# MHRH230

Size ϕ0.1 ～ ϕ3

Premium ≦65 HRC

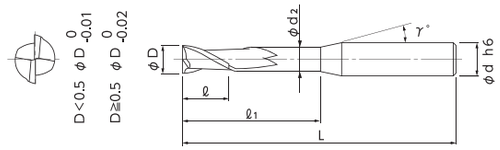
## MUGEN COATING PREMIUM 2-Flute Long Neck End Mill for Hardened Steel

Total 134 sizes

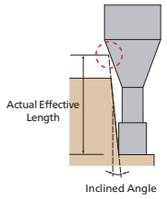


Long neck square end mill for hardened steels up to 65HRC.
Maximum L/D=25

MG | 2 | 30°
Side | Slot | Face




- MUGEN COATING PREMIUM to improve accuracy and tool life on machining hardened steels!
- Total 134 sizes!



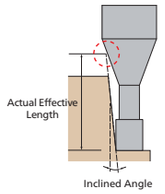

Unit : mm

| Code No. | Dia. (D) | Under Neck Length (ℓ1) | Length of Cut (ℓ) | Neck Dia. (d2) | Neck Taper Angle (γ) | Shank Dia. (d) | Overall Length (L) | Actual effective length depending on inclined angle of workpiece | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 30´ | 1° | 1°30´ | 2° | 3° |
| 08-00207-01003 | 0.1 | 0.3 | 0.08 | 0.085 | 12° | 4 | 45 | 0.34 | 0.36 | 0.38 | 0.40 | 0.44 |
| 08-00207-01005 | | 0.5 | | | | | 45 | 0.55 | 0.58 | 0.61 | 0.64 | 0.71 |
| 08-00207-01007 | | 0.75 | | | | | 45 | 0.81 | 0.85 | 0.89 | 0.93 | 1.04 |
| 08-00207-01010 | | 1 | | | | | 45 | 1.07 | 1.12 | 1.18 | 1.23 | 1.37 |
| 08-00207-01503 | 0.15 | 0.3 | 0.12 | 0.13 | 12° | 4 | 45 | 0.36 | 0.37 | 0.39 | 0.41 | 0.46 |
| 08-00207-01505 | | 0.5 | | | | | 45 | 0.57 | 0.59 | 0.62 | 0.65 | 0.72 |
| 08-00207-01507 | | 0.75 | | | | | 45 | 0.83 | 0.86 | 0.90 | 0.95 | 1.05 |
| 08-00207-01510 | | 1 | | | | | 45 | 1.09 | 1.14 | 1.19 | 1.25 | 1.38 |
| 08-00207-01515 | | 1.5 | | | | | 45 | 1.61 | 1.68 | 1.76 | 1.85 | 2.05 |
| 08-00207-02005 | 0.2 | 0.5 | 0.15 | 0.18 | 12° | 4 | 45 | 0.57 | 0.59 | 0.62 | 0.65 | 0.72 |
| 08-00207-02007 | | 0.75 | | | | | 45 | 0.83 | 0.86 | 0.90 | 0.95 | 1.05 |
| 08-00207-02010 | | 1 | | | | | 45 | 1.09 | 1.14 | 1.19 | 1.25 | 1.38 |
| 08-00207-02015 | | 1.5 | | | | | 45 | 1.61 | 1.68 | 1.76 | 1.85 | 2.05 |
| 08-00207-02020 | | 2 | | | | | 45 | 2.13 | 2.23 | 2.33 | 2.44 | 2.71 |
| 08-00207-02025 | | 2.5 | | | | | 45 | 2.65 | 2.77 | 2.90 | 3.04 | 3.38 |
| 08-00207-02030 | | 3 | | | | | 45 | 3.17 | 3.31 | 3.47 | 3.64 | 4.04 |
| 08-00207-03010 | 0.3 | 1 | 0.25 | 0.28 | 12° | 4 | 45 | 1.09 | 1.14 | 1.19 | 1.25 | 1.38 |
| 08-00207-03015 | | 1.5 | | | | | 45 | 1.61 | 1.68 | 1.76 | 1.85 | 2.05 |
| 08-00207-03020 | | 2 | | | | | 45 | 2.13 | 2.23 | 2.33 | 2.44 | 2.71 |
| 08-00207-03025 | | 2.5 | | | | | 45 | 2.65 | 2.77 | 2.90 | 3.04 | 3.38 |
| 08-00207-03030 | | 3 | | | | | 45 | 3.17 | 3.31 | 3.47 | 3.64 | 4.04 |
| 08-00207-04010 | 0.4 | 1 | 0.3 | 0.37 | 12° | 4 | 45 | 1.11 | 1.16 | 1.22 | 1.28 | 1.42 |
| 08-00207-04015 | | 1.5 | | | | | 45 | 1.63 | 1.71 | 1.79 | 1.87 | 2.08 |
| 08-00207-04020 | | 2 | | | | | 45 | 2.15 | 2.25 | 2.36 | 2.47 | 2.74 |
| 08-00207-04025 | | 2.5 | | | | | 45 | 2.68 | 2.80 | 2.93 | 3.07 | 3.41 |
| 08-00207-04030 | | 3 | | | | | 45 | 3.20 | 3.34 | 3.50 | 3.67 | 4.07 |
| 08-00207-04035 | | 3.5 | | | | | 45 | 3.72 | 3.89 | 4.07 | 4.27 | 4.73 |
| 08-00207-04040 | | 4 | | | | | 45 | 4.24 | 4.43 | 4.64 | 4.87 | 5.40 |
| 08-00207-04050 | | 5 | | | | | 45 | 5.28 | 5.52 | 5.78 | 6.06 | 6.72 |
| 08-00207-04060 | | 6 | | | | | 45 | 6.33 | 6.61 | 6.92 | 7.26 | 8.05 |
| 08-00207-04080 | | 8 | | | | | 45 | 8.41 | 8.79 | 9.20 | 9.65 | 10.71 |
| 08-00207-04100 | | 10 | | | | | 45 | 10.50 | 10.97 | 11.48 | 12.05 | 13.36 |
| 08-00207-05010 | 0.5 | 1 | 0.4 | 0.46 | 12° | 4 | 45 | 1.14 | 1.19 | 1.24 | 1.30 | 1.45 |
| 08-00207-05015 | | 1.5 | | | | | 45 | 1.66 | 1.73 | 1.81 | 1.90 | 2.11 |
| 08-00207-05020 | | 2 | | | | | 45 | 2.18 | 2.28 | 2.38 | 2.50 | 2.77 |
| 08-00207-05025 | | 2.5 | | | | | 45 | 2.70 | 2.82 | 2.95 | 3.10 | 3.44 |

How to Order — When you order, indicate MHRH230 (D)×(ℓ1). ※(γ) is reference value.








Unit : mm

| Code No. | Dia. (D) | Under Neck Length (ℓ1) | Length of Cut (ℓ) | Neck Dia. (d2) | Neck Taper Angle (γ) | Shank Dia. (d) | Overall Length (L) | Actual effective length depending on inclined angle of workpiece | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 30´ | 1° | 1°30´ | 2° | 3° |
| 08-00207-05030 | 0.5 | 3 | 0.4 | 0.46 | 12° | 4 | 45 | 3.22 | 3.37 | 3.52 | 3.70 | 4.10 |
| 08-00207-05035 | | 3.5 | | | | | 45 | 3.74 | 3.91 | 4.09 | 4.30 | 4.77 |
| 08-00207-05040 | | 4 | | | | | 45 | 4.26 | 4.46 | 4.66 | 4.89 | 5.43 |
| 08-00207-05045 | | 4.5 | | | | | 45 | 4.79 | 5.00 | 5.23 | 5.49 | 6.09 |
| 08-00207-05050 | | 5 | | | | | 45 | 5.31 | 5.54 | 5.80 | 6.09 | 6.76 |
| 08-00207-05060 | | 6 | | | | | 45 | 6.35 | 6.63 | 6.95 | 7.29 | 8.08 |
| 08-00207-05070 | | 7 | | | | | 45 | 7.39 | 7.72 | 8.09 | 8.48 | 9.41 |
| 08-00207-05080 | | 8 | | | | | 50 | 8.44 | 8.81 | 9.23 | 9.68 | 10.74 |
| 08-00207-05090 | | 9 | | | | | 50 | 9.48 | 9.90 | 10.37 | 10.88 | 12.07 |
| 08-00207-05100 | | 10 | | | | | 50 | 10.52 | 10.99 | 11.51 | 12.07 | 13.39 |
| 08-00207-06015 | 0.6 | 1.5 | 0.5 | 0.56 | 12° | 4 | 45 | 1.66 | 1.73 | 1.81 | 1.90 | 2.11 |
| 08-00207-06020 | | 2 | | | | | 45 | 2.18 | 2.28 | 2.38 | 2.50 | 2.77 |
| 08-00207-06030 | | 3 | | | | | 45 | 3.22 | 3.37 | 3.52 | 3.70 | 4.10 |
| 08-00207-06040 | | 4 | | | | | 45 | 4.26 | 4.46 | 4.66 | 4.89 | 5.43 |
| 08-00207-06050 | | 5 | | | | | 45 | 5.31 | 5.54 | 5.80 | 6.09 | 6.76 |
| 08-00207-06060 | | 6 | | | | | 45 | 6.35 | 6.63 | 6.95 | 7.29 | 8.08 |
| 08-00207-07020 | 0.7 | 2 | 0.55 | 0.66 | 12° | 4 | 45 | 2.18 | 2.28 | 2.38 | 2.50 | 2.77 |
| 08-00207-07040 | | 4 | | | | | 45 | 4.26 | 4.46 | 4.66 | 4.89 | 5.43 |
| 08-00207-07060 | | 6 | | | | | 45 | 6.35 | 6.63 | 6.95 | 7.29 | 8.08 |
| 08-00207-07080 | | 8 | | | | | 50 | 8.44 | 8.81 | 9.23 | 9.68 | 10.74 |
| 08-00207-07100 | | 10 | | | | | 50 | 10.52 | 10.99 | 11.51 | 12.07 | 13.39 |
| 08-00207-08030 | 0.8 | 3 | 0.65 | 0.76 | 12° | 4 | 45 | 3.22 | 3.37 | 3.52 | 3.70 | 4.10 |
| 08-00207-08040 | | 4 | | | | | 45 | 4.26 | 4.46 | 4.66 | 4.89 | 5.43 |
| 08-00207-08050 | | 5 | | | | | 45 | 5.31 | 5.54 | 5.80 | 6.09 | 6.76 |
| 08-00207-08060 | | 6 | | | | | 45 | 6.35 | 6.63 | 6.95 | 7.29 | 8.08 |
| 08-00207-08080 | | 8 | | | | | 50 | 8.44 | 8.81 | 9.23 | 9.68 | 10.74 |
| 08-00207-08100 | | 10 | | | | | 50 | 10.52 | 10.99 | 11.51 | 12.07 | 13.39 |
| 08-00207-08120 | | 12 | | | | | 50 | 12.61 | 13.17 | 13.79 | 14.47 | 16.05 |
| 08-00207-10020 | 1 | 2 | 0.8 | 0.95 | 12° | 4 | 50 | 2.20 | 2.30 | 2.41 | 2.53 | 2.81 |
| 08-00207-10030 | | 3 | | | | | 50 | 3.25 | 3.39 | 3.55 | 3.73 | 4.13 |
| 08-00207-10040 | | 4 | | | | | 50 | 4.29 | 4.48 | 4.69 | 4.92 | 5.46 |
| 08-00207-10050 | | 5 | | | | | 50 | 5.33 | 5.57 | 5.83 | 6.12 | 6.79 |
| 08-00207-10060 | | 6 | | | | | 50 | 6.37 | 6.66 | 6.97 | 7.32 | 8.11 |
| 08-00207-10070 | | 7 | | | | | 50 | 7.42 | 7.75 | 8.11 | 8.51 | 9.44 |
| 08-00207-10080 | | 8 | | | | | 50 | 8.46 | 8.84 | 9.25 | 9.71 | 10.77 |
| 08-00207-10090 | | 9 | | | | | 50 | 9.50 | 9.93 | 10.39 | 10.91 | 12.10 |
| 08-00207-10100 | | 10 | | | | | 50 | 10.55 | 11.02 | 11.53 | 12.10 | 13.42 |
| 08-00207-10120 | | 12 | | | | | 50 | 12.63 | 13.20 | 13.82 | 14.49 | 16.08 |
| 08-00207-10140 | | 14 | | | | | 50 | 14.72 | 15.38 | 16.10 | 16.89 | 18.73 |
| 08-00207-10160 | | 16 | | | | | 60 | 16.80 | 17.55 | 18.38 | 19.28 | 21.39 |
| 08-00207-10180 | | 18 | | | | | 60 | 18.89 | 19.73 | 20.66 | 21.67 | 24.04 |
| 08-00207-10200 | | 20 | | | | | 60 | 20.97 | 21.91 | 22.94 | 24.07 | 26.70 |
| 08-00207-10220 | | 22 | | | | | 60 | 23.06 | 24.09 | 25.22 | 26.46 | Free |
| 08-00207-12060 | 1.2 | 6 | 1 | 1.15 | 12° | 4 | 50 | 6.37 | 6.66 | 6.97 | 7.32 | 8.11 |
| 08-00207-12080 | | 8 | | | | | 50 | 8.46 | 8.84 | 9.25 | 9.71 | 10.77 |
| 08-00207-12100 | | 10 | | | | | 50 | 10.55 | 11.02 | 11.53 | 12.10 | 13.42 |
| 08-00207-12120 | | 12 | | | | | 50 | 12.63 | 13.20 | 13.82 | 14.49 | 16.08 |
| 08-00207-12160 | | 16 | | | | | 60 | 16.80 | 17.55 | 18.38 | 19.28 | 21.39 |
| 08-00207-14060 | 1.4 | 6 | 1.1 | 1.35 | 12° | 4 | 50 | 6.37 | 6.66 | 6.97 | 7.32 | 8.11 |
| 08-00207-14120 | | 12 | | | | | 50 | 12.63 | 13.20 | 13.82 | 14.49 | 16.08 |

# MHRH230

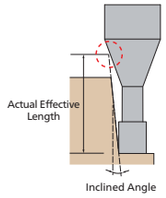
## MUGEN COATING PREMIUM 2-Flute Long Neck End Mill for Hardened Steel

MHRH230

## Recommended Milling Conditions

Regular Line
MUGEN PREMIUM
Long Neck Type






Unit : mm

| Code No. | Dia. (D) | Under Neck Length (ℓ1) | Length of Cut (ℓ) | Neck Dia. (d2) | Neck Taper Angle (γ) | Shank Dia. (d) | Overall Length (L) | Actual effective length depending on inclined angle of workpiece | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 30´ | 1° | 1°30´ | 2° | 3° |
| 08-00207-15040 | 1.5 | 4 | 1.2 | 1.45 | 12° | 4 | 50 | 4.29 | 4.48 | 4.69 | 4.92 | 5.46 |
| 08-00207-15060 | | 6 | | | | | 50 | 6.37 | 6.66 | 6.97 | 7.32 | 8.11 |
| 08-00207-15080 | | 8 | | | | | 50 | 8.46 | 8.84 | 9.25 | 9.71 | 10.77 |
| 08-00207-15100 | | 10 | | | | | 50 | 10.55 | 11.02 | 11.53 | 12.10 | 13.42 |
| 08-00207-15120 | | 12 | | | | | 50 | 12.63 | 13.20 | 13.82 | 14.49 | 16.08 |
| 08-00207-15140 | | 14 | | | | | 60 | 14.72 | 15.38 | 16.10 | 16.89 | 18.73 |
| 08-00207-15160 | | 16 | | | | | 60 | 16.80 | 17.55 | 18.38 | 19.28 | 21.39 |
| 08-00207-15180 | | 18 | | | | | 60 | 18.89 | 19.73 | 20.66 | 21.67 | Free |
| 08-00207-15200 | | 20 | | | | | 60 | 20.97 | 21.91 | 22.94 | 24.07 | Free |
| 08-00207-15250 | | 25 | | | | | 70 | 26.19 | 27.36 | 28.64 | 30.05 | Free |
| 08-00207-15300 | | 30 | | | | | 70 | 31.40 | 32.81 | 34.34 | Free | Free |
| 08-00207-15350 | | 35 | | | | | 80 | 36.62 | 38.25 | 40.05 | Free | Free |
| 08-00207-16060 | 1.6 | 6 | 1.3 | 1.55 | 12° | 4 | 50 | 6.37 | 6.66 | 6.97 | 7.32 | 8.11 |
| 08-00207-16080 | | 8 | | | | | 50 | 8.46 | 8.84 | 9.25 | 9.71 | 10.77 |
| 08-00207-18060 | 1.8 | 6 | 1.4 | 1.75 | 12° | 4 | 50 | 6.37 | 6.66 | 6.97 | 7.32 | 8.11 |
| 08-00207-18080 | | 8 | | | | | 50 | 8.46 | 8.84 | 9.25 | 9.71 | 10.77 |
| 08-00207-18100 | | 10 | | | | | 50 | 10.55 | 11.02 | 11.53 | 12.10 | 13.42 |
| 08-00207-18120 | | 12 | | | | | 50 | 12.63 | 13.20 | 13.82 | 14.49 | 16.08 |
| 08-00207-18140 | | 14 | | | | | 50 | 14.72 | 15.38 | 16.10 | 16.89 | 18.73 |
| 08-00207-18160 | | 16 | | | | | 60 | 16.80 | 17.55 | 18.38 | 19.28 | Free |
| 08-00207-18180 | | 18 | | | | | 60 | 18.89 | 19.73 | 20.66 | 21.67 | Free |
| 08-00207-20040 | 2 | 4 | 1.6 | 1.94 | 12° | 4 | 50 | 4.31 | 4.51 | 4.72 | 4.95 | 5.49 |
| 08-00207-20060 | | 6 | | | | | 50 | 6.40 | 6.69 | 7.00 | 7.34 | 8.15 |
| 08-00207-20080 | | 8 | | | | | 50 | 8.48 | 8.86 | 9.28 | 9.74 | 10.80 |
| 08-00207-20100 | | 10 | | | | | 50 | 10.57 | 11.04 | 11.56 | 12.13 | 13.45 |
| 08-00207-20120 | | 12 | | | | | 50 | 12.66 | 13.22 | 13.84 | 14.52 | 16.11 |
| 08-00207-20140 | | 14 | | | | | 60 | 14.74 | 15.40 | 16.12 | 16.92 | 18.76 |
| 08-00207-20160 | | 16 | | | | | 60 | 16.83 | 17.58 | 18.40 | 19.31 | Free |
| 08-00207-20180 | | 18 | | | | | 60 | 18.91 | 19.76 | 20.69 | 21.70 | Free |
| 08-00207-20200 | | 20 | | | | | 60 | 21.00 | 21.94 | 22.97 | 24.10 | Free |
| 08-00207-20250 | | 25 | | | | | 70 | 26.21 | 27.39 | 28.67 | Free | Free |
| 08-00207-20300 | | 30 | | | | | 70 | 31.43 | 32.83 | 34.37 | Free | Free |
| 08-00207-20350 | | 35 | | | | | 80 | 36.64 | 38.28 | Free | Free | Free |
| 08-00207-20400 | | 40 | | | | | 90 | 41.85 | 43.73 | Free | Free | Free |
| 08-00207-20500 | | 50 | | | | | 100 | 52.28 | 54.62 | Free | Free | Free |
| 08-00207-25080 | 2.5 | 8 | 2 | 2.4 | 12° | 4 | 50 | 8.58 | 8.97 | 9.39 | 9.85 | 10.93 |
| 08-00207-25120 | | 12 | | | | | 50 | 12.75 | 13.32 | 13.95 | 14.64 | Free |
| 08-00207-25160 | | 16 | | | | | 60 | 16.93 | 17.68 | 18.51 | 19.42 | Free |
| 08-00207-25200 | | 20 | | | | | 60 | 21.10 | 22.04 | 23.07 | Free | Free |
| 08-00207-25300 | | 30 | | | | | 70 | 31.52 | 32.94 | Free | Free | Free |
| 08-00207-25400 | | 40 | | | | | 90 | 41.95 | Free | Free | Free | Free |
| 08-00207-25500 | | 50 | | | | | 100 | 52.38 | Free | Free | Free | Free |
| 08-00207-30080 | 3 | 8 | 4.5 | 2.85 | 12° | 6 | 50 | 8.71 | 9.10 | 9.52 | 9.99 | 11.08 |
| 08-00207-30120 | | 12 | | | | | 50 | 12.88 | 13.45 | 14.08 | 14.78 | 16.39 |
| 08-00207-30160 | | 16 | | | | | 60 | 17.05 | 17.81 | 18.65 | 19.56 | 21.70 |
| 08-00207-30200 | | 20 | | | | | 60 | 21.22 | 22.17 | 23.21 | 24.35 | 27.01 |
| 08-00207-30250 | | 25 | | | | | 70 | 26.43 | 27.62 | 28.91 | 30.33 | Free |
| 08-00207-30300 | | 30 | | | | | 70 | 31.65 | 33.06 | 34.61 | 36.31 | Free |

How to Order When you order, indicate MHRH230 (D)×(ℓ1). ※(γ) is reference value.

| Work Material | | Carbon Steels・Prehardened Steels S50C・NAK55・NAK80・HPM1 (～43HRC) | | | | Hardened Steels HPM38・STAVAX・SKD61 (～55HRC) | | | | Hardened Steels SKD11・PD613 (～62HRC) | | | | High Speed Steels SKH (～65HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dia. | Under Neck Length | Spindle Speed | Feed | Depth of Cut | | Spindle Speed | Feed | Depth of Cut | | Spindle Speed | Feed | Depth of Cut | | Spindle Speed | Feed | Depth of Cut | |
| | | min-1 | mm/min | ap mm | ae mm | min-1 | mm/min | ap mm | ae mm | min-1 | mm/min | ap mm | ae mm | min-1 | mm/min | ap mm | ae mm |
| 0.1 | 0.3 | 40,000 | 150 | 0.005 | 0.06 | 40,000 | 120 | 0.003 | 0.05 | 40,000 | 100 | 0.002 | 0.04 | 40,000 | 70 | 0.002 | 0.03 |
| | 0.5 | 40,000 | 100 | 0.005 | 0.06 | 40,000 | 80 | 0.003 | 0.05 | 40,000 | 60 | 0.002 | 0.04 | 40,000 | 50 | 0.002 | 0.03 |
| | 0.75 | 40,000 | 80 | 0.003 | 0.06 | 40,000 | 70 | 0.002 | 0.05 | 40,000 | 50 | 0.001 | 0.04 | 40,000 | 30 | 0.001 | 0.03 |
| | 1 | 40,000 | 60 | 0.002 | 0.06 | 40,000 | 50 | 0.001 | 0.05 | 40,000 | 40 | 0.001 | 0.04 | 40,000 | 20 | 0.001 | 0.03 |
| 0.15 | 0.3 | 40,000 | 180 | 0.005 | 0.09 | 40,000 | 150 | 0.003 | 0.07 | 40,000 | 120 | 0.002 | 0.06 | 40,000 | 100 | 0.002 | 0.04 |
| | 0.5 | 40,000 | 150 | 0.005 | 0.09 | 40,000 | 120 | 0.003 | 0.07 | 40,000 | 100 | 0.002 | 0.06 | 40,000 | 80 | 0.002 | 0.04 |
| | 0.75 | 40,000 | 120 | 0.003 | 0.09 | 40,000 | 100 | 0.002 | 0.07 | 40,000 | 80 | 0.001 | 0.06 | 40,000 | 60 | 0.001 | 0.04 |
| | 1 | 40,000 | 100 | 0.002 | 0.09 | 40,000 | 80 | 0.001 | 0.07 | 40,000 | 60 | 0.001 | 0.06 | 40,000 | 40 | 0.001 | 0.04 |
| | 1.5 | 40,000 | 80 | 0.002 | 0.09 | 40,000 | 60 | 0.001 | 0.07 | 40,000 | 40 | 0.001 | 0.06 | 40,000 | 20 | 0.001 | 0.04 |
| 0.2 | 0.5 | 30,000 | 240 | 0.005 | 0.12 | 30,000 | 200 | 0.003 | 0.1 | 30,000 | 160 | 0.003 | 0.08 | 30,000 | 120 | 0.003 | 0.06 |
| | 0.75 | 30,000 | 200 | 0.005 | 0.12 | 30,000 | 180 | 0.003 | 0.1 | 30,000 | 140 | 0.003 | 0.08 | 30,000 | 100 | 0.003 | 0.06 |
| | 1 | 30,000 | 180 | 0.005 | 0.12 | 30,000 | 150 | 0.003 | 0.1 | 30,000 | 120 | 0.003 | 0.08 | 30,000 | 80 | 0.003 | 0.06 |
| | 1.5 | 30,000 | 120 | 0.003 | 0.12 | 30,000 | 100 | 0.002 | 0.1 | 30,000 | 80 | 0.002 | 0.08 | 30,000 | 60 | 0.002 | 0.06 |
| | 2 | 30,000 | 80 | 0.003 | 0.12 | 30,000 | 50 | 0.002 | 0.1 | 30,000 | 40 | 0.002 | 0.08 | 30,000 | 30 | 0.002 | 0.06 |
| | 2.5 | 30,000 | 60 | 0.002 | 0.12 | 30,000 | 50 | 0.001 | 0.1 | 25,000 | 40 | 0.001 | 0.08 | 25,000 | 30 | 0.001 | 0.06 |
| | 3 | 30,000 | 40 | 0.002 | 0.12 | 25,000 | 40 | 0.001 | 0.1 | 25,000 | 30 | 0.001 | 0.08 | 22,000 | 20 | 0.001 | 0.06 |
| 0.3 | 1 | 30,000 | 350 | 0.007 | 0.18 | 30,000 | 300 | 0.003 | 0.15 | 30,000 | 250 | 0.003 | 0.12 | 30,000 | 200 | 0.003 | 0.09 |
| | 1.5 | 30,000 | 260 | 0.007 | 0.18 | 30,000 | 200 | 0.003 | 0.15 | 30,000 | 160 | 0.003 | 0.12 | 30,000 | 120 | 0.003 | 0.09 |
| | 2 | 30,000 | 180 | 0.005 | 0.18 | 30,000 | 150 | 0.003 | 0.15 | 30,000 | 120 | 0.003 | 0.12 | 25,000 | 100 | 0.003 | 0.09 |
| | 2.5 | 30,000 | 150 | 0.004 | 0.18 | 25,000 | 100 | 0.002 | 0.15 | 25,000 | 80 | 0.002 | 0.12 | 20,000 | 60 | 0.002 | 0.09 |
| | 3 | 30,000 | 70 | 0.004 | 0.18 | 25,000 | 50 | 0.002 | 0.15 | 25,000 | 40 | 0.002 | 0.12 | 20,000 | 30 | 0.002 | 0.09 |
| 0.4 | 1 | 30,000 | 450 | 0.01 | 0.24 | 30,000 | 400 | 0.005 | 0.2 | 30,000 | 350 | 0.005 | 0.16 | 25,000 | 300 | 0.005 | 0.12 |
| | 1.5 | 30,000 | 400 | 0.01 | 0.24 | 30,000 | 360 | 0.005 | 0.2 | 30,000 | 330 | 0.005 | 0.16 | 25,000 | 250 | 0.005 | 0.12 |
| | 2 | 30,000 | 360 | 0.01 | 0.24 | 30,000 | 320 | 0.005 | 0.2 | 25,000 | 280 | 0.005 | 0.16 | 25,000 | 220 | 0.005 | 0.12 |
| | 2.5 | 30,000 | 340 | 0.008 | 0.24 | 25,000 | 280 | 0.005 | 0.2 | 25,000 | 250 | 0.004 | 0.16 | 20,000 | 200 | 0.004 | 0.12 |
| | 3 | 30,000 | 320 | 0.008 | 0.24 | 25,000 | 260 | 0.004 | 0.2 | 20,000 | 220 | 0.003 | 0.16 | 18,000 | 180 | 0.003 | 0.12 |
| | 3.5 | 30,000 | 280 | 0.007 | 0.24 | 25,000 | 220 | 0.004 | 0.2 | 20,000 | 180 | 0.003 | 0.16 | 18,000 | 150 | 0.002 | 0.12 |
| | 4 | 30,000 | 250 | 0.006 | 0.24 | 25,000 | 200 | 0.003 | 0.2 | 20,000 | 160 | 0.002 | 0.16 | 18,000 | 120 | 0.002 | 0.12 |
| | 5 | 25,000 | 250 | 0.005 | 0.24 | 22,000 | 180 | 0.003 | 0.2 | 20,000 | 150 | 0.002 | 0.16 | 18,000 | 90 | 0.002 | 0.12 |
| | 6 | 25,000 | 200 | 0.004 | 0.24 | 22,000 | 150 | 0.002 | 0.2 | 18,000 | 130 | 0.002 | 0.16 | 16,000 | 70 | 0.001 | 0.12 |
| | 8 | 20,000 | 150 | 0.002 | 0.24 | 16,000 | 120 | 0.001 | 0.2 | 14,000 | 90 | 0.001 | 0.16 | 12,000 | 40 | 0.001 | 0.12 |
| | 10 | 16,000 | 100 | 0.002 | 0.24 | 13,000 | 80 | 0.001 | 0.2 | 12,000 | 50 | 0.001 | 0.16 | 10,000 | 20 | 0.001 | 0.12 |
| 0.5 | 1 | 30,000 | 550 | 0.02 | 0.3 | 25,000 | 500 | 0.01 | 0.25 | 23,000 | 450 | 0.007 | 0.2 | 20,000 | 400 | 0.005 | 0.15 |
| | 1.5 | 30,000 | 520 | 0.02 | 0.3 | 25,000 | 450 | 0.01 | 0.25 | 23,000 | 400 | 0.007 | 0.2 | 20,000 | 360 | 0.005 | 0.15 |
| | 2 | 30,000 | 500 | 0.02 | 0.3 | 25,000 | 420 | 0.01 | 0.25 | 23,000 | 380 | 0.007 | 0.2 | 20,000 | 320 | 0.005 | 0.15 |
| | 2.5 | 30,000 | 480 | 0.015 | 0.3 | 25,000 | 400 | 0.008 | 0.25 | 23,000 | 360 | 0.006 | 0.2 | 20,000 | 300 | 0.004 | 0.15 |
| | 3 | 30,000 | 420 | 0.015 | 0.3 | 25,000 | 350 | 0.007 | 0.25 | 23,000 | 320 | 0.005 | 0.2 | 20,000 | 280 | 0.003 | 0.15 |
| | 3.5 | 25,000 | 400 | 0.012 | 0.3 | 25,000 | 320 | 0.006 | 0.25 | 23,000 | 280 | 0.003 | 0.2 | 20,000 | 240 | 0.003 | 0.15 |
| | 4 | 25,000 | 380 | 0.01 | 0.3 | 25,000 | 280 | 0.005 | 0.25 | 23,000 | 240 | 0.003 | 0.2 | 20,000 | 200 | 0.002 | 0.15 |
| | 4.5 | 25,000 | 350 | 0.008 | 0.3 | 25,000 | 230 | 0.004 | 0.25 | 20,000 | 200 | 0.003 | 0.2 | 18,000 | 160 | 0.002 | 0.15 |
| | 5 | 25,000 | 320 | 0.007 | 0.3 | 20,000 | 200 | 0.003 | 0.25 | 18,000 | 150 | 0.003 | 0.2 | 16,000 | 100 | 0.002 | 0.15 |
| | 6 | 25,000 | 300 | 0.005 | 0.3 | 20,000 | 200 | 0.003 | 0.25 | 18,000 | 150 | 0.002 | 0.2 | 16,000 | 100 | 0.002 | 0.15 |
| | 7 | 20,000 | 250 | 0.005 | 0.3 | 16,000 | 180 | 0.003 | 0.25 | 14,000 | 140 | 0.002 | 0.2 | 14,000 | 80 | 0.002 | 0.15 |
| | 8 | 20,000 | 200 | 0.005 | 0.3 | 16,000 | 160 | 0.002 | 0.25 | 14,000 | 130 | 0.002 | 0.2 | 12,000 | 60 | 0.001 | 0.15 |
| | 9 | 20,000 | 200 | 0.003 | 0.3 | 16,000 | 150 | 0.002 | 0.25 | 14,000 | 120 | 0.001 | 0.2 | 12,000 | 50 | 0.001 | 0.15 |
| | 10 | 16,000 | 170 | 0.003 | 0.3 | 13,000 | 130 | 0.002 | 0.25 | 12,000 | 110 | 0.001 | 0.2 | 10,000 | 40 | 0.001 | 0.15 |
| 0.6 | 1.5 | 30,000 | 650 | 0.02 | 0.35 | 25,000 | 550 | 0.01 | 0.3 | 23,000 | 450 | 0.007 | 0.25 | 20,000 | 400 | 0.005 | 0.18 |
| | 2 | 30,000 | 550 | 0.02 | 0.35 | 25,000 | 500 | 0.01 | 0.3 | 23,000 | 400 | 0.007 | 0.25 | 20,000 | 350 | 0.005 | 0.18 |
| | 3 | 30,000 | 500 | 0.015 | 0.35 | 25,000 | 450 | 0.007 | 0.3 | 23,000 | 350 | 0.005 | 0.25 | 20,000 | 300 | 0.003 | 0.18 |
| | 4 | 25,000 | 450 | 0.01 | 0.35 | 25,000 | 400 | 0.005 | 0.3 | 23,000 | 300 | 0.003 | 0.25 | 20,000 | 250 | 0.002 | 0.18 |

Prehardened Steel P
Hardened Steel ~55 HRC H
Hardened Steel ~65 HRC H
Stainless Steel M
Titanium Alloy Heat Resistant Alloy S
Long Neck Square Coating

MHRH230

Recommended Milling Conditions

Regular Line
MUGEN PREMIUM
Long Neck Type

Prehardened Steel P
Hardened Steel ~55 HRC H
Hardened Steel ~65 HRC H
Stainless Steel M
Titanium Alloy Heat Resistant Alloy S

| Work Material | | Carbon Steels・Prehardened Steels S50C・NAK55・NAK80・HPM1 (~43HRC) | | | | Hardened Steels HPM38・STAVAX・SKD61 (~55HRC) | | | | Hardened Steels SKD11・PD613 (~62HRC) | | | | High Speed Steels SKH (~65HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dia. | Under Neck Length | Spindle Speed | Feed | Depth of Cut | | Spindle Speed | Feed | Depth of Cut | | Spindle Speed | Feed | Depth of Cut | | Spindle Speed | Feed | Depth of Cut | |
| | | min$^{-1}$ | mm/min | ap mm | ae mm | min$^{-1}$ | mm/min | ap mm | ae mm | min$^{-1}$ | mm/min | ap mm | ae mm | min$^{-1}$ | mm/min | ap mm | ae mm |
| 0.6 | 5 | 25,000 | 400 | 0.007 | 0.35 | 20,000 | 350 | 0.003 | 0.3 | 18,000 | 250 | 0.003 | 0.25 | 16,000 | 200 | 0.002 | 0.18 |
| | 6 | 25,000 | 350 | 0.005 | 0.35 | 20,000 | 300 | 0.002 | 0.3 | 18,000 | 200 | 0.002 | 0.25 | 16,000 | 150 | 0.001 | 0.18 |
| 0.7 | 2 | 30,000 | 750 | 0.04 | 0.4 | 25,000 | 600 | 0.03 | 0.35 | 23,000 | 450 | 0.02 | 0.28 | 20,000 | 400 | 0.012 | 0.21 |
| | 4 | 25,000 | 690 | 0.03 | 0.4 | 25,000 | 560 | 0.02 | 0.35 | 23,000 | 400 | 0.015 | 0.28 | 20,000 | 320 | 0.007 | 0.21 |
| | 6 | 25,000 | 550 | 0.02 | 0.4 | 20,000 | 410 | 0.015 | 0.35 | 18,000 | 300 | 0.012 | 0.28 | 16,000 | 240 | 0.007 | 0.21 |
| | 8 | 20,000 | 430 | 0.012 | 0.4 | 16,000 | 330 | 0.01 | 0.35 | 14,000 | 230 | 0.007 | 0.28 | 12,000 | 180 | 0.005 | 0.21 |
| | 10 | 16,000 | 300 | 0.008 | 0.4 | 13,000 | 200 | 0.005 | 0.35 | 12,000 | 180 | 0.003 | 0.28 | 10,000 | 120 | 0.002 | 0.21 |
| 0.8 | 3 | 25,000 | 850 | 0.04 | 0.45 | 25,000 | 780 | 0.03 | 0.4 | 23,000 | 650 | 0.02 | 0.32 | 20,000 | 550 | 0.012 | 0.24 |
| | 4 | 25,000 | 800 | 0.03 | 0.45 | 25,000 | 700 | 0.025 | 0.4 | 23,000 | 600 | 0.015 | 0.32 | 20,000 | 500 | 0.007 | 0.24 |
| | 5 | 25,000 | 700 | 0.03 | 0.45 | 23,000 | 630 | 0.02 | 0.4 | 20,000 | 530 | 0.012 | 0.32 | 18,000 | 450 | 0.006 | 0.24 |
| | 6 | 20,000 | 620 | 0.025 | 0.45 | 20,000 | 550 | 0.02 | 0.4 | 18,000 | 450 | 0.01 | 0.32 | 16,000 | 350 | 0.005 | 0.24 |
| | 8 | 16,000 | 500 | 0.015 | 0.45 | 16,000 | 400 | 0.007 | 0.4 | 14,000 | 300 | 0.005 | 0.32 | 12,000 | 200 | 0.003 | 0.24 |
| | 10 | 16,000 | 400 | 0.012 | 0.45 | 16,000 | 350 | 0.007 | 0.4 | 12,000 | 180 | 0.005 | 0.32 | 10,000 | 150 | 0.003 | 0.24 |
| | 12 | 16,000 | 300 | 0.007 | 0.45 | 13,000 | 220 | 0.005 | 0.4 | 12,000 | 120 | 0.003 | 0.32 | 10,000 | 120 | 0.002 | 0.24 |
| 1 | 2 | 25,000 | 1,200 | 0.07 | 0.6 | 23,000 | 1,000 | 0.06 | 0.5 | 18,000 | 900 | 0.05 | 0.4 | 14,000 | 600 | 0.035 | 0.3 |
| | 3 | 25,000 | 1,200 | 0.06 | 0.6 | 23,000 | 1,000 | 0.05 | 0.5 | 18,000 | 900 | 0.04 | 0.4 | 14,000 | 600 | 0.03 | 0.3 |
| | 4 | 25,000 | 1,000 | 0.05 | 0.6 | 23,000 | 900 | 0.04 | 0.5 | 18,000 | 800 | 0.03 | 0.4 | 14,000 | 500 | 0.02 | 0.3 |
| | 5 | 22,000 | 1,000 | 0.04 | 0.6 | 20,000 | 800 | 0.03 | 0.5 | 16,000 | 700 | 0.02 | 0.4 | 12,000 | 450 | 0.012 | 0.3 |
| | 6 | 20,000 | 900 | 0.03 | 0.6 | 18,000 | 700 | 0.02 | 0.5 | 14,000 | 600 | 0.01 | 0.4 | 10,000 | 400 | 0.007 | 0.3 |
| | 7 | 20,000 | 900 | 0.03 | 0.6 | 18,000 | 650 | 0.02 | 0.5 | 14,000 | 550 | 0.01 | 0.4 | 10,000 | 370 | 0.006 | 0.3 |
| | 8 | 18,000 | 800 | 0.03 | 0.6 | 16,000 | 600 | 0.02 | 0.5 | 12,000 | 500 | 0.01 | 0.4 | 8,000 | 340 | 0.005 | 0.3 |
| | 9 | 18,000 | 700 | 0.02 | 0.6 | 16,000 | 550 | 0.015 | 0.5 | 12,000 | 450 | 0.007 | 0.4 | 8,000 | 300 | 0.005 | 0.3 |
| | 10 | 16,000 | 600 | 0.02 | 0.6 | 14,000 | 500 | 0.01 | 0.5 | 10,000 | 400 | 0.007 | 0.4 | 6,000 | 250 | 0.005 | 0.3 |
| | 12 | 16,000 | 500 | 0.02 | 0.6 | 13,000 | 400 | 0.01 | 0.5 | 10,000 | 300 | 0.005 | 0.4 | 6,000 | 180 | 0.004 | 0.3 |
| | 14 | 16,000 | 450 | 0.015 | 0.6 | 13,000 | 360 | 0.008 | 0.5 | 10,000 | 280 | 0.005 | 0.4 | 5,500 | 160 | 0.004 | 0.3 |
| | 16 | 14,000 | 400 | 0.012 | 0.6 | 12,000 | 320 | 0.006 | 0.5 | 9,000 | 250 | 0.004 | 0.4 | 5,500 | 150 | 0.003 | 0.3 |
| | 18 | 14,000 | 300 | 0.01 | 0.6 | 12,000 | 240 | 0.006 | 0.5 | 8,000 | 200 | 0.004 | 0.4 | 5,000 | 120 | 0.002 | 0.3 |
| | 20 | 12,000 | 200 | 0.007 | 0.6 | 10,000 | 160 | 0.005 | 0.5 | 7,000 | 130 | 0.003 | 0.4 | 4,500 | 90 | 0.001 | 0.3 |
| | 22 | 12,000 | 180 | 0.005 | 0.6 | 10,000 | 150 | 0.003 | 0.5 | 6,000 | 100 | 0.002 | 0.4 | 4,200 | 60 | 0.001 | 0.3 |
| 1.2 | 6 | 20,000 | 900 | 0.04 | 0.7 | 18,000 | 700 | 0.03 | 0.6 | 14,000 | 600 | 0.02 | 0.5 | 10,000 | 400 | 0.01 | 0.4 |
| | 8 | 18,000 | 800 | 0.04 | 0.7 | 16,000 | 600 | 0.02 | 0.6 | 12,000 | 500 | 0.01 | 0.5 | 8,000 | 340 | 0.007 | 0.4 |
| | 10 | 16,000 | 600 | 0.03 | 0.7 | 12,000 | 500 | 0.02 | 0.6 | 10,000 | 430 | 0.01 | 0.5 | 8,000 | 300 | 0.005 | 0.4 |
| | 12 | 14,000 | 600 | 0.02 | 0.7 | 10,000 | 500 | 0.01 | 0.6 | 9,000 | 400 | 0.007 | 0.5 | 7,000 | 250 | 0.005 | 0.4 |
| | 16 | 12,000 | 400 | 0.018 | 0.7 | 9,000 | 300 | 0.01 | 0.6 | 8,000 | 260 | 0.005 | 0.5 | 6,000 | 180 | 0.003 | 0.4 |
| 1.4 | 6 | 22,000 | 1,000 | 0.06 | 0.8 | 20,000 | 800 | 0.04 | 0.7 | 18,000 | 700 | 0.03 | 0.56 | 12,000 | 450 | 0.02 | 0.42 |
| | 12 | 16,000 | 700 | 0.03 | 0.8 | 13,000 | 500 | 0.01 | 0.7 | 11,000 | 400 | 0.007 | 0.56 | 8,000 | 280 | 0.005 | 0.42 |
| 1.5 | 4 | 23,000 | 1,200 | 0.07 | 0.9 | 20,000 | 900 | 0.05 | 0.75 | 18,000 | 800 | 0.04 | 0.6 | 14,000 | 600 | 0.03 | 0.45 |
| | 6 | 23,000 | 1,000 | 0.06 | 0.9 | 20,000 | 800 | 0.04 | 0.75 | 18,000 | 700 | 0.03 | 0.6 | 14,000 | 500 | 0.02 | 0.45 |
| | 8 | 20,000 | 900 | 0.06 | 0.9 | 18,000 | 600 | 0.03 | 0.75 | 14,000 | 600 | 0.03 | 0.6 | 10,000 | 380 | 0.01 | 0.45 |
| | 10 | 20,000 | 800 | 0.04 | 0.9 | 16,000 | 500 | 0.03 | 0.75 | 14,000 | 500 | 0.02 | 0.6 | 10,000 | 350 | 0.01 | 0.45 |
| | 12 | 16,000 | 700 | 0.04 | 0.9 | 14,000 | 500 | 0.02 | 0.75 | 12,000 | 430 | 0.02 | 0.6 | 8,000 | 310 | 0.007 | 0.45 |
| | 14 | 14,000 | 600 | 0.03 | 0.9 | 12,000 | 400 | 0.02 | 0.75 | 10,000 | 380 | 0.01 | 0.6 | 7,500 | 250 | 0.007 | 0.45 |
| | 16 | 12,000 | 500 | 0.02 | 0.9 | 10,000 | 360 | 0.01 | 0.75 | 9,000 | 300 | 0.007 | 0.6 | 6,800 | 200 | 0.005 | 0.45 |
| | 18 | 10,000 | 400 | 0.02 | 0.9 | 9,000 | 330 | 0.008 | 0.75 | 8,000 | 260 | 0.005 | 0.6 | 6,000 | 170 | 0.004 | 0.45 |
| | 20 | 9,000 | 320 | 0.014 | 0.9 | 8,000 | 280 | 0.005 | 0.75 | 7,000 | 200 | 0.004 | 0.6 | 5,500 | 150 | 0.003 | 0.45 |
| | 25 | 8,000 | 250 | 0.01 | 0.9 | 7,000 | 200 | 0.004 | 0.75 | 6,000 | 150 | 0.003 | 0.6 | 4,500 | 100 | 0.002 | 0.45 |
| | 30 | 7,000 | 200 | 0.005 | 0.9 | 6,000 | 150 | 0.003 | 0.75 | 5,000 | 110 | 0.002 | 0.6 | 4,000 | 80 | 0.002 | 0.45 |
| | 35 | 6,000 | 150 | 0.003 | 0.9 | 5,000 | 110 | 0.002 | 0.75 | 4,500 | 90 | 0.002 | 0.6 | 3,500 | 60 | 0.002 | 0.45 |
| 1.6 | 6 | 22,000 | 1,000 | 0.06 | 0.96 | 19,000 | 850 | 0.04 | 0.8 | 17,000 | 750 | 0.03 | 0.64 | 13,000 | 600 | 0.025 | 0.48 |
| | 8 | 20,000 | 900 | 0.06 | 0.96 | 17,000 | 750 | 0.03 | 0.8 | 14,000 | 600 | 0.03 | 0.64 | 10,000 | 430 | 0.015 | 0.48 |

Long Neck Square Coating

| Work Material | | Carbon Steels・Prehardened Steels S50C・NAK55・NAK80・HPM1 (~43HRC) | | | | Hardened Steels HPM38・STAVAX・SKD61 (~55HRC) | | | | Hardened Steels SKD11・PD613 (~62HRC) | | | | High Speed Steels SKH (~65HRC) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dia. | Under Neck Length | Spindle Speed | Feed | Depth of Cut | | Spindle Speed | Feed | Depth of Cut | | Spindle Speed | Feed | Depth of Cut | | Spindle Speed | Feed | Depth of Cut | |
| | | min$^{-1}$ | mm/min | ap mm | ae mm | min$^{-1}$ | mm/min | ap mm | ae mm | min$^{-1}$ | mm/min | ap mm | ae mm | min$^{-1}$ | mm/min | ap mm | ae mm |
| 1.8 | 6 | 20,000 | 1,000 | 0.07 | 1 | 18,000 | 900 | 0.05 | 0.9 | 15,000 | 750 | 0.04 | 0.7 | 12,000 | 600 | 0.03 | 0.5 |
| | 8 | 18,000 | 900 | 0.06 | 1 | 16,000 | 800 | 0.04 | 0.9 | 12,000 | 600 | 0.03 | 0.7 | 9,500 | 500 | 0.02 | 0.5 |
| | 10 | 16,000 | 800 | 0.06 | 1 | 14,000 | 700 | 0.04 | 0.9 | 12,000 | 500 | 0.03 | 0.7 | 9,500 | 450 | 0.02 | 0.5 |
| | 12 | 14,000 | 700 | 0.05 | 1 | 12,000 | 600 | 0.03 | 0.9 | 10,000 | 500 | 0.02 | 0.7 | 8,200 | 400 | 0.01 | 0.5 |
| | 14 | 14,000 | 700 | 0.05 | 1 | 12,000 | 600 | 0.03 | 0.9 | 10,000 | 430 | 0.02 | 0.7 | 8,200 | 360 | 0.01 | 0.5 |
| | 16 | 12,000 | 600 | 0.04 | 1 | 10,000 | 500 | 0.02 | 0.9 | 9,200 | 400 | 0.01 | 0.7 | 7,500 | 340 | 0.007 | 0.5 |
| | 18 | 10,000 | 500 | 0.04 | 1 | 9,200 | 410 | 0.02 | 0.9 | 8,500 | 370 | 0.01 | 0.7 | 6,000 | 320 | 0.007 | 0.5 |
| 2 | 4 | 20,000 | 1,200 | 0.1 | 1.2 | 18,000 | 1,000 | 0.08 | 1 | 15,000 | 800 | 0.06 | 0.8 | 12,000 | 600 | 0.04 | 0.6 |
| | 6 | 20,000 | 1,000 | 0.08 | 1.2 | 18,000 | 900 | 0.06 | 1 | 15,000 | 750 | 0.05 | 0.8 | 12,000 | 600 | 0.03 | 0.6 |
| | 8 | 18,000 | 900 | 0.07 | 1.2 | 16,000 | 800 | 0.05 | 1 | 12,000 | 600 | 0.04 | 0.8 | 9,500 | 500 | 0.02 | 0.6 |
| | 10 | 16,000 | 800 | 0.06 | 1.2 | 14,000 | 700 | 0.05 | 1 | 12,000 | 500 | 0.04 | 0.8 | 9,500 | 450 | 0.02 | 0.6 |
| | 12 | 14,000 | 700 | 0.05 | 1.2 | 12,000 | 600 | 0.04 | 1 | 10,000 | 500 | 0.03 | 0.8 | 8,200 | 400 | 0.01 | 0.6 |
| | 14 | 14,000 | 700 | 0.04 | 1.2 | 12,000 | 600 | 0.03 | 1 | 10,000 | 430 | 0.02 | 0.8 | 8,200 | 360 | 0.007 | 0.6 |
| | 16 | 12,000 | 600 | 0.04 | 1.2 | 10,000 | 500 | 0.03 | 1 | 9,200 | 400 | 0.02 | 0.8 | 7,500 | 340 | 0.007 | 0.6 |
| | 18 | 10,000 | 500 | 0.03 | 1.2 | 9,200 | 410 | 0.02 | 1 | 8,500 | 370 | 0.01 | 0.8 | 6,000 | 320 | 0.005 | 0.6 |
| | 20 | 10,000 | 400 | 0.03 | 1.2 | 9,200 | 380 | 0.02 | 1 | 8,500 | 340 | 0.01 | 0.8 | 6,000 | 260 | 0.005 | 0.6 |
| | 25 | 9,000 | 350 | 0.02 | 1.2 | 8,500 | 330 | 0.015 | 1 | 8,000 | 300 | 0.008 | 0.8 | 5,000 | 180 | 0.004 | 0.6 |
| | 30 | 8,000 | 300 | 0.015 | 1.2 | 7,500 | 280 | 0.01 | 1 | 7,000 | 250 | 0.006 | 0.8 | 4,500 | 150 | 0.004 | 0.6 |
| | 35 | 7,000 | 250 | 0.012 | 1.2 | 6,500 | 230 | 0.008 | 1 | 6,000 | 200 | 0.005 | 0.8 | 4,000 | 120 | 0.003 | 0.6 |
| | 40 | 6,000 | 200 | 0.008 | 1.2 | 5,500 | 180 | 0.005 | 1 | 5,000 | 150 | 0.004 | 0.8 | 3,500 | 100 | 0.003 | 0.6 |
| | 50 | 5,000 | 120 | 0.005 | 1.2 | 4,500 | 100 | 0.004 | 1 | 4,000 | 80 | 0.003 | 0.8 | 3,000 | 55 | 0.002 | 0.6 |
| 2.5 | 8 | 16,000 | 1,000 | 0.08 | 1.5 | 14,000 | 800 | 0.07 | 1.25 | 10,000 | 700 | 0.05 | 1 | 8,000 | 500 | 0.03 | 0.75 |
| | 12 | 14,000 | 800 | 0.07 | 1.5 | 12,000 | 700 | 0.06 | 1.25 | 9,600 | 600 | 0.04 | 1 | 7,500 | 480 | 0.02 | 0.75 |
| | 16 | 12,000 | 700 | 0.06 | 1.5 | 10,000 | 600 | 0.05 | 1.25 | 8,500 | 500 | 0.02 | 1 | 7,000 | 400 | 0.01 | 0.75 |
| | 20 | 10,000 | 600 | 0.06 | 1.5 | 8,200 | 500 | 0.05 | 1.25 | 7,500 | 500 | 0.02 | 1 | 5,000 | 400 | 0.01 | 0.75 |
| | 30 | 8,000 | 400 | 0.03 | 1.5 | 7,000 | 300 | 0.025 | 1.25 | 6,000 | 250 | 0.015 | 1 | 4,000 | 150 | 0.008 | 0.75 |
| | 40 | 6,000 | 250 | 0.015 | 1.5 | 5,500 | 200 | 0.012 | 1.25 | 5,000 | 180 | 0.01 | 1 | 3,500 | 110 | 0.005 | 0.75 |
| | 50 | 5,000 | 150 | 0.01 | 1.5 | 4,500 | 120 | 0.008 | 1.25 | 4,000 | 100 | 0.005 | 1 | 3,000 | 70 | 0.004 | 0.75 |
| 3 | 8 | 16,000 | 1,000 | 0.15 | 1.8 | 14,000 | 900 | 0.1 | 1.5 | 10,000 | 800 | 0.07 | 1.2 | 8,000 | 600 | 0.05 | 0.9 |
| | 12 | 14,000 | 900 | 0.1 | 1.8 | 12,000 | 800 | 0.08 | 1.5 | 9,200 | 700 | 0.06 | 1.2 | 7,200 | 500 | 0.04 | 0.9 |
| | 16 | 12,000 | 800 | 0.08 | 1.8 | 10,000 | 700 | 0.07 | 1.5 | 8,500 | 600 | 0.05 | 1.2 | 6,500 | 400 | 0.03 | 0.9 |
| | 20 | 10,000 | 800 | 0.08 | 1.8 | 9,000 | 700 | 0.07 | 1.5 | 7,800 | 600 | 0.04 | 1.2 | 5,800 | 400 | 0.02 | 0.9 |
| | 25 | 9,000 | 700 | 0.07 | 1.8 | 8,200 | 600 | 0.06 | 1.5 | 7,000 | 500 | 0.03 | 1.2 | 5,000 | 360 | 0.01 | 0.9 |
| | 30 | 8,000 | 700 | 0.05 | 1.8 | 7,000 | 600 | 0.03 | 1.5 | 6,500 | 500 | 0.02 | 1.2 | 4,500 | 330 | 0.007 | 0.9 |

**Notes**

※1 These recommended cutting conditions indicate just reference. It should be adjusted according to milling shape and machine type.
※2 ap:Axial Depth of Cut, ae:Radial Depth of Cut.
※3 Recommend to use oil mist coolant for machining hardened steel.
※4 Recommend to apply herical or ramping for approaching into axial direction.
※5 Adjust feed rate 50% lower and cutting depth(ae) 30% lower for milling deep wall area. When L/D exceeds 8 for stable milling.
※6 For slotting, recommend reciprocating milling by adjusting feed & ap in below 50% of recommended milling condition.
※7 Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine.
※8 Recommend guide slotting process with short neck tool before milling with L/D 5 time or longer neck tool.
※9 Major adjustment of milling conditions appropriately on milling profile, machine tool and etc. required for the tools smaller than Dia. 0.5mm, or L/D 15 times longer.

P Prehardened Steel
H ~55 HRC Hardened Steel
H ~65 HRC Hardened Steel
M Stainless Steel
S Titanium Alloy Heat Resistant Alloy

Long Neck Square Coating