

# RECOMMENDED CUTTING CONDITIONS

Vc = (m/min.)  
 fz = (mm/tooth)  
 RPM = (rev/min.)  
 FEED = (mm/min.)

| G9F44 / G9J56 SERIES |                                    | 2 FLUTE BALL NOSE    |                                     |                                     |           |              |       |       |       |       |       |       |       |       |       |
|----------------------|------------------------------------|----------------------|-------------------------------------|-------------------------------------|-----------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| ISO                  | VDI 3323                           | Material Description | Ae(mm)                              | Ap(mm)                              | Parameter | Diameter (Ø) |       |       |       |       |       |       |       |       |       |
|                      |                                    |                      |                                     |                                     |           | 2.0          | 3.0   | 4.0   | 5.0   | 6.0   | 8.0   | 10.0  | 12.0  | 16.0  | 20.0  |
| P                    | 1-4                                | Non-alloy steel      | 0.2D                                | D1~D6<br>=0.2mm<br>D8~D20<br>=0.3mm | Vc        | 84           | 116   | 121   | 132   | 148   | 166   | 185   | 204   | 221   | 242   |
|                      |                                    |                      |                                     |                                     | fz        | 0.026        | 0.025 | 0.035 | 0.045 | 0.060 | 0.089 | 0.122 | 0.150 | 0.181 | 0.200 |
|                      | RPM                                |                      |                                     |                                     | 13350     | 12300        | 9650  | 8400  | 7850  | 6600  | 5900  | 5400  | 4400  | 3850  |       |
|                      | FEED                               |                      |                                     |                                     | 690       | 620          | 680   | 755   | 940   | 1180  | 1435  | 1620  | 1590  | 1540  |       |
|                      | Vc                                 |                      |                                     |                                     | 62        | 87           | 97    | 105   | 120   | 133   | 148   | 160   | 173   | 188   |       |
|                      | fz                                 |                      |                                     |                                     | 0.023     | 0.023        | 0.031 | 0.040 | 0.060 | 0.080 | 0.100 | 0.121 | 0.141 | 0.159 |       |
|                      | RPM                                | 9900                 | 9250                                | 7700                                | 6700      | 6350         | 5300  | 4700  | 4250  | 3450  | 3000  |       |       |       |       |
|                      | FEED                               | 450                  | 420                                 | 485                                 | 530       | 760          | 850   | 940   | 1026  | 975   | 955   |       |       |       |       |
|                      | 5                                  | Low alloy steel      | 0.2D                                | D1~D6<br>=0.2mm<br>D8~D20<br>=0.3mm | Vc        | 84           | 116   | 121   | 132   | 148   | 166   | 185   | 204   | 221   | 242   |
|                      |                                    |                      |                                     |                                     | fz        | 0.026        | 0.025 | 0.035 | 0.045 | 0.060 | 0.089 | 0.122 | 0.150 | 0.181 | 0.200 |
| RPM                  | 13350                              |                      |                                     |                                     | 12300     | 9650         | 8400  | 7850  | 6600  | 5900  | 5400  | 4400  | 3850  |       |       |
| FEED                 | 690                                |                      |                                     |                                     | 620       | 680          | 755   | 940   | 1180  | 1435  | 1620  | 1590  | 1540  |       |       |
| Vc                   | 62                                 |                      |                                     |                                     | 87        | 97           | 105   | 120   | 133   | 148   | 160   | 173   | 188   |       |       |
| fz                   | 0.023                              |                      |                                     |                                     | 0.023     | 0.031        | 0.040 | 0.060 | 0.080 | 0.100 | 0.121 | 0.141 | 0.159 |       |       |
| RPM                  | 9900                               | 9250                 | 7700                                | 6700                                | 6350      | 5300         | 4700  | 4250  | 3450  | 3000  |       |       |       |       |       |
| FEED                 | 450                                | 420                  | 485                                 | 530                                 | 760       | 850          | 940   | 1026  | 975   | 955   |       |       |       |       |       |
| 6-7                  | High alloyed steel, and tool steel | 0.2D                 | D1~D6<br>=0.2mm<br>D8~D20<br>=0.3mm | Vc                                  | 84        | 116          | 121   | 132   | 148   | 166   | 185   | 204   | 221   | 242   |       |
|                      |                                    |                      |                                     | fz                                  | 0.026     | 0.025        | 0.035 | 0.045 | 0.060 | 0.089 | 0.122 | 0.150 | 0.181 | 0.200 |       |
| RPM                  |                                    |                      |                                     | 13350                               | 12300     | 9650         | 8400  | 7850  | 6600  | 5900  | 5400  | 4400  | 3850  |       |       |
| FEED                 |                                    |                      |                                     | 690                                 | 620       | 680          | 755   | 940   | 1180  | 1435  | 1620  | 1590  | 1540  |       |       |
| Vc                   |                                    |                      |                                     | 62                                  | 87        | 97           | 105   | 120   | 133   | 148   | 160   | 173   | 188   |       |       |
| fz                   |                                    |                      |                                     | 0.023                               | 0.023     | 0.031        | 0.040 | 0.060 | 0.080 | 0.100 | 0.121 | 0.141 | 0.159 |       |       |
| RPM                  | 9900                               | 9250                 | 7700                                | 6700                                | 6350      | 5300         | 4700  | 4250  | 3450  | 3000  |       |       |       |       |       |
| FEED                 | 450                                | 420                  | 485                                 | 530                                 | 760       | 850          | 940   | 1026  | 975   | 955   |       |       |       |       |       |
| 8-9                  | Grey cast iron                     | 0.7D                 | 0.3D                                | Vc                                  | 71        | 72           | 70    | 71    | 69    | 68    | 69    | 72    | 70    | 72    |       |
|                      |                                    |                      |                                     | fz                                  | 0.011     | 0.016        | 0.028 | 0.039 | 0.053 | 0.092 | 0.113 | 0.130 | 0.177 | 0.196 |       |
| RPM                  |                                    |                      |                                     | 11350                               | 7600      | 5550         | 4500  | 3650  | 2700  | 2200  | 1900  | 1400  | 1150  |       |       |
| FEED                 |                                    |                      |                                     | 240                                 | 250       | 310          | 355   | 390   | 495   | 495   | 495   | 495   | 450   |       |       |
| Vc                   |                                    |                      |                                     | 71                                  | 72        | 70           | 71    | 69    | 68    | 69    | 72    | 70    | 72    |       |       |
| fz                   |                                    |                      |                                     | 0.011                               | 0.016     | 0.028        | 0.039 | 0.053 | 0.092 | 0.113 | 0.130 | 0.177 | 0.196 |       |       |
| RPM                  | 11350                              | 7600                 | 5550                                | 4500                                | 3650      | 2700         | 2200  | 1900  | 1400  | 1150  |       |       |       |       |       |
| FEED                 | 240                                | 250                  | 310                                 | 355                                 | 390       | 495          | 495   | 495   | 495   | 450   |       |       |       |       |       |
| 10                   | Nodular cast iron                  | 0.7D                 | 0.3D                                | Vc                                  | 71        | 72           | 70    | 71    | 69    | 68    | 69    | 72    | 70    | 72    |       |
|                      |                                    |                      |                                     | fz                                  | 0.011     | 0.016        | 0.028 | 0.039 | 0.053 | 0.092 | 0.113 | 0.130 | 0.177 | 0.196 |       |
| RPM                  |                                    |                      |                                     | 11350                               | 7600      | 5550         | 4500  | 3650  | 2700  | 2200  | 1900  | 1400  | 1150  |       |       |
| FEED                 |                                    |                      |                                     | 240                                 | 250       | 310          | 355   | 390   | 495   | 495   | 495   | 495   | 450   |       |       |
| Vc                   |                                    |                      |                                     | 71                                  | 72        | 70           | 71    | 69    | 68    | 69    | 72    | 70    | 72    |       |       |
| fz                   |                                    |                      |                                     | 0.011                               | 0.016     | 0.028        | 0.039 | 0.053 | 0.092 | 0.113 | 0.130 | 0.177 | 0.196 |       |       |
| RPM                  | 11350                              | 7600                 | 5550                                | 4500                                | 3650      | 2700         | 2200  | 1900  | 1400  | 1150  |       |       |       |       |       |
| FEED                 | 240                                | 250                  | 310                                 | 355                                 | 390       | 495          | 495   | 495   | 495   | 450   |       |       |       |       |       |
| 11.1<br>11.2         | Malleable cast iron                | 0.7D                 | 0.3D                                | Vc                                  | 71        | 72           | 70    | 71    | 69    | 68    | 69    | 72    | 70    | 72    |       |
|                      |                                    |                      |                                     | fz                                  | 0.011     | 0.016        | 0.028 | 0.039 | 0.053 | 0.092 | 0.113 | 0.130 | 0.177 | 0.196 |       |
| RPM                  |                                    |                      |                                     | 11350                               | 7600      | 5550         | 4500  | 3650  | 2700  | 2200  | 1900  | 1400  | 1150  |       |       |
| FEED                 |                                    |                      |                                     | 240                                 | 250       | 310          | 355   | 390   | 495   | 495   | 495   | 495   | 450   |       |       |
| Vc                   |                                    |                      |                                     | 71                                  | 72        | 70           | 71    | 69    | 68    | 69    | 72    | 70    | 72    |       |       |
| fz                   |                                    |                      |                                     | 0.011                               | 0.016     | 0.028        | 0.039 | 0.053 | 0.092 | 0.113 | 0.130 | 0.177 | 0.196 |       |       |
| RPM                  | 11350                              | 7600                 | 5550                                | 4500                                | 3650      | 2700         | 2200  | 1900  | 1400  | 1150  |       |       |       |       |       |
| FEED                 | 240                                | 250                  | 310                                 | 355                                 | 390       | 495          | 495   | 495   | 495   | 450   |       |       |       |       |       |
| K                    | 15-16                              | Hardened steel       | 0.2D                                | D1~D6<br>=0.2mm<br>D8~D20<br>=0.3mm | Vc        | 62           | 87    | 97    | 105   | 120   | 133   | 148   | 160   | 173   | 188   |
|                      |                                    |                      |                                     |                                     | fz        | 0.023        | 0.023 | 0.031 | 0.040 | 0.060 | 0.080 | 0.100 | 0.121 | 0.141 | 0.159 |
|                      |                                    |                      |                                     |                                     | RPM       | 9900         | 9250  | 7700  | 6700  | 6350  | 5300  | 4700  | 4250  | 3450  | 3000  |
|                      |                                    |                      |                                     |                                     | FEED      | 450          | 420   | 485   | 530   | 760   | 850   | 940   | 1026  | 975   | 955   |
|                      |                                    |                      |                                     |                                     | Vc        | 27           | 39    | 49    | 53    | 55    | 55    | 60    | 60    | 63    | 66    |
|                      |                                    |                      |                                     |                                     | fz        | 0.016        | 0.016 | 0.021 | 0.024 | 0.029 | 0.047 | 0.054 | 0.070 | 0.090 | 0.107 |
|                      | RPM                                | 4300                 | 4100                                | 3900                                | 3350      | 2900         | 2200  | 1900  | 1600  | 1250  | 1050  |       |       |       |       |
|                      | FEED                               | 135                  | 135                                 | 160                                 | 160       | 170          | 205   | 205   | 225   | 225   | 225   |       |       |       |       |
|                      | 38.1                               | Chilled Cast Iron    | 0.2D                                | D1~D6<br>=0.2mm<br>D8~D20<br>=0.3mm | Vc        | 62           | 87    | 97    | 105   | 120   | 133   | 148   | 160   | 173   | 188   |
|                      |                                    |                      |                                     |                                     | fz        | 0.023        | 0.023 | 0.031 | 0.040 | 0.060 | 0.080 | 0.100 | 0.121 | 0.141 | 0.159 |
|                      | RPM                                |                      |                                     |                                     | 9900      | 9250         | 7700  | 6700  | 6350  | 5300  | 4700  | 4250  | 3450  | 3000  |       |
|                      | FEED                               |                      |                                     |                                     | 450       | 420          | 485   | 530   | 760   | 850   | 940   | 1026  | 975   | 955   |       |
| Vc                   | 27                                 |                      |                                     |                                     | 39        | 49           | 53    | 55    | 55    | 60    | 60    | 63    | 66    |       |       |
| fz                   | 0.016                              |                      |                                     |                                     | 0.016     | 0.021        | 0.024 | 0.029 | 0.047 | 0.054 | 0.070 | 0.090 | 0.107 |       |       |
| RPM                  | 4300                               | 4100                 | 3900                                | 3350                                | 2900      | 2200         | 1900  | 1600  | 1250  | 1050  |       |       |       |       |       |
| FEED                 | 135                                | 135                  | 160                                 | 160                                 | 170       | 205          | 205   | 225   | 225   | 225   |       |       |       |       |       |
| 38.2                 | Hardened Cast Iron                 | 0.2D                 | D1~D6<br>=0.2mm<br>D8~D20<br>=0.3mm | Vc                                  | 62        | 87           | 97    | 105   | 120   | 133   | 148   | 160   | 173   | 188   |       |
|                      |                                    |                      |                                     | fz                                  | 0.023     | 0.023        | 0.031 | 0.040 | 0.060 | 0.080 | 0.100 | 0.121 | 0.141 | 0.159 |       |
| RPM                  |                                    |                      |                                     | 9900                                | 9250      | 7700         | 6700  | 6350  | 5300  | 4700  | 4250  | 3450  | 3000  |       |       |
| FEED                 |                                    |                      |                                     | 450                                 | 420       | 485          | 530   | 760   | 850   | 940   | 1026  | 975   | 955   |       |       |
| Vc                   |                                    |                      |                                     | 27                                  | 39        | 49           | 53    | 55    | 55    | 60    | 60    | 63    | 66    |       |       |
| fz                   |                                    |                      |                                     | 0.016                               | 0.016     | 0.021        | 0.024 | 0.029 | 0.047 | 0.054 | 0.070 | 0.090 | 0.107 |       |       |
| RPM                  | 4300                               | 4100                 | 3900                                | 3350                                | 2900      | 2200         | 1900  | 1600  | 1250  | 1050  |       |       |       |       |       |
| FEED                 | 135                                | 135                  | 160                                 | 160                                 | 170       | 205          | 205   | 225   | 225   | 225   |       |       |       |       |       |
| 40                   | Hardened Cast Iron                 | 0.2D                 | D1~D6<br>=0.2mm<br>D8~D20<br>=0.3mm | Vc                                  | 62        | 87           | 97    | 105   | 120   | 133   | 148   | 160   | 173   | 188   |       |
|                      |                                    |                      |                                     | fz                                  | 0.023     | 0.023        | 0.031 | 0.040 | 0.060 | 0.080 | 0.100 | 0.121 | 0.141 | 0.159 |       |
| RPM                  |                                    |                      |                                     | 9900                                | 9250      | 7700         | 6700  | 6350  | 5300  | 4700  | 4250  | 3450  | 3000  |       |       |
| FEED                 |                                    |                      |                                     | 450                                 | 420       | 485          | 530   | 760   | 850   | 940   | 1026  | 975   | 955   |       |       |
| Vc                   |                                    |                      |                                     | 27                                  | 39        | 49           | 53    | 55    | 55    | 60    | 60    | 63    | 66    |       |       |
| fz                   |                                    |                      |                                     | 0.016                               | 0.016     | 0.021        | 0.024 | 0.029 | 0.047 | 0.054 | 0.070 | 0.090 | 0.107 |       |       |
| RPM                  | 4300                               | 4100                 | 3900                                | 3350                                | 2900      | 2200         | 1900  | 1600  | 1250  | 1050  |       |       |       |       |       |
| FEED                 | 135                                | 135                  | 160                                 | 160                                 | 170       | 205          | 205   | 225   | 225   | 225   |       |       |       |       |       |
| 41                   | Hardened Cast Iron                 | 0.2D                 | D1~D6<br>=0.2mm<br>D8~D20<br>=0.3mm | Vc                                  | 62        | 87           | 97    | 105   | 120   | 133   | 148   | 160   | 173   | 188   |       |
|                      |                                    |                      |                                     | fz                                  | 0.023     | 0.023        | 0.031 | 0.040 | 0.060 | 0.080 | 0.100 | 0.121 | 0.141 | 0.159 |       |
| RPM                  |                                    |                      |                                     | 9900                                | 9250      | 7700         | 6700  | 6350  | 5300  | 4700  | 4250  | 3450  | 3000  |       |       |
| FEED                 |                                    |                      |                                     | 450                                 | 420       | 485          | 530   | 760   | 850   | 940   | 1026  | 975   | 955   |       |       |
| Vc                   |                                    |                      |                                     | 27                                  | 39        | 49           | 53    | 55    | 55    | 60    | 60    | 63    | 66    |       |       |
| fz                   |                                    |                      |                                     | 0.016                               | 0.016     | 0.021        | 0.024 | 0.029 | 0.047 | 0.054 | 0.070 | 0.090 | 0.107 |       |       |
| RPM                  | 4300                               | 4100                 | 3900                                | 3350                                | 2900      | 2200         | 1900  | 1600  | 1250  | 1050  |       |       |       |       |       |
| FEED                 | 135                                | 135                  | 160                                 | 160                                 | 170       | 205          | 205   | 225   | 225   | 225   |       |       |       |       |       |

SUPER HARDENED  
HSS END MILL

COATED CARBIDE END MILL  
FOR GENERAL

COATED CARBIDE END MILL  
FOR HEAVY CUTTING

COATED CARBIDE END MILL  
FOR HARDENED MATERIAL

COATED CARBIDE DRILL  
FOR GENERAL

