

**MSTAR END MILLS**

CARBIDE

**MS2SB**

Ball nose, Short cut length, 2 flute

**MS2MB**

Ball nose, Medium cut length, 2 flute

**RECOMMENDED CUTTING CONDITIONS**

| Work material | Carbon steel, Cast iron, Alloy steel, Pre-hardened steel<br>Cf53, GG25 |                       |                                    |                       |                      | Hardened steel (45—55HRC)<br>X40CrMoV51 |                       |                                    |                       |                      |
|---------------|--|-----------------------|------------------------------------|-----------------------|----------------------|---|-----------------------|------------------------------------|-----------------------|----------------------|
|               | $\alpha \leq 15^\circ$   |                       | $\alpha > 15^\circ$                |                       | Depth of cut<br>(mm) | $\alpha \leq 15^\circ$                  |                       | $\alpha > 15^\circ$                |                       | Depth of cut<br>(mm) |
| R<br>(mm)     | Revolution<br>(min <sup>-1</sup> )                                     | Feed rate<br>(mm/min) | Revolution<br>(min <sup>-1</sup> ) | Feed rate<br>(mm/min) |                      | Revolution<br>(min <sup>-1</sup> )      | Feed rate<br>(mm/min) | Revolution<br>(min <sup>-1</sup> ) | Feed rate<br>(mm/min) |                      |
| R 0.1         | 40000  | 300                   | 40000                              | 250                   | 0.003                | 40000                                   | 300                   | 40000                              | 250                   | 0.003                |
| R 0.15        | 40000  | 500                   | 40000                              | 350                   | 0.007                | 40000                                   | 500                   | 40000                              | 350                   | 0.007                |
| R 0.2         | 40000  | 1600                  | 40000                              | 1200                  | 0.02                 | 40000                                   | 1300                  | 40000                              | 950                   | 0.015                |
| R 0.25        | 40000  | 2400                  | 40000                              | 1400                  | 0.025                | 40000                                   | 1900                  | 40000                              | 1100                  | 0.020                |
| R 0.3         | 40000  | 3200                  | 40000                              | 1600                  | 0.03                 | 40000                                   | 2500                  | 40000                              | 1300                  | 0.025                |
| R 0.4         | 40000  | 4800                  | 40000                              | 2400                  | 0.05                 | 40000                                   | 4000                  | 40000                              | 1900                  | 0.04                 |
| R 0.5         | 40000  | 5600                  | 40000                              | 3200                  | 0.06                 | 40000                                   | 5600                  | 40000                              | 3000                  | 0.05                 |
| R 0.75        | 40000  | 6500                  | 40000                              | 4000                  | 0.09                 | 40000                                   | 6500                  | 32000                              | 3200                  | 0.08                 |
| R 1           | 40000  | 6500                  | 39000                              | 4700                  | 0.11                 | 40000                                   | 6500                  | 31000                              | 3500                  | 0.11                 |
| R 1.25        | 40000  | 7000                  | 33000                              | 4500                  | 0.12                 | 36000                                   | 6500                  | 26000                              | 3500                  | 0.12                 |
| R 1.5         | 40000  | 7500                  | 27000                              | 4300                  | 0.13                 | 32000                                   | 6000                  | 22000                              | 3400                  | 0.13                 |
| R 2           | 32000  | 7500                  | 20000                              | 3600                  | 0.15                 | 25000                                   | 6000                  | 16000                              | 2700                  | 0.15                 |
| R 2.5         | 25000  | 6000                  | 16000                              | 2900                  | 0.20                 | 20000                                   | 5400                  | 13000                              | 2300                  | 0.20                 |
| R 3           | 21000  | 5800                  | 13000                              | 2600                  | 0.25                 | 17000                                   | 4700                  | 10000                              | 2000                  | 0.25                 |
| R 4           | 16000  | 4500                  | 10000                              | 2000                  | 0.30                 | 13000                                   | 3600                  | 8000                               | 1500                  | 0.30                 |
| R 5           | 13000  | 3600                  | 8000                               | 1700                  | 0.50                 | 10000                                   | 2900                  | 6400                               | 1200                  | 0.50                 |
| R 6           | 9000   | 2500                  | 6000                               | 1300                  | 0.50                 | 7200                                    | 2000                  | 4800                               | 1000                  | 0.50                 |
| Depth of cut  |  |                       |                                    |                       |                      |   |                       |                                    |                       |                      |
|               | R: Radius  |                       |                                    |                       |                      |   |                       |                                    |                       |                      |

- 1)  $\alpha$  is the inclination angle of the machined surface.
- 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
- 3) If the rigidity of the machine or the work materials installation is very low, or chattering and noise are generated, reduce the revolution and feed rate proportionately.

