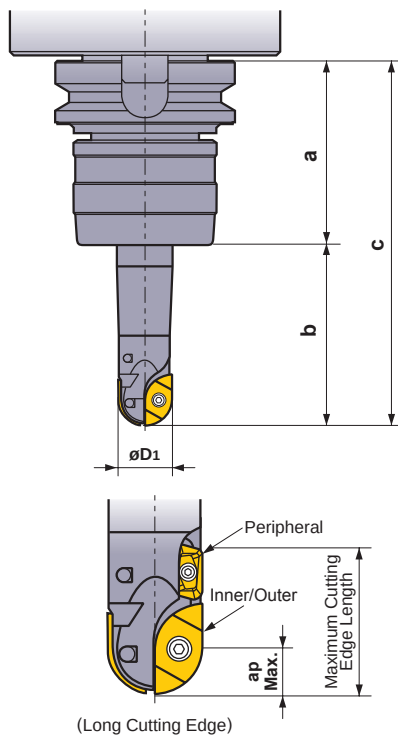


# ROTATING TOOLS

## RECOMMENDED CUTTING CONDITIONS



### Tool Overhang

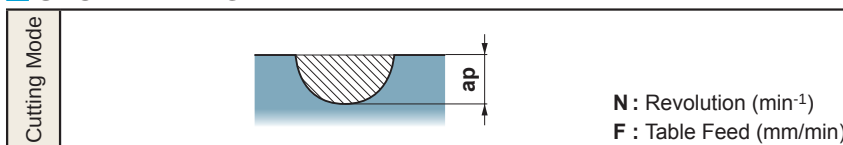
The recommended cutting conditions are chosen based on deflection, vibration and surface finish when using a BT50 arbor under the conditions below - "a", a length from a gauge line to the arbor end face and "b", neck length (tool overhang from the arbor).

| Cutting Edge Diameter: $\phi D_1$ | Type       | a   | b   | c   |
|-----------------------------------|------------|-----|-----|-----|
| 16                                | Standard   | 105 | 50  | 155 |
|                                   | Long Neck  |     | 70  | 175 |
|                                   | Extra Long |     | —   | —   |
| 20                                | Standard   |     | 70  | 175 |
|                                   | Long Neck  |     | 100 | 205 |
|                                   | Extra Long |     | 150 | 255 |
| 25                                | Standard   |     | 80  | 185 |
|                                   | Long Neck  |     | 120 | 225 |
|                                   | Extra Long |     | 200 | 305 |
| 30                                | Standard   |     | 100 | 205 |
|                                   | Long Neck  |     | 150 | 255 |
|                                   | Extra Long |     | 250 | 355 |

### Recommended Depth of Cut for Long Cutting Edge Type

The maximum cutting edge length of the long cutting edge type with a peripheral insert is 1.4-1.5D<sub>1</sub>. The peripheral insert's main purpose is to remove the small un-machined portions of the pre-machined surface above the main cutting edge. Recommended depth of cut: **Maximum ap** is 0.5D<sub>1</sub> or below.

## SLOT MILLING



| Cutting Mode | Work Material               | Hardness       | Cutting Speed (m/min) | Insert Grade, Type       | Holder Type | $\phi 16$ |     |    | $\phi 20$ |     |     | $\phi 25$ |      |      | $\phi 30$ |     |     |
|--------------|-----------------------------|----------------|-----------------------|--------------------------|-------------|-----------|-----|----|-----------|-----|-----|-----------|------|------|-----------|-----|-----|
|              |                             |                |                       |                          |             | N         | F   | ap | N         | F   | ap  | N         | F    | ap   | N         | F   | ap  |
| P            | Carbon Steel<br>Alloy Steel | 180—280HB      | 160<br>(120—200)      | VP15TF                   | Standard    | 3183      | 382 | 6  | 2546      | 306 | 8   | 2037      | 489  | 12.5 | 1698      | 407 | 15  |
|              |                             |                |                       | Low Resistance Type      | Long Neck   | 3183      | 382 | 4  | 2546      | 306 | 4   | 2037      | 489  | 6    | 1698      | 407 | 7.5 |
|              |                             |                |                       |                          | Extra Long  | —         | —   | —  | 2546      | 306 | 2   | 2037      | 489  | 4    | 1698      | 407 | 3   |
|              |                             | 280—350HB      | 140<br>(120—160)      | VP15TF                   | Standard    | 2785      | 334 | 6  | 2228      | 267 | 8   | 1783      | 428  | 12.5 | 1485      | 357 | 15  |
|              |                             |                |                       | Low Resistance Type      | Long Neck   | 2785      | 334 | 4  | 2228      | 267 | 4   | 1783      | 428  | 6    | 1485      | 357 | 7.5 |
|              |                             |                |                       |                          | Extra Long  | —         | —   | —  | 2228      | 267 | 2   | 1783      | 428  | 4    | 1485      | 357 | 3   |
|              | Pre-Hardened Steel          | 35—45HRC       | 120<br>(100—160)      | VP15TF                   | Standard    | 2387      | 286 | 6  | 1910      | 229 | 8   | 1528      | 367  | 12.5 | 1273      | 306 | 15  |
|              |                             |                |                       | Low Resistance Type      | Long Neck   | 2387      | 286 | 4  | 1910      | 229 | 4   | 1528      | 367  | 6    | 1273      | 306 | 7.5 |
|              |                             |                |                       |                          | Extra Long  | —         | —   | —  | 1910      | 229 | 2   | 1528      | 367  | 4    | 1273      | 306 | 3   |
|              | Alloy Tool Steel            | $\leq 350$ HB  | 140<br>(120—160)      | VP15TF                   | Standard    | 2785      | 334 | 6  | 2228      | 267 | 8   | 1783      | 535  | 10   | 1485      | 594 | 12  |
|              |                             |                |                       | Low Resistance Type      | Long Neck   | 2785      | 334 | 4  | 2228      | 267 | 4   | 1783      | 535  | 5    | 1485      | 594 | 4.5 |
|              |                             |                |                       |                          | Extra Long  | —         | —   | —  | 2228      | 267 | 2   | 1783      | 535  | 2.5  | 1485      | 594 | 1.5 |
| M            | Stainless Steel             | $\leq 270$ HB  | 200<br>(100—250)      | VP15TF                   | Standard    | 3979      | 477 | 4  | 3183      | 382 | 5   | 2546      | 764  | 6    | 2122      | 849 | 7.5 |
|              |                             |                |                       | Low Resistance Type      | Long Neck   | 3979      | 477 | 3  | 3183      | 382 | 3   | 2546      | 611  | 4    | 2122      | 637 | 4.5 |
|              |                             |                |                       |                          | Extra Long  | —         | —   | —  | 3183      | 382 | 1.5 | 2546      | 509  | 1.5  | 2122      | 509 | 1.5 |
| K            | Cast Iron                   | $\leq 350$ MPa | 200<br>(150—300)      | VP15TF                   | Standard    | 3979      | 796 | 6  | 3183      | 637 | 8   | 2546      | 1019 | 12.5 | 2122      | 849 | 15  |
|              |                             |                |                       | Low Resistance Type      | Long Neck   | 3979      | 796 | 4  | 3183      | 637 | 4   | 2546      | 1019 | 7.5  | 2122      | 849 | 4.5 |
|              |                             |                |                       |                          | Extra Long  | —         | —   | —  | 3183      | 637 | 2   | 2546      | 1019 | 4    | 2122      | 849 | 3   |
|              | Ductile Cast Iron           | $\leq 500$ MPa | 180<br>(150—240)      | VP15TF                   | Standard    | 3581      | 716 | 6  | 2865      | 573 | 8   | 2292      | 917  | 12.5 | 1910      | 764 | 15  |
|              |                             |                |                       | Low Resistance Type      | Long Neck   | 3581      | 716 | 4  | 2865      | 573 | 4   | 2292      | 917  | 7.5  | 1910      | 764 | 4.5 |
|              |                             |                |                       |                          | Extra Long  | —         | —   | —  | 2865      | 573 | 2   | 2292      | 917  | 4    | 1910      | 764 | 1.5 |
|              |                             | $\leq 800$ MPa | 160<br>(150—250)      | VP15TF                   | Standard    | 3183      | 637 | 6  | 2546      | 509 | 8   | 2037      | 815  | 12.5 | 1698      | 679 | 15  |
|              |                             |                |                       | Low Resistance Type      | Long Neck   | 3183      | 637 | 4  | 2546      | 509 | 4   | 2037      | 815  | 7.5  | 1698      | 679 | 4.5 |
|              |                             |                |                       |                          | Extra Long  | —         | —   | —  | 2546      | 509 | 2   | 2037      | 815  | 4    | 1698      | 679 | 1.5 |
| H            | Hardened Steel              | 45—50HRC       | 100<br>(60—120)       | VP15TF                   | Standard    | 1989      | 239 | 4  | 1591      | 191 | 4   | 1273      | 255  | 6    | 1061      | 212 | 7.5 |
|              |                             |                |                       | Strong Cutting Edge Type | Long Neck   | 1989      | 239 | 2  | 1591      | 191 | 2   | 1273      | 255  | 4    | 1061      | 212 | 3   |
|              |                             |                |                       |                          | Extra Long  | —         | —   | —  | 1591      | 191 | 1   | 1273      | 255  | 2.5  | 1061      | 212 | 1.5 |
|              |                             | 50—60HRC       | 60<br>(40—100)        | VP15TF                   | Standard    | 1194      | 143 | 4  | 955       | 115 | 4   | 764       | 153  | 6    | 637       | 127 | 7.5 |
|              |                             |                |                       | Strong Cutting Edge Type | Long Neck   | 1194      | 143 | 2  | 955       | 115 | 2   | 764       | 153  | 4    | 637       | 127 | 3   |
|              |                             |                |                       |                          | Extra Long  | —         | —   | —  | 955       | 115 | 1   | 764       | 153  | 2.5  | 637       | 127 | 1.5 |