

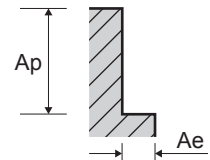
# RECOMMENDED CUTTING CONDITIONS

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

## G9F43 / G9J59 SERIES

### 3 FLUTE - SIDE CUTTING

| ISO          | VDI 3323                           | Material Description | Ae(mm) | Ap(mm) | Parameter | Diameter (Ø) |       |       |       |       |       |       |       |       |       |       |       |       |       |
|--------------|------------------------------------|----------------------|--------|--------|-----------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|              |                                    |                      |        |        |           | 1.0          | 2.0   | 2.5   | 3.0   | 3.5   | 4.0   | 5.0   | 6.0   | 8.0   | 10.0  | 12.0  | 14.0  | 16.0  | 20.0  |
| P            | 1-4                                | Non-alloy steel      | 0.05D  | 1D     | Vc        | 49           | 53    | 58    | 62    | 66    | 70    | 73    | 77    | 78    | 74    | 75    | 81    | 80    | 79    |
|              |                                    |                      |        |        | fz        | 0.005        | 0.012 | 0.014 | 0.017 | 0.024 | 0.030 | 0.037 | 0.048 | 0.068 | 0.077 | 0.078 | 0.075 | 0.075 | 0.075 |
|              |                                    |                      |        |        | RPM       | 15450        | 8500  | 7385  | 6600  | 600   | 5550  | 4650  | 4100  | 3100  | 2350  | 2000  | 1850  | 1600  | 1250  |
|              |                                    |                      |        |        | FEED      | 210          | 305   | 310   | 340   | 430   | 500   | 520   | 590   | 630   | 540   | 470   | 415   | 360   | 280   |
|              | 5                                  |                      | 0.05D  | 1D     | Vc        | 29           | 35    | 37    | 39    | 41    | 43    | 43    | 47    | 46    | 46    | 47    | 51    | 50    | 47    |
|              |                                    |                      |        |        | fz        | 0.005        | 0.012 | 0.016 | 0.019 | 0.024 | 0.029 | 0.037 | 0.049 | 0.060 | 0.061 | 0.057 | 0.058 | 0.060 | 0.062 |
|              |                                    |                      |        |        | RPM       | 9200         | 5550  | 4710  | 4100  | 3730  | 3400  | 2750  | 2500  | 1850  | 1450  | 1250  | 1150  | 1000  | 750   |
|              |                                    |                      |        |        | FEED      | 125          | 200   | 225   | 235   | 270   | 300   | 305   | 370   | 335   | 265   | 215   | 200   | 180   | 140   |
|              | 6-7                                | Low alloy steel      | 0.05D  | 1D     | Vc        | 49           | 53    | 58    | 62    | 66    | 70    | 73    | 77    | 78    | 74    | 75    | 81    | 80    | 79    |
|              |                                    |                      |        |        | fz        | 0.005        | 0.012 | 0.014 | 0.017 | 0.024 | 0.030 | 0.037 | 0.048 | 0.068 | 0.077 | 0.078 | 0.075 | 0.075 | 0.075 |
|              |                                    |                      |        |        | RPM       | 15450        | 8500  | 7385  | 6600  | 600   | 5550  | 4650  | 4100  | 3100  | 2350  | 2000  | 1850  | 1600  | 1250  |
|              |                                    |                      |        |        | FEED      | 210          | 305   | 310   | 340   | 430   | 500   | 520   | 590   | 630   | 540   | 470   | 415   | 360   | 280   |
|              | 8-9                                |                      | 0.05D  | 1D     | Vc        | 29           | 35    | 37    | 39    | 41    | 43    | 43    | 47    | 46    | 46    | 47    | 51    | 50    | 47    |
|              |                                    |                      |        |        | fz        | 0.005        | 0.012 | 0.016 | 0.019 | 0.024 | 0.029 | 0.037 | 0.049 | 0.060 | 0.061 | 0.057 | 0.058 | 0.060 | 0.062 |
| RPM          |                                    |                      |        |        | 9200      | 5550         | 4710  | 4100  | 3730  | 3400  | 2750  | 2500  | 1850  | 1450  | 1250  | 1150  | 1000  | 750   |       |
| FEED         |                                    |                      |        |        | 125       | 200          | 225   | 235   | 270   | 300   | 305   | 370   | 335   | 265   | 215   | 200   | 180   | 140   |       |
| 10           | High alloyed steel, and tool steel | 0.05D                | 1D     | Vc     | 49        | 53           | 58    | 62    | 66    | 70    | 73    | 77    | 78    | 74    | 75    | 81    | 80    | 79    |       |
|              |                                    |                      |        | fz     | 0.005     | 0.012        | 0.014 | 0.017 | 0.024 | 0.030 | 0.037 | 0.048 | 0.068 | 0.077 | 0.078 | 0.075 | 0.075 | 0.075 |       |
|              |                                    |                      |        | RPM    | 15450     | 8500         | 7385  | 6600  | 600   | 5550  | 4650  | 4100  | 3100  | 2350  | 2000  | 1850  | 1600  | 1250  |       |
|              |                                    |                      |        | FEED   | 210       | 305          | 310   | 340   | 430   | 500   | 520   | 590   | 630   | 540   | 470   | 415   | 360   | 280   |       |
| 11.1<br>11.2 |                                    | 0.05D                | 1D     | Vc     | 29        | 35           | 37    | 39    | 41    | 43    | 43    | 47    | 46    | 46    | 47    | 51    | 50    | 47    |       |
|              |                                    |                      |        | fz     | 0.005     | 0.012        | 0.016 | 0.019 | 0.024 | 0.029 | 0.037 | 0.049 | 0.060 | 0.061 | 0.057 | 0.058 | 0.060 | 0.062 |       |
|              |                                    |                      |        | RPM    | 9200      | 5550         | 4710  | 4100  | 3730  | 3400  | 2750  | 2500  | 1850  | 1450  | 1250  | 1150  | 1000  | 750   |       |
|              |                                    |                      |        | FEED   | 125       | 200          | 225   | 235   | 270   | 300   | 305   | 370   | 335   | 265   | 215   | 200   | 180   | 140   |       |
| M            | 14.1                               | Stainless steel      | 0.05D  | 1D     | Vc        | 24           | 29    | 30    | 32    | 34    | 36    | 36    | 40    | 39    | 39    | 40    | 40    | 38    | 38    |
|              |                                    |                      |        |        | fz        | 0.004        | 0.011 | 0.015 | 0.020 | 0.024 | 0.029 | 0.038 | 0.042 | 0.057 | 0.071 | 0.068 | 0.074 | 0.080 | 0.078 |
|              |                                    |                      |        |        | RPM       | 7700         | 4650  | 3820  | 3400  | 3090  | 2850  | 2300  | 2100  | 1550  | 1250  | 1050  | 900   | 750   | 600   |
|              |                                    |                      |        |        | FEED      | 100          | 155   | 170   | 200   | 225   | 250   | 265   | 265   | 265   | 265   | 215   | 200   | 180   | 140   |
| K            | 15-16                              | Grey cast iron       | 0.05D  | 1D     | Vc        | 63           | 63    | 62    | 62    | 62    | 62    | 62    | 60    | 60    | 63    | 58    | 62    | 60    | 60    |
|              |                                    |                      |        |        | fz        | 0.006        | 0.013 | 0.017 | 0.020 | 0.023 | 0.027 | 0.033 | 0.047 | 0.068 | 0.085 | 0.114 | 0.132 | 0.158 | 0.212 |
|              |                                    |                      |        |        | RPM       | 20200        | 10100 | 7895  | 6550  | 5640  | 4950  | 3950  | 3200  | 2400  | 2000  | 1550  | 1400  | 1200  | 950   |
|              |                                    |                      |        |        | FEED      | 365          | 395   | 405   | 395   | 390   | 395   | 395   | 455   | 490   | 510   | 530   | 555   | 570   | 605   |
|              | 17-18                              | Nodular cast iron    | 0.05D  | 1D     | Vc        | 63           | 63    | 62    | 62    | 62    | 62    | 62    | 60    | 60    | 63    | 58    | 62    | 60    | 60    |
|              |                                    |                      |        |        | fz        | 0.006        | 0.013 | 0.017 | 0.020 | 0.023 | 0.027 | 0.033 | 0.047 | 0.068 | 0.085 | 0.114 | 0.132 | 0.158 | 0.212 |
|              |                                    |                      |        |        | RPM       | 20200        | 10100 | 7895  | 6550  | 5640  | 4950  | 3950  | 3200  | 2400  | 2000  | 1550  | 1400  | 1200  | 950   |
|              |                                    |                      |        |        | FEED      | 365          | 395   | 405   | 395   | 390   | 395   | 395   | 455   | 490   | 510   | 530   | 555   | 570   | 605   |
|              | 19-20                              | Malleable cast iron  | 0.05D  | 1D     | Vc        | 63           | 63    | 62    | 62    | 62    | 62    | 62    | 60    | 60    | 63    | 58    | 62    | 60    | 60    |
|              |                                    |                      |        |        | fz        | 0.006        | 0.013 | 0.017 | 0.020 | 0.023 | 0.027 | 0.033 | 0.047 | 0.068 | 0.085 | 0.114 | 0.132 | 0.158 | 0.212 |
|              |                                    |                      |        |        | RPM       | 20200        | 10100 | 7895  | 6550  | 5640  | 4950  | 3950  | 3200  | 2400  | 2000  | 1550  | 1400  | 1200  | 950   |
|              |                                    |                      |        |        | FEED      | 365          | 395   | 405   | 395   | 390   | 395   | 395   | 455   | 490   | 510   | 530   | 555   | 570   | 605   |
| H            | 38.1                               | Hardened steel       | 0.05D  | 1D     | Vc        | 29           | 35    | 37    | 39    | 41    | 43    | 43    | 47    | 46    | 46    | 47    | 51    | 50    | 47    |
|              |                                    |                      |        |        | fz        | 0.005        | 0.012 | 0.016 | 0.019 | 0.024 | 0.029 | 0.037 | 0.049 | 0.060 | 0.061 | 0.057 | 0.058 | 0.060 | 0.062 |
|              |                                    |                      |        |        | RPM       | 9200         | 5550  | 4710  | 4100  | 3730  | 3400  | 2750  | 2500  | 1850  | 1450  | 1250  | 1150  | 1000  | 750   |
|              |                                    |                      |        |        | FEED      | 125          | 200   | 225   | 235   | 270   | 300   | 305   | 370   | 335   | 265   | 215   | 200   | 180   | 140   |
|              | 40                                 | Chilled Cast Iron    | 0.05D  | 1D     | Vc        | 29           | 35    | 37    | 39    | 41    | 43    | 43    | 47    | 46    | 46    | 47    | 51    | 50    | 47    |
|              |                                    |                      |        |        | fz        | 0.005        | 0.012 | 0.016 | 0.019 | 0.024 | 0.029 | 0.037 | 0.049 | 0.060 | 0.061 | 0.057 | 0.058 | 0.060 | 0.062 |
|              |                                    |                      |        |        | RPM       | 9200         | 5550  | 4710  | 4100  | 3730  | 3400  | 2750  | 2500  | 1850  | 1450  | 1250  | 1150  | 1000  | 750   |
|              |                                    |                      |        |        | FEED      | 125          | 200   | 225   | 235   | 270   | 300   | 305   | 370   | 335   | 265   | 215   | 200   | 180   | 140   |

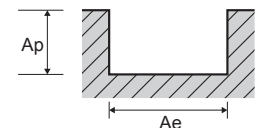


# RECOMMENDED CUTTING CONDITIONS

## G9F43 / G9J59 SERIES 3 FLUTE - SLOTTING

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

| ISO | VDI 3323     | Material Description               | Ae(mm) | Ap(mm)                    | Parameter | Diameter (Ø) |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-----|--------------|------------------------------------|--------|---------------------------|-----------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|     |              |                                    |        |                           |           | 1            | 2     | 2.5   | 3     | 3.5   | 4     | 5     | 6     | 8     | 10    | 12    | 14    | 16    | 20    |
| P   | 1-4          | Non-alloy steel                    | 1D     | 0.5D<br>(Up to Ø3 : 0.2D) | Vc        | 49           | 53    | 58    | 62    | 66    | 70    | 73    | 77    | 78    | 74    | 75    | 81    | 80    | 79    |
|     |              |                                    |        |                           | fz        | 0.004        | 0.010 | 0.012 | 0.014 | 0.019 | 0.025 | 0.031 | 0.040 | 0.056 | 0.064 | 0.065 | 0.062 | 0.063 | 0.062 |
|     |              |                                    |        |                           | RPM       | 15450        | 8500  | 7385  | 6600  | 6000  | 5550  | 4650  | 4100  | 3100  | 2350  | 2000  | 1850  | 1600  | 1250  |
|     | 5            | Non-alloy steel                    | 1D     | 0.5D<br>(Up to Ø3 : 0.2D) | FEED      | 175          | 255   | 265   | 285   | 340   | 415   | 435   | 490   | 525   | 450   | 390   | 345   | 300   | 235   |
|     |              |                                    |        |                           | Vc        | 29           | 35    | 37    | 39    | 41    | 43    | 43    | 47    | 46    | 46    | 47    | 51    | 50    | 47    |
|     |              |                                    |        |                           | fz        | 0.004        | 0.010 | 0.013 | 0.016 | 0.020 | 0.024 | 0.031 | 0.041 | 0.050 | 0.050 | 0.048 | 0.048 | 0.050 | 0.050 |
|     | 6-7          | Low alloy steel                    | 1D     | 0.5D<br>(Up to Ø3 : 0.2D) | RPM       | 9200         | 5550  | 4710  | 4100  | 3730  | 3400  | 2750  | 2500  | 1850  | 1450  | 1250  | 1150  | 1000  | 750   |
|     |              |                                    |        |                           | FEED      | 105          | 165   | 185   | 195   | 225   | 250   | 255   | 310   | 280   | 220   | 180   | 165   | 150   | 115   |
|     | 8-9          | Low alloy steel                    | 1D     | 0.5D<br>(Up to Ø3 : 0.2D) | Vc        | 49           | 53    | 58    | 62    | 66    | 70    | 73    | 77    | 78    | 74    | 75    | 81    | 80    | 79    |
|     |              |                                    |        |                           | fz        | 0.004        | 0.010 | 0.012 | 0.014 | 0.019 | 0.025 | 0.031 | 0.040 | 0.056 | 0.064 | 0.065 | 0.062 | 0.063 | 0.062 |
|     |              |                                    |        |                           | RPM       | 15450        | 8500  | 7385  | 6600  | 6000  | 5550  | 4650  | 4100  | 3100  | 2350  | 2000  | 1850  | 1600  | 1250  |
| M   | 10           | High alloyed steel, and tool steel | 1D     | 0.5D<br>(Up to Ø3 : 0.2D) | FEED      | 175          | 255   | 265   | 285   | 340   | 415   | 435   | 490   | 525   | 450   | 390   | 345   | 300   | 235   |
|     |              |                                    |        |                           | Vc        | 29           | 35    | 37    | 39    | 41    | 43    | 43    | 47    | 46    | 46    | 47    | 51    | 50    | 47    |
|     |              |                                    |        |                           | fz        | 0.004        | 0.010 | 0.013 | 0.016 | 0.020 | 0.024 | 0.031 | 0.041 | 0.050 | 0.050 | 0.048 | 0.048 | 0.050 | 0.050 |
|     | 11.1<br>11.2 | High alloyed steel, and tool steel | 1D     | 0.5D<br>(Up to Ø3 : 0.2D) | RPM       | 9200         | 5550  | 4710  | 4100  | 3730  | 3400  | 2750  | 2500  | 1850  | 1450  | 1250  | 1150  | 1000  | 750   |
|     |              |                                    |        |                           | FEED      | 105          | 165   | 185   | 195   | 225   | 250   | 255   | 310   | 280   | 220   | 180   | 165   | 150   | 115   |
|     | 14.1         | Stainless steel                    | 1D     | 0.5D<br>(Up to Ø3 : 0.2D) | Vc        | 24           | 29    | 30    | 32    | 34    | 36    | 36    | 40    | 39    | 39    | 40    | 40    | 38    | 38    |
|     |              |                                    |        |                           | fz        | 0.004        | 0.009 | 0.012 | 0.016 | 0.020 | 0.025 | 0.032 | 0.039 | 0.053 | 0.058 | 0.057 | 0.061 | 0.067 | 0.063 |
|     |              |                                    |        |                           | RPM       | 7700         | 4650  | 3820  | 3400  | 3090  | 2850  | 2300  | 2100  | 1550  | 1250  | 1050  | 900   | 750   | 600   |
|     | 15-16        | Grey cast iron                     | 1D     | 1D                        | FEED      | 85           | 130   | 140   | 165   | 185   | 210   | 220   | 220   | 220   | 220   | 180   | 165   | 150   | 115   |
|     |              |                                    |        |                           | Vc        | 63           | 63    | 62    | 62    | 62    | 62    | 62    | 60    | 60    | 63    | 58    | 62    | 60    | 60    |
|     |              |                                    |        |                           | fz        | 0.005        | 0.012 | 0.015 | 0.018 | 0.021 | 0.024 | 0.030 | 0.043 | 0.061 | 0.078 | 0.103 | 0.120 | 0.144 | 0.192 |
| K   | 17-18        | Nodular cast iron                  | 1D     | 1D                        | RPM       | 20200        | 10100 | 7895  | 6550  | 5640  | 4950  | 3950  | 3200  | 2400  | 2000  | 1550  | 1400  | 1200  | 950   |
|     |              |                                    |        |                           | FEED      | 330          | 360   | 355   | 360   | 355   | 360   | 360   | 415   | 445   | 465   | 480   | 505   | 520   | 550   |
|     | 19-20        | Malleable cast iron                | 1D     | 1D                        | Vc        | 63           | 63    | 62    | 62    | 62    | 62    | 62    | 60    | 60    | 63    | 58    | 62    | 60    | 60    |
|     |              |                                    |        |                           | fz        | 0.005        | 0.012 | 0.015 | 0.018 | 0.021 | 0.024 | 0.030 | 0.043 | 0.061 | 0.078 | 0.103 | 0.120 | 0.144 | 0.192 |
|     |              |                                    |        |                           | RPM       | 20200        | 10100 | 7895  | 6550  | 5640  | 4950  | 3950  | 3200  | 2400  | 2000  | 1550  | 1400  | 1200  | 950   |
| H   | 38.1         | Hardened steel                     | 1D     | 0.5D<br>(Up to Ø3 : 0.2D) | FEED      | 330          | 360   | 355   | 360   | 355   | 360   | 360   | 415   | 445   | 465   | 480   | 505   | 520   | 550   |
|     |              |                                    |        |                           | Vc        | 29           | 35    | 37    | 39    | 41    | 43    | 43    | 47    | 46    | 46    | 47    | 51    | 50    | 47    |
|     |              |                                    |        |                           | fz        | 0.004        | 0.010 | 0.013 | 0.016 | 0.020 | 0.024 | 0.031 | 0.041 | 0.050 | 0.050 | 0.048 | 0.048 | 0.050 | 0.050 |
|     | 40           | Chilled Cast Iron                  | 1D     | 0.5D<br>(Up to Ø3 : 0.2D) | RPM       | 9200         | 5550  | 4710  | 4100  | 3730  | 3400  | 2750  | 2500  | 1850  | 1450  | 1250  | 1150  | 1000  | 750   |
|     |              |                                    |        |                           | FEED      | 105          | 165   | 185   | 195   | 225   | 250   | 255   | 310   | 280   | 220   | 180   | 165   | 150   | 115   |
|     |              |                                    |        |                           | Vc        | 29           | 35    | 37    | 39    | 41    | 43    | 43    | 47    | 46    | 46    | 47    | 51    | 50    | 47    |
|     |              |                                    |        |                           | fz        | 0.004        | 0.010 | 0.013 | 0.016 | 0.020 | 0.024 | 0.031 | 0.041 | 0.050 | 0.050 | 0.048 | 0.048 | 0.050 | 0.050 |
|     |              |                                    |        |                           | RPM       | 9200         | 5550  | 4710  | 4100  | 3730  | 3400  | 2750  | 2500  | 1850  | 1450  | 1250  | 1150  | 1000  | 750   |
|     |              |                                    |        |                           | FEED      | 105          | 165   | 185   | 195   | 225   | 250   | 255   | 310   | 280   | 220   | 180   | 165   | 150   | 115   |



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