# MRB230

Size R0.05 ～ R3

≦55 HRC

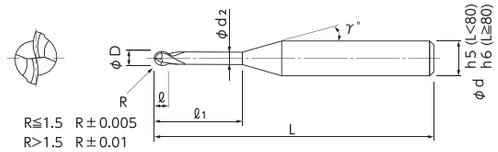
## MUGEN COATING 2-Flute Long Neck Ball End Mill

Total 282 sizes

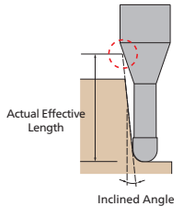


Standard type long neck ball end mill. Sufficient variations with 282 sizes

MG | 2 | 30° | R ±0.005 (R≦1.5) | φd h5 (L<80) | 3D




- The Long Neck type is suitable for narrow and deep machining.
- It is possible to have deep and precision three-dimensional cutting in the low to high speed range.



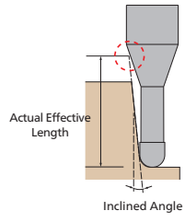

Unit : mm

| Code No. | Radius (R) | Under Neck Length (ℓ1) | Length of Cut (ℓ) | Dia. (D) | 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° |
| 08-00520-20051 | R0.05 | 0.3 | 0.07 | 0.1 | 0.085 | 12° | 4 | 45 | 0.34 | 0.36 | 0.37 | 0.39 | 0.42 |
| 08-00520-20052 | | 0.5 | 0.07 | 0.1 | 0.085 | 12° | 4 | 45 | 0.55 | 0.57 | 0.60 | 0.63 | 0.69 |
| 08-00520-40075 | R0.075 | 0.3 | 0.1 | 0.15 | 0.13 | 12° | 4 | 45 | 0.35 | 0.37 | 0.38 | 0.40 | 0.43 |
| 08-00520-40076 | | 0.5 | 0.1 | 0.15 | 0.13 | 12° | 4 | 45 | 0.56 | 0.58 | 0.61 | 0.64 | 0.70 |
| 08-00520-40077 | | 1 | 0.1 | 0.15 | 0.13 | 12° | 4 | 45 | 1.08 | 1.13 | 1.18 | 1.23 | 1.36 |
| 08-00520-00101 | R0.1 | 0.5 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 0.56 | 0.58 | 0.61 | 0.63 | 0.69 |
| 08-00521-00101 | | 0.5 | 0.15 | 0.2 | 0.18 | 12° | 6 | 50 | 0.56 | 0.58 | 0.61 | 0.63 | 0.69 |
| 08-00520-10101 | | 0.75 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 0.82 | 0.85 | 0.89 | 0.93 | 1.02 |
| 08-00520-00102 | | 1 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 1.08 | 1.13 | 1.18 | 1.23 | 1.35 |
| 08-00521-00102 | | 1 | 0.15 | 0.2 | 0.18 | 12° | 6 | 50 | 1.08 | 1.13 | 1.18 | 1.23 | 1.35 |
| 08-00520-10102 | | 1.25 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 1.34 | 1.40 | 1.46 | 1.53 | 1.68 |
| 08-00520-00103 | | 1.5 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 1.60 | 1.67 | 1.75 | 1.83 | 2.02 |
| 08-00521-00103 | | 1.5 | 0.15 | 0.2 | 0.18 | 12° | 6 | 50 | 1.60 | 1.67 | 1.75 | 1.83 | 2.02 |
| 08-00520-10103 | | 1.75 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 1.86 | 1.94 | 2.03 | 2.13 | 2.35 |
| 08-00520-00104 | | 2 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 2.13 | 2.22 | 2.32 | 2.43 | 2.68 |
| 08-00521-00104 | | 2 | 0.15 | 0.2 | 0.18 | 12° | 6 | 50 | 2.13 | 2.22 | 2.32 | 2.43 | 2.68 |
| 08-00520-00105 | | 2.5 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 2.65 | 2.76 | 2.89 | 3.02 | 3.34 |
| 08-00520-00106 | | 3 | 0.15 | 0.2 | 0.18 | 12° | 4 | 45 | 3.17 | 3.31 | 3.46 | 3.62 | 4.01 |
| 08-00520-40151 | R0.15 | 0.5 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 0.56 | 0.58 | 0.60 | 0.62 | 0.67 |
| 08-00520-10151 | | 0.6 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 0.66 | 0.69 | 0.71 | 0.74 | 0.81 |
| 08-00520-40152 | | 0.75 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 0.82 | 0.85 | 0.88 | 0.92 | 1.01 |
| 08-00520-00151 | | 1 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 1.08 | 1.12 | 1.17 | 1.22 | 1.34 |
| 08-00521-00151 | | 1 | 0.2 | 0.3 | 0.28 | 12° | 6 | 50 | 1.08 | 1.12 | 1.17 | 1.22 | 1.34 |
| 08-00520-30153 | | 1.25 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 1.34 | 1.39 | 1.45 | 1.52 | 1.67 |
| 08-00520-10152 | | 1.5 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 1.60 | 1.67 | 1.74 | 1.82 | 2.00 |
| 08-00521-00152 | | 1.5 | 0.2 | 0.3 | 0.28 | 12° | 6 | 50 | 1.60 | 1.67 | 1.74 | 1.82 | 2.00 |
| 08-00520-30154 | | 1.75 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 1.86 | 1.94 | 2.02 | 2.12 | 2.33 |
| 08-00520-00152 | | 2 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 2.12 | 2.21 | 2.31 | 2.42 | 2.66 |
| 08-00521-00153 | | 2 | 0.2 | 0.3 | 0.28 | 12° | 6 | 50 | 2.12 | 2.21 | 2.31 | 2.42 | 2.66 |
| 08-00520-30155 | | 2.25 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 2.38 | 2.48 | 2.59 | 2.71 | 3.00 |
| 08-00520-10153 | | 2.5 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 2.64 | 2.76 | 2.88 | 3.01 | 3.33 |
| 08-00520-30156 | | 2.75 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 2.91 | 3.03 | 3.16 | 3.31 | 3.66 |

**How to Order** When you order, indicate MRB230 (R)×(ℓ1)×(d). ※(γ) is reference value.







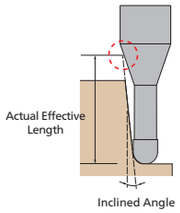

Unit : mm

| Code No. | Radius (R) | Under Neck Length (ℓ1) | Length of Cut (ℓ) | Dia. (D) | 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° |
| 08-00520-10154 | R0.15 | 3 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 3.17 | 3.30 | 3.45 | 3.61 | 3.99 |
| 08-00520-30157 | | 3.5 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 3.69 | 3.85 | 4.02 | 4.21 | 4.65 |
| 08-00520-20151 | | 4 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 4.21 | 4.39 | 4.59 | 4.81 | 5.32 |
| 08-00520-30158 | | 4.5 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 4.73 | 4.94 | 5.16 | 5.41 | 5.98 |
| 08-00520-20152 | | 5 | 0.2 | 0.3 | 0.28 | 12° | 4 | 45 | 5.25 | 5.48 | 5.73 | 6.01 | 6.65 |
| 08-00520-40201 | R0.2 | 0.5 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 0.58 | 0.60 | 0.62 | 0.64 | 0.69 |
| 08-00520-10201 | | 0.75 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 0.84 | 0.87 | 0.90 | 0.94 | 1.02 |
| 08-00520-00201 | | 1 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 1.10 | 1.14 | 1.19 | 1.24 | 1.35 |
| 08-00521-00201 | | 1 | 0.3 | 0.4 | 0.37 | 12° | 6 | 50 | 1.10 | 1.14 | 1.19 | 1.24 | 1.35 |
| 08-00520-00204 | | 1.5 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 1.62 | 1.69 | 1.76 | 1.84 | 2.02 |
| 08-00521-00202 | | 1.5 | 0.3 | 0.4 | 0.37 | 12° | 6 | 50 | 1.62 | 1.69 | 1.76 | 1.84 | 2.02 |
| 08-00520-00202 | | 2 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 2.15 | 2.23 | 2.33 | 2.43 | 2.68 |
| 08-00521-00203 | | 2 | 0.3 | 0.4 | 0.37 | 12° | 6 | 50 | 2.15 | 2.23 | 2.33 | 2.43 | 2.68 |
| 08-00520-00205 | | 2.5 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 2.67 | 2.78 | 2.90 | 3.03 | 3.34 |
| 08-00521-00204 | | 2.5 | 0.3 | 0.4 | 0.37 | 12° | 6 | 50 | 2.67 | 2.78 | 2.90 | 3.03 | 3.34 |
| 08-00520-00203 | | 3 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 3.19 | 3.32 | 3.47 | 3.63 | 4.01 |
| 08-00521-00205 | | 3 | 0.3 | 0.4 | 0.37 | 12° | 6 | 50 | 3.19 | 3.32 | 3.47 | 3.63 | 4.01 |
| 08-00520-10202 | | 3.5 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 3.71 | 3.87 | 4.04 | 4.23 | 4.67 |
| 08-00520-00206 | | 4 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 4.23 | 4.41 | 4.61 | 4.83 | 5.33 |
| 08-00520-10203 | | 4.5 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 4.75 | 4.96 | 5.18 | 5.43 | 6.00 |
| 08-00520-00207 | | 5 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 5.27 | 5.50 | 5.75 | 6.02 | 6.66 |
| 08-00520-10204 | | 5.5 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 5.80 | 6.05 | 6.32 | 6.62 | 7.32 |
| 08-00520-10205 | | 6 | 0.3 | 0.4 | 0.37 | 12° | 4 | 45 | 6.32 | 6.59 | 6.89 | 7.22 | 7.99 |
| 08-00520-30251 | R0.25 | 1 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 1.13 | 1.16 | 1.21 | 1.26 | 1.37 |
| 08-00520-10251 | | 1.5 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 1.65 | 1.71 | 1.78 | 1.85 | 2.03 |
| 08-00521-00251 | | 1.5 | 0.35 | 0.5 | 0.46 | 12° | 6 | 50 | 1.65 | 1.71 | 1.78 | 1.85 | 2.03 |
| 08-00520-00251 | | 2 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 2.17 | 2.25 | 2.35 | 2.45 | 2.69 |
| 08-00521-00252 | | 2 | 0.35 | 0.5 | 0.46 | 12° | 6 | 50 | 2.17 | 2.25 | 2.35 | 2.45 | 2.69 |
| 08-00520-10252 | | 2.5 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 2.69 | 2.80 | 2.92 | 3.05 | 3.36 |
| 08-00520-10253 | | 3 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 3.21 | 3.34 | 3.49 | 3.65 | 4.02 |
| 08-00520-10254 | | 3.5 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 3.73 | 3.89 | 4.06 | 4.25 | 4.69 |
| 08-00520-00252 | | 4 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 4.25 | 4.43 | 4.63 | 4.85 | 5.35 |
| 08-00521-00253 | | 4 | 0.35 | 0.5 | 0.46 | 12° | 6 | 50 | 4.25 | 4.43 | 4.63 | 4.85 | 5.35 |
| 08-00520-10255 | | 4.5 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 4.78 | 4.98 | 5.20 | 5.44 | 6.01 |
| 08-00520-00255 | | 5 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 5.30 | 5.52 | 5.77 | 6.04 | 6.68 |
| 08-00521-00254 | | 5 | 0.35 | 0.5 | 0.46 | 12° | 6 | 50 | 5.30 | 5.52 | 5.77 | 6.04 | 6.68 |
| 08-00520-10256 | | 5.5 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 5.82 | 6.07 | 6.34 | 6.64 | 7.34 |
| 08-00520-00253 | | 6 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 6.34 | 6.61 | 6.91 | 7.24 | 8.00 |
| 08-00521-00255 | | 6 | 0.35 | 0.5 | 0.46 | 12° | 6 | 50 | 6.34 | 6.61 | 6.91 | 7.24 | 8.00 |
| 08-00520-10257 | | 7 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 7.38 | 7.70 | 8.05 | 8.44 | 9.33 |
| 08-00520-00254 | | 8 | 0.35 | 0.5 | 0.46 | 12° | 4 | 45 | 8.42 | 8.79 | 9.19 | 9.63 | 10.66 |
| 08-00521-00256 | | 8 | 0.35 | 0.5 | 0.46 | 12° | 6 | 50 | 8.42 | 8.79 | 9.19 | 9.63 | 10.66 |
| 08-00521-30251 | | 9 | 0.35 | 0.5 | 0.46 | 12° | 6 | 55 | 9.47 | 9.88 | 10.33 | 10.83 | 11.99 |
| 08-00521-30252 | | 10 | 0.35 | 0.5 | 0.46 | 12° | 6 | 55 | 10.51 | 10.97 | 11.47 | 12.03 | 13.31 |

# MRB230

## MUGEN COATING 2-Flute Long Neck Ball End Mill





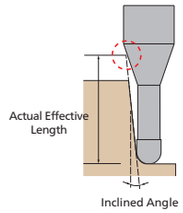

Unit : mm

| Code No. | Radius (R) | Under Neck Length (ℓ1) | Length of Cut (ℓ) | Dia. (D) | 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° |
| 08-00520-40301 | R0.3 | 1 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 1.12 | 1.16 | 1.20 | 1.25 | 1.35 |
| 08-00520-10301 | | 1.5 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 1.64 | 1.71 | 1.77 | 1.84 | 2.02 |
| 08-00520-00301 | | 2 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 2.17 | 2.25 | 2.34 | 2.44 | 2.68 |
| 08-00521-00301 | | 2 | 0.45 | 0.6 | 0.56 | 12° | 6 | 50 | 2.17 | 2.25 | 2.34 | 2.44 | 2.68 |
| 08-00520-10302 | | 2.5 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 2.69 | 2.79 | 2.91 | 3.04 | 3.34 |
| 08-00520-00305 | | 3 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 3.21 | 3.34 | 3.48 | 3.64 | 4.01 |
| 08-00521-00302 | | 3 | 0.45 | 0.6 | 0.56 | 12° | 6 | 50 | 3.21 | 3.34 | 3.48 | 3.64 | 4.01 |
| 08-00520-10303 | | 3.5 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 3.73 | 3.88 | 4.05 | 4.24 | 4.67 |
| 08-00520-00302 | | 4 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 4.25 | 4.43 | 4.62 | 4.84 | 5.33 |
| 08-00521-00303 | | 4 | 0.45 | 0.6 | 0.56 | 12° | 6 | 50 | 4.25 | 4.43 | 4.62 | 4.84 | 5.33 |
| 08-00520-10304 | | 4.5 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 4.77 | 4.97 | 5.19 | 5.43 | 6.00 |
| 08-00520-00306 | | 5 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 5.29 | 5.52 | 5.76 | 6.03 | 6.66 |
| 08-00520-10305 | | 5.5 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 5.82 | 6.06 | 6.33 | 6.63 | 7.32 |
| 08-00520-00303 | | 6 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 6.34 | 6.61 | 6.90 | 7.23 | 7.99 |
| 08-00521-00304 | | 6 | 0.45 | 0.6 | 0.56 | 12° | 6 | 50 | 6.34 | 6.61 | 6.90 | 7.23 | 7.99 |
| 08-00520-10306 | | 6.5 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 6.86 | 7.15 | 7.47 | 7.83 | 8.65 |
| 08-00520-00307 | | 7 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 7.38 | 7.70 | 8.04 | 8.43 | 9.31 |
| 08-00520-10307 | | 7.5 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 7.90 | 8.24 | 8.61 | 9.02 | 9.98 |
| 08-00520-00304 | | 8 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 8.42 | 8.79 | 9.18 | 9.62 | 10.64 |
| 08-00521-00305 | | 8 | 0.45 | 0.6 | 0.56 | 12° | 6 | 50 | 8.42 | 8.79 | 9.18 | 9.62 | 10.64 |
| 08-00520-10308 | | 8.5 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 8.94 | 9.33 | 9.76 | 10.22 | 11.31 |
| 08-00520-10309 | | 9 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 9.47 | 9.88 | 10.33 | 10.82 | 11.97 |
| 08-00520-10310 | | 9.5 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 9.99 | 10.42 | 10.90 | 11.42 | 12.63 |
| 08-00520-10311 | | 10 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 10.51 | 10.97 | 11.47 | 12.02 | 13.30 |
| 08-00521-00306 | | 10 | 0.45 | 0.6 | 0.56 | 12° | 6 | 50 | 10.51 | 10.97 | 11.47 | 12.02 | 13.30 |
| 08-00520-10312 | | 11 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 11.55 | 12.06 | 12.61 | 13.21 | 14.62 |
| 08-00520-10313 | | 12 | 0.45 | 0.6 | 0.56 | 12° | 4 | 45 | 12.59 | 13.14 | 13.75 | 14.41 | 15.95 |
| 08-00520-40351 | R0.35 | 2 | 0.5 | 0.7 | 0.66 | 12° | 4 | 45 | 2.16 | 2.25 | 2.33 | 2.43 | 2.66 |
| 08-00520-40352 | | 4 | 0.5 | 0.7 | 0.66 | 12° | 4 | 45 | 4.25 | 4.42 | 4.62 | 4.83 | 5.32 |
| 08-00520-40353 | | 6 | 0.5 | 0.7 | 0.66 | 12° | 4 | 45 | 6.34 | 6.60 | 6.90 | 7.22 | 7.97 |
| 08-00520-40354 | | 8 | 0.5 | 0.7 | 0.66 | 12° | 4 | 45 | 8.42 | 8.78 | 9.18 | 9.61 | 10.63 |
| 08-00520-00400 | R0.4 | 2 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 2.16 | 2.24 | 2.33 | 2.42 | 2.65 |
| 08-00521-00401 | | 2 | 0.6 | 0.8 | 0.76 | 12° | 6 | 50 | 2.16 | 2.24 | 2.33 | 2.42 | 2.65 |
| 08-00520-10401 | | 3 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 3.20 | 3.33 | 3.47 | 3.62 | 3.97 |
| 08-00521-00402 | | 3 | 0.6 | 0.8 | 0.76 | 12° | 6 | 50 | 3.20 | 3.33 | 3.47 | 3.62 | 3.97 |
| 08-00520-00401 | | 4 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 4.25 | 4.42 | 4.61 | 4.82 | 5.30 |
| 08-00521-00403 | | 4 | 0.6 | 0.8 | 0.76 | 12° | 6 | 50 | 4.25 | 4.42 | 4.61 | 4.82 | 5.30 |
| 08-00520-00405 | | 5 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 5.29 | 5.51 | 5.75 | 6.01 | 6.63 |
| 08-00520-00402 | | 6 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 6.33 | 6.60 | 6.89 | 7.21 | 7.96 |
| 08-00521-00404 | | 6 | 0.6 | 0.8 | 0.76 | 12° | 6 | 50 | 6.33 | 6.60 | 6.89 | 7.21 | 7.96 |
| 08-00520-00406 | | 7 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 7.38 | 7.69 | 8.03 | 8.41 | 9.28 |
| 08-00520-00403 | | 8 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 8.42 | 8.78 | 9.17 | 9.60 | 10.61 |
| 08-00521-00405 | | 8 | 0.6 | 0.8 | 0.76 | 12° | 6 | 50 | 8.42 | 8.78 | 9.17 | 9.60 | 10.61 |
| 08-00520-30401 | | 9 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 9.46 | 9.87 | 10.31 | 10.80 | 11.94 |

**How to Order** When you order, indicate MRB230 (R)×(ℓ1)×(d). ※(γ) is reference value.



MRB230
MUGEN COATING 2-Flute Long Neck Ball End Mill
Regular Line
MUGEN COATING
Long Neck Type
Carbon Steel P
Alloy Steel P
Prehardened Steel P
Hardened Steel ~55 HRC H
Stainless Steel M
Aluminium Alloy N
Copper N
Resin O
Long Neck Ball Coating



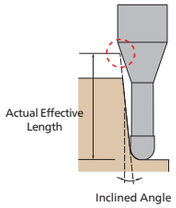

Unit : mm

| Code No. | Radius (R) | Under Neck Length (ℓ1) | Length of Cut (ℓ) | Dia. (D) | 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° |
| 08-00520-00404 | R0.4 | 10 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 10.50 | 10.96 | 11.45 | 12.00 | 13.26 |
| 08-00521-00406 | | 10 | 0.6 | 0.8 | 0.76 | 12° | 6 | 50 | 10.50 | 10.96 | 11.45 | 12.00 | 13.26 |
| 08-00520-20401 | | 12 | 0.6 | 0.8 | 0.76 | 12° | 4 | 45 | 12.59 | 13.14 | 13.73 | 14.39 | 15.92 |
| 08-00520-40451 | R0.45 | 2 | 0.65 | 0.9 | 0.86 | 12° | 4 | 45 | 2.16 | 2.24 | 2.32 | 2.41 | 2.63 |
| 08-00520-40452 | | 4 | 0.65 | 0.9 | 0.86 | 12° | 4 | 45 | 4.25 | 4.42 | 4.60 | 4.81 | 5.29 |
| 08-00520-40453 | | 6 | 0.65 | 0.9 | 0.86 | 12° | 4 | 45 | 6.33 | 6.59 | 6.88 | 7.20 | 7.94 |
| 08-00520-40454 | | 8 | 0.65 | 0.9 | 0.86 | 12° | 4 | 45 | 8.42 | 8.77 | 9.16 | 9.59 | 10.59 |
| 08-00520-40501 | R0.5 | 2 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 2.18 | 2.26 | 2.34 | 2.43 | 2.65 |
| 08-00520-40502 | | 2.5 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 2.70 | 2.80 | 2.91 | 3.03 | 3.31 |
| 08-00520-00505 | | 3 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 3.22 | 3.35 | 3.48 | 3.63 | 3.97 |
| 08-00521-00501 | | 3 | 0.75 | 1 | 0.95 | 12° | 6 | 50 | 3.22 | 3.35 | 3.48 | 3.63 | 3.97 |
| 08-00520-00506 | | 4 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 4.27 | 4.44 | 4.62 | 4.83 | 5.30 |
| 08-00521-00502 | | 4 | 0.75 | 1 | 0.95 | 12° | 6 | 50 | 4.27 | 4.44 | 4.62 | 4.83 | 5.30 |
| 08-00520-00510 | | 5 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 5.31 | 5.53 | 5.76 | 6.02 | 6.63 |
| 08-00521-00503 | | 5 | 0.75 | 1 | 0.95 | 12° | 6 | 50 | 5.31 | 5.53 | 5.76 | 6.02 | 6.63 |
| 08-00520-00501 | | 6 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 6.35 | 6.62 | 6.90 | 7.22 | 7.96 |
| 08-00521-00504 | | 6 | 0.75 | 1 | 0.95 | 12° | 6 | 50 | 6.35 | 6.62 | 6.90 | 7.22 | 7.96 |
| 08-00520-00511 | | 7 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 7.40 | 7.71 | 8.04 | 8.42 | 9.28 |
| 08-00520-00502 | | 8 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 8.44 | 8.79 | 9.18 | 9.61 | 10.61 |
| 08-00521-00505 | | 8 | 0.75 | 1 | 0.95 | 12° | 6 | 50 | 8.44 | 8.79 | 9.18 | 9.61 | 10.61 |
| 08-00520-00512 | | 9 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 9.48 | 9.88 | 10.32 | 10.81 | 11.94 |
| 08-00520-00507 | | 10 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 10.52 | 10.97 | 11.46 | 12.01 | 13.26 |
| 08-00521-00506 | | 10 | 0.75 | 1 | 0.95 | 12° | 6 | 50 | 10.52 | 10.97 | 11.46 | 12.01 | 13.26 |
| 08-00520-00504 | | 12 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 12.61 | 13.15 | 13.75 | 14.40 | 15.92 |
| 08-00521-00507 | | 12 | 0.75 | 1 | 0.95 | 12° | 6 | 50 | 12.61 | 13.15 | 13.75 | 14.40 | 15.92 |
| 08-00520-40503 | | 13 | 0.75 | 1 | 0.95 | 12° | 4 | 45 | 13.65 | 14.24 | 14.89 | 15.59 | 17.25 |
| 08-00520-00513 | | 14 | 0.75 | 1 | 0.95 | 12° | 4 | 50 | 14.70 | 15.33 | 16.03 | 16.79 | 18.57 |
| 08-00520-00508 | | 16 | 0.75 | 1 | 0.95 | 12° | 4 | 50 | 16.78 | 17.51 | 18.31 | 19.18 | 21.23 |
| 08-00521-00508 | | 16 | 0.75 | 1 | 0.95 | 12° | 6 | 60 | 16.78 | 17.51 | 18.31 | 19.18 | 21.23 |
| 08-00520-00514 | | 18 | 0.75 | 1 | 0.95 | 12° | 4 | 55 | 18.87 | 19.69 | 20.59 | 21.58 | 23.88 |
| 08-00520-00509 | | 20 | 0.75 | 1 | 0.95 | 12° | 4 | 55 | 20.95 | 21.87 | 22.87 | 23.97 | 26.54 |
| 08-00521-00509 | | 20 | 0.75 | 1 | 0.95 | 12° | 6 | 60 | 20.95 | 21.87 | 22.87 | 23.97 | 26.54 |
| 08-00521-00510 | | 22 | 0.75 | 1 | 0.95 | 12° | 6 | 60 | 23.04 | 24.05 | 25.15 | 26.36 | 29.19 |
| 08-00520-40601 | R0.6 | 2.4 | 0.9 | 1.2 | 1.15 | 12° | 4 | 45 | 2.59 | 2.68 | 2.78 | 2.89 | 3.15 |
| 08-00520-20601 | | 4 | 0.9 | 1.2 | 1.15 | 12° | 4 | 45 | 4.26 | 4.43 | 4.61 | 4.81 | 5.27 |
| 08-00520-00600 | | 6 | 0.9 | 1.2 | 1.15 | 12° | 4 | 45 | 6.35 | 6.61 | 6.89 | 7.20 | 7.92 |
| 08-00521-00601 | | 6 | 0.9 | 1.2 | 1.15 | 12° | 6 | 50 | 6.35 | 6.61 | 6.89 | 7.20 | 7.92 |
| 08-00520-00601 | | 8 | 0.9 | 1.2 | 1.15 | 12° | 4 | 45 | 8.43 | 8.79 | 9.17 | 9.59 | 10.58 |
| 08-00521-00602 | | 8 | 0.9 | 1.2 | 1.15 | 12° | 6 | 50 | 8.43 | 8.79 | 9.17 | 9.59 | 10.58 |
| 08-00520-00602 | | 10 | 0.9 | 1.2 | 1.15 | 12° | 4 | 45 | 10.52 | 10.96 | 11.45 | 11.99 | 13.23 |
| 08-00521-00603 | | 10 | 0.9 | 1.2 | 1.15 | 12° | 6 | 50 | 10.52 | 10.96 | 11.45 | 11.99 | 13.23 |
| 08-00520-00603 | | 12 | 0.9 | 1.2 | 1.15 | 12° | 4 | 45 | 12.61 | 13.14 | 13.73 | 14.38 | 15.89 |
| 08-00521-00604 | | 12 | 0.9 | 1.2 | 1.15 | 12° | 6 | 50 | 12.61 | 13.14 | 13.73 | 14.38 | 15.89 |
| 08-00520-10601 | | 14 | 0.9 | 1.2 | 1.15 | 12° | 4 | 50 | 14.69 | 15.32 | 16.01 | 16.77 | 18.54 |

# MRB230

## MUGEN COATING 2-Flute Long Neck Ball End Mill






Unit : mm

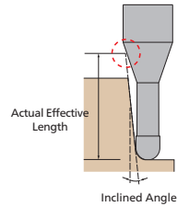
| Code No. | Radius (R) | Under Neck Length (ℓ1) | Length of Cut (ℓ) | Dia. (D) | Neck Dia. (d2) | Neck Taper Angle (γ) | Shank Dia. (d) | Overall Length (L) | Actual effective length depending on inclined angle of workpiece | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 30´ | 1° | 1°30´ | 2° | 3° |
| 08-00520-10602 | R0.6 | 16 | 0.9 | 1.2 | 1.15 | 12° | 4 | 50 | 16.78 | 17.50 | 18.29 | 19.17 | 21.20 |
| 08-00521-00605 | | 16 | 0.9 | 1.2 | 1.15 | 12° | 6 | 60 | 16.78 | 17.50 | 18.29 | 19.17 | 21.20 |
| 08-00520-20602 | | 18 | 0.9 | 1.2 | 1.15 | 12° | 4 | 55 | 18.86 | 19.68 | 20.58 | 21.56 | 23.85 |
| 08-00520-30601 | | 20 | 0.9 | 1.2 | 1.15 | 12° | 4 | 55 | 20.95 | 21.86 | 22.86 | 23.95 | 26.50 |
| 08-00520-20603 | | 24 | 0.9 | 1.2 | 1.15 | 12° | 4 | 60 | 25.12 | 26.22 | 27.42 | 28.74 | Free |
| 08-00520-30701 | R0.7 | 8 | 1 | 1.4 | 1.35 | 12° | 4 | 45 | 8.43 | 8.78 | 9.16 | 9.57 | 10.55 |
| 08-00520-30702 | | 12 | 1 | 1.4 | 1.35 | 12° | 4 | 50 | 12.60 | 13.13 | 13.72 | 14.36 | 15.85 |
| 08-00520-30703 | | 16 | 1 | 1.4 | 1.35 | 12° | 4 | 50 | 16.77 | 17.49 | 18.28 | 19.15 | 21.16 |
| 08-00520-30751 | R0.75 | 3 | 1.1 | 1.5 | 1.45 | 12° | 4 | 45 | 3.21 | 3.33 | 3.45 | 3.58 | 3.89 |
| 08-00520-20751 | | 4 | 1.1 | 1.5 | 1.45 | 12° | 4 | 45 | 4.26 | 4.41 | 4.59 | 4.78 | 5.22 |
| 08-00520-20752 | | 6 | 1.1 | 1.5 | 1.45 | 12° | 4 | 45 | 6.34 | 6.59 | 6.87 | 7.17 | 7.88 |
| 08-00520-00751 | | 8 | 1.1 | 1.5 | 1.45 | 12° | 4 | 45 | 8.43 | 8.77 | 9.15 | 9.56 | 10.53 |
| 08-00521-00751 | | 8 | 1.1 | 1.5 | 1.45 | 12° | 6 | 50 | 8.43 | 8.77 | 9.15 | 9.56 | 10.53 |
| 08-00520-00752 | | 10 | 1.1 | 1.5 | 1.45 | 12° | 4 | 45 | 10.51 | 10.95 | 11.43 | 11.96 | 13.18 |
| 08-00520-00753 | | 12 | 1.1 | 1.5 | 1.45 | 12° | 4 | 45 | 12.60 | 13.13 | 13.71 | 14.35 | 15.84 |
| 08-00521-00752 | | 12 | 1.1 | 1.5 | 1.45 | 12° | 6 | 50 | 12.60 | 13.13 | 13.71 | 14.35 | 15.84 |
| 08-00520-00754 | | 14 | 1.1 | 1.5 | 1.45 | 12° | 4 | 50 | 14.69 | 15.31 | 15.99 | 16.74 | 18.49 |
| 08-00520-00755 | | 16 | 1.1 | 1.5 | 1.45 | 12° | 4 | 50 | 16.77 | 17.49 | 18.27 | 19.14 | 21.15 |
| 08-00521-00755 | | 16 | 1.1 | 1.5 | 1.45 | 12° | 6 | 60 | 16.77 | 17.49 | 18.27 | 19.14 | 21.15 |
| 08-00520-00756 | | 18 | 1.1 | 1.5 | 1.45 | 12° | 4 | 55 | 18.86 | 19.67 | 20.55 | 21.53 | 23.80 |
| 08-00520-00757 | | 20 | 1.1 | 1.5 | 1.45 | 12° | 4 | 55 | 20.94 | 21.85 | 22.84 | 23.92 | Free |
| 08-00521-00757 | | 20 | 1.1 | 1.5 | 1.45 | 12° | 6 | 60 | 20.94 | 21.85 | 22.84 | 23.92 | 26.46 |
| 08-00520-10751 | | 22 | 1.1 | 1.5 | 1.45 | 12° | 4 | 55 | 23.03 | 24.02 | 25.12 | 26.32 | Free |
| 08-00520-20753 | | 30 | 1.1 | 1.5 | 1.45 | 12° | 4 | 70 | 31.37 | 32.74 | 34.24 | 35.89 | Free |
| 08-00520-20801 | R0.8 | 4 | 1.2 | 1.6 | 1.55 | 12° | 4 | 45 | 4.25 | 4.41 | 4.58 | 4.77 | 5.21 |
| 08-00520-00801 | | 8 | 1.2 | 1.6 | 1.55 | 12° | 4 | 45 | 8.43 | 8.77 | 9.14 | 9.55 | 10.51 |
| 08-00520-00803 | | 12 | 1.2 | 1.6 | 1.55 | 12° | 4 | 45 | 12.60 | 13.13 | 13.70 | 14.34 | 15.82 |
| 08-00520-00805 | | 16 | 1.2 | 1.6 | 1.55 | 12° | 4 | 50 | 16.77 | 17.48 | 18.27 | 19.13 | 21.13 |
| 08-00520-00807 | | 20 | 1.2 | 1.6 | 1.55 | 12° | 4 | 55 | 20.94 | 21.84 | 22.83 | 23.91 | Free |
| 08-00520-30901 | R0.9 | 8 | 1.3 | 1.8 | 1.75 | 12° | 4 | 45 | 8.42 | 8.76 | 9.13 | 9.53 | 10.48 |
| 08-00520-30902 | | 12 | 1.3 | 1.8 | 1.75 | 12° | 4 | 45 | 12.59 | 13.12 | 13.69 | 14.32 | 15.79 |
| 08-00520-30903 | | 16 | 1.3 | 1.8 | 1.75 | 12° | 4 | 50 | 16.76 | 17.47 | 18.25 | 19.11 | 21.10 |
| 08-00520-30904 | | 20 | 1.3 | 1.8 | 1.75 | 12° | 4 | 55 | 20.94 | 21.83 | 22.81 | 23.89 | Free |
| 08-00520-31001 | R1 | 3 | 1.5 | 2 | 1.94 | 12° | 4 | 45 | 3.23 | 3.33 | 3.44 | 3.56 | 3.85 |
| 08-00520-01000 | | 4 | 1.5 | 2 | 1.94 | 12° | 4 | 45 | 4.27 | 4.42 | 4.58 | 4.76 | 5.17 |
| 08-00521-01000 | | 4 | 1.5 | 2 | 1.94 | 12° | 6 | 50 | 4.27 | 4.42 | 4.58 | 4.76 | 5.17 |
| 08-00520-01001 | | 6 | 1.5 | 2 | 1.94 | 12° | 4 | 45 | 6.36 | 6.60 | 6.86 | 7.15 | 7.83 |
| 08-00521-01001 | | 6 | 1.5 | 2 | 1.94 | 12° | 6 | 50 | 6.36 | 6.60 | 6.86 | 7.15 | 7.83 |
| 08-00520-01002 | | 8 | 1.5 | 2 | 1.94 | 12° | 4 | 45 | 8.44 | 8.78 | 9.14 | 9.54 | 10.48 |
| 08-00521-01002 | | 8 | 1.5 | 2 | 1.94 | 12° | 6 | 50 | 8.44 | 8.78 | 9.14 | 9.54 | 10.48 |
| 08-00520-01003 | | 10 | 1.5 | 2 | 1.94 | 12° | 4 | 45 | 10.53 | 10.95 | 11.42 | 11.94 | 13.14 |
| 08-00521-01003 | | 10 | 1.5 | 2 | 1.94 | 12° | 6 | 50 | 10.53 | 10.95 | 11.42 | 11.94 | 13.14 |
| 08-00520-01004 | | 12 | 1.5 | 2 | 1.94 | 12° | 4 | 45 | 12.61 | 13.13 | 13.70 | 14.33 | 15.79 |
| 08-00521-01004 | | 12 | 1.5 | 2 | 1.94 | 12° | 6 | 50 | 12.61 | 13.13 | 13.70 | 14.33 | 15.79 |

**How to Order** When you order, indicate MRB230 (R)×(ℓ1)×(d). ※(γ) is reference value.



MRB230

MUGEN COATING 2-Flute Long Neck Ball End Mill



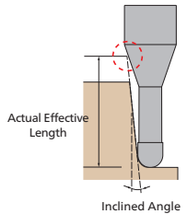

Unit : mm

| Code No. | Radius (R) | Under Neck Length (ℓ1) | Length of Cut (ℓ) | Dia. (D) | 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° |
| 08-00520-41001 | R1 | 13 | 1.5 | 2 | 1.94 | 12° | 4 | 45 | 13.66 | 14.22 | 14.84 | 15.53 | 17.12 |
| 08-00520-01005 | | 14 | 1.5 | 2 | 1.94 | 12° | 4 | 50 | 14.70 | 15.31 | 15.98 | 16.72 | 18.45 |
| 08-00520-01006 | | 16 | 1.5 | 2 | 1.94 | 12° | 4 | 50 | 16.78 | 17.49 | 18.27 | 19.12 | Free |
| 08-00521-01005 | | 16 | 1.5 | 2 | 1.94 | 12° | 6 | 60 | 16.78 | 17.49 | 18.27 | 19.12 | 21.10 |
| 08-00520-01007 | | 18 | 1.5 | 2 | 1.94 | 12° | 4 | 55 | 18.87 | 19.67 | 20.55 | 21.51 | Free |
| 08-00520-01008 | | 20 | 1.5 | 2 | 1.94 | 12° | 4 | 55 | 20.96 | 21.85 | 22.83 | 23.90 | Free |
| 08-00521-01008 | | 20 | 1.5 | 2 | 1.94 | 12° | 6 | 60 | 20.96 | 21.85 | 22.83 | 23.90 | 26.41 |
| 08-00520-01009 | | 22 | 1.5 | 2 | 1.94 | 12° | 4 | 60 | 23.04 | 24.03 | 25.11 | 26.30 | Free |
| 08-00520-01010 | | 25 | 1.5 | 2 | 1.94 | 12° | 4 | 65 | 26.17 | 27.30 | 28.53 | Free | Free |
| 08-00521-01010 | | 25 | 1.5 | 2 | 1.94 | 12° | 6 | 80 | 26.17 | 27.30 | 28.53 | 29.89 | 33.04 |
| 08-00520-01011 | | 30 | 1.5 | 2 | 1.94 | 12° | 4 | 70 | 31.38 | 32.74 | 34.23 | Free | Free |
| 08-00521-01012 | | 30 | 1.5 | 2 | 1.94 | 12° | 6 | 80 | 31.38 | 32.74 | 34.23 | 35.87 | Free |
| 08-00520-11001 | | 35 | 1.5 | 2 | 1.94 | 12° | 4 | 70 | 36.60 | 38.19 | Free | Free | Free |
| 08-00521-01014 | | 35 | 1.5 | 2 | 1.94 | 12° | 6 | 80 | 36.60 | 38.19 | 39.93 | 41.85 | Free |
| 08-00520-31002 | | 40 | 1.5 | 2 | 1.94 | 12° | 4 | 90 | 41.81 | 43.64 | Free | Free | Free |
| 08-00521-01015 | | 40 | 1.5 | 2 | 1.94 | 12° | 6 | 90 | 41.81 | 43.64 | 45.64 | 47.83 | Free |
| 08-00520-21251 | R1.25 | 6 | 2.3 | 2.5 | 2.4 | 12° | 4 | 45 | 6.44 | 6.68 | 6.93 | 7.21 | 7.87 |
| 08-00520-11251 | | 10 | 2.3 | 2.5 | 2.4 | 12° | 4 | 45 | 10.62 | 11.04 | 11.49 | 12.00 | 13.18 |
| 08-00520-11252 | | 15 | 2.3 | 2.5 | 2.4 | 12° | 4 | 50 | 15.83 | 16.48 | 17.20 | 17.98 | Free |
| 08-00520-11253 | | 20 | 2.3 | 2.5 | 2.4 | 12° | 4 | 55 | 21.04 | 21.93 | 22.90 | Free | Free |
| 08-00520-11254 | | 25 | 2.3 | 2.5 | 2.4 | 12° | 4 | 65 | 26.26 | 27.38 | 28.60 | Free | Free |
| 08-00520-11255 | | 30 | 2.3 | 2.5 | 2.4 | 12° | 4 | 70 | 31.47 | 32.82 | Free | Free | Free |
| 08-00520-21252 | | 35 | 2.3 | 2.5 | 2.4 | 12° | 4 | 70 | 36.69 | 38.27 | Free | Free | Free |
| 08-00520-31502 | R1.5 | 6 | 2.5 | 3 | 2.85 | 12° | 4 | 60 | 6.56 | 6.78 | 7.03 | 7.31 | 7.95 |
| 08-00520-31503 | | 6 | 2.5 | 3 | 2.85 | 12° | 6 | 60 | 6.56 | 6.78 | 7.03 | 7.31 | 7.95 |
| 08-00520-01500 | | 8 | 2.5 | 3 | 2.85 | 12° | 6 | 60 | 8.64 | 8.96 | 9.31 | 9.70 | 10.60 |
| 08-00520-01501 | | 10 | 2.5 | 3 | 2.85 | 12° | 6 | 60 | 10.73 | 11.14 | 11.59 | 12.09 | 13.26 |
| 08-00520-31504 | | 12 | 2.5 | 3 | 2.85 | 12° | 6 | 60 | 12.81 | 13.32 | 13.88 | 14.49 | 15.91 |
| 08-00520-31505 | | 14 | 2.5 | 3 | 2.85 | 12° | 6 | 60 | 14.90 | 15.50 | 16.16 | 16.88 | 18.57 |
| 08-00520-01503 | | 15 | 2.5 | 3 | 2.85 | 12° | 6 | 60 | 15.94 | 16.59 | 17.30 | 18.08 | 19.89 |
| 08-00520-31506 | | 16 | 2.5 | 3 | 2.85 | 12° | 6 | 60 | 16.98 | 17.68 | 18.44 | 19.27 | 21.22 |
| 08-00520-01505 | | 20 | 2.5 | 3 | 2.85 | 12° | 6 | 65 | 21.16 | 22.04 | 23.00 | 24.06 | 26.53 |
| 08-00520-01506 | | 25 | 2.5 | 3 | 2.85 | 12° | 6 | 65 | 26.37 | 27.48 | 28.70 | 30.04 | Free |
| 08-00520-01507 | | 30 | 2.5 | 3 | 2.85 | 12° | 6 | 70 | 31.58 | 32.93 | 34.40 | 36.03 | Free |
| 08-00520-01508 | | 35 | 2.5 | 3 | 2.85 | 12° | 6 | 80 | 36.80 | 38.38 | 40.11 | 42.01 | Free |
| 08-00520-11501 | | 40 | 2.5 | 3 | 2.85 | 12° | 6 | 90 | 42.01 | 43.83 | 45.81 | Free | Free |
| 08-00520-11751 | R1.75 | 10 | 2.8 | 3.5 | 3.35 | 12° | 6 | 60 | 10.72 | 11.12 | 11.56 | 12.05 | 13.18 |
| 08-00520-11752 | | 15 | 2.8 | 3.5 | 3.35 | 12° | 6 | 60 | 15.93 | 16.57 | 17.26 | 18.03 | 19.81 |
| 08-00520-11753 | | 20 | 2.8 | 3.5 | 3.35 | 12° | 6 | 65 | 21.14 | 22.01 | 22.96 | 24.01 | Free |
| 08-00520-11754 | | 25 | 2.8 | 3.5 | 3.35 | 12° | 6 | 65 | 26.36 | 27.46 | 28.67 | 29.99 | Free |
| 08-00520-11755 | | 30 | 2.8 | 3.5 | 3.35 | 12° | 6 | 70 | 31.57 | 32.91 | 34.37 | 35.98 | Free |
| 08-00520-11756 | | 35 | 2.8 | 3.5 | 3.35 | 12° | 6 | 80 | 36.79 | 38.36 | 40.07 | Free | Free |
| 08-00520-11757 | | 40 | 2.8 | 3.5 | 3.35 | 12° | 6 | 90 | 42.00 | 43.80 | 45.77 | Free | Free |
| 08-00520-11758 | | 45 | 2.8 | 3.5 | 3.35 | 12° | 6 | 90 | 47.22 | 49.25 | Free | Free | Free |

# MRB230

## MUGEN COATING 2-Flute Long Neck Ball End Mill






Unit : mm

| Code No. | Radius (R) | Under Neck Length (ℓ1) | Length of Cut (ℓ) | Dia. (D) | 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° |
| 08-00520-02000 | R2 | 10 | 3 | 4 | 3.8 | 12° | 6 | 65 | 10.83 | 11.22 | 11.66 | 12.14 | 13.25 |
| 08-00520-32001 | | 12 | 3 | 4 | 3.8 | 12° | 6 | 65 | 12.91 | 13.40 | 13.94 | 14.53 | 15.91 |
| 08-00520-32002 | | 14 | 3 | 4 | 3.8 | 12° | 6 | 65 | 15.00 | 15.58 | 16.22 | 16.92 | 18.56 |
| 08-00520-02001 | | 15 | 3 | 4 | 3.8 | 12° | 6 | 65 | 16.04 | 16.67 | 17.36 | 18.12 | 19.89 |
| 08-00520-32003 | | 16 | 3 | 4 | 3.8 | 12° | 6 | 65 | 17.09 | 17.76 | 18.50 | 19.32 | Free |
| 08-00520-02003 | | 20 | 3 | 4 | 3.8 | 12° | 6 | 65 | 21.26 | 22.12 | 23.06 | 24.10 | Free |
| 08-00520-02004 | | 25 | 3 | 4 | 3.8 | 12° | 6 | 70 | 26.47 | 27.57 | 28.77 | 30.09 | Free |
| 08-00520-02005 | | 30 | 3 | 4 | 3.8 | 12° | 6 | 70 | 31.68 | 33.01 | 34.47 | Free | Free |
| 08-00520-02006 | | 35 | 3 | 4 | 3.8 | 12° | 6 | 80 | 36.90 | 38.46 | Free | Free | Free |
| 08-00520-02007 | | 40 | 3 | 4 | 3.8 | 12° | 6 | 85 | 42.11 | 43.91 | Free | Free | Free |
| 08-00520-02008 | | 45 | 3 | 4 | 3.8 | 12° | 6 | 90 | 47.33 | 49.36 | Free | Free | Free |
| 08-00520-02009 | | 50 | 3 | 4 | 3.8 | 12° | 6 | 100 | 52.54 | 54.80 | Free | Free | Free |
| 08-00520-32501 | R2.5 | 10 | 3.5 | 5 | 4.8 | 12° | 6 | 70 | 10.81 | 11.18 | 11.59 | 12.04 | Free |
| 08-00520-12501 | | 15 | 3.5 | 5 | 4.8 | 12° | 6 | 70 | 16.02 | 16.63 | 17.29 | Free | Free |
| 08-00520-02501 | | 20 | 3.5 | 5 | 4.8 | 12° | 6 | 70 | 21.24 | 22.08 | Free | Free | Free |
| 08-00520-02502 | | 25 | 3.5 | 5 | 4.8 | 12° | 6 | 70 | 26.45 | 27.52 | Free | Free | Free |
| 08-00520-02503 | | 30 | 3.5 | 5 | 4.8 | 12° | 6 | 80 | 31.66 | Free | Free | Free | Free |
| 08-00520-02504 | | 35 | 3.5 | 5 | 4.8 | 12° | 6 | 80 | 36.88 | Free | Free | Free | Free |
| 08-00520-12502 | | 40 | 3.5 | 5 | 4.8 | 12° | 6 | 90 | 42.09 | Free | Free | Free | Free |
| 08-00520-12503 | | 45 | 3.5 | 5 | 4.8 | 12° | 6 | 100 | 47.31 | Free | Free | Free | Free |
| 08-00520-12504 | | 50 | 3.5 | 5 | 4.8 | 12° | 6 | 100 | 52.52 | Free | Free | Free | Free |
| 08-00520-33001 | R3 | 10 | 6 | 6 | 5.8 | – | 6 | 70 | Free | Free | Free | Free | Free |
| 08-00520-43001 | | 15 | 6 | 6 | 5.8 | – | 6 | 70 | Free | Free | Free | Free | Free |
| 08-00520-13001 | | 20 | 6 | 6 | 5.8 | – | 6 | 70 | Free | Free | Free | Free | Free |
| 08-00520-13002 | | 25 | 6 | 6 | 5.8 | – | 6 | 70 | Free | Free | Free | Free | Free |
| 08-00520-03001 | | 30 | 6 | 6 | 5.8 | – | 6 | 80 | Free | Free | Free | Free | Free |
| 08-00520-13003 | | 35 | 6 | 6 | 5.8 | – | 6 | 80 | Free | Free | Free | Free | Free |
| 08-00520-13004 | | 40 | 6 | 6 | 5.8 | – | 6 | 90 | Free | Free | Free | Free | Free |
| 08-00520-13005 | | 45 | 6 | 6 | 5.8 | – | 6 | 100 | Free | Free | Free | Free | Free |
| 08-00520-03003 | | 50 | 6 | 6 | 5.8 | – | 6 | 120 | Free | Free | Free | Free | Free |

**How to Order** When you order, indicate MRB230 (R)×(ℓ1)×(d). ※(γ) is reference value.



MRB230

## Recommended Milling Conditions

Regular Line
MUGEN COATING
Long Neck Type
P Carbon Steel
P Alloy Steel
P Prehardened Steel
H ~55 HRC Hardened Steel
M Stainless Steel
N Aluminium Alloy
N Copper
O Resin
Long Neck Ball Coating

| Work Material | | | Carbon Steels・Prehardened Steels S50C・NAK・HPM1 (~45HRC) | | | | Hardened Steels SKD・STAVAX・HPM38 (~55HRC) | | | | Copper | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Radius | Under Neck Length | L/D | Depth of Cut | | Feed | Spindle Speed | Depth of Cut | | Feed | Spindle Speed | Depth of Cut | | Feed | Spindle Speed |
| | | | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ | ap mm | ae mm | mm/min | $min^{-1}$ |
| 0.05 | 0.3 | 3 | 0.005 | 0.005 | 80 | 20,000~50,000 | 0.003 | 0.003 | 60 | 20,000~50,000 | 0.005 | 0.005 | 80 | 20,000~50,000 |
| | 0.5 | 5 | 0.003 | 0.003 | 70 | 20,000~50,000 | 0.003 | 0.003 | 40 | 20,000~50,000 | 0.005 | 0.005 | 70 | 20,000~50,000 |
| 0.075 | 0.3 | 2 | 0.005 | 0.015 | 150 | 20,000~50,000 | 0.003 | 0.005 | 120 | 20,000~50,000 | 0.008 | 0.01 | 150 | 20,000~50,000 |
| | 0.5 | 3.33 | 0.004 | 0.007 | 150 | 20,000~50,000 | 0.003 | 0.005 | 120 | 20,000~50,000 | 0.007 | 0.008 | 150 | 20,000~50,000 |
| | 1 | 6.67 | 0.003 | 0.005 | 100 | 20,000~50,000 | 0.002 | 0.003 | 70 | 20,000~50,000 | 0.005 | 0.007 | 100 | 20,000~50,000 |
| 0.1 | 0.5 | 2.5 | 0.01 | 0.02 | 250 | 20,000~50,000 | 0.01 | 0.01 | 210 | 20,000~50,000 | 0.01 | 0.02 | 250 | 20,000~50,000 |
| | 0.75 | 3.75 | 0.007 | 0.01 | 250 | 20,000~50,000 | 0.005 | 0.01 | 210 | 20,000~50,000 | 0.01 | 0.015 | 250 | 20,000~50,000 |
| | 1 | 5 | 0.005 | 0.01 | 250 | 20,000~50,000 | 0.003 | 0.005 | 210 | 20,000~50,000 | 0.008 | 0.015 | 250 | 20,000~50,000 |
| | 1.25 | 6.25 | 0.003 | 0.01 | 150 | 20,000~50,000 | 0.003 | 0.005 | 120 | 20,000~50,000 | 0.005 | 0.015 | 150 | 20,000~50,000 |
| | 1.5 | 7.5 | 0.003 | 0.01 | 150 | 20,000~50,000 | 0.003 | 0.005 | 120 | 20,000~50,000 | 0.005 | 0.015 | 150 | 20,000~50,000 |
| | 1.75 | 8.75 | 0.003 | 0.007 | 150 | 20,000~50,000 | 0.002 | 0.005 | 120 | 20,000~50,000 | 0.005 | 0.01 | 150 | 20,000~50,000 |
| | 2 | 10 | 0.003 | 0.005 | 100 | 20,000~50,000 | 0.002 | 0.003 | 80 | 20,000~50,000 | 0.005 | 0.007 | 100 | 20,000~50,000 |
| | 2.5 | 12.5 | 0.003 | 0.005 | 100 | 20,000~50,000 | 0.002 | 0.003 | 80 | 20,000~50,000 | 0.005 | 0.007 | 100 | 20,000~50,000 |
| | 3 | 15 | 0.002 | 0.003 | 80 | 20,000~50,000 | 0.002 | 0.002 | 60 | 20,000~50,000 | 0.003 | 0.004 | 80 | 20,000~50,000 |
| 0.15 | 0.5 | 1.7 | 0.01 | 0.02 | 250 | 20,000~50,000 | 0.01 | 0.015 | 210 | 20,000~50,000 | 0.012 | 0.025 | 250 | 20,000~50,000 |
| | 0.6 | 2 | 0.01 | 0.02 | 250 | 20,000~50,000 | 0.01 | 0.015 | 210 | 20,000~50,000 | 0.012 | 0.025 | 250 | 20,000~50,000 |
| | 0.75 | 2.5 | 0.008 | 0.015 | 250 | 20,000~50,000 | 0.007 | 0.01 | 210 | 20,000~50,000 | 0.01 | 0.02 | 250 | 20,000~50,000 |
| | 1 | 3.3 | 0.007 | 0.01 | 250 | 20,000~50,000 | 0.005 | 0.01 | 210 | 20,000~50,000 | 0.01 | 0.02 | 250 | 20,000~50,000 |
| | 1.25 | 4.2 | 0.005 | 0.01 | 250 | 20,000~50,000 | 0.005 | 0.005 | 210 | 20,000~50,000 | 0.008 | 0.015 | 250 | 20,000~50,000 |
| | 1.5 | 5 | 0.005 | 0.01 | 200 | 20,000~50,000 | 0.005 | 0.005 | 170 | 20,000~50,000 | 0.008 | 0.015 | 200 | 20,000~50,000 |
| | 1.75 | 5.8 | 0.005 | 0.01 | 200 | 20,000~50,000 | 0.005 | 0.005 | 170 | 20,000~50,000 | 0.008 | 0.015 | 200 | 20,000~50,000 |
| | 2 | 6.7 | 0.003 | 0.01 | 150 | 20,000~50,000 | 0.003 | 0.005 | 120 | 20,000~50,000 | 0.005 | 0.012 | 150 | 20,000~50,000 |
| | 2.25 | 7.5 | 0.003 | 0.01 | 150 | 20,000~50,000 | 0.003 | 0.005 | 120 | 20,000~50,000 | 0.005 | 0.012 | 150 | 20,000~50,000 |
| | 2.5 | 8.3 | 0.003 | 0.007 | 150 | 20,000~50,000 | 0.003 | 0.003 | 120 | 20,000~50,000 | 0.005 | 0.01 | 150 | 20,000~50,000 |
| | 2.75 | 9.2 | 0.003 | 0.007 | 150 | 20,000~50,000 | 0.003 | 0.003 | 120 | 20,000~50,000 | 0.005 | 0.01 | 150 | 20,000~50,000 |
| | 3 | 10 | 0.003 | 0.005 | 150 | 20,000~50,000 | 0.003 | 0.003 | 120 | 20,000~50,000 | 0.005 | 0.007 | 150 | 20,000~50,000 |
| | 3.5 | 11.7 | 0.003 | 0.005 | 100 | 20,000~50,000 | 0.003 | 0.003 | 80 | 20,000~50,000 | 0.005 | 0.007 | 100 | 20,000~50,000 |
| | 4 | 13.3 | 0.003 | 0.005 | 100 | 20,000~50,000 | 0.003 | 0.003 | 80 | 20,000~50,000 | 0.005 | 0.007 | 100 | 20,000~50,000 |
| | 4.5 | 15 | 0.003 | 0.003 | 80 | 20,000~50,000 | 0.003 | 0.003 | 80 | 20,000~50,000 | 0.005 | 0.005 | 80 | 20,000~50,000 |
| | 5 | 16.7 | 0.003 | 0.003 | 80 | 20,000~50,000 | 0.003 | 0.003 | 80 | 20,000~50,000 | 0.005 | 0.005 | 80 | 20,000~50,000 |
| 0.2 | 0.5 | 1.25 | 0.02 | 0.05 | 800 | 20,000~50,000 | 0.02 | 0.03 | 650 | 20,000~50,000 | 0.03 | 0.07 | 800 | 20,000~50,000 |
| | 0.75 | 1.9 | 0.02 | 0.05 | 800 | 20,000~50,000 | 0.02 | 0.03 | 650 | 20,000~50,000 | 0.03 | 0.07 | 800 | 20,000~50,000 |
| | 1 | 2.5 | 0.02 | 0.05 | 800 | 20,000~50,000 | 0.02 | 0.03 | 650 | 20,000~50,000 | 0.03 | 0.07 | 800 | 20,000~50,000 |
| | 1.5 | 3.8 | 0.02 | 0.03 | 700 | 20,000~50,000 | 0.01 | 0.02 | 600 | 20,000~50,000 | 0.03 | 0.05 | 700 | 20,000~50,000 |
| | 2 | 5 | 0.015 | 0.02 | 600 | 20,000~50,000 | 0.01 | 0.015 | 500 | 20,000~50,000 | 0.02 | 0.03 | 600 | 20,000~50,000 |
| | 2.5 | 6.3 | 0.015 | 0.02 | 450 | 20,000~50,000 | 0.01 | 0.015 | 380 | 20,000~50,000 | 0.02 | 0.03 | 450 | 20,000~50,000 |
| | 3 | 7.5 | 0.01 | 0.02 | 400 | 20,000~30,000 | 0.01 | 0.01 | 340 | 20,000~30,000 | 0.015 | 0.03 | 400 | 20,000~30,000 |
| | 3.5 | 8.8 | 0.01 | 0.015 | 350 | 20,000~30,000 | 0.01 | 0.01 | 300 | 20,000~30,000 | 0.015 | 0.02 | 350 | 20,000~30,000 |
| | 4 | 10 | 0.005 | 0.01 | 250 | 20,000~30,000 | 0.005 | 0.007 | 210 | 20,000~30,000 | 0.008 | 0.015 | 250 | 20,000~30,000 |
| | 4.5 | 11.3 | 0.005 | 0.007 | 200 | 20,000~30,000 | 0.005 | 0.005 | 170 | 20,000~30,000 | 0.008 | 0.01 | 200 | 20,000~30,000 |
| | 5 | 12.5 | 0.003 | 0.005 | 150 | 20,000~30,000 | 0.003 | 0.005 | 120 | 20,000~30,000 | 0.005 | 0.007 | 150 | 20,000~30,000 |
| | 5.5 | 13.8 | 0.003 | 0.005 | 100 | 20,000~30,000 | 0.003 | 0.005 | 80 | 20,000~30,000 | 0.005 | 0.007 | 100 | 20,000~30,000 |
| | 6 | 15 | 0.003 | 0.003 | 80 | 20,000~30,000 | 0.003 | 0.003 | 60 | 20,000~30,000 | 0.005 | 0.005 | 80 | 20,000~30,000 |
| 0.25 | 1 | 2 | 0.03 | 0.05 | 800 | 20,000~50,000 | 0.02 | 0.05 | 680 | 20,000~50,000 | 0.045 | 0.07 | 800 | 20,000~50,000 |
| | 1.5 | 3 | 0.03 | 0.05 | 700 | 20,000~50,000 | 0.02 | 0.04 | 600 | 20,000~50,000 | 0.04 | 0.07 | 700 | 20,000~50,000 |
| | 2 | 4 | 0.02 | 0.04 | 600 | 20,000~50,000 | 0.02 | 0.03 | 510 | 20,000~50,000 | 0.03 | 0.06 | 600 | 20,000~50,000 |
| | 2.5 | 5 | 0.015 | 0.04 | 600 | 20,000~50,000 | 0.01 | 0.03 | 510 | 20,000~50,000 | 0.02 | 0.06 | 600 | 20,000~50,000 |
| | 3 | 6 | 0.015 | 0.035 | 500 | 20,000~50,000 | 0.01 | 0.025 | 420 | 20,000~50,000 | 0.02 | 0.05 | 500 | 20,000~50,000 |
| | 3.5 | 7 | 0.015 | 0.03 | 400 | 20,000~50,000 | 0.01 | 0.02 | 340 | 20,000~50,000 | 0.02 | 0.045 | 400 | 20,000~50,000 |

# MRB230

## Recommended Milling Conditions



| Work Material | | | Carbon Steels・Prehardened Steels S50C・NAK・HPM1 (~45HRC) | | | | Hardened Steels SKD・STAVAX・HPM38 (~55HRC) | | | | Copper | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Radius | Under Neck Length | L/D | Depth of Cut | | Feed | Spindle Speed | Depth of Cut | | Feed | Spindle Speed | Depth of Cut | | Feed | Spindle Speed |
| | | | ap mm | ae mm | mm/min | min$^{-1}$ | ap mm | ae mm | mm/min | min$^{-1}$ | ap mm | ae mm | mm/min | min$^{-1}$ |
| 0.25 | 4 | 8 | 0.012 | 0.02 | 400 | 20,000~50,000 | 0.005 | 0.01 | 340 | 20,000~50,000 | 0.018 | 0.03 | 400 | 20,000~50,000 |
| | 4.5 | 9 | 0.008 | 0.01 | 320 | 20,000~50,000 | 0.005 | 0.005 | 270 | 20,000~50,000 | 0.012 | 0.015 | 320 | 20,000~50,000 |
| | 5 | 10 | 0.005 | 0.01 | 250 | 20,000~30,000 | 0.005 | 0.005 | 210 | 20,000~30,000 | 0.008 | 0.015 | 250 | 20,000~30,000 |
| | 5.5 | 11 | 0.005 | 0.007 | 200 | 20,000~30,000 | 0.003 | 0.003 | 170 | 20,000~30,000 | 0.008 | 0.01 | 200 | 20,000~30,000 |
| | 6 | 12 | 0.005 | 0.005 | 150 | 20,000~30,000 | 0.003 | 0.003 | 120 | 20,000~30,000 | 0.008 | 0.008 | 150 | 20,000~30,000 |
| | 7 | 14 | 0.003 | 0.005 | 120 | 20,000~30,000 | 0.003 | 0.003 | 100 | 20,000~30,000 | 0.005 | 0.008 | 120 | 20,000~30,000 |
| | 8 | 16 | 0.003 | 0.003 | 120 | 20,000~30,000 | 0.002 | 0.002 | 100 | 20,000~30,000 | 0.005 | 0.005 | 120 | 20,000~30,000 |
| | 9 | 18 | 0.002 | 0.002 | 100 | 18,000~24,000 | 0.002 | 0.002 | 80 | 18,000~24,000 | 0.003 | 0.003 | 100 | 18,000~24,000 |
| | 10 | 20 | 0.002 | 0.002 | 80 | 18,000~24,000 | 0.002 | 0.002 | 60 | 18,000~24,000 | 0.003 | 0.003 | 80 | 18,000~24,000 |
| 0.3 | 1 | 1.7 | 0.05 | 0.1 | 1,200 | 20,000~50,000 | 0.05 | 0.07 | 1,000 | 20,000~50,000 | 0.07 | 0.12 | 1,200 | 20,000~50,000 |
| | 1.5 | 2.5 | 0.05 | 0.1 | 1,200 | 20,000~50,000 | 0.05 | 0.07 | 1,000 | 20,000~50,000 | 0.07 | 0.12 | 1,200 | 20,000~50,000 |
| | 2 | 3.3 | 0.05 | 0.1 | 1,200 | 20,000~50,000 | 0.04 | 0.07 | 1,000 | 20,000~50,000 | 0.07 | 0.12 | 1,200 | 20,000~50,000 |
| | 2.5 | 4.2 | 0.035 | 0.1 | 1,200 | 20,000~50,000 | 0.03 | 0.06 | 1,000 | 20,000~50,000 | 0.05 | 0.12 | 1,200 | 20,000~50,000 |
| | 3 | 5 | 0.025 | 0.1 | 1,000 | 20,000~50,000 | 0.03 | 0.05 | 850 | 20,000~50,000 | 0.04 | 0.1 | 1,000 | 20,000~50,000 |
| | 3.5 | 5.8 | 0.025 | 0.08 | 1,000 | 20,000~50,000 | 0.02 | 0.05 | 850 | 20,000~50,000 | 0.04 | 0.1 | 1,000 | 20,000~50,000 |
| | 4 | 6.7 | 0.025 | 0.05 | 800 | 20,000~50,000 | 0.02 | 0.04 | 680 | 20,000~50,000 | 0.035 | 0.08 | 800 | 20,000~50,000 |
| | 4.5 | 7.5 | 0.025 | 0.05 | 750 | 20,000~50,000 | 0.01 | 0.03 | 630 | 20,000~50,000 | 0.035 | 0.08 | 750 | 20,000~50,000 |
| | 5 | 8.3 | 0.02 | 0.04 | 500 | 20,000~30,000 | 0.01 | 0.02 | 420 | 20,000~30,000 | 0.03 | 0.06 | 500 | 20,000~30,000 |
| | 5.5 | 9.2 | 0.013 | 0.02 | 500 | 20,000~30,000 | 0.01 | 0.01 | 420 | 20,000~30,000 | 0.02 | 0.03 | 500 | 20,000~30,000 |
| | 6 | 10 | 0.01 | 0.02 | 450 | 20,000~30,000 | 0.005 | 0.01 | 380 | 20,000~30,000 | 0.015 | 0.03 | 450 | 20,000~30,000 |
| | 6.5 | 10.8 | 0.008 | 0.02 | 450 | 20,000~30,000 | 0.005 | 0.005 | 380 | 20,000~30,000 | 0.012 | 0.03 | 450 | 20,000~30,000 |
| | 7 | 11.7 | 0.008 | 0.02 | 400 | 20,000~30,000 | 0.005 | 0.005 | 340 | 20,000~30,000 | 0.012 | 0.03 | 400 | 20,000~30,000 |
| | 7.5 | 12.5 | 0.005 | 0.02 | 350 | 20,000~30,000 | 0.003 | 0.005 | 300 | 20,000~30,000 | 0.008 | 0.03 | 350 | 20,000~30,000 |
| | 8 | 13.3 | 0.005 | 0.01 | 300 | 18,000~24,000 | 0.003 | 0.005 | 250 | 18,000~24,000 | 0.008 | 0.015 | 300 | 18,000~24,000 |
| | 8.5 | 14.2 | 0.005 | 0.01 | 250 | 18,000~24,000 | 0.003 | 0.003 | 210 | 18,000~24,000 | 0.008 | 0.015 | 250 | 18,000~24,000 |
| | 9 | 15 | 0.005 | 0.01 | 250 | 18,000~24,000 | 0.003 | 0.003 | 210 | 18,000~24,000 | 0.007 | 0.015 | 250 | 18,000~24,000 |
| | 9.5 | 15.8 | 0.005 | 0.005 | 200 | 18,000~24,000 | 0.003 | 0.003 | 170 | 18,000~24,000 | 0.007 | 0.008 | 200 | 18,000~24,000 |
| | 10 | 16.7 | 0.003 | 0.005 | 150 | 18,000~24,000 | 0.002 | 0.003 | 120 | 18,000~24,000 | 0.005 | 0.008 | 150 | 18,000~24,000 |
| | 11 | 18.3 | 0.003 | 0.003 | 110 | 16,000~20,000 | 0.002 | 0.002 | 90 | 16,000~20,000 | 0.005 | 0.005 | 110 | 16,000~20,000 |
| | 12 | 20 | 0.003 | 0.003 | 80 | 16,000~20,000 | 0.002 | 0.002 | 60 | 16,000~20,000 | 0.005 | 0.005 | 80 | 16,000~20,000 |
| 0.35 | 2 | 2.9 | 0.08 | 0.12 | 1,800 | 20,000~50,000 | 0.07 | 0.08 | 1,300 | 20,000~50,000 | 0.1 | 0.15 | 1,500 | 20,000~30,000 |
| | 4 | 5.7 | 0.05 | 0.11 | 1,300 | 20,000~50,000 | 0.03 | 0.06 | 1,100 | 20,000~50,000 | 0.06 | 0.12 | 1,200 | 20,000~30,000 |
| | 6 | 8.6 | 0.03 | 0.05 | 700 | 20,000~30,000 | 0.01 | 0.02 | 600 | 20,000~30,000 | 0.04 | 0.07 | 600 | 20,000~30,000 |
| | 8 | 11.4 | 0.005 | 0.01 | 400 | 18,000~24,000 | 0.003 | 0.005 | 330 | 18,000~24,000 | 0.008 | 0.01 | 400 | 18,000~24,000 |
| 0.4 | 2 | 2.5 | 0.1 | 0.15 | 2,000 | 20,000~50,000 | 0.1 | 0.12 | 1,700 | 20,000~50,000 | 0.15 | 0.2 | 2,000 | 20,000~50,000 |
| | 3 | 3.8 | 0.07 | 0.15 | 1,800 | 20,000~50,000 | 0.07 | 0.1 | 1,500 | 20,000~50,000 | 0.12 | 0.2 | 1,800 | 20,000~50,000 |
| | 4 | 5 | 0.05 | 0.12 | 1,500 | 20,000~50,000 | 0.05 | 0.08 | 1,300 | 20,000~50,000 | 0.1 | 0.2 | 1,500 | 20,000~50,000 |
| | 5 | 6.3 | 0.05 | 0.1 | 1,200 | 20,000~50,000 | 0.04 | 0.07 | 1,000 | 20,000~50,000 | 0.08 | 0.15 | 1,200 | 20,000~50,000 |
| | 6 | 7.5 | 0.05 | 0.08 | 900 | 20,000~30,000 | 0.03 | 0.05 | 750 | 20,000~30,000 | 0.07 | 0.12 | 900 | 20,000~30,000 |
| | 7 | 8.8 | 0.03 | 0.05 | 700 | 20,000~30,000 | 0.02 | 0.03 | 600 | 20,000~30,000 | 0.05 | 0.08 | 700 | 20,000~30,000 |
| | 8 | 10 | 0.015 | 0.03 | 500 | 18,000~24,000 | 0.01 | 0.01 | 420 | 18,000~24,000 | 0.02 | 0.05 | 500 | 18,000~24,000 |
| | 9 | 11.3 | 0.005 | 0.01 | 400 | 18,000~24,000 | 0.003 | 0.005 | 340 | 18,000~24,000 | 0.008 | 0.01 | 400 | 18,000~24,000 |
| | 10 | 12.5 | 0.005 | 0.01 | 350 | 18,000~24,000 | 0.003 | 0.005 | 300 | 18,000~24,000 | 0.008 | 0.008 | 350 | 18,000~24,000 |
| | 12 | 15 | 0.005 | 0.005 | 250 | 16,000~20,000 | 0.003 | 0.003 | 210 | 16,000~20,000 | 0.008 | 0.008 | 250 | 16,000~20,000 |
| 0.45 | 2 | 2.2 | 0.15 | 0.2 | 2,500 | 20,000~50,000 | 0.1 | 0.2 | 2,000 | 20,000~50,000 | 0.2 | 0.3 | 2,800 | 20,000~50,000 |
| | 4 | 4.4 | 0.1 | 0.2 | 2,000 | 20,000~50,000 | 0.05 | 0.12 | 1,500 | 20,000~50,000 | 0.15 | 0.25 | 2,000 | 20,000~50,000 |
| | 6 | 6.7 | 0.07 | 0.15 | 1,300 | 20,000~30,000 | 0.035 | 0.05 | 1,000 | 20,000~30,000 | 0.1 | 0.2 | 1,300 | 20,000~30,000 |
| | 8 | 8.9 | 0.035 | 0.05 | 800 | 20,000~30,000 | 0.025 | 0.04 | 700 | 20,000~30,000 | 0.055 | 0.08 | 800 | 18,000~24,000 |



MRB230
Recommended Milling Conditions

| Work Material | | | Carbon Steels・Prehardened Steels S50C・NAK・HPM1 (~45HRC) | | | | Hardened Steels SKD・STAVAX・HPM38 (~55HRC) | | | | Copper | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Radius | Under Neck Length | L/D | Depth of Cut | | Feed | Spindle Speed | Depth of Cut | | Feed | Spindle Speed | Depth of Cut | | Feed | Spindle Speed |
| | | | ap mm | ae mm | mm/min | min$^{-1}$ | ap mm | ae mm | mm/min | min$^{-1}$ | ap mm | ae mm | mm/min | min$^{-1}$ |
| 0.5 | 2 | 2 | 0.25 | 0.35 | 3,200 | 20,000~50,000 | 0.12 | 0.3 | 2,500 | 20,000~50,000 | 0.25 | 0.4 | 3,500 | 20,000~50,000 |
| | 2.5 | 2.5 | 0.25 | 0.3 | 3,000 | 20,000~50,000 | 0.12 | 0.3 | 2,500 | 20,000~50,000 | 0.25 | 0.4 | 3,200 | 20,000~50,000 |
| | 3 | 3 | 0.2 | 0.3 | 3,000 | 20,000~50,000 | 0.12 | 0.3 | 2,500 | 20,000~50,000 | 0.25 | 0.4 | 3,000 | 20,000~50,000 |
| | 4 | 4 | 0.15 | 0.25 | 2,500 | 20,000~50,000 | 0.1 | 0.2 | 2,100 | 20,000~50,000 | 0.2 | 0.4 | 2,500 | 20,000~50,000 |
| | 5 | 5 | 0.1 | 0.25 | 2,000 | 20,000~50,000 | 0.08 | 0.17 | 1,700 | 20,000~50,000 | 0.15 | 0.35 | 2,000 | 20,000~50,000 |
| | 6 | 6 | 0.1 | 0.2 | 1,500 | 20,000~50,000 | 0.07 | 0.12 | 1,200 | 20,000~50,000 | 0.15 | 0.3 | 1,500 | 20,000~50,000 |
| | 7 | 7 | 0.08 | 0.2 | 1,300 | 20,000~30,000 | 0.06 | 0.1 | 1,100 | 20,000~30,000 | 0.12 | 0.3 | 1,300 | 20,000~30,000 |
| | 8 | 8 | 0.05 | 0.1 | 1,200 | 20,000~30,000 | 0.05 | 0.08 | 1,000 | 20,000~30,000 | 0.08 | 0.15 | 1,200 | 20,000~30,000 |
| | 9 | 9 | 0.04 | 0.06 | 1,000 | 20,000~30,000 | 0.05 | 0.05 | 850 | 20,000~30,000 | 0.06 | 0.1 | 1,000 | 20,000~30,000 |
| | 10 | 10 | 0.03 | 0.05 | 800 | 20,000~30,000 | 0.03 | 0.05 | 680 | 20,000~30,000 | 0.05 | 0.08 | 800 | 20,000~30,000 |
| | 12 | 12 | 0.015 | 0.025 | 600 | 16,000~20,000 | 0.01 | 0.03 | 510 | 16,000~20,000 | 0.02 | 0.04 | 600 | 16,000~20,000 |
| | 13 | 13 | 0.012 | 0.025 | 600 | 16,000~20,000 | 0.007 | 0.02 | 450 | 16,000~20,000 | 0.015 | 0.03 | 600 | 16,000~20,000 |
| | 14 | 14 | 0.01 | 0.02 | 500 | 16,000~20,000 | 0.005 | 0.01 | 420 | 16,000~20,000 | 0.015 | 0.03 | 500 | 16,000~20,000 |
| | 16 | 16 | 0.005 | 0.01 | 250 | 12,000~16,000 | 0.005 | 0.01 | 210 | 12,000~16,000 | 0.01 | 0.015 | 250 | 12,000~16,000 |
| | 18 | 18 | 0.005 | 0.005 | 150 | 12,000~16,000 | 0.003 | 0.003 | 120 | 12,000~16,000 | 0.008 | 0.01 | 150 | 12,000~16,000 |
| | 20 | 20 | 0.005 | 0.005 | 100 | 12,000~16,000 | 0.003 | 0.003 | 80 | 12,000~16,000 | 0.008 | 0.008 | 100 | 12,000~16,000 |
| | 22 | 22 | 0.003 | 0.005 | 80 | 12,000~16,000 | 0.002 | 0.003 | 60 | 12,000~16,000 | 0.005 | 0.008 | 80 | 12,000~16,000 |
| 0.6 | 2.4 | 2 | 0.25 | 0.35 | 3,400 | 20,000~30,000 | 0.12 | 0.3 | 2,500 | 20,000~30,000 | 0.3 | 0.45 | 3,400 | 20,000~30,000 |
| | 4 | 3.3 | 0.2 | 0.3 | 3,000 | 20,000~30,000 | 0.12 | 0.3 | 2,500 | 20,000~30,000 | 0.28 | 0.45 | 3,000 | 20,000~30,000 |
| | 6 | 5 | 0.1 | 0.25 | 2,000 | 20,000~30,000 | 0.08 | 0.17 | 1,700 | 20,000~30,000 | 0.15 | 0.4 | 2,000 | 20,000~30,000 |
| | 8 | 6.7 | 0.08 | 0.2 | 1,300 | 20,000~30,000 | 0.06 | 0.15 | 1,100 | 20,000~30,000 | 0.12 | 0.3 | 1,300 | 20,000~30,000 |
| | 10 | 8.3 | 0.05 | 0.1 | 1,200 | 14,000~20,000 | 0.03 | 0.08 | 1,000 | 14,000~20,000 | 0.08 | 0.15 | 1,200 | 14,000~20,000 |
| | 12 | 10 | 0.03 | 0.05 | 800 | 14,000~20,000 | 0.02 | 0.04 | 680 | 14,000~20,000 | 0.05 | 0.08 | 800 | 14,000~20,000 |
| | 14 | 11.7 | 0.015 | 0.025 | 600 | 14,000~20,000 | 0.01 | 0.02 | 510 | 14,000~20,000 | 0.02 | 0.04 | 600 | 14,000~20,000 |
| | 16 | 13.3 | 0.01 | 0.02 | 400 | 14,000~20,000 | 0.01 | 0.01 | 340 | 14,000~20,000 | 0.015 | 0.03 | 400 | 14,000~20,000 |
| | 18 | 15 | 0.005 | 0.01 | 250 | 12,000~18,000 | 0.005 | 0.01 | 210 | 12,000~18,000 | 0.012 | 0.015 | 250 | 12,000~18,000 |
| | 20 | 16.7 | 0.005 | 0.007 | 200 | 12,000~18,000 | 0.005 | 0.005 | 170 | 12,000~18,000 | 0.01 | 0.01 | 200 | 12,000~18,000 |
| | 24 | 20 | 0.005 | 0.005 | 100 | 12,000~18,000 | 0.003 | 0.003 | 80 | 12,000~18,000 | 0.008 | 0.01 | 100 | 12,000~18,000 |
| 0.7 | 8 | 5.7 | 0.1 | 0.3 | 2,500 | 20,000~30,000 | 0.1 | 0.2 | 2,100 | 20,000~30,000 | 0.15 | 0.45 | 2,500 | 20,000~30,000 |
| | 12 | 8.6 | 0.07 | 0.12 | 1,200 | 14,000~20,000 | 0.05 | 0.1 | 1,000 | 14,000~20,000 | 0.1 | 0.18 | 1,200 | 14,000~20,000 |
| | 16 | 11.4 | 0.03 | 0.05 | 600 | 14,000~20,000 | 0.015 | 0.03 | 510 | 14,000~20,000 | 0.05 | 0.08 | 600 | 14,000~20,000 |
| 0.75 | 3 | 2 | 0.2 | 0.35 | 4,000 | 20,000~30,000 | 0.15 | 0.3 | 3,400 | 20,000~30,000 | 0.3 | 0.5 | 4,000 | 20,000~30,000 |
| | 4 | 2.7 | 0.2 | 0.3 | 4,000 | 20,000~30,000 | 0.15 | 0.25 | 3,400 | 20,000~30,000 | 0.3 | 0.45 | 4,000 | 20,000~30,000 |
| | 6 | 4 | 0.15 | 0.3 | 3,000 | 20,000~30,000 | 0.12 | 0.2 | 2,500 | 20,000~30,000 | 0.2 | 0.45 | 3,000 | 20,000~30,000 |
| | 8 | 5.3 | 0.1 | 0.25 | 2,400 | 20,000~30,000 | 0.08 | 0.18 | 2,000 | 20,000~30,000 | 0.15 | 0.4 | 2,400 | 20,000~30,000 |
| | 10 | 6.7 | 0.08 | 0.2 | 1,800 | 20,000~30,000 | 0.06 | 0.12 | 1,500 | 20,000~30,000 | 0.12 | 0.3 | 1,800 | 20,000~30,000 |
| | 12 | 8 | 0.07 | 0.13 | 1,200 | 18,000~24,000 | 0.05 | 0.09 | 1,000 | 18,000~24,000 | 0.1 | 0.2 | 1,200 | 18,000~24,000 |
| | 14 | 9.3 | 0.06 | 0.1 | 1,200 | 18,000~24,000 | 0.04 | 0.07 | 1,000 | 18,000~24,000 | 0.1 | 0.15 | 1,200 | 18,000~24,000 |
| | 16 | 10.7 | 0.05 | 0.08 | 800 | 12,000~18,000 | 0.035 | 0.06 | 680 | 12,000~18,000 | 0.07 | 0.12 | 800 | 12,000~18,000 |
| | 18 | 12 | 0.03 | 0.05 | 500 | 12,000~18,000 | 0.02 | 0.04 | 420 | 12,000~18,000 | 0.05 | 0.08 | 500 | 12,000~18,000 |
| | 20 | 13.3 | 0.02 | 0.04 | 400 | 12,000~18,000 | 0.015 | 0.03 | 340 | 12,000~18,000 | 0.03 | 0.06 | 400 | 12,000~18,000 |
| | 22 | 14.7 | 0.01 | 0.02 | 250 | 10,000~14,000 | 0.005 | 0.005 | 210 | 10,000~14,000 | 0.02 | 0.03 | 250 | 10,000~14,000 |
| | 30 | 20 | 0.005 | 0.005 | 100 | 10,000~14,000 | 0.003 | 0.005 | 80 | 10,000~14,000 | 0.01 | 0.008 | 100 | 10,000~14,000 |
| 0.8 | 4 | 2.5 | 0.2 | 0.3 | 4,000 | 18,000~24,000 | 0.17 | 0.25 | 3,400 | 18,000~24,000 | 0.3 | 0.45 | 4,000 | 18,000~24,000 |
| | 8 | 5 | 0.1 | 0.3 | 3,000 | 18,000~24,000 | 0.09 | 0.2 | 2,500 | 18,000~24,000 | 0.15 | 0.45 | 3,000 | 18,000~24,000 |
| | 12 | 7.5 | 0.07 | 0.15 | 1,800 | 18,000~24,000 | 0.06 | 0.12 | 1,500 | 18,000~24,000 | 0.1 | 0.25 | 1,800 | 18,000~24,000 |
| | 16 | 10 | 0.05 | 0.1 | 650 | 12,000~18,000 | 0.035 | 0.07 | 550 | 12,000~18,000 | 0.08 | 0.15 | 650 | 12,000~18,000 |
| | 20 | 12.5 | 0.03 | 0.05 | 450 | 12,000~18,000 | 0.02 | 0.04 | 380 | 12,000~18,000 | 0.05 | 0.08 | 450 | 12,000~18,000 |

Regular Line
MUGEN COATING
Long Neck Type
P Carbon Steel
P Alloy Steel
P Prehardened Steel
H ~55 HRC Hardened Steel
M Stainless Steel
N Aluminium Alloy
N Copper
O Resin
Long Neck Ball Coating

# MRB230

## Recommended Milling Conditions



| Work Material | | | Carbon Steels・Prehardened Steels S50C・NAK・HPM1 (~45HRC) | | | | Hardened Steels SKD・STAVAX・HPM38 (~55HRC) | | | | Copper | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Radius | Under Neck Length | L/D | Depth of Cut | | Feed | Spindle Speed | Depth of Cut | | Feed | Spindle Speed | Depth of Cut | | Feed | Spindle Speed |
| | | | ap mm | ae mm | mm/min | min$^{-1}$ | ap mm | ae mm | mm/min | min$^{-1}$ | ap mm | ae mm | mm/min | min$^{-1}$ |
| 0.9 | 8 | 4.4 | 0.15 | 0.3 | 2,500 | 16,000~20,000 | 0.12 | 0.2 | 2,100 | 16,000~20,000 | 0.2 | 0.45 | 2,500 | 16,000~20,000 |
| | 12 | 6.7 | 0.1 | 0.2 | 1,800 | 12,000~16,000 | 0.07 | 0.15 | 1,500 | 12,000~16,000 | 0.15 | 0.3 | 1,800 | 12,000~16,000 |
| | 16 | 8.9 | 0.08 | 0.13 | 1,600 | 10,000~14,000 | 0.06 | 0.1 | 1,400 | 10,000~14,000 | 0.12 | 0.2 | 1,600 | 10,000~14,000 |
| | 20 | 11.1 | 0.05 | 0.1 | 1,000 | 8,000~12,000 | 0.04 | 0.08 | 850 | 8,000~12,000 | 0.08 | 0.15 | 1,000 | 8,000~12,000 |
| 1 | 3 | 1.5 | 0.3 | 0.5 | 4,000 | 20,000~30,000 | 0.2 | 0.5 | 3,400 | 20,000~30,000 | 0.45 | 0.7 | 4,000 | 20,000~30,000 |
| | 4 | 2 | 0.3 | 0.5 | 4,000 | 20,000~30,000 | 0.2 | 0.45 | 3,400 | 20,000~30,000 | 0.45 | 0.7 | 4,000 | 20,000~30,000 |
| | 6 | 3 | 0.25 | 0.5 | 3,000 | 20,000~30,000 | 0.2 | 0.4 | 2,500 | 20,000~30,000 | 0.38 | 0.7 | 3,000 | 20,000~30,000 |
| | 8 | 4 | 0.2 | 0.3 | 2,500 | 16,000~20,000 | 0.15 | 0.3 | 2,100 | 16,000~20,000 | 0.3 | 0.45 | 2,500 | 16,000~20,000 |
| | 10 | 5 | 0.15 | 0.3 | 2,500 | 16,000~20,000 | 0.1 | 0.2 | 2,100 | 16,000~20,000 | 0.23 | 0.45 | 2,500 | 16,000~20,000 |
| | 12 | 6 | 0.13 | 0.2 | 1,800 | 12,000~16,000 | 0.1 | 0.15 | 1,500 | 12,000~16,000 | 0.2 | 0.3 | 1,800 | 12,000~16,000 |
| | 13 | 6.5 | 0.12 | 0.2 | 1,800 | 12,000~16,000 | 0.08 | 0.13 | 1,500 | 12,000~16,000 | 0.2 | 0.3 | 1,800 | 12,000~16,000 |
| | 14 | 7 | 0.1 | 0.2 | 1,800 | 12,000~16,000 | 0.07 | 0.13 | 1,500 | 12,000~16,000 | 0.15 | 0.3 | 1,800 | 12,000~16,000 |
| | 16 | 8 | 0.1 | 0.15 | 1,600 | 10,000~14,000 | 0.06 | 0.11 | 1,400 | 10,000~14,000 | 0.15 | 0.25 | 1,600 | 10,000~14,000 |
| | 18 | 9 | 0.07 | 0.12 | 1,600 | 10,000~14,000 | 0.05 | 0.1 | 1,400 | 10,000~14,000 | 0.1 | 0.2 | 1,600 | 10,000~14,000 |
| | 20 | 10 | 0.06 | 0.1 | 1,000 | 8,000~12,000 | 0.05 | 0.07 | 850 | 8,000~12,000 | 0.1 | 0.15 | 1,000 | 8,000~12,000 |
| | 22 | 11 | 0.05 | 0.1 | 1,000 | 8,000~12,000 | 0.04 | 0.06 | 850 | 8,000~12,000 | 0.08 | 0.15 | 1,000 | 8,000~12,000 |
| | 25 | 12.5 | 0.03 | 0.05 | 800 | 8,000~12,000 | 0.03 | 0.04 | 680 | 8,000~12,000 | 0.05 | 0.08 | 800 | 8,000~12,000 |
| | 30 | 15 | 0.02 | 0.04 | 420 | 6,000~10,000 | 0.02 | 0.04 | 360 | 6,000~10,000 | 0.03 | 0.06 | 420 | 6,000~10,000 |
| | 35 | 17.5 | 0.02 | 0.03 | 140 | 6,000~10,000 | 0.015 | 0.02 | 120 | 6,000~10,000 | 0.03 | 0.04 | 140 | 6,000~10,000 |
| | 40 | 20 | 0.007 | 0.01 | 100 | 6,000~10,000 | 0.004 | 0.007 | 80 | 6,000~10,000 | 0.01 | 0.015 | 100 | 6,000~10,000 |
| 1.25 | 6 | 2.4 | 0.35 | 0.5 | 4,000 | 16,000~20,000 | 0.3 | 0.4 | 3,400 | 16,000~20,000 | 0.5 | 0.8 | 4,000 | 16,000~20,000 |
| | 10 | 4 | 0.2 | 0.5 | 3,000 | 16,000~20,000 | 0.25 | 0.35 | 2,500 | 16,000~20,000 | 0.3 | 0.8 | 3,000 | 16,000~20,000 |
| | 15 | 6 | 0.15 | 0.3 | 2,500 | 16,000~20,000 | 0.1 | 0.2 | 2,100 | 16,000~20,000 | 0.25 | 0.45 | 2,500 | 16,000~20,000 |
| | 20 | 8 | 0.1 | 0.2 | 1,800 | 12,000~16,000 | 0.08 | 0.15 | 1,500 | 12,000~16,000 | 0.15 | 0.3 | 1,800 | 12,000~16,000 |
| | 25 | 10 | 0.075 | 0.14 | 1,100 | 10,000~14,000 | 0.05 | 0.1 | 930 | 10,000~14,000 | 0.1 | 0.2 | 1,100 | 10,000~14,000 |
| | 30 | 12 | 0.04 | 0.08 | 800 | 8,000~12,000 | 0.02 | 0.06 | 680 | 8,000~12,000 | 0.06 | 0.15 | 800 | 8,000~12,000 |
| | 35 | 14 | 0.03 | 0.07 | 450 | 6,000~10,000 | 0.01 | 0.03 | 380 | 6,000~10,000 | 0.05 | 0.1 | 450 | 6,000~10,000 |
| 1.5 | 6 | 2 | 0.35 | 0.6 | 4,000 | 16,000~20,000 | 0.25 | 0.5 | 3,400 | 16,000~20,000 | 0.5 | 1 | 4,000 | 16,000~20,000 |
| | 8 | 2.7 | 0.3 | 0.5 | 4,000 | 16,000~20,000 | 0.2 | 0.5 | 3,400 | 16,000~20,000 | 0.45 | 0.8 | 4,000 | 16,000~20,000 |
| | 10 | 3.3 | 0.3 | 0.5 | 4,000 | 16,000~20,000 | 0.2 | 0.45 | 3,400 | 16,000~20,000 | 0.45 | 0.8 | 4,000 | 16,000~20,000 |
| | 12 | 4 | 0.2 | 0.4 | 3,000 | 16,000~20,000 | 0.2 | 0.4 | 2,500 | 16,000~20,000 | 0.3 | 0.6 | 3,000 | 16,000~20,000 |
| | 14 | 4.7 | 0.2 | 0.4 | 3,000 | 16,000~20,000 | 0.15 | 0.35 | 2,500 | 16,000~20,000 | 0.3 | 0.6 | 3,000 | 16,000~20,000 |
| | 15 | 5 | 0.15 | 0.4 | 3,000 | 16,000~20,000 | 0.13 | 0.35 | 2,500 | 16,000~20,000 | 0.23 | 0.6 | 3,000 | 16,000~20,000 |
| | 16 | 5.3 | 0.15 | 0.35 | 3,000 | 16,000~20,000 | 0.13 | 0.35 | 2,500 | 16,000~20,000 | 0.23 | 0.5 | 3,000 | 16,000~20,000 |
| | 20 | 6.7 | 0.15 | 0.3 | 1,800 | 12,000~16,000 | 0.1 | 0.2 | 1,500 | 12,000~16,000 | 0.23 | 0.45 | 1,800 | 12,000~16,000 |
| | 25 | 8.3 | 0.13 | 0.27 | 1,200 | 12,000~16,000 | 0.1 | 0.16 | 1,000 | 12,000~16,000 | 0.2 | 0.4 | 1,200 | 12,000~16,000 |
| | 30 | 10 | 0.1 | 0.2 | 800 | 8,000~12,000 | 0.07 | 0.12 | 680 | 8,000~12,000 | 0.15 | 0.3 | 800 | 8,000~12,000 |
| | 35 | 11.7 | 0.07 | 0.15 | 600 | 8,000~12,000 | 0.05 | 0.1 | 510 | 8,000~12,000 | 0.1 | 0.2 | 600 | 8,000~12,000 |
| | 40 | 13.3 | 0.05 | 0.1 | 460 | 6,000~10,000 | 0.05 | 0.07 | 390 | 6,000~10,000 | 0.08 | 0.15 | 460 | 6,000~10,000 |
| 1.75 | 10 | 2.9 | 0.35 | 0.6 | 4,000 | 16,000~20,000 | 0.25 | 0.5 | 3,400 | 16,000~20,000 | 0.5 | 1 | 4,000 | 16,000~20,000 |
| | 15 | 4.3 | 0.3 | 0.4 | 4,000 | 16,000~20,000 | 0.2 | 0.45 | 3,400 | 16,000~20,000 | 0.45 | 0.6 | 4,000 | 16,000~20,000 |
| | 20 | 5.7 | 0.2 | 0.3 | 2,400 | 14,000~18,000 | 0.13 | 0.35 | 2,000 | 14,000~18,000 | 0.3 | 0.45 | 2,400 | 14,000~18,000 |
| | 25 | 7.1 | 0.17 | 0.3 | 2,000 | 14,000~18,000 | 0.1 | 0.3 | 1,800 | 14,000~18,000 | 0.25 | 0.42 | 2,000 | 14,000~18,000 |
| | 30 | 8.6 | 0.15 | 0.27 | 1,600 | 8,000~12,000 | 0.1 | 0.2 | 1,400 | 8,000~12,000 | 0.23 | 0.4 | 1,600 | 8,000~12,000 |
| | 35 | 10 | 0.1 | 0.2 | 1,200 | 8,000~12,000 | 0.07 | 0.15 | 1,000 | 8,000~12,000 | 0.15 | 0.3 | 1,200 | 8,000~12,000 |
| | 40 | 11.4 | 0.07 | 0.13 | 800 | 6,000~10,000 | 0.05 | 0.1 | 680 | 6,000~10,000 | 0.1 | 0.2 | 800 | 6,000~10,000 |
| | 45 | 12.9 | 0.05 | 0.1 | 800 | 6,000~10,000 | 0.05 | 0.05 | 680 | 6,000~10,000 | 0.08 | 0.15 | 800 | 6,000~10,000 |



MRB230

Recommended Milling Conditions

Regular Line
MUGEN COATING
Long Neck Type

P Carbon Steel
P Alloy Steel
P Prehardened Steel
H ~55 HRC Hardened Steel
M Stainless Steel
N Aluminium Alloy
N Copper
O Resin
Long Neck Ball Coating

| Work Material | | | Carbon Steels・Prehardened Steels S50C・NAK・HPM1 (~45HRC) | | | | Hardened Steels SKD・STAVAX・HPM38 (~55HRC) | | | | Copper | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Radius | Under Neck Length | L/D | Depth of Cut | | Feed | Spindle Speed | Depth of Cut | | Feed | Spindle Speed | Depth of Cut | | Feed | Spindle Speed |
| | | | ap mm | ae mm | mm/min | min$^{-1}$ | ap mm | ae mm | mm/min | min$^{-1}$ | ap mm | ae mm | mm/min | min$^{-1}$ |
| 2 | 10 | 2.5 | 0.35 | 0.8 | 4,000 | 16,000~20,000 | 0.25 | 0.7 | 3,400 | 16,000~20,000 | 0.55 | 1.2 | 4,000 | 16,000~20,000 |
| | 12 | 3 | 0.35 | 0.7 | 4,000 | 16,000~20,000 | 0.25 | 0.7 | 3,400 | 16,000~20,000 | 0.53 | 1 | 4,000 | 16,000~20,000 |
| | 14 | 3.5 | 0.3 | 0.6 | 4,000 | 16,000~20,000 | 0.2 | 0.5 | 3,400 | 16,000~20,000 | 0.45 | 1 | 4,000 | 16,000~20,000 |
| | 15 | 3.8 | 0.25 | 0.55 | 3,500 | 16,000~20,000 | 0.2 | 0.4 | 3,000 | 16,000~20,000 | 0.38 | 0.8 | 3,500 | 16,000~20,000 |
| | 16 | 4 | 0.2 | 0.5 | 3,500 | 16,000~20,000 | 0.2 | 0.3 | 3,000 | 16,000~20,000 | 0.3 | 0.8 | 3,500 | 16,000~20,000 |
| | 20 | 5 | 0.2 | 0.35 | 3,300 | 16,000~20,000 | 0.15 | 0.3 | 2,800 | 16,000~20,000 | 0.3 | 0.5 | 3,300 | 16,000~20,000 |
| | 25 | 6.3 | 0.15 | 0.3 | 2,600 | 12,000~16,000 | 0.12 | 0.25 | 2,200 | 12,000~16,000 | 0.23 | 0.45 | 2,600 | 12,000~16,000 |
| | 30 | 7.5 | 0.12 | 0.25 | 2,600 | 12,000~16,000 | 0.1 | 0.2 | 2,200 | 12,000~16,000 | 0.2 | 0.4 | 2,600 | 12,000~16,000 |
| | 35 | 8.8 | 0.12 | 0.2 | 1,800 | 10,000~14,000 | 0.07 | 0.15 | 1,500 | 10,000~14,000 | 0.18 | 0.3 | 1,800 | 10,000~14,000 |
| | 40 | 10 | 0.1 | 0.15 | 1,200 | 10,000~14,000 | 0.07 | 0.12 | 1,000 | 10,000~14,000 | 0.15 | 0.2 | 1,200 | 10,000~14,000 |
| | 45 | 11.3 | 0.07 | 0.12 | 800 | 10,000~14,000 | 0.05 | 0.1 | 700 | 10,000~14,000 | 0.1 | 0.17 | 800 | 10,000~14,000 |
| | 50 | 12.5 | 0.07 | 0.1 | 600 | 6,000~10,000 | 0.05 | 0.07 | 500 | 6,000~10,000 | 0.1 | 0.15 | 600 | 6,000~10,000 |
| 2.5 | 10 | 2 | 0.4 | 1.2 | 4,000 | 16,000~20,000 | 0.3 | 1 | 3,400 | 16,000~20,000 | 0.6 | 1.8 | 4,000 | 16,000~20,000 |
| | 15 | 3 | 0.35 | 1 | 4,000 | 16,000~20,000 | 0.3 | 0.9 | 3,400 | 16,000~20,000 | 0.55 | 1.5 | 4,000 | 16,000~20,000 |
| | 20 | 4 | 0.3 | 0.7 | 4,000 | 16,000~20,000 | 0.25 | 0.7 | 3,400 | 16,000~20,000 | 0.45 | 1 | 4,000 | 16,000~20,000 |
| | 25 | 5 | 0.25 | 0.6 | 3,000 | 14,000~16,000 | 0.2 | 0.5 | 2,500 | 14,000~16,000 | 0.38 | 0.9 | 3,000 | 14,000~16,000 |
| | 30 | 6 | 0.2 | 0.5 | 2,400 | 14,000~16,000 | 0.15 | 0.4 | 2,000 | 14,000~16,000 | 0.3 | 0.8 | 2,400 | 14,000~16,000 |
| | 35 | 7 | 0.15 | 0.4 | 1,600 | 10,000~14,000 | 0.15 | 0.3 | 1,400 | 10,000~14,000 | 0.23 | 0.6 | 1,600 | 10,000~14,000 |
| | 40 | 8 | 0.15 | 0.3 | 1,200 | 8,000~12,000 | 0.12 | 0.2 | 1,000 | 8,000~12,000 | 0.23 | 0.45 | 1,200 | 8,000~12,000 |
| | 45 | 9 | 0.12 | 0.2 | 1,000 | 8,000~12,000 | 0.1 | 0.15 | 850 | 8,000~12,000 | 0.18 | 0.3 | 1,000 | 8,000~12,000 |
| | 50 | 10 | 0.1 | 0.15 | 680 | 6,000~10,000 | 0.07 | 0.1 | 570 | 6,000~10,000 | 0.15 | 0.25 | 680 | 6,000~10,000 |
| 3 | 10 | 1.7 | 0.5 | 1.5 | 4,000 | 14,000~18,000 | 0.35 | 1.2 | 3,400 | 14,000~18,000 | 0.75 | 2.3 | 4,000 | 14,000~18,000 |
| | 15 | 2.5 | 0.5 | 1.3 | 4,000 | 14,000~18,000 | 0.35 | 1.2 | 3,400 | 14,000~18,000 | 0.75 | 2 | 4,000 | 14,000~18,000 |
| | 20 | 3.3 | 0.5 | 1.2 | 4,000 | 14,000~18,000 | 0.35 | 1.1 | 3,400 | 14,000~18,000 | 0.75 | 1.8 | 4,000 | 14,000~18,000 |
| | 25 | 4.2 | 0.4 | 1 | 4,000 | 14,000~18,000 | 0.3 | 0.8 | 3,400 | 14,000~18,000 | 0.6 | 1.5 | 4,000 | 14,000~18,000 |
| | 30 | 5 | 0.35 | 0.7 | 3,000 | 8,000~12,000 | 0.25 | 0.6 | 2,500 | 8,000~12,000 | 0.53 | 1 | 3,000 | 8,000~12,000 |
| | 35 | 5.8 | 0.35 | 0.5 | 2,500 | 8,000~12,000 | 0.2 | 0.5 | 2,100 | 8,000~12,000 | 0.53 | 0.8 | 2,500 | 8,000~12,000 |
| | 40 | 6.7 | 0.25 | 0.4 | 2,300 | 8,000~12,000 | 0.2 | 0.4 | 1,900 | 8,000~12,000 | 0.38 | 0.6 | 2,300 | 8,000~12,000 |
| | 45 | 7.5 | 0.25 | 0.4 | 1,500 | 6,000~ 8,000 | 0.2 | 0.35 | 1,200 | 6,000~ 8,000 | 0.38 | 0.6 | 1,500 | 6,000~ 8,000 |
| | 50 | 8.3 | 0.2 | 0.4 | 1,500 | 6,000~ 8,000 | 0.2 | 0.3 | 1,200 | 6,000~ 8,000 | 0.3 | 0.6 | 1,500 | 6,000~ 8,000 |

**Notes**

※1 Recommend to use the milling condition as just reference. Adjust milling conditions according to machining shape and machine status.
※2 Depth of Cut : ap=Axial Depth of Cut / ae=Radial Depth of Cut.
※3 Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine.
※4 In case L/D exceeds 15, find an adequate condition considering machining profile.
※5 Oil mist coolant is recommended for the machining of hardened steels.