

Identification(Shoulder Milling)

Reduce the cutting parameters by the coefficient values shown according to the length of overhang.
 For long edge and oversize types heads refer to their specific recommended conditions.

(inch)

| L/D | Carbon Steels, Alloy Steels, Mild Steels, Copper, Copper Alloys | | | Pre-hardened Steels, Carbon Steels, Alloy Steels, Alloy Tool Steels | | | Austenitic Stainless Steels, Ferritic and Martensitic Stainless Steels, Titanium Alloys | | |
|-----|---|-------------------------|-----------------|---|-------------------------|-----------------|---|-------------------------|-----------------|
| | Revolution n (min ⁻¹) | Feed per Tooth fz (IPT) | Width of Cut ae | Revolution n (min ⁻¹) | Feed per Tooth fz (IPT) | Width of Cut ae | Revolution n (min ⁻¹) | Feed per Tooth fz (IPT) | Width of Cut ae |
| 2 | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| 3 | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| 4 | 80% | 90% | 70% | 80% | 90% | 70% | 80% | 90% | 70% |
| 5 | 60% | 80% | 40% | 60% | 80% | 40% | 60% | 80% | 40% |
| 6 | 50% | 70% | 30% | 50% | 70% | 30% | 50% | 70% | 30% |
| 7 | 40% | 70% | 20% | 40% | 70% | 20% | 30% | 60% | 20% |
| 8 | 40% | 60% | 10% | 40% | 60% | 10% | 30% | 50% | 10% |
| 9 | 30% | 60% | 10% | 30% | 60% | 10% | 20% | 50% | 10% |

| L/D | Precipitation Hardening Stainless Steels, Cobalt Chromium Alloys | | | Heat Resistant Alloys Inconel718 | | |
|-----|--|-------------------------|-----------------|-------------------------------------|-------------------------|-----------------|
| | Revolution n (min ⁻¹) | Feed per Tooth fz (IPT) | Width of Cut ae | Revolution n (min ⁻¹) | Feed per Tooth fz (IPT) | Width of Cut ae |
| 2 | 100% | 100% | 100% | 100% | 100% | 100% |
| 3 | 100% | 100% | 100% | 100% | 100% | 100% |
| 4 | 80% | 90% | 70% | 80% | 90% | 70% |
| 5 | 60% | 80% | 40% | 60% | 80% | 40% |
| 6 | 50% | 70% | 30% | 50% | 70% | 30% |
| 7 | 30% | 60% | 20% | 30% | 60% | 20% |
| 8 | 30% | 50% | 10% | 30% | 50% | 10% |
| 9 | 20% | 50% | 10% | 20% | 50% | 10% |

iMX-B4HV/iMX-B4HV-E

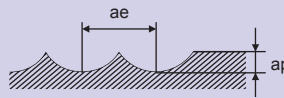
Ball nose head, 4 flute, Irregular curve (With/Without coolant hole)

Recommended Cutting Conditions

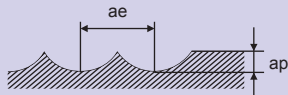
Shoulder Milling

(inch)

| Workpiece Material | | Carbon Steels, Alloy Steels, Mild Steels, Pre-hardened Steels, Copper, Copper Alloys | | | | | Austenitic Stainless Steels, Ferritic and Martensitic Stainless Steels, Cobalt Chromium Alloys, Titanium Alloys | | | | | | |
|--------------------|--------------|--|----------------------------|---|----------------------------|-----------------------|---|---|----------------------------|---|----------------------------|-----------------------|-----------------------|
| Inclination Angle | | $\alpha \leq 15^\circ$ | | $\alpha > 15^\circ$ | | Depth of Cut a_p | Width of Cut a_e | $\alpha \leq 15^\circ$ | | $\alpha > 15^\circ$ | | Depth of Cut a_p | Width of Cut a_e |
| RE | | Revolution n (min ⁻¹) | Feed Rate vf (IPM) | Revolution n (min ⁻¹) | Feed Rate vf (IPM) | | | Revolution n (min ⁻¹) | Feed Rate vf (IPM) | Revolution n (min ⁻¹) | Feed Rate vf (IPM) | | |
| (mm) | (inch) | | | | | | | | | | | | |
| | .1875 | 10000 | 168.0 | 6700 | 75.0 | .038 | .100 | 7500 | 123.0 | 5000 | 52.0 | .038 | .100 |
| 5 | .1969 | 9500 | 157.5 | 6400 | 71.7 | .039 | .100 | 7200 | 118.1 | 4800 | 49.9 | .039 | .100 |
| 6 | .2362 | 8000 | 156.8 | 5300 | 70.0 | .047 | .120 | 6000 | 117.6 | 4000 | 49.6 | .047 | .120 |
| | .2500 | 7500 | 147.0 | 5000 | 66.0 | .050 | .120 | 5700 | 111.7 | 3700 | 45.9 | .050 | .120 |
| | .3125 | 6000 | 127.2 | 4000 | 56.0 | .063 | .160 | 4500 | 99.0 | 3000 | 42.0 | .063 | .160 |
| 8 | .3150 | 6000 | 127.2 | 4000 | 56.0 | .063 | .160 | 4500 | 99.0 | 3000 | 42.0 | .063 | .160 |
| | .3750 | 5000 | 122.0 | 3300 | 51.5 | .075 | .190 | 3800 | 95.8 | 2500 | 41.0 | .075 | .190 |
| 10 | .3937 | 4800 | 117.1 | 3200 | 49.9 | .079 | .200 | 3600 | 90.7 | 2400 | 39.4 | .079 | .200 |
| 12.5 | .4921 | 3800 | 95.8 | 2500 | 39.0 | .098 | .240 | 2900 | 73.1 | 1900 | 31.2 | .098 | .240 |
| | .5000 | 3800 | 95.8 | 2500 | 39.0 | .100 | .240 | 2800 | 70.6 | 1900 | 31.2 | .100 | .240 |



| Workpiece Material | | Heat Resistant Alloys Inconel718 | | | | | |
|--------------------|--------------|---|----------------------------|---|----------------------------|-----------------------|-----------------------|
| Inclination Angle | | $\alpha \leq 15^\circ$ | | $\alpha > 15^\circ$ | | Depth of Cut a_p | Width of Cut a_e |
| RE | | Revolution n (min ⁻¹) | Feed Rate vf (IPM) | Revolution n (min ⁻¹) | Feed Rate vf (IPM) | | |
| (mm) | (inch) | | | | | | |
| | .1875 | 2000 | 17.6 | 1300 | 7.3 | .019 | .038 |
| 5 | .1969 | 1900 | 16.7 | 1300 | 7.3 | .020 | .039 |
| 6 | .2362 | 1600 | 14.1 | 1100 | 6.2 | .024 | .047 |
| | .2500 | 1500 | 13.2 | 990 | 5.5 | .025 | .050 |
| | .3125 | 1200 | 11.5 | 790 | 5.1 | .031 | .063 |
| 8 | .3150 | 1200 | 11.5 | 790 | 5.1 | .031 | .063 |
| | .3750 | 990 | 9.5 | 660 | 4.2 | .038 | .075 |
| 10 | .3937 | 950 | 9.1 | 630 | 4.0 | .039 | .079 |
| 12.5 | .4921 | 760 | 7.3 | 500 | 3.2 | .047 | .100 |
| | .5000 | 740 | 7.1 | 500 | 3.2 | .048 | .100 |



Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abnormal sound can occur.

In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.

Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.

Note 3) For stainless steels, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.

Note 4) α is the inclination angle of the machined surface.

