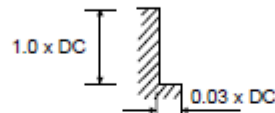


103350, 101550 (4 Flute Extended Neck)

| MATERIAL GROUP | HARDNESS HRC |              | Size (mm)     |              |       |       |       |       |       |       |       |       |
|----------------|--------------|--------------|---------------|--------------|-------|-------|-------|-------|-------|-------|-------|-------|
|                |              |              | 1.0           | 1.5          | 2.0   | 2.5   | 3.0   | 3.5   | 4.0   | 4.5   |       |       |
| <b>P</b>       | 13           | <b>30-40</b> | $v_c$ (m/min) | 150          | 180   | 210   | 210   | 210   | 210   | 210   | 225   |       |
|                |              |              | $n$           | 47770        | 38215 | 33435 | 26750 | 22290 | 19105 | 16720 | 15920 |       |
|                | 14           |              | $f_z$         | 0.008        | 0.01  | 0.013 | 0.016 | 0.02  | 0.023 | 0.027 | 0.029 |       |
|                |              |              | $f$ (mm/min)  | 1525         | 1525  | 1735  | 1710  | 1780  | 1755  | 1805  | 1845  |       |
| <b>H</b>       | 15           | <b>40-50</b> | $v_c$ (m/min) | 120          | 140   | 165   | 165   | 165   | 165   | 165   | 180   |       |
|                |              |              | $n$           | 38215        | 29720 | 26270 | 21015 | 17515 | 15010 | 13135 | 12735 |       |
|                |              |              | 16            | $f_z$        | 0.007 | 0.009 | 0.012 | 0.015 | 0.018 | 0.021 | 0.025 | 0.028 |
|                |              |              |               | $f$ (mm/min) | 1070  | 1070  | 1260  | 1280  | 1280  | 1280  | 1310  | 1425  |
|                | 15           | <b>50-55</b> | $v_c$ (m/min) | 80           | 95    | 110   | 110   | 110   | 110   | 110   | 120   |       |
|                |              |              | $n$           | 25475        | 20170 | 17515 | 14010 | 11675 | 10005 | 8755  | 8490  |       |
|                |              |              | 16            | $f_z$        | 0.007 | 0.009 | 0.012 | 0.015 | 0.018 | 0.021 | 0.025 | 0.028 |
|                |              |              |               | $f$ (mm/min) | 710   | 725   | 840   | 840   | 840   | 840   | 875   | 950   |
|                | 15           | <b>55-60</b> | $v_c$ (m/min) | 65           | 75    | 90    | 90    | 90    | 90    | 90    | 95    |       |
|                |              |              | $n$           | 20700        | 15920 | 14330 | 11465 | 9550  | 8185  | 7165  | 6720  |       |
|                |              |              | 16            | $f_z$        | 0.005 | 0.007 | 0.009 | 0.011 | 0.014 | 0.016 | 0.019 | 0.021 |
|                |              |              |               | $f$ (mm/min) | 410   | 445   | 515   | 500   | 535   | 520   | 545   | 565   |
|                | 15           | <b>60-65</b> | $v_c$ (m/min) | 50           | 60    | 70    | 70    | 70    | 70    | 70    | 75    |       |
|                |              |              | $n$           | 15920        | 12735 | 11145 | 8915  | 7430  | 6365  | 5570  | 5305  |       |
|                |              |              | 16            | $f_z$        | 0.004 | 0.005 | 0.007 | 0.009 | 0.011 | 0.013 | 0.015 | 0.016 |
|                |              |              |               | $f$ (mm/min) | 255   | 255   | 310   | 320   | 325   | 330   | 330   | 340   |
|                | 15           | <b>65-70</b> | $v_c$ (m/min) | 40           | 50    | 60    | 60    | 60    | 60    | 60    | 65    |       |
|                |              |              | $n$           | 12735        | 10615 | 9550  | 7640  | 6365  | 5460  | 4775  | 4600  |       |
|                |              |              | 16            | $f_z$        | 0.002 | 0.003 | 0.005 | 0.007 | 0.009 | 0.011 | 0.013 | 0.014 |
|                |              |              |               | $f$ (mm/min) | 100   | 125   | 190   | 210   | 225   | 240   | 245   | 255   |



$v_c$  - cutting speed (m/min)  
 $n$  - RPM (rev/min)  
 $f_z$  - feed rate (mm/tooth)  
 $f$  - feed rate (mm/rev)  
 $z$  - No. of teeth  
 $a_p$  - axial depth of cut  
 $a_e$  - radial depth of cut

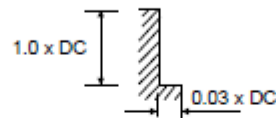
To calculate RPM from cutting speed:  $n = \frac{v_c \cdot 1000}{\pi \cdot \phi}$

To calculate cutting speed from RPM:  $v_c = \frac{n \cdot \pi \cdot \phi}{1000}$

All recommendations are based on ideal machining conditions. Adjustments may need to be made according to your set-up. The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points.

103350, 101550 (4 Flute Extended Neck)

| MATERIAL GROUP | HARDNESS HRC |       | Size (mm)     |       |       |       |       |       |       |       |
|----------------|--------------|-------|---------------|-------|-------|-------|-------|-------|-------|-------|
|                |              |       | 5.0           | 6.0   | 8.0   | 10.0  | 12.0  | 16.0  | 20.0  |       |
| <b>P</b>       | 13<br>14     | 30-40 | $v_c$ (m/min) | 245   | 245   | 245   | 250   | 250   | 250   | 250   |
|                |              |       | $n$           | 15605 | 13000 | 9750  | 7965  | 6635  | 4975  | 3980  |
|                |              |       | $f_z$         | 0.032 | 0.037 | 0.048 | 0.056 | 0.066 | 0.077 | 0.083 |
|                |              |       | $f$ (mm/min)  | 1995  | 1925  | 1870  | 1780  | 1750  | 1530  | 1320  |
| <b>H</b>       | 15<br>16     | 40-50 | $v_c$ (m/min) | 195   | 195   | 195   | 195   | 195   | 195   | 195   |
|                |              |       | $n$           | 12420 | 10350 | 7760  | 6210  | 5175  | 3880  | 3105  |
|                |              |       | $f_z$         | 0.03  | 0.034 | 0.043 | 0.051 | 0.06  | 0.071 | 0.078 |
|                |              |       | $f$ (mm/min)  | 1490  | 1405  | 1335  | 1265  | 1240  | 1100  | 965   |
|                | 15<br>16     | 50-55 | $v_c$ (m/min) | 130   | 130   | 130   | 130   | 130   | 130   | 130   |
|                |              |       | $n$           | 8280  | 6900  | 5175  | 4140  | 3450  | 2585  | 2070  |
|                |              |       | $f_z$         | 0.03  | 0.034 | 0.043 | 0.051 | 0.06  | 0.07  | 0.079 |
|                |              |       | $f$ (mm/min)  | 990   | 935   | 890   | 845   | 825   | 725   | 650   |
|                | 15<br>16     | 55-60 | $v_c$ (m/min) | 100   | 100   | 100   | 100   | 100   | 100   | 100   |
|                |              |       | $n$           | 6365  | 5305  | 3980  | 3185  | 2650  | 1990  | 1590  |
|                |              |       | $f_z$         | 0.023 | 0.026 | 0.033 | 0.038 | 0.045 | 0.053 | 0.059 |
|                |              |       | $f$ (mm/min)  | 585   | 550   | 525   | 480   | 475   | 422   | 375   |
|                | 15<br>16     | 60-65 | $v_c$ (m/min) | 80    | 80    | 80    | 80    | 80    | 80    | 80    |
|                |              |       | $n$           | 5095  | 4245  | 3185  | 2545  | 2120  | 1590  | 1270  |
|                |              |       | $f_z$         | 0.018 | 0.021 | 0.026 | 0.03  | 0.036 | 0.042 | 0.048 |
|                |              |       | $f$ (mm/min)  | 365   | 355   | 330   | 305   | 305   | 265   | 245   |
|                | 15<br>16     | 65-70 | $v_c$ (m/min) | 70    | 70    | 70    | 70    | 70    | 70    | 70    |
|                |              |       | $n$           | 4455  | 3715  | 2785  | 2225  | 1855  | 1390  | 1115  |
|                |              |       | $f_z$         | 0.016 | 0.019 | 0.024 | 0.028 | 0.033 | 0.038 | 0.044 |
|                |              |       | $f$ (mm/min)  | 285   | 280   | 265   | 250   | 245   | 210   | 195   |



$v_c$  - cutting speed (m/min)  
 $n$  - RPM (rev/min)  
 $f_z$  - feed rate (mm/tooth)  
 $f$  - feed rate (mm/rev)  
 $z$  - No. of teeth  
 $a_p$  - axial depth of cut  
 $a_w$  - radial depth of cut

To calculate RPM from cutting speed:  $n = \frac{v_c \cdot 1000}{\pi \cdot \phi}$

To calculate cutting speed from RPM:  $v_c = \frac{n \cdot \pi \cdot \phi}{1000}$

All recommendations are based on ideal machining conditions. Adjustments may need to be made according to your set-up. The recommendations for speeds, feeds and other parameters presented in this chart are nominal recommendations and should be considered only as good starting points.