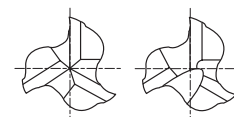


## PREMIUM HSS-PM, 3 FLUTE SHORT LENGTH

## PREMIUM HSS-PM, 3 SCHNEIDEN KURZ

- Designed to machine carbon steels, alloyed steels, stainless steels.
- Well balanced web design to minimize deflection and chattering.
- 3 flute design possess the advantage of 2 flute and 4 flute end mill.
- YG-1's new developed TANK-POWER Coating suitable for high speed cutting.

- Geeignet zum Fräsen von Stahl, legiertem Stahl und rostfreier Stahl.
- Verstärkter Kern zur Erhöhung der Stabilität.
- 3 Schneiden Design besitzt die Vorteile von 2-bzw 4 Schneiden Fräsen.
- Neuentwickelte Beschichtung für Hochgeschwindigkeitsfräsen.



up to Ø1mm over Ø1mm



P.1152, 1153, 1154, 1155

Unit : mm

| EDP No.  |                   | Mill Diameter | Shank Diameter | Length of Cut | Overall Length |
|----------|-------------------|---------------|----------------|---------------|----------------|
| UNCOATED | TANK-POWER COATED | e8            | h6             |               |                |
| E9A30010 | GAA30010          | 1.0           | 6              | 3             | 47             |
| E9A30020 | GAA30020          | 2.0           | 6              | 7             | 51             |
| E9A30030 | GAA30030          | 3.0           | 6              | 8             | 52             |
| E9A30040 | GAA30040          | 4.0           | 6              | 11            | 55             |
| E9A30050 | GAA30050          | 5.0           | 6              | 13            | 57             |
| E9A30060 | GAA30060          | 6.0           | 6              | 13            | 57             |
| E9A30070 | GAA30070          | 7.0           | 10             | 16            | 66             |
| E9A30080 | GAA30080          | 8.0           | 10             | 19            | 69             |
| E9A30090 | GAA30090          | 9.0           | 10             | 19            | 69             |
| E9A30100 | GAA30100          | 10.0          | 10             | 22            | 72             |
| E9A30120 | GAA30120          | 12.0          | 12             | 26            | 83             |
| E9A30140 | GAA30140          | 14.0          | 12             | 26            | 83             |
| E9A30160 | GAA30160          | 16.0          | 16             | 32            | 92             |
| E9A30180 | GAA30180          | 18.0          | 16             | 32            | 92             |
| E9A30200 | GAA30200          | 20.0          | 20             | 38            | 104            |
| E9A30220 | GAA30220          | 22.0          | 20             | 38            | 104            |
| E9A30250 | GAA30250          | 25.0          | 25             | 45            | 121            |

### Tolerances according to DIN 7160 & 7161

### Toleranzen nach DIN 7160 & 7161

| Tolerance range in $\mu\text{m}$ / Toleranzwerte in $\mu\text{m}$ |                            |                             |                               |                                 |                                 |
|-------------------------------------------------------------------|----------------------------|-----------------------------|-------------------------------|---------------------------------|---------------------------------|
| Nominal-Diameter in mm / Nennmaßbereich in mm                     |                            |                             |                               |                                 |                                 |
|                                                                   | from 1 to 3<br>von 1 bis 3 | over 3 to 6<br>über 3 bis 6 | over 6 to 10<br>über 6 bis 10 | over 10 to 18<br>über 10 bis 18 | over 18 to 30<br>über 18 bis 30 |
| e8                                                                | — 14<br>— 28               | — 20<br>— 38                | — 25<br>— 47                  | — 32<br>— 59                    | — 40<br>— 73                    |
| h6                                                                | 0<br>— 6                   | 0<br>— 8                    | 0<br>— 9                      | 0<br>— 11                       | 0<br>— 13                       |

◎ : Excellent ○ : Good

| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels   | High Hardened Steels | Copper | Graphite | Cast Iron | Aluminum | Stainless Steels | Titanium | Inconel | Acrylic | CFRP |
|---------------|--------------|--------------------|-------------------|----------------------|--------|----------|-----------|----------|------------------|----------|---------|---------|------|
| ~HB225        | HB225~325    | HRC30~40           | HRC40~45 HRc45~55 | HRc55~70             |        |          |           |          |                  |          |         |         |      |
| ◎             | ◎            | ○                  |                   |                      | ○      |          | ◎         |          | ◎                |          |         |         |      |



# TANK-POWER END MILLS

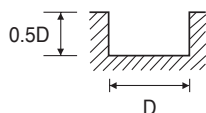
## RECOMMENDED CUTTING CONDITIONS EMPFOHLENE SCHNEIDKONDITIONEN

### PREMIUM HSS-PM, 3 FLUTE - SLOTING PREMIUM HSS-PM, 3 SCHNEIDEN - NUTENFRÄSEN

#### GA942, GAA30 SERIES

| MATERIAL | STRUCTURAL STEELS<br>CARBON STEELS |      |    |       | STRUCTURAL STEELS<br>CARBON STEELS<br>CAST IRONS |      |    |       | CARBON STEELS<br>ALLOY STEELS<br>TOOL STEELS |      |    |       |
|----------|------------------------------------|------|----|-------|--------------------------------------------------|------|----|-------|----------------------------------------------|------|----|-------|
| HARDNESS |                                    |      |    |       | ~ HRc20                                          |      |    |       | HRc20 ~ HRc30                                |      |    |       |
| STRENGTH | ~ 500N/mm <sup>2</sup>             |      |    |       | 500 ~ 800N/mm <sup>2</sup>                       |      |    |       | 800 ~ 1000N/mm <sup>2</sup>                  |      |    |       |
| DIAMETER | RPM                                | FEED | Vc | fz    | RPM                                              | FEED | Vc | fz    | RPM                                          | FEED | Vc | fz    |
| 2.0      | 6500                               | 70   | 40 | 0.004 | 5500                                             | 55   | 35 | 0.003 | 4800                                         | 45   | 30 | 0.003 |
| 3.0      | 4600                               | 102  | 45 | 0.007 | 3900                                             | 85   | 35 | 0.007 | 3350                                         | 52   | 30 | 0.005 |
| 4.0      | 4300                               | 140  | 55 | 0.011 | 3600                                             | 115  | 45 | 0.011 | 3000                                         | 80   | 40 | 0.009 |
| 5.0      | 3800                               | 160  | 60 | 0.014 | 3200                                             | 130  | 50 | 0.014 | 2600                                         | 92   | 40 | 0.012 |
| 6.0      | 3350                               | 230  | 65 | 0.023 | 2800                                             | 190  | 55 | 0.023 | 2300                                         | 140  | 45 | 0.020 |
| 8.0      | 2600                               | 240  | 65 | 0.031 | 2200                                             | 210  | 55 | 0.032 | 1800                                         | 150  | 45 | 0.028 |
| 10.0     | 100                                | 250  | 5  | 0.833 | 1800                                             | 210  | 55 | 0.039 | 1400                                         | 160  | 45 | 0.038 |
| 12.0     | 1800                               | 275  | 70 | 0.051 | 1450                                             | 230  | 55 | 0.053 | 1200                                         | 170  | 45 | 0.047 |
| 14.0     | 1600                               | 250  | 70 | 0.052 | 1350                                             | 220  | 60 | 0.054 | 1000                                         | 160  | 45 | 0.053 |
| 16.0     | 1350                               | 240  | 70 | 0.059 | 1150                                             | 210  | 60 | 0.061 | 890                                          | 150  | 45 | 0.056 |
| 18.0     | 1150                               | 240  | 65 | 0.070 | 890                                              | 190  | 50 | 0.071 | 790                                          | 150  | 45 | 0.063 |
| 20.0     | 950                                | 230  | 60 | 0.081 | 790                                              | 190  | 50 | 0.080 | 700                                          | 140  | 45 | 0.067 |
| 22.0     | 840                                | 230  | 60 | 0.091 | 730                                              | 195  | 50 | 0.089 | 600                                          | 150  | 40 | 0.083 |
| 25.0     | 750                                | 240  | 60 | 0.107 | 630                                              | 210  | 50 | 0.111 | 490                                          | 160  | 40 | 0.109 |

| MATERIAL | PREHARDENED STEELS<br>ALLOY STEELS<br>TOOL STEELS |      |    |       | ALLOY STEELS<br>TOOL STEELS<br>AUSTENITIC STAINLESS STEELS |      |    |       |
|----------|---------------------------------------------------|------|----|-------|------------------------------------------------------------|------|----|-------|
| HARDNESS | HRc30 ~ HRc35                                     |      |    |       | HRc35 ~ HRc40                                              |      |    |       |
| STRENGTH | 1000 ~ 1100N/mm <sup>2</sup>                      |      |    |       | 1100 ~ 1300N/mm <sup>2</sup>                               |      |    |       |
| DIAMETER | RPM                                               | FEED | Vc | fz    | RPM                                                        | FEED | Vc | fz    |
| 2.0      | 3000                                              | 35   | 20 | 0.004 | 1900                                                       | 28   | 10 | 0.005 |
| 3.0      | 2200                                              | 45   | 20 | 0.007 | 1800                                                       | 45   | 15 | 0.008 |
| 4.0      | 1900                                              | 52   | 25 | 0.009 | 1500                                                       | 55   | 20 | 0.012 |
| 5.0      | 1700                                              | 62   | 25 | 0.012 | 1300                                                       | 55   | 20 | 0.014 |
| 6.0      | 1450                                              | 92   | 25 | 0.021 | 1100                                                       | 75   | 20 | 0.023 |
| 8.0      | 1150                                              | 102  | 30 | 0.030 | 890                                                        | 85   | 20 | 0.032 |
| 10.0     | 890                                               | 115  | 30 | 0.043 | 680                                                        | 92   | 20 | 0.045 |
| 12.0     | 740                                               | 115  | 30 | 0.052 | 580                                                        | 92   | 20 | 0.053 |
| 14.0     | 660                                               | 110  | 30 | 0.056 | 500                                                        | 85   | 20 | 0.057 |
| 16.0     | 560                                               | 102  | 30 | 0.061 | 440                                                        | 85   | 20 | 0.064 |
| 18.0     | 500                                               | 95   | 30 | 0.063 | 400                                                        | 80   | 25 | 0.067 |
| 20.0     | 440                                               | 92   | 30 | 0.070 | 360                                                        | 80   | 25 | 0.074 |
| 22.0     | 400                                               | 95   | 30 | 0.079 | 315                                                        | 85   | 20 | 0.090 |
| 25.0     | 360                                               | 102  | 30 | 0.094 | 250                                                        | 85   | 20 | 0.113 |



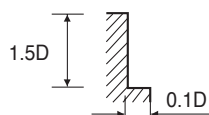
※ The FEED, in long & long reach types, should be reduced by around 50%

RPM = rev./min.  
FEED = mm/min.  
Vc = m/min.  
fz = mm/t

**PREMIUM HSS-PM, 3 FLUTE - SIDE CUTTING**  
**PREMIUM HSS-PM, 3 SCHNEIDEN - SEITENFRÄSEN**
**GA942, GAA30 SERIES**

| MATERIAL | STRUCTURAL STEELS<br>CARBON STEELS |      |    |       | STRUCTURAL STEELS<br>CARBON STEELS<br>CAST IRONS |      |    |       | CARBON STEELS<br>ALLOY STEELS<br>TOOL STEELS |      |    |       |
|----------|------------------------------------|------|----|-------|--------------------------------------------------|------|----|-------|----------------------------------------------|------|----|-------|
| HARDNESS |                                    |      |    |       | ~ HRc20                                          |      |    |       | HRc20 ~ HRc30                                |      |    |       |
| STRENGTH | ~ 500N/mm <sup>2</sup>             |      |    |       | 500 ~ 800N/mm <sup>2</sup>                       |      |    |       | 800 ~ 1000N/mm <sup>2</sup>                  |      |    |       |
| DIAMETER | RPM                                | FEED | Vc | fz    | RPM                                              | FEED | Vc | fz    | RPM                                          | FEED | Vc | fz    |
| 2.0      | 8200                               | 100  | 50 | 0.004 | 6800                                             | 80   | 45 | 0.004 | 5500                                         | 65   | 35 | 0.004 |
| 3.0      | 5800                               | 145  | 55 | 0.008 | 4800                                             | 120  | 45 | 0.008 | 3800                                         | 75   | 35 | 0.007 |
| 4.0      | 5200                               | 185  | 65 | 0.012 | 4400                                             | 155  | 55 | 0.012 | 3500                                         | 110  | 45 | 0.010 |
| 5.0      | 4700                               | 210  | 75 | 0.015 | 4000                                             | 175  | 65 | 0.015 | 2900                                         | 125  | 45 | 0.014 |
| 6.0      | 4200                               | 300  | 80 | 0.024 | 3600                                             | 250  | 70 | 0.023 | 2600                                         | 190  | 50 | 0.024 |
| 8.0      | 3200                               | 330  | 80 | 0.034 | 2600                                             | 270  | 65 | 0.035 | 2000                                         | 200  | 50 | 0.033 |
| 10.0     | 2500                               | 350  | 80 | 0.047 | 2100                                             | 290  | 65 | 0.046 | 1600                                         | 210  | 50 | 0.044 |
| 12.0     | 2100                               | 350  | 80 | 0.056 | 1800                                             | 300  | 70 | 0.056 | 1400                                         | 230  | 55 | 0.055 |
| 14.0     | 1800                               | 350  | 80 | 0.065 | 1500                                             | 285  | 65 | 0.063 | 1150                                         | 210  | 50 | 0.061 |
| 16.0     | 1600                               | 330  | 80 | 0.069 | 1300                                             | 275  | 65 | 0.071 | 1000                                         | 200  | 50 | 0.067 |
| 18.0     | 1350                               | 310  | 75 | 0.077 | 1150                                             | 265  | 65 | 0.077 | 890                                          | 195  | 50 | 0.073 |
| 20.0     | 1250                               | 300  | 80 | 0.080 | 1050                                             | 255  | 65 | 0.081 | 780                                          | 190  | 50 | 0.081 |
| 22.0     | 1150                               | 310  | 80 | 0.090 | 950                                              | 265  | 65 | 0.093 | 740                                          | 195  | 50 | 0.088 |
| 25.0     | 1000                               | 330  | 80 | 0.110 | 840                                              | 275  | 65 | 0.109 | 630                                          | 210  | 50 | 0.111 |

| MATERIAL | PREHARDENED STEELS<br>ALLOY STEELS<br>TOOL STEELS |      |    |       | ALLOY STEELS<br>TOOL STEELS<br>AUSTENITIC STAINLESS STEELS |      |    |       |
|----------|---------------------------------------------------|------|----|-------|------------------------------------------------------------|------|----|-------|
| HARDNESS | HRc30 ~ HRc35                                     |      |    |       | HRc35 ~ HRc40                                              |      |    |       |
| STRENGTH | 1000 ~ 1100N/mm <sup>2</sup>                      |      |    |       | 1100 ~ 1300N/mm <sup>2</sup>                               |      |    |       |
| DIAMETER | RPM                                               | FEED | Vc | fz    | RPM                                                        | FEED | Vc | fz    |
| 2.0      | 3800                                              | 50   | 25 | 0.004 | 2400                                                       | 40   | 15 | 0.006 |
| 3.0      | 2700                                              | 65   | 25 | 0.008 | 2200                                                       | 65   | 20 | 0.010 |
| 4.0      | 2300                                              | 75   | 30 | 0.011 | 1900                                                       | 75   | 25 | 0.013 |
| 5.0      | 2000                                              | 85   | 30 | 0.014 | 1700                                                       | 75   | 25 | 0.015 |
| 6.0      | 1800                                              | 125  | 35 | 0.023 | 1500                                                       | 100  | 30 | 0.022 |
| 8.0      | 1300                                              | 140  | 35 | 0.036 | 1100                                                       | 115  | 30 | 0.035 |
| 10.0     | 1000                                              | 150  | 30 | 0.050 | 890                                                        | 125  | 30 | 0.047 |
| 12.0     | 900                                               | 150  | 35 | 0.056 | 740                                                        | 125  | 30 | 0.056 |
| 14.0     | 780                                               | 140  | 35 | 0.060 | 630                                                        | 120  | 30 | 0.063 |
| 16.0     | 660                                               | 140  | 35 | 0.071 | 550                                                        | 115  | 30 | 0.070 |
| 18.0     | 580                                               | 130  | 35 | 0.075 | 500                                                        | 110  | 30 | 0.073 |
| 20.0     | 520                                               | 125  | 35 | 0.080 | 440                                                        | 110  | 30 | 0.083 |
| 22.0     | 470                                               | 130  | 30 | 0.092 | 400                                                        | 110  | 30 | 0.092 |
| 25.0     | 420                                               | 135  | 35 | 0.107 | 360                                                        | 120  | 30 | 0.111 |



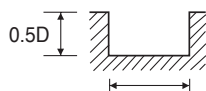
※ The FEED, in long & long reach types, should be reduced by around 50%

RPM = rev./min.  
FEED = mm/min.  
Vc = m/min.  
fz = mm/t


**PREMIUM HSS-PM, 3 FLUTE - SLOTING**  
**PREMIUM HSS-PM, 3 SCHNEIDEN - NUTENFRÄSEN**
**E9942, E9A30 SERIES**

| MATERIAL | STRUCTURAL STEELS<br>CARBON STEELS |      |    |       | STRUCTURAL STEELS<br>CARBON STEELS<br>CAST IRONS |      |    |       | CARBON STEELS<br>ALLOY STEELS<br>TOOL STEELS |      |    |       |
|----------|------------------------------------|------|----|-------|--------------------------------------------------|------|----|-------|----------------------------------------------|------|----|-------|
| HARDNESS |                                    |      |    |       | ~ HRc20                                          |      |    |       | HRc20 ~ HRc30                                |      |    |       |
| STRENGTH | ~ 500N/mm <sup>2</sup>             |      |    |       | 500 ~ 800N/mm <sup>2</sup>                       |      |    |       | 800 ~ 1000N/mm <sup>2</sup>                  |      |    |       |
| DIAMETER | RPM                                | FEED | Vc | fz    | RPM                                              | FEED | Vc | fz    | RPM                                          | FEED | Vc | fz    |
| 2.0      | 4400                               | 45   | 30 | 0.003 | 3700                                             | 35   | 25 | 0.003 | 3300                                         | 30   | 20 | 0.003 |
| 3.0      | 3150                               | 65   | 30 | 0.007 | 2650                                             | 55   | 25 | 0.007 | 3200                                         | 30   | 30 | 0.003 |
| 4.0      | 2900                               | 85   | 35 | 0.010 | 2400                                             | 70   | 30 | 0.010 | 2100                                         | 50   | 25 | 0.008 |
| 5.0      | 2600                               | 100  | 40 | 0.013 | 2150                                             | 80   | 35 | 0.012 | 1800                                         | 55   | 30 | 0.010 |
| 6.0      | 2300                               | 145  | 45 | 0.021 | 1900                                             | 120  | 35 | 0.021 | 1600                                         | 85   | 30 | 0.018 |
| 8.0      | 1800                               | 150  | 45 | 0.028 | 1500                                             | 130  | 40 | 0.029 | 1200                                         | 95   | 30 | 0.026 |
| 10.0     | 1400                               | 155  | 45 | 0.037 | 1200                                             | 130  | 40 | 0.036 | 960                                          | 100  | 30 | 0.035 |
| 12.0     | 1200                               | 170  | 45 | 0.047 | 1000                                             | 145  | 40 | 0.048 | 820                                          | 105  | 30 | 0.043 |
| 14.0     | 1070                               | 155  | 45 | 0.048 | 930                                              | 135  | 40 | 0.048 | 680                                          | 100  | 30 | 0.049 |
| 16.0     | 930                                | 150  | 45 | 0.054 | 780                                              | 130  | 40 | 0.056 | 610                                          | 95   | 30 | 0.052 |
| 18.0     | 780                                | 150  | 45 | 0.064 | 610                                              | 120  | 35 | 0.066 | 530                                          | 95   | 30 | 0.060 |
| 20.0     | 640                                | 145  | 40 | 0.076 | 530                                              | 120  | 35 | 0.075 | 480                                          | 85   | 30 | 0.059 |
| 22.0     | 570                                | 145  | 40 | 0.085 | 500                                              | 120  | 35 | 0.080 | 410                                          | 95   | 30 | 0.077 |
| 25.0     | 520                                | 150  | 40 | 0.096 | 430                                              | 130  | 35 | 0.101 | 340                                          | 100  | 25 | 0.098 |

| MATERIAL | PREHARDENED STEELS<br>ALLOY STEELS<br>TOOL STEELS |      |    |       | ALLOY STEELS<br>TOOL STEELS<br>AUSTENITIC STAINLESS STEELS |      |    |       |
|----------|---------------------------------------------------|------|----|-------|------------------------------------------------------------|------|----|-------|
| HARDNESS | HRc30 ~ HRc35                                     |      |    |       | HRc35 ~ HRc40                                              |      |    |       |
| STRENGTH | 1000 ~ 1100N/mm <sup>2</sup>                      |      |    |       | 1100 ~ 1300N/mm <sup>2</sup>                               |      |    |       |
| DIAMETER | RPM                                               | FEED | Vc | fz    | RPM                                                        | FEED | Vc | fz    |
| 2.0      | 2100                                              | 20   | 15 | 0.003 | 1300                                                       | 18   | 10 | 0.005 |
| 3.0      | 1500                                              | 30   | 15 | 0.007 | 1200                                                       | 28   | 10 | 0.008 |
| 4.0      | 1300                                              | 35   | 15 | 0.009 | 1000                                                       | 35   | 15 | 0.012 |
| 5.0      | 1100                                              | 40   | 15 | 0.012 | 890                                                        | 35   | 15 | 0.013 |
| 6.0      | 1000                                              | 55   | 20 | 0.018 | 750                                                        | 45   | 15 | 0.020 |
| 8.0      | 780                                               | 65   | 20 | 0.028 | 610                                                        | 55   | 15 | 0.030 |
| 10.0     | 610                                               | 70   | 20 | 0.038 | 460                                                        | 58   | 15 | 0.042 |
| 12.0     | 500                                               | 70   | 20 | 0.047 | 395                                                        | 58   | 15 | 0.049 |
| 14.0     | 450                                               | 65   | 20 | 0.048 | 345                                                        | 55   | 15 | 0.053 |
| 16.0     | 380                                               | 65   | 20 | 0.057 | 300                                                        | 55   | 15 | 0.061 |
| 18.0     | 350                                               | 60   | 20 | 0.057 | 270                                                        | 50   | 15 | 0.062 |
| 20.0     | 300                                               | 55   | 20 | 0.061 | 245                                                        | 50   | 15 | 0.068 |
| 22.0     | 270                                               | 60   | 20 | 0.074 | 215                                                        | 55   | 15 | 0.085 |
| 25.0     | 240                                               | 65   | 20 | 0.090 | 170                                                        | 55   | 15 | 0.108 |

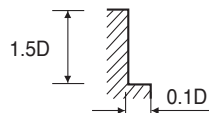


RPM = rev./min.  
FEED = mm/min.  
Vc = m/min.  
fz = mm/t

**PREMIUM HSS-PM, 3 FLUTE - SIDE CUTTING**  
**PREMIUM HSS-PM, 3 SCHNEIDEN - SEITENFRÄSEN**
**E9942, E9A30 SERIES**

| MATERIAL | STRUCTURAL STEELS<br>CARBON STEELS |      |    |       | STRUCTURAL STEELS<br>CARBON STEELS<br>CAST IRONS |      |    |       | CARBON STEELS<br>ALLOY STEELS<br>TOOL STEELS |      |    |       |
|----------|------------------------------------|------|----|-------|--------------------------------------------------|------|----|-------|----------------------------------------------|------|----|-------|
| HARDNESS |                                    |      |    |       | ~ HRc20                                          |      |    |       | HRc20 ~ HRc30                                |      |    |       |
| STRENGTH | ~ 500N/mm <sup>2</sup>             |      |    |       | 500 ~ 800N/mm <sup>2</sup>                       |      |    |       | 800 ~ 1000N/mm <sup>2</sup>                  |      |    |       |
| DIAMETER | RPM                                | FEED | Vc | fz    | RPM                                              | FEED | Vc | fz    | RPM                                          | FEED | Vc | fz    |
| 2.0      | 5600                               | 60   | 35 | 0.004 | 4600                                             | 50   | 30 | 0.004 | 3700                                         | 40   | 25 | 0.004 |
| 3.0      | 3900                               | 90   | 35 | 0.008 | 3300                                             | 75   | 30 | 0.008 | 1600                                         | 45   | 15 | 0.009 |
| 4.0      | 3600                               | 115  | 45 | 0.011 | 3000                                             | 95   | 40 | 0.011 | 2400                                         | 68   | 30 | 0.009 |
| 5.0      | 3200                               | 130  | 50 | 0.014 | 2700                                             | 110  | 40 | 0.014 | 2000                                         | 80   | 30 | 0.013 |
| 6.0      | 2800                               | 190  | 55 | 0.023 | 2400                                             | 155  | 45 | 0.022 | 1800                                         | 120  | 35 | 0.022 |
| 8.0      | 2100                               | 210  | 55 | 0.033 | 1800                                             | 170  | 45 | 0.031 | 1350                                         | 125  | 35 | 0.031 |
| 10.0     | 1700                               | 210  | 55 | 0.041 | 1400                                             | 180  | 45 | 0.043 | 1100                                         | 130  | 35 | 0.039 |
| 12.0     | 1400                               | 220  | 55 | 0.052 | 1200                                             | 185  | 45 | 0.051 | 930                                          | 145  | 35 | 0.052 |
| 14.0     | 1200                               | 215  | 55 | 0.060 | 1000                                             | 180  | 45 | 0.060 | 780                                          | 130  | 35 | 0.056 |
| 16.0     | 1100                               | 210  | 55 | 0.064 | 890                                              | 170  | 45 | 0.064 | 680                                          | 125  | 35 | 0.061 |
| 18.0     | 930                                | 195  | 55 | 0.070 | 790                                              | 165  | 45 | 0.070 | 610                                          | 120  | 35 | 0.066 |
| 20.0     | 860                                | 185  | 55 | 0.072 | 720                                              | 155  | 45 | 0.072 | 540                                          | 120  | 35 | 0.074 |
| 22.0     | 790                                | 195  | 55 | 0.082 | 650                                              | 165  | 45 | 0.085 | 500                                          | 120  | 35 | 0.080 |
| 25.0     | 680                                | 210  | 55 | 0.103 | 580                                              | 170  | 45 | 0.098 | 430                                          | 130  | 35 | 0.101 |

| MATERIAL | PREHARDENED STEELS<br>ALLOY STEELS<br>TOOL STEELS |      |    |       | ALLOY STEELS<br>TOOL STEELS<br>AUSTENITIC STAINLESS STEELS |      |    |       |
|----------|---------------------------------------------------|------|----|-------|------------------------------------------------------------|------|----|-------|
| HARDNESS | HRc30 ~ HRc35                                     |      |    |       | HRc35 ~ HRc40                                              |      |    |       |
| STRENGTH | 1000 ~ 1100N/mm <sup>2</sup>                      |      |    |       | 1100 ~ 1300N/mm <sup>2</sup>                               |      |    |       |
| DIAMETER | RPM                                               | FEED | Vc | fz    | RPM                                                        | FEED | Vc | fz    |
| 2.0      | 2600                                              | 32   | 15 | 0.004 | 1600                                                       | 25   | 10 | 0.005 |
| 3.0      | 1800                                              | 40   | 15 | 0.007 | 1500                                                       | 40   | 15 | 0.009 |
| 4.0      | 1600                                              | 45   | 20 | 0.009 | 1300                                                       | 45   | 15 | 0.012 |
| 5.0      | 1400                                              | 55   | 20 | 0.013 | 1100                                                       | 45   | 15 | 0.014 |
| 6.0      | 1200                                              | 80   | 25 | 0.022 | 1000                                                       | 65   | 20 | 0.022 |
| 8.0      | 890                                               | 85   | 20 | 0.032 | 710                                                        | 70   | 20 | 0.033 |
| 10.0     | 710                                               | 95   | 20 | 0.045 | 610                                                        | 80   | 20 | 0.044 |
| 12.0     | 610                                               | 95   | 25 | 0.052 | 500                                                        | 80   | 20 | 0.053 |
| 14.0     | 540                                               | 90   | 25 | 0.056 | 430                                                        | 75   | 20 | 0.058 |
| 16.0     | 440                                               | 85   | 20 | 0.064 | 370                                                        | 70   | 20 | 0.063 |
| 18.0     | 390                                               | 80   | 20 | 0.068 | 340                                                        | 68   | 20 | 0.067 |
| 20.0     | 360                                               | 80   | 25 | 0.074 | 300                                                        | 68   | 20 | 0.076 |
| 22.0     | 320                                               | 80   | 20 | 0.083 | 270                                                        | 68   | 20 | 0.084 |
| 25.0     | 290                                               | 85   | 25 | 0.098 | 240                                                        | 75   | 20 | 0.104 |



RPM = rev./min.  
FEED = mm/min.  
Vc = m/min.  
fz = mm/t