
| Rigidity of Machine | <ul style="list-style-type: none"> • Use a rigid machine whenever possible. • If rigidity is poor - adjust cutting conditions accordingly. |
| Chuck and End Mill Run Out | <ul style="list-style-type: none"> • Use rigid and high quality chucking system. • Check and minimise End-Mill run-out. |
| Workpiece Clamping | <ul style="list-style-type: none"> • Ensure workpiece is firmly and securely clamped. • If this cannot be achieved or if vibrations occur - reduce cutting conditions accordingly. |
| Cutting Fluid and Chip Evacuation | <ul style="list-style-type: none"> • Maximise coolant flow whenever possible. • Always use flood coolant for heavy roughing applications. • Please refer to manual for (dry machining conditions - HSM applications) - on Hardened Steels. • Use “air blow” for HSM applications. • Always ensure good evacuation of chips from the working area. |
| End Mill Selection | <ul style="list-style-type: none"> • Please ensure the correct cutter is selected - see technical data for detailed information and selection of correct cutter for task, application and material to be machined. • Refer to page 115 for more details. |
| Cutting Conditions | <ul style="list-style-type: none"> • Please refer to recommended cutting condition data in this catalogue. • The recommended cutting conditions always refer to optimum conditions - if machine rigidity or work piece clamping is not ideal - these cutting conditions should be altered accordingly. |
| Overhang of End Mill From Spindle Nose | <ul style="list-style-type: none"> • Always minimise the cutter overhang to the minimum possible. • If cutter overhang cannot be reduced - cutting conditions should be altered accordingly. |

User Guide

■ Trouble shooting

| Trouble | Caused by | Solution |
|---------------------------------------|---------------------------------------|---|
| Chipping | ● Excessive feedrate | ➤ Reduce feedrate |
| | ● Sharp cutting edge | ➤ Chamfer or round the cutting edge to reduce sharp edge |
| | ● Chatter/Vibration | ➤ Reduce RPM |
| | ● Low cutting speed | ➤ Increase RPM - or change to a high helix End Mill |
| | ● Excessive overhang | ➤ Reduce tool overhang to minimum possible |
| | ● Unreliable chucking of End Mill | ➤ Check run out and change to a more precise system |
| | ● Unstable workpiece | ➤ Try to improve stability and clamping or reduce cutting conditions |
| Wear | ● High cutting speeds | ➤ Check the cutting data - and select the recommended conditions |
| | ● Low feedrate | ➤ Check the cutting data - and select the recommended conditions |
| | ● Incorrect helix on End Mill | ➤ Check the recommended cutter for the material being machined |
| | ● Up milling | ➤ Change to Down Mill machining |
| | ● High hardness material | ➤ Replace End Mill with correct style as recommended or change to TiAlN coated cutter |
| | ● Poor chip evacuation | ➤ Use air-blast or flood coolant to remove chips or replace cutter with a lower number of flutes. |
| | ● Material with low heat conductivity | ➤ Increase feedrate - use a sharp edged End Mill |
| | ● Too small primary relief angle | ➤ Change to large relief angle |
| Tool breakage | ● Excessive chipping or wear | ➤ Regrind cutter or replace |
| | ● Excessive feedrate | ➤ Reduce feedrate to recommended conditions |
| | ● Excessive cutting forces | ➤ Check conditions - reduce/increase RPM or feed to the recommended conditions |
| | ● Excessive overhang | ➤ Reduce to minimum possible |
| Surface finish | ● Chatter | ➤ Check recommended data and change cutting conditions |
| | ● Built-up edge | ➤ Increase speed - use higher helix cutter or climb mill and apply flood coolant |
| | ● Tool wear | ➤ Regrind or replace cutter |
| | ● High feed - low speed | ➤ Reduce feedrate and increase RPM to recommended conditions |
| Accuracy of finished workpiece | ● Cutting condition | ➤ Start with the recommended cutting conditions |
| | ● Excessive feedrate | ➤ Reduce as required to achieve the required surface finish and part accuracy |
| | ● Number of flutes | ➤ Replace high flute number End Mill |
| | ● Tool deflection | ➤ Use large diameter and short fluted tool and minimize overhang |
| | ● Not enough rigidity | ➤ Change machine holder or cutting conditions |
| Burrs | ● Too much wear on primary relief | ➤ Regrind at earlier stage |
| | ● Incorrect conditions | ➤ Correct milling conditions |
| | ● Improper cutting angle | ➤ Change to correct cutting angle |

User Guide

Spindle Speed Table

| Diameter | Cutting Speed (m/min) | | | | | | | | | | | | | | | |
|------------|-----------------------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| | D | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 120 | 140 | 150 | 180 | 200 | 250 |
| 0.2 | 31,850 | 47,770 | 63,690 | 79,620 | 95,540 | 111,460 | 127,390 | 143,310 | 159,240 | 191,080 | 222,930 | 238,850 | 286,620 | 318,470 | 398,090 | 477,710 |
| 0.3 | 21,230 | 31,850 | 42,460 | 53,080 | 63,690 | 74,310 | 84,930 | 95,540 | 106,160 | 127,390 | 148,620 | 159,240 | 191,080 | 212,310 | 265,390 | 318,470 |
| 0.4 | 15,920 | 23,890 | 31,850 | 39,810 | 47,740 | 55,730 | 63,690 | 71,660 | 79,620 | 95,540 | 111,460 | 119,430 | 143,310 | 159,240 | 199,040 | 238,850 |
| 0.5 | 12,740 | 19,110 | 25,480 | 31,850 | 38,820 | 44,950 | 50,960 | 57,320 | 63,690 | 76,430 | 89,170 | 95,540 | 114,650 | 127,390 | 159,240 | 191,080 |
| 0.6 | 10,620 | 15,920 | 21,230 | 26,540 | 31,850 | 37,150 | 42,460 | 47,770 | 53,080 | 63,690 | 74,310 | 79,620 | 95,540 | 106,160 | 132,700 | 159,240 |
| 0.7 | 9,100 | 13,650 | 18,200 | 22,750 | 27,300 | 31,850 | 36,400 | 40,950 | 45,500 | 54,590 | 63,690 | 68,240 | 81,890 | 90,990 | 113,740 | 136,490 |
| 0.8 | 7,960 | 11,940 | 15,920 | 19,900 | 23,890 | 27,870 | 31,850 | 35,830 | 39,810 | 47,770 | 55,730 | 59,710 | 71,650 | 79,620 | 99,520 | 119,430 |
| 0.9 | 7,080 | 10,620 | 14,150 | 17,690 | 21,230 | 24,770 | 28,310 | 31,850 | 35,390 | 42,640 | 49,540 | 53,080 | 63,690 | 70,770 | 88,460 | 106,160 |
| 1 | 6,370 | 9,550 | 12,740 | 15,920 | 19,110 | 22,290 | 25,480 | 28,650 | 31,850 | 38,220 | 44,590 | 47,770 | 57,320 | 63,390 | 79,620 | 95,540 |
| 1.4 | 4,550 | 6,820 | 9,100 | 11,370 | 13,650 | 15,920 | 18,200 | 20,470 | 22,750 | 27,300 | 31,850 | 34,120 | 40,950 | 45,500 | 56,870 | 68,240 |
| 1.6 | 3,980 | 5,970 | 7,960 | 9,950 | 11,940 | 13,930 | 15,920 | 17,910 | 19,900 | 23,890 | 27,870 | 29,860 | 35,830 | 39,810 | 49,760 | 59,710 |
| 1.8 | 3,540 | 5,310 | 7,080 | 8,850 | 10,620 | 12,380 | 14,150 | 15,920 | 17,690 | 21,230 | 24,770 | 26,540 | 31,850 | 35,390 | 44,230 | 53,080 |
| 2 | 3,180 | 4,780 | 6,370 | 7,960 | 9,550 | 11,150 | 12,740 | 14,330 | 15,920 | 19,110 | 22,290 | 23,890 | 28,660 | 31,850 | 39,810 | 47,770 |
| 2.2 | 2,900 | 4,340 | 5,790 | 7,240 | 8,690 | 10,130 | 11,580 | 13,030 | 14,480 | 17,370 | 20,270 | 21,710 | 26,060 | 28,950 | 36,190 | 43,430 |
| 2.4 | 2,650 | 3,980 | 5,310 | 6,630 | 7,960 | 9,290 | 10,620 | 11,940 | 13,270 | 15,920 | 18,580 | 19,900 | 23,890 | 26,540 | 33,170 | 39,810 |
| 2.6 | 2,450 | 3,670 | 4,900 | 6,120 | 7,350 | 8,570 | 9,800 | 11,020 | 12,250 | 14,700 | 17,150 | 18,370 | 22,050 | 24,500 | 30,620 | 36,750 |
| 2.8 | 2,270 | 3,410 | 4,550 | 5,690 | 6,820 | 7,960 | 9,100 | 10,240 | 11,370 | 13,650 | 15,920 | 17,060 | 20,470 | 22,750 | 28,430 | 34,120 |
| 3 | 2,120 | 3,180 | 4,250 | 5,310 | 6,370 | 7,430 | 8,490 | 9,550 | 10,620 | 12,740 | 14,860 | 15,920 | 19,110 | 21,230 | 26,540 | 31,850 |
| 4 | 1,590 | 2,390 | 3,180 | 3,980 | 4,780 | 5,570 | 6,370 | 7,170 | 7,960 | 9,550 | 11,150 | 11,940 | 14,330 | 15,920 | 19,900 | 23,890 |
| 5 | 1,270 | 1,910 | 2,550 | 3,180 | 3,820 | 4,460 | 5,100 | 5,730 | 6,370 | 7,640 | 8,920 | 9,550 | 11,460 | 12,740 | 15,920 | 19,110 |
| 6 | 1,060 | 1,590 | 2,120 | 2,650 | 3,180 | 3,720 | 4,250 | 4,780 | 5,310 | 6,370 | 7,430 | 7,960 | 9,550 | 10,620 | 13,270 | 15,920 |
| 7 | 910 | 1,360 | 1,820 | 2,270 | 2,730 | 3,180 | 3,640 | 4,090 | 4,550 | 5,460 | 6,370 | 6,820 | 8,190 | 9,100 | 11,370 | 13,650 |
| 8 | 800 | 1,190 | 1,590 | 1,990 | 2,390 | 2,790 | 3,180 | 3,580 | 3,980 | 4,780 | 5,570 | 5,970 | 7,170 | 7,960 | 9,950 | 11,940 |
| 9 | 710 | 1,060 | 1,420 | 1,770 | 2,120 | 2,480 | 2,830 | 3,180 | 3,540 | 4,250 | 4,950 | 5,310 | 6,370 | 7,080 | 8,850 | 10,620 |
| 10 | 640 | 960 | 1,270 | 1,590 | 1,910 | 2,230 | 2,550 | 2,870 | 3,180 | 3,820 | 4,460 | 4,780 | 5,730 | 6,370 | 7,960 | 9,550 |
| 11 | 580 | 870 | 1,160 | 1,450 | 1,740 | 2,030 | 2,320 | 2,610 | 2,900 | 3,470 | 4,050 | 4,340 | 5,210 | 5,790 | 7,240 | 8,690 |
| 12 | 530 | 800 | 1,060 | 1,330 | 1,590 | 1,860 | 2,120 | 2,390 | 2,650 | 3,180 | 3,720 | 3,980 | 4,780 | 5,310 | 6,630 | 7,960 |
| 13 | 490 | 730 | 980 | 1,220 | 1,470 | 1,710 | 1,960 | 2,200 | 2,450 | 2,940 | 3,430 | 3,670 | 4,410 | 4,900 | 6,120 | 7,350 |
| 14 | 450 | 680 | 910 | 1,140 | 1,360 | 1,590 | 1,820 | 2,050 | 2,270 | 2,730 | 3,180 | 3,410 | 4,090 | 4,550 | 5,690 | 6,820 |
| 15 | 420 | 640 | 850 | 1,060 | 1,270 | 1,490 | 1,700 | 1,910 | 2,120 | 2,550 | 2,970 | 3,180 | 3,820 | 4,250 | 5,310 | 6,370 |
| 16 | 400 | 600 | 800 | 1,000 | 1,190 | 1,390 | 1,590 | 1,790 | 1,990 | 2,390 | 2,790 | 2,990 | 3,580 | 3,980 | 4,980 | 5,970 |
| 17 | 370 | 560 | 750 | 940 | 1,120 | 1,310 | 1,500 | 1,690 | 1,870 | 2,250 | 2,620 | 2,810 | 3,370 | 3,750 | 4,680 | 5,620 |
| 18 | 350 | 530 | 710 | 880 | 1,060 | 1,240 | 1,420 | 1,590 | 1,770 | 2,120 | 2,480 | 2,650 | 3,180 | 3,540 | 4,420 | 5,310 |
| 19 | 340 | 500 | 670 | 840 | 1,010 | 1,170 | 1,340 | 1,510 | 1,680 | 2,020 | 2,350 | 2,510 | 3,020 | 3,350 | 4,190 | 5,030 |
| 20 | 320 | 480 | 640 | 800 | 960 | 1,110 | 1,270 | 1,430 | 1,590 | 1,910 | 2,230 | 2,390 | 2,870 | 3,180 | 3,980 | 4,780 |
| 21 | 300 | 450 | 610 | 760 | 910 | 1,060 | 1,210 | 1,360 | 1,520 | 1,820 | 2,120 | 2,270 | 2,730 | 3,030 | 3,790 | 4,550 |
| 22 | 290 | 430 | 580 | 720 | 870 | 1,010 | 1,160 | 1,300 | 1,450 | 1,740 | 2,030 | 2,170 | 2,610 | 2,900 | 3,620 | 4,340 |
| 23 | 280 | 420 | 550 | 690 | 830 | 970 | 1,100 | 1,250 | 1,380 | 1,660 | 1,940 | 2,080 | 2,490 | 2,770 | 3,460 | 4,150 |
| 24 | 270 | 400 | 530 | 660 | 800 | 930 | 1,060 | 1,190 | 1,330 | 1,590 | 1,860 | 1,990 | 2,390 | 2,650 | 3,320 | 3,980 |
| 25 | 250 | 380 | 510 | 640 | 760 | 890 | 1,020 | 1,150 | 1,270 | 1,530 | 1,780 | 1,910 | 2,290 | 2,550 | 3,180 | 3,820 |
| 26 | 240 | 370 | 490 | 610 | 730 | 860 | 980 | 1,100 | 1,220 | 1,470 | 1,710 | 1,840 | 2,200 | 2,450 | 3,060 | 3,670 |
| 27 | 240 | 350 | 470 | 590 | 710 | 830 | 940 | 1,060 | 1,180 | 1,420 | 1,650 | 1,770 | 2,120 | 2,350 | 2,950 | 3,540 |
| 28 | 230 | 340 | 450 | 570 | 680 | 800 | 910 | 1,020 | 1,140 | 1,360 | 1,590 | 1,710 | 2,050 | 2,270 | 2,840 | 3,410 |
| 29 | 220 | 330 | 440 | 550 | 660 | 770 | 880 | 990 | 1,100 | 1,320 | 1,540 | 1,650 | 1,980 | 2,200 | 2,750 | 3,290 |
| 30 | 210 | 320 | 420 | 530 | 640 | 740 | 850 | 960 | 1,060 | 1,270 | 1,490 | 1,590 | 1,910 | 2,120 | 2,650 | 3,180 |

User Guide

Actual Diameter of Ball Nose End Mill

| Diameter | | Depth of Cut (Ad, mm) | | | | | | | | | | | | | | |
|----------|-----|--------------------------|-------|-------|-------|-------|-------|------|------|------|------|------|------|------|-------|-------|
| Radius | Dia | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.08 | 0.1 | 0.15 | 0.2 | 0.3 | 0.5 | 0.8 | 1 | 2 | 3 |
| 0.1 | 0.2 | 0.087 | 0.12 | 0.143 | 0.16 | 0.173 | 0.196 | 0.2 | | | | | | | | |
| 0.2 | 0.4 | 0.125 | 0.174 | 0.211 | 0.24 | 0.265 | 0.32 | 0.35 | 0.39 | 0.4 | | | | | | |
| 0.3 | 0.6 | 0.154 | 0.215 | 0.262 | 0.299 | 0.332 | 0.41 | 0.45 | 0.52 | 0.57 | 0.6 | | | | | |
| 0.4 | 0.8 | 0.178 | 0.25 | 0.304 | 0.349 | 0.387 | 0.48 | 0.53 | 0.62 | 0.69 | 0.77 | | | | | |
| 0.5 | 1 | 0.199 | 0.28 | 0.341 | 0.392 | 0.436 | 0.54 | 0.6 | 0.71 | 0.8 | 0.92 | 1 | | | | |
| 1 | 2 | 0.282 | 0.398 | 0.486 | 0.56 | 0.624 | 0.78 | 0.87 | 1.05 | 1.2 | 1.43 | 1.73 | 1.96 | 2 | | |
| 1.5 | 3 | 0.346 | 0.488 | 0.597 | 0.688 | 0.768 | 0.97 | 1.08 | 1.31 | 1.5 | 1.8 | 2.24 | 2.65 | 2.83 | | |
| 2 | 4 | 0.399 | 0.564 | 0.69 | 0.796 | 0.889 | 1.12 | 1.25 | 1.52 | 1.74 | 2.11 | 2.65 | 3.2 | 3.46 | 4 | |
| 2.5 | 5 | 0.447 | 0.631 | 0.722 | 0.891 | 0.995 | 1.25 | 1.4 | 1.71 | 1.96 | 2.37 | 3 | 3.67 | 4 | 4.9 | |
| 3 | 6 | 0.489 | 0.692 | 0.846 | 0.977 | 1.091 | 1.38 | 1.54 | 1.87 | 2.15 | 2.62 | 3.32 | 4.08 | 4.47 | 5.66 | 6 |
| 4 | 8 | 0.565 | 0.799 | 0.978 | 1.129 | 1.261 | 1.59 | 1.78 | 2.17 | 2.5 | 3.04 | 3.87 | 4.8 | 5.29 | 6.93 | 7.75 |
| 5 | 10 | 0.632 | 0.894 | 1.094 | 1.262 | 1.411 | 1.78 | 1.99 | 2.43 | 2.8 | 3.41 | 4.36 | 5.43 | 6 | 8 | 9.17 |
| 6 | 12 | 0.693 | 0.979 | 1.198 | 1.383 | 1.546 | 1.95 | 2.18 | 2.67 | 3.07 | 3.75 | 4.8 | 5.99 | 6.63 | 8.94 | 10.39 |
| 7 | 14 | 0.748 | 1.058 | 1.295 | 1.495 | 1.67 | 2.11 | 2.36 | 2.88 | 3.32 | 4.05 | 5.2 | 6.5 | 7.21 | 9.8 | 11.49 |
| 8 | 16 | 0.8 | 1.131 | 1.384 | 1.598 | 1.786 | 2.26 | 2.52 | 3.08 | 3.56 | 4.34 | 5.57 | 6.97 | 7.75 | 10.58 | 12.49 |
| 9 | 18 | 0.848 | 1.199 | 1.468 | 1.695 | 1.895 | 2.39 | 2.68 | 3.27 | 3.77 | 4.61 | 5.92 | 7.42 | 8.25 | 11.31 | 13.42 |
| 10 | 20 | 0.894 | 1.264 | 1.548 | 1.787 | 1.997 | 2.52 | 2.82 | 3.45 | 3.98 | 4.86 | 6.24 | 7.84 | 8.72 | 12 | 14.28 |

Calculation of Actual Diameter

$$d = 2 \sqrt{Ad (D-Ad)}$$

