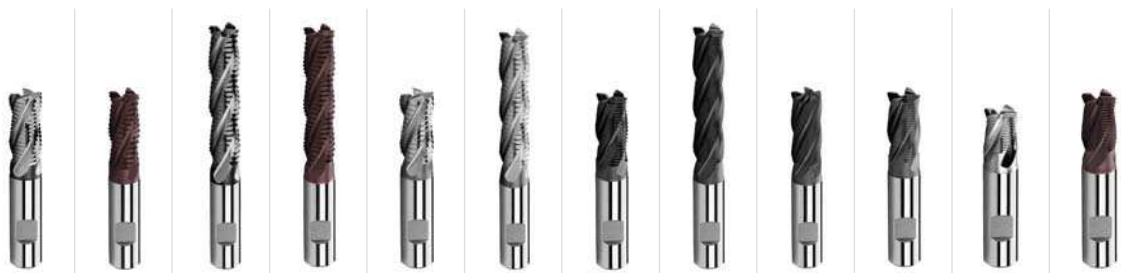


|                |        |        |        |        |        |        |        |        |        |        |         |         |
|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|
| Code           | 1144   | 1154   | 1004   | 1014   | 2706   | 2736   | 1104   | 1114   | 1044P  | 1054P  | 1245    | 1255    |
| DIN            | 844    | 844    |        |        | 844    | 844    | 844    | 844    | 844    | 844    | 844     | 844     |
| Type           | WR     | WR     | W      | W      | W      | W      | W      | W      | NR-F   | NR-F   | NR      | NR      |
| Material       | HSSCo8 | HSSCo8 | HSSCo5 | HSSCo5 | HSSCo8 | HSSCo8 | HSSCo8 | HSSCo8 | HSSCo8 | HSSCo8 | HSSE-PM | HSSE-PM |
| Dimension (mm) | 6-20   | 6-20   | 3-12   | 4-8    | 2-32   | 2-25   | 2-20   | 6-20   | 6-32   | 6-32   | 6-32    | 6-32    |
| Page           | 13     | 13     | 14     | 15     | 16-17  | 16-17  | 18     | 18     | 19     | 19     | 20      | 20      |

|   |     |   |   |   |   |   |   |   |   |   |   |   |
|---|-----|---|---|---|---|---|---|---|---|---|---|---|
| P | P.1 |   |   |   | • | • | • | • | • | • | • | • |
|   | P.2 |   |   |   |   |   |   |   | • | • | • | • |
|   | P.3 |   |   |   |   |   |   |   | • | • |   |   |
|   | P.4 |   |   |   |   |   |   |   | • | • | • | • |
|   | P.5 |   |   |   |   |   |   |   | • | • |   |   |
|   | P.6 |   |   |   |   |   |   |   |   |   |   |   |
| M | M.1 |   |   |   |   |   |   |   |   |   | • | • |
|   | M.2 |   |   |   |   |   |   |   |   |   | • | • |
|   | M.3 |   |   |   |   |   |   |   |   |   |   |   |
| K | K.1 |   |   |   |   |   |   |   | • | • | • | • |
|   | K.2 |   |   |   |   |   |   |   |   |   |   |   |
| N | N.1 | • | • | • | • |   |   |   |   |   |   |   |
|   | N.2 | • | • | • | • | • | • | • |   |   |   |   |
|   | N.3 | • | • |   |   |   |   |   |   |   |   |   |
|   | N.4 |   |   |   |   |   |   |   |   |   |   |   |
| S | S.1 |   |   |   |   |   |   |   |   |   |   |   |
|   | S.2 |   |   |   |   |   |   |   |   |   |   |   |
| H | H.1 |   |   |   |   |   |   |   |   |   |   |   |
|   | H.2 |   |   |   |   |   |   |   |   |   |   |   |



| Code           | 1245   | 1245   | 1255   | 1255   | 1245P  | 1255P  | 1285    | 1295    | 1285X   | 1285P   | 1285S  | 1285S  |
|----------------|--------|--------|--------|--------|--------|--------|---------|---------|---------|---------|--------|--------|
| DIN            | 844    | 844    | 844    | 844    | 844    | 844    | 844     | 844     | 844     | 844     |        |        |
| Type           | NR     | NR     | NR     | NR     | NR-F   | NR-F   | HR      | HR      | HR      | HR-F    | HR     | HR     |
| Material       | HSSCo8 | HSSCo8 | HSSCo8 | HSSCo8 | HSSCo8 | HSSCo8 | HSSE-PM | HSSE-PM | HSSE-PM | HSSE-PM | HSSCo8 | HSSCo8 |
| Dimension (mm) | 6-40   | 6-40   | 6-40   | 6-40   | 6-32   | 6-32   | 6-32    | 6-20    | 9-20    | 6-32    | 6-30   | 6-30   |
| Page           | 21     | 21     | 21     | 21     | 22     | 22     | 23      | 23      | 24      | 25      | 26     | 26     |

|          |     |   |   |   |   |   |   |   |   |   |   |   |
|----------|-----|---|---|---|---|---|---|---|---|---|---|---|
| <b>P</b> | P.1 | • | • | • | • | • |   |   |   |   |   |   |
|          | P.2 | • | • | • | • | • |   |   |   |   |   |   |
|          | P.3 |   |   |   |   |   | • | • | • | • | • | • |
|          | P.4 | • | • | • | • | • |   |   |   |   |   |   |
|          | P.5 |   |   |   | • | • | • | • | • | • |   |   |
|          | P.6 |   |   |   |   |   | • | • | • | • |   |   |
| <b>M</b> | M.1 |   |   |   |   |   | • | • | • | • |   |   |
|          | M.2 | • | • | • | • | • | • | • | • | • |   |   |
|          | M.3 |   |   |   |   |   |   |   |   |   |   |   |
| <b>K</b> | K.1 | • | • | • | • | • |   |   |   |   |   |   |
|          | K.2 |   |   |   |   |   | • | • | • | • | • | • |
| <b>N</b> | N.1 |   |   |   |   |   |   |   |   |   |   |   |
|          | N.2 |   |   |   |   |   |   |   |   |   |   |   |
|          | N.3 |   |   |   |   |   |   |   |   |   |   |   |
|          | N.4 |   |   |   |   |   |   |   |   |   |   |   |
| <b>S</b> | S.1 |   |   |   |   |   | • | • | • | • | • | • |
|          | S.2 |   |   |   |   |   | • | • | • | • |   |   |
| <b>H</b> | H.1 |   |   |   |   |   |   |   |   |   |   |   |
|          | H.2 |   |   |   |   |   |   |   |   |   |   |   |





|                |        |        |        |        |        |        |        |        |        |        |         |         |
|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|
| Code           | 1285   | 1285   | 1295   | 1295   | 1285P  | 1295P  | 1252E  | 1212E  | 1242K  | 1202K  | 1485R   | 1205R   |
| DIN            | 844    | 844    | 844    | 844    | 844    | 844    |        |        |        |        | 844     | 844     |
| Type           | HR     | HR     | HR     | HR     | HR-F   | HR-F   | NR     | N      | NR     | N      | HR      | N       |
| Material       | HSSCo8 | HSSCo8 | HSSCo8 | HSSCo8 | HSSCo8 | HSSCo8 | HSSCo5 | HSSCo5 | HSSCo8 | HSSCo8 | HSSE-PM | HSSE-PM |
| Dimension (mm) | 6-32   | 6-32   | 6-32   | 6-32   | 6-32   | 6-32   | 10-32  | 10-32  | 30-50  | 30-50  | 6-20    | 6-20    |
| Page           | 27     | 27     | 27     | 27     | 28     | 28     | 29     | 29     | 30     | 30     | 31      | 31      |

|   |     |   |   |   |   |   |   |   |   |   |   |   |
|---|-----|---|---|---|---|---|---|---|---|---|---|---|
| P | P.1 |   |   |   |   |   | • | • | • | • | • | • |
|   | P.2 |   |   |   |   |   | • | • | • | • |   |   |
|   | P.3 | • | • | • | • | • | • | • | • | • | • | • |
|   | P.4 |   |   |   |   |   | • | • | • | • |   |   |
|   | P.5 | • |   |   |   | • | • | • |   |   |   |   |
|   | P.6 |   |   |   |   | • | • |   |   |   | • | • |
| M | M.1 |   |   |   |   |   | • | • |   |   |   |   |
|   | M.2 |   |   |   |   |   | • | • | • | • |   |   |
|   | M.3 |   |   |   |   |   | • | • |   |   | • | • |
| K | K.1 |   |   |   |   |   | • | • |   |   |   |   |
|   | K.2 | • | • | • | • | • | • | • |   |   |   |   |
| N | N.1 |   |   |   |   |   | • | • |   |   | • | • |
|   | N.2 |   |   |   |   |   |   |   |   |   |   |   |
|   | N.3 |   |   |   |   |   |   |   |   |   |   |   |
|   | N.4 |   |   |   |   |   | • | • | • | • | • | • |
| S | S.1 | • | • | • | • | • | • | • |   |   | • | • |
|   | S.2 |   |   |   |   |   | • | • |   |   | • | • |
| H | H.1 |   |   |   |   |   |   |   |   |   |   |   |
|   | H.2 |   |   |   |   |   |   |   |   |   |   |   |



|                |         |        |        |         |         |         |         |        |        |        |        |        |
|----------------|---------|--------|--------|---------|---------|---------|---------|--------|--------|--------|--------|--------|
| Code           | 1204    | 1404   | 1404   | 1205    | 1215    | 1406X   | 1506S   | 1205   | 1205   | 1215   | 1215   | 1402   |
| DIN            | 844     | 844    | 844    | 844     | 844     | 844     |         | 844    | 844    | 844    | 844    | 844    |
| Type           | N       | N      | N      | N       | N       | N       | N       | N      | N      | N      | N      | N      |
| Material       | HSSE-PM | HSSCo8 | HSSCo8 | HSSE-PM | HSSE-PM | HSSE-PM | HSSE-PM | HSSCo8 | HSSCo8 | HSSCo8 | HSSCo8 | HSSCo8 |
| Dimension (mm) | 2-20    | 2-32   | 2-32   | 2-32    | 3-32    | 6-20    | 6-20    | 2-40   | 2-40   | 2-40   | 2-40   | 6-40   |
| Page           | 32      | 33     | 33     | 34      | 34      | 35      | 36      | 38-39  | 38-39  | 40-41  | 40-41  | 42     |

|   |     |   |   |   |   |   |   |   |   |   |   |   |
|---|-----|---|---|---|---|---|---|---|---|---|---|---|
| P | P.1 |   |   |   |   | • | • | • | • | • | • | • |
|   | P.2 | • | • | • | • | • | • | • | • | • | • | • |
|   | P.3 | • | • | • | • | • | • | • | • | • | • | • |
|   | P.4 | • | • | • | • | • | • | • | • | • | • | • |
|   | P.5 | • | • | • | • | • | • |   |   |   |   | • |
|   | P.6 |   |   |   |   | • | • | • | • | • | • |   |
| M | M.1 |   |   |   | • | • | • |   |   |   |   |   |
|   | M.2 | • | • | • | • | • | • | • | • | • | • |   |
|   | M.3 |   |   |   |   | • | • |   |   |   |   |   |
| K | K.1 | • | • | • | • |   |   | • | • | • | • |   |
|   | K.2 |   |   |   |   | • |   |   |   |   |   |   |
| N | N.1 |   |   |   |   |   |   |   |   |   |   |   |
|   | N.2 | • |   |   |   |   |   |   |   |   |   |   |
|   | N.3 |   |   |   |   |   |   |   |   |   |   |   |
|   | N.4 |   |   |   |   |   |   |   |   |   |   |   |
| S | S.1 |   | • | • | • |   |   | • | • | • | • |   |
|   | S.2 | • | • | • | • |   |   |   |   |   |   |   |
| H | H.1 |   |   |   |   |   |   |   |   |   |   |   |
|   | H.2 |   |   |   |   |   |   |   |   |   |   |   |



|                |        |        |        |        |        |        |        |         |        |        |        |        |
|----------------|--------|--------|--------|--------|--------|--------|--------|---------|--------|--------|--------|--------|
| Code           | 1412   | 1406   | 1406   | 1416   | 1604   | 1604   | 1614   | 2204    | 2204   | 2204   | 2214   | 2214   |
| DIN            | 844    | 844    | 844    | 844    |        |        |        | 327     | 327    | 327    |        |        |
| Type           | N      | N      | N      | N      | N      | N      | N      | N       | N      | N      | N      | N      |
| Material       | HSSCo8 | HSSCo8 | HSSCo8 | HSSCo8 | HSSCo8 | HSSCo8 | HSSCo8 | HSSE-PM | HSSCo8 | HSSCo8 | HSSCo8 | HSSCo8 |
| Dimension (mm) | 6-40   | 2-32   | 2-32   | 2-32   | 1,5-10 | 1,5-10 | 1,5-10 | 2-28    | 1-40   | 1-40   | 2-40   | 2-40   |
| Page           | 42     | 44-45  | 44-45  | 44-45  | 46-47  | 46-47  | 46-47  | 48      | 49-51  | 49-51  | 52-53  | 52-53  |

|          |     |   |   |   |   |   |   |   |   |   |   |   |  |
|----------|-----|---|---|---|---|---|---|---|---|---|---|---|--|
| <b>P</b> | P.1 | • | • | • | • | • | • | • | • | • | • | • |  |
|          | P.2 | • | • | • | • | • | • | • | • | • | • | • |  |
|          | P.3 | • | • | • | • | • | • | • | • | • | • | • |  |
|          | P.4 | • | • | • | • | • | • | • | • | • | • | • |  |
|          | P.5 | • | • | • | • | • | • | • | • | • | • | • |  |
|          | P.6 |   |   |   |   | • | • | • | • |   |   |   |  |
| <b>M</b> | M.1 |   |   |   |   |   |   |   |   |   |   |   |  |
|          | M.2 |   |   |   | • | • | • | • | • | • | • | • |  |
|          | M.3 |   |   |   |   |   |   |   |   |   |   |   |  |
| <b>K</b> | K.1 |   | • | • | • | • | • | • | • | • | • | • |  |
|          | K.2 |   |   |   | • | • | • | • | • | • | • | • |  |
| <b>N</b> | N.1 |   |   |   |   |   |   |   |   |   |   |   |  |
|          | N.2 |   |   |   |   |   |   |   |   |   |   |   |  |
|          | N.3 |   |   |   |   |   |   |   |   |   |   |   |  |
|          | N.4 |   |   |   |   |   |   |   |   |   |   |   |  |
| <b>S</b> | S.1 |   | • | • | • |   |   |   |   |   |   |   |  |
|          | S.2 |   |   |   |   |   |   |   |   |   |   |   |  |
| <b>H</b> | H.1 |   |   |   |   |   |   |   |   |   |   |   |  |
|          | H.2 |   |   |   |   |   |   |   |   |   |   |   |  |

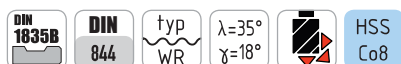


|                |         |        |        |          |        |        |        |
|----------------|---------|--------|--------|----------|--------|--------|--------|
| Code           | 2304    | 2304   | 2304   | 2304H    | 2314   | 2314   | 2334   |
| DIN            | 327     | 327    | 327    | 327      | 327    | 327    |        |
| Type           | N       | N      | N      | N        | N      | N      | N      |
| Material       | HSSE-PM | HSSCo8 | HSSCo8 | HSSCo8   | HSSCo8 | HSSCo8 | HSSCo8 |
| Dimension (mm) | 2-32    | 2-32   | 2-32   | 11,7-247 | 2,8-25 | 2,8-25 | 2,25   |
| Page           | 54-55   | 54-55  | 54-55  | 56       | 57     | 57     | 58     |

|          |     |   |   |   |   |   |   |  |  |  |  |  |
|----------|-----|---|---|---|---|---|---|--|--|--|--|--|
| <b>P</b> | P.1 | • | • | • | • | • | • |  |  |  |  |  |
|          | P.2 | • | • | • | • | • | • |  |  |  |  |  |
|          | P.3 | • | • | • | • | • | • |  |  |  |  |  |
|          | P.4 | • | • | • | • | • | • |  |  |  |  |  |
|          | P.5 |   |   |   |   |   |   |  |  |  |  |  |
|          | P.6 |   |   |   |   |   |   |  |  |  |  |  |
| <b>M</b> | M.1 |   |   |   |   |   |   |  |  |  |  |  |
|          | M.2 | • | • | • | • | • | • |  |  |  |  |  |
|          | M.3 |   |   |   |   |   |   |  |  |  |  |  |
| <b>K</b> | K.1 | • | • | • | • | • | • |  |  |  |  |  |
|          | K.2 | • | • | • | • | • | • |  |  |  |  |  |
| <b>N</b> | N.1 |   |   |   |   |   |   |  |  |  |  |  |
|          | N.2 |   |   |   |   |   |   |  |  |  |  |  |
|          | N.3 |   |   |   |   |   |   |  |  |  |  |  |
|          | N.4 |   |   |   |   |   |   |  |  |  |  |  |
| <b>S</b> | S.1 |   |   |   |   |   |   |  |  |  |  |  |
|          | S.2 | • | • | • | • | • | • |  |  |  |  |  |
| <b>H</b> | H.1 |   |   |   |   |   |   |  |  |  |  |  |
|          | H.2 |   |   |   |   |   |   |  |  |  |  |  |



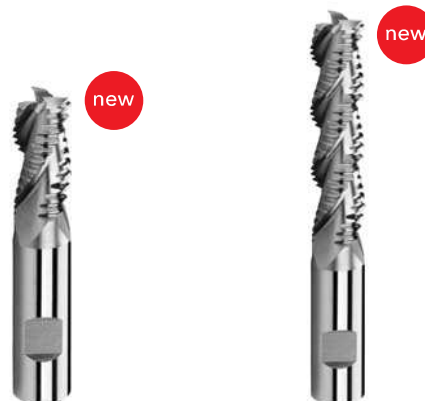
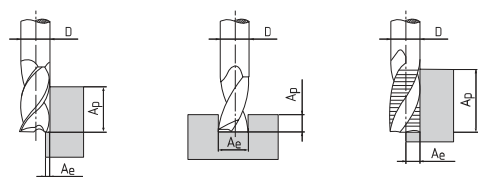
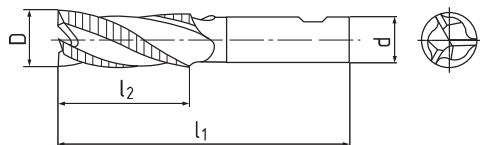
EN End mills | for Aluminium roughing  
 DE Schafffräser | für Aluminium schrappen  
 RU Фрезы цилиндрические торцевые | черновые по Алюминию



1144

1154

SSH



| D<br>k 12 | d<br>h 6 | l <sub>1</sub><br>1144 | l <sub>1</sub><br>1154 | l <sub>2</sub><br>1144 | l <sub>2</sub><br>1154 | z |
|-----------|----------|------------------------|------------------------|------------------------|------------------------|---|
| 6         | 6        | 57                     | 68                     | 13                     | 24                     | 3 |
| 8         | 10       | 69                     | 88                     | 19                     | 38                     | 3 |
| 10        | 10       | 72                     | 95                     | 22                     | 45                     | 3 |
| 12        | 12       | 83                     | 110                    | 26                     | 53                     | 3 |
| 16        | 16       | 92                     | 123                    | 32                     | 63                     | 3 |
| 20        | 20       | 104                    | 141                    | 38                     | 75                     | 3 |

| 114418 | 115418 |
|--------|--------|
| .060   | .060   |
| .080   | .080   |
| .100   | .100   |
| .120   | .120   |
| .160   | .160   |
| .200   | .200   |

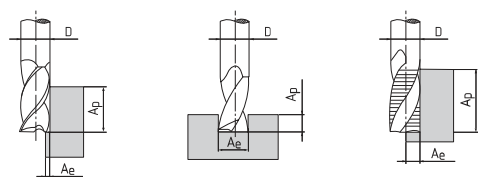
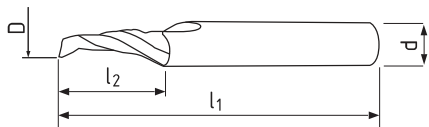
## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material |          |       |        |     | f <sub>z</sub> (mm/z) |        |       |        |        |       |
|----------|----------|-------|--------|-----|-----------------------|--------|-------|--------|--------|-------|
|          |          |       |        |     | Ø 6                   | Ø 8    | Ø 10  | Ø 12   | Ø 16   | Ø 20  |
| 114418   |          |       |        |     |                       |        |       |        |        |       |
| N.3      | Si > 12% | 1,5xD | 0,5xD  | 196 | 0,0276                | 0,0368 | 0,046 | 0,0552 | 0,0736 | 0,092 |
| N.2      | Si ≤ 12% | 1,5xD | 0,5xD  | 165 | 0,0264                | 0,0352 | 0,044 | 0,0528 | 0,0704 | 0,088 |
| N.1      | Si ≤ 6%  | 1,5xD | 0,5xD  | 108 | 0,0246                | 0,0328 | 0,041 | 0,0492 | 0,0656 | 0,082 |
| 115418   |          |       |        |     |                       |        |       |        |        |       |
| N.3      | Si > 12% | 1,5xD | 0,25xD | 143 | 0,0306                | 0,0408 | 0,051 | 0,0612 | 0,0816 | 0,102 |
| N.2      | Si ≤ 12% | 1,5xD | 0,25xD | 138 | 0,0288                | 0,0384 | 0,048 | 0,0576 | 0,0768 | 0,096 |
| N.1      | Si ≤ 6%  | 1,5xD | 0,25xD | 125 | 0,027                 | 0,036  | 0,045 | 0,054  | 0,072  | 0,09  |

- EN End mills | short, 1 tooth cut over centre  
 DE Schafffräser | Kurz, 1 Schneide über Mitte  
 RU Фрезы концевые с цилиндрическим хвостовиком | короткие, с центрорежущим зубом



1004



| D<br>k 12 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z |
|-----------|----------|----------------|----------------|---|
| 3         | 8        | 60             | 12             | 1 |
| 4         | 8        | 60             | 12             | 1 |
| 5         | 8        | 60             | 14             | 1 |
| 6         | 8        | 60             | 14             | 1 |
| 7         | 8        | 60             | 14             | 1 |
| 8         | 8        | 80             | 14             | 1 |
| 9         | 8        | 80             | 14             | 1 |
| 10        | 8        | 80             | 14             | 1 |
| 12        | 8        | 80             | 14             | 1 |

100405

.030  
 .040  
 .050  
 .060  
 .070  
 .080  
 .090  
 .100  
 .120

### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material     | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |      |
|--------------|----------------|----------------|----------------|-----------------------|-------|-------|------|
|              |                |                |                | Ø 3                   | Ø 6   | Ø 8   | Ø 10 |
| N.2 Si ≤ 12% |                |                | 160-260        | 0,008                 | 0,018 | 0,024 | 0,03 |



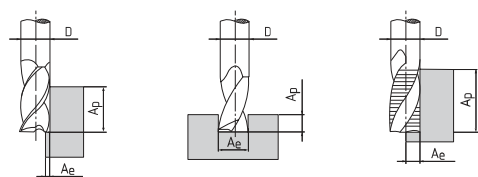
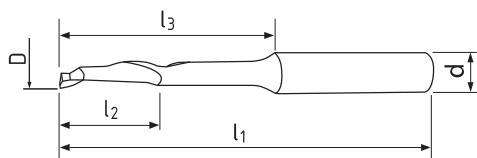
EN End mills | long, 1 tooth cut over centre

DE Schafffräser | Lang, 1 Schneide über Mitte

RU Фрезы концевые с цилиндрическим хвостовиком | длинные, с центрорежущим зубом



1014



| D<br>k 12 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | l <sub>3</sub> | Z | 101405  |
|-----------|----------|----------------|----------------|----------------|---|---------|
| 4         | 8        | 80             | 16             | 45             | 1 | .040    |
| 5         | 8        | 80             | 16             | 45             | 1 | .050    |
| 5         | 8        | 120            | 16             | 84             | 1 | .050120 |
| 6         | 8        | 90             | 16             | 45             | 1 | .060    |
| 8         | 8        | 100            | 30             | 70             | 1 | .080    |
| 8         | 8        | 120            | 16             | 90             | 1 | .080120 |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material     | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |        |        |       |
|--------------|----------------|----------------|----------------|-----------------------|--------|--------|-------|
|              |                |                |                | Ø 3                   | Ø 6    | Ø 8    | Ø 10  |
| N.2 Si ≤ 12% |                |                | 160-260        | 0,0056                | 0,0126 | 0,0168 | 0,021 |

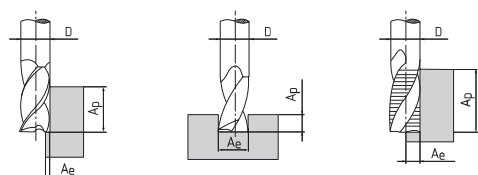
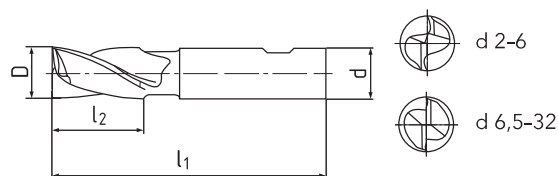


- EN Slot drills | 2 - fluted, 2 teeth cut to centre  
 DE Langlochfräser | zweischneider, bis Mitte schneidend  
 RU Фрезы шпоночные | двузубые, 2 режущие кромки ч. центр



2706

2736

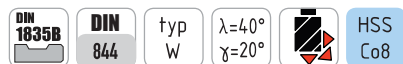


| D<br>e 8 | d<br>h 6 | l <sub>1</sub><br>2706 | l <sub>1</sub><br>2736 | l <sub>2</sub><br>2706 | l <sub>2</sub><br>2736 | Z | 270618 | 273618 |
|----------|----------|------------------------|------------------------|------------------------|------------------------|---|--------|--------|
| 2        | 6        | 51                     | 54                     | 7                      | 10                     | 2 | .020   | .020   |
| 2,5      | 6        | 52                     |                        | 8                      |                        | 2 | .025   |        |
| 3        | 6        | 52                     | 56                     | 8                      | 12                     | 2 | .030   | .030   |
| 3,5      | 6        | 54                     |                        | 10                     |                        | 2 | .035   |        |
| 4        | 6        | 55                     | 63                     | 11                     | 19                     | 2 | .040   | .040   |
| 4,5      | 6        | 55                     |                        | 11                     |                        | 2 | .045   |        |
| 5        | 6        | 57                     | 68                     | 13                     | 24                     | 2 | .050   | .050   |
| 5,5      | 6        | 57                     |                        | 13                     |                        | 2 | .055   |        |
| 6        | 6        | 57                     | 68                     | 13                     | 24                     | 2 | .060   | .060   |
| 6,5      | 10       | 66                     |                        | 16                     |                        | 2 | .065   |        |
| 7        | 10       | 66                     | 80                     | 16                     | 30                     | 2 | .070   | .070   |
| 7,5      | 10       | 66                     |                        | 16                     |                        | 2 | .075   |        |
| 8        | 10       | 69                     | 88                     | 19                     | 38                     | 2 | .080   | .080   |
| 8,5      | 10       | 69                     |                        | 19                     |                        | 2 | .085   |        |
| 9        | 10       | 69                     |                        | 19                     |                        | 2 | .090   |        |
| 9,5      | 10       | 69                     |                        | 19                     |                        | 2 | .095   |        |
| 10       | 10       | 72                     | 95                     | 22                     | 45                     | 2 | .100   | .100   |
| 11       | 12       | 79                     | 102                    | 22                     | 45                     | 2 | .110   | .110   |
| 12       | 12       | 83                     | 110                    | 26                     | 53                     | 2 | .120   | .120   |
| 13       | 12       | 83                     | 110                    | 26                     | 53                     | 2 | .130   | .130   |
| 14       | 12       | 83                     | 110                    | 26                     | 53                     | 2 | .140   | .140   |
| 15       | 12       | 83                     | 110                    | 26                     | 53                     | 2 | .150   | .150   |
| 16       | 16       | 92                     | 123                    | 32                     | 63                     | 2 | .160   | .160   |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

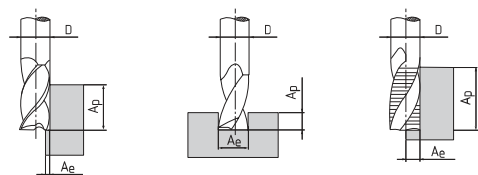
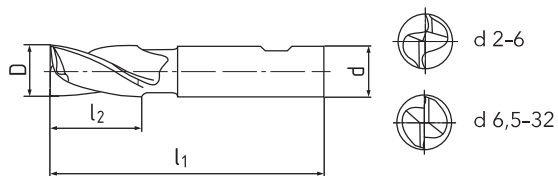
| Material                    | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |        |        |        |        |        |
|-----------------------------|----------------|----------------|----------------|-----------------------|--------|--------|--------|--------|--------|
|                             |                |                |                | Ø 3                   | Ø 6    | Ø 8    | Ø 10   | Ø 12   | Ø 16   |
| P.1 ≤ 600 N/mm <sup>2</sup> | 0,5xD          | 1xD            | 45             | 0,009                 | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  |
| N.2 Si ≤ 12%                | 0,5xD          | 1xD            | 160-300        | 0,0117                | 0,0286 | 0,0377 | 0,0468 | 0,0572 | 0,0754 |

- EN Slot drills | 2 - fluted, 2 teeth cut to centre  
 DE Langlochfräser | zweischneider, bis Mitte schneidend  
 RU Фрезы шпоночные | двузубые, 2 режущие кромки ч. центр



2706

2736

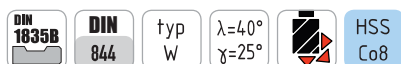
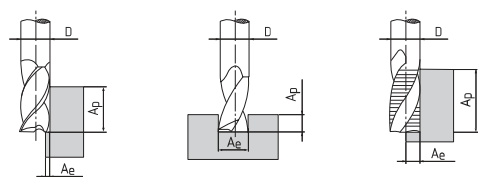
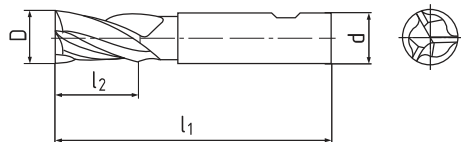


| D<br>e 8 | d<br>h 6 | l <sub>1</sub><br>2706 | l <sub>1</sub><br>2736 | l <sub>2</sub><br>2706 | l <sub>2</sub><br>2736 | z | 270618 | 273618 |
|----------|----------|------------------------|------------------------|------------------------|------------------------|---|--------|--------|
| 17       | 16       | 92                     |                        | 32                     |                        | 2 | .170   |        |
| 18       | 16       | 92                     | 123                    | 32                     | 63                     | 2 | .180   | .180   |
| 19       | 16       | 92                     |                        | 32                     |                        | 2 | .190   |        |
| 20       | 20       | 104                    | 141                    | 38                     | 75                     | 2 | .200   | .200   |
| 21       | 20       | 104                    |                        | 38                     |                        | 2 | .210   |        |
| 22       | 20       | 104                    | 141                    | 38                     | 75                     | 2 | .220   | .220   |
| 23       | 20       | 104                    |                        | 38                     |                        | 2 | .230   |        |
| 24       | 25       | 121                    |                        | 45                     |                        | 2 | .240   |        |
| 25       | 25       | 121                    | 166                    | 45                     | 90                     | 2 | .250   | .250   |
| 26       | 25       | 121                    |                        | 45                     |                        | 2 | .260   |        |
| 28       | 25       | 121                    |                        | 45                     |                        | 2 | .280   |        |
| 30       | 25       | 121                    |                        | 45                     |                        | 2 | .300   |        |
| 32       | 32       | 133                    |                        | 53                     |                        | 2 | .320   |        |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                    | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | fz (mm/z) |        |       |       |
|-----------------------------|----------------|----------------|----------------|-----------|--------|-------|-------|
|                             |                |                |                | Ø 18      | Ø 20   | Ø 25  | Ø 30  |
| P.1 ≤ 600 N/mm <sup>2</sup> | 0,5xD          | 1xD            | 45             | 0,065     | 0,073  | 0,71  | 0,11  |
| N.2 Si ≤ 12%                | 0,5xD          | 1xD            | 160-300        | 0,0845    | 0,0949 | 0,923 | 0,143 |

- EN End mills | 1 tooth cut over centre  
 DE Schafffräser | 1 Schneide über die Mitte  
 RU Фрезы концевые с цилиндрическим хвостовиком | с центрорежущим зубом

**1104****1114**

| D<br>k 10 | d<br>h 6 | l <sub>1</sub><br>1104 | l <sub>1</sub><br>1114 | l <sub>2</sub><br>1104 | l <sub>2</sub><br>1114 | z |
|-----------|----------|------------------------|------------------------|------------------------|------------------------|---|
| 2         | 6        | 51                     |                        | 7                      |                        | 3 |
| 3         | 6        | 52                     |                        | 8                      |                        | 3 |
| 4         | 6        | 55                     |                        | 11                     |                        | 3 |
| 4,5       | 6        | 55                     |                        | 11                     |                        | 3 |
| 5         | 6        | 57                     |                        | 13                     |                        | 3 |
| 6         | 6        | 57                     | 68                     | 13                     | 24                     | 3 |
| 7         | 10       | 66                     | 80                     | 16                     | 30                     | 3 |
| 8         | 10       | 69                     | 88                     | 19                     | 38                     | 3 |
| 9         | 10       | 69                     | 88                     | 19                     | 38                     | 3 |
| 10        | 10       | 72                     | 95                     | 22                     | 45                     | 3 |
| 12        | 12       | 83                     | 110                    | 26                     | 53                     | 3 |
| 14        | 12       | 83                     | 110                    | 26                     | 53                     | 3 |
| 15        | 12       | 83                     | 110                    | 26                     | 53                     | 3 |
| 16        | 16       | 92                     | 123                    | 32                     | 63                     | 3 |
| 18        | 16       | 92                     | 123                    | 32                     | 63                     | 3 |
| 20        | 20       | 104                    | 141                    | 38                     | 75                     | 3 |

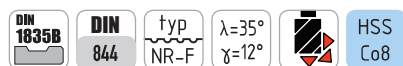
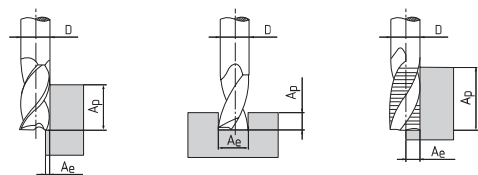
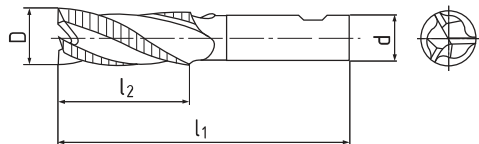
**110418****111418**

|      |      |
|------|------|
| .020 |      |
| .030 |      |
| .040 |      |
| .045 |      |
| .050 |      |
| .060 | .060 |
| .070 | .070 |
| .080 | .080 |
| .090 | .090 |
| .100 | .100 |
| .120 | .120 |
| .140 | .140 |
| .150 | .150 |
| .160 | .160 |
| .180 | .180 |
| .200 | .200 |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material |                         | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |        |        |        |        |        |        |        |
|----------|-------------------------|----------------|----------------|----------------|-----------------------|--------|--------|--------|--------|--------|--------|--------|
|          |                         |                |                |                | Ø 3                   | Ø 6    | Ø 8    | Ø 10   | Ø 12   | Ø 16   | Ø 18   | Ø 20   |
| 110418   |                         |                |                |                |                       |        |        |        |        |        |        |        |
| P.1      | ≤ 600 N/mm <sup>2</sup> | 1xD            | 0,1xD          | 45             | 0,006                 | 0,015  | 0,021  | 0,028  | 0,034  | 0,044  | 0,051  | 0,057  |
| N.2      | Si ≤ 12%                | 1xD            | 0,1xD          | 160-300        | 0,006                 | 0,015  | 0,021  | 0,028  | 0,034  | 0,044  | 0,051  | 0,057  |
| 111418   |                         |                |                |                |                       |        |        |        |        |        |        |        |
| P.1      | ≤ 600 N/mm <sup>2</sup> | 1,5xD          | 0,1xD          | 45             | 0,006                 | 0,015  | 0,021  | 0,028  | 0,034  | 0,044  | 0,051  | 0,057  |
| N.2      | Si ≤ 12%                | 1,5xD          | 0,1xD          | 160-300        | 0,0078                | 0,0195 | 0,0273 | 0,0364 | 0,0442 | 0,0572 | 0,0663 | 0,0741 |

- EN End mills | NR-F 1 tooth cut over centre  
 DE Schafffräser | NR-F, 1 Schneide über die Mitte  
 RU Фрезы концевые с цилиндрическим хвостовиком | NR-F, с центрорежущим зубом

**1044P****1054P**

| D<br>k 12 | d<br>h 6 | l <sub>1</sub><br>1044P | l <sub>1</sub><br>1055P | l <sub>2</sub><br>1044P | l <sub>2</sub><br>1055P | Z | 104418P | 105418P |
|-----------|----------|-------------------------|-------------------------|-------------------------|-------------------------|---|---------|---------|
| 6         | 6        | 57                      | 68                      | 13                      | 24                      | 3 | .060    | .060    |
| 8         | 10       | 69                      | 88                      | 19                      | 38                      | 3 | .080    | .080    |
| 9         | 10       | 69                      | 88                      | 19                      | 38                      | 3 | .090    | .090    |
| 10        | 10       | 72                      | 95                      | 22                      | 45                      | 3 | .100    | .100    |
| 12        | 12       | 83                      | 110                     | 26                      | 53                      | 3 | .120    | .120    |
| 14        | 12       | 83                      | 110                     | 26                      | 53                      | 3 | .140    | .140    |
| 16        | 16       | 92                      | 123                     | 32                      | 63                      | 3 | .160    | .160    |
| 18        | 16       | 92                      | 123                     | 32                      | 63                      | 3 | .180    | .180    |
| 20        | 20       | 104                     | 141                     | 38                      | 75                      | 3 | .200    | .200    |
| 24        | 25       | 121                     | 166                     | 45                      | 90                      | 3 | .240    | .240    |
| 25        | 25       | 121                     | 166                     | 45                      | 90                      | 3 | .250    | .250    |
| 32        | 32       | 133                     | 186                     | 53                      | 106                     | 3 | .320    | .320    |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

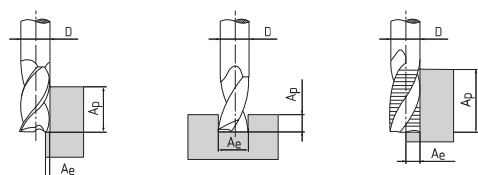
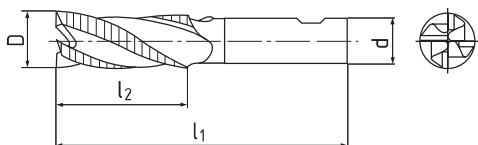
|          |              |       |       |    | fz (mm/z) |       |       |      |      |      |      |      |      |
|----------|--------------|-------|-------|----|-----------|-------|-------|------|------|------|------|------|------|
| Material |              | Ap    | Ae    | Vc | Ø 6       | Ø 8   | Ø 10  | Ø 12 | Ø 16 | Ø 18 | Ø 20 | Ø 25 | Ø 32 |
| P.1      | ≤ 600 N/mm²  | 1,5xD | 0,5xD | 45 | 0,02      | 0,025 | 0,035 | 0,04 | 0,07 | 0,08 | 0,09 | 0,1  | 0,12 |
| P.2      | ≤ 850 N/mm²  | 1,5xD | 0,5xD | 39 | 0,02      | 0,025 | 0,035 | 0,04 | 0,07 | 0,08 | 0,09 | 0,1  | 0,12 |
| P.3      | ≤ 1100 N/mm² | 1,5xD | 0,5xD | 24 | 0,02      | 0,025 | 0,035 | 0,04 | 0,07 | 0,08 | 0,09 | 0,1  | 0,12 |
| P.4      | ≤ 900 N/mm²  | 1,5xD | 0,5xD | 30 | 0,02      | 0,025 | 0,035 | 0,04 | 0,07 | 0,08 | 0,09 | 0,1  | 0,12 |
| P.5      | ≤ 1100 N/mm² | 1,5xD | 0,5xD | 24 | 0,02      | 0,025 | 0,035 | 0,04 | 0,07 | 0,08 | 0,09 | 0,1  | 0,12 |
| K.1      | < 240 HB     | 1,5xD | 0,5xD | 35 | 0,02      | 0,025 | 0,035 | 0,04 | 0,07 | 0,08 | 0,09 | 0,1  | 0,12 |

- EN End mills | NR, 1 tooth cut over centre  
 DE Schafffräser | NR, 1 Schneide über die Mitte  
 RU Фрезы концевые с цилиндрическим хвостовиком | NR, с центрорежущим зубом



1245

1255

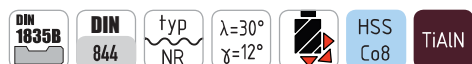


| D<br>k 12 | d<br>h 6 | l <sub>1</sub><br>1245 | l <sub>1</sub><br>1255 | l <sub>2</sub><br>1245 | l <sub>2</sub><br>1255 | z | 124517 | 125517 |
|-----------|----------|------------------------|------------------------|------------------------|------------------------|---|--------|--------|
| 6         | 6        | 57                     | 68                     | 13                     | 24                     | 4 | .060   | .060   |
| 8         | 10       | 69                     | 88                     | 19                     | 38                     | 4 | .080   | .080   |
| 10        | 10       | 72                     | 95                     | 22                     | 45                     | 4 | .100   | .100   |
| 12        | 12       | 83                     | 110                    | 26                     | 53                     | 4 | .120   | .120   |
| 14        | 12       | 83                     | 110                    | 26                     | 53                     | 4 | .140   | .140   |
| 16        | 16       | 92                     | 123                    | 32                     | 63                     | 4 | .160   | .160   |
| 18        | 16       | 92                     | 123                    | 32                     | 63                     | 4 | .180   | .180   |
| 20        | 20       | 104                    | 141                    | 38                     | 75                     | 4 | .200   | .200   |
| 22        | 20       | 104                    |                        | 38                     |                        | 5 | .220   |        |
| 25        | 25       | 121                    | 166                    | 45                     | 90                     | 5 | .250   | .250   |
| 28        | 25       | 121                    |                        | 45                     |                        | 5 | .280   |        |
| 30        | 25       | 121                    |                        | 45                     |                        | 5 | .300   |        |
| 32        | 32       | 133                    | 186                    | 53                     | 106                    | 6 | .320   | .320   |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

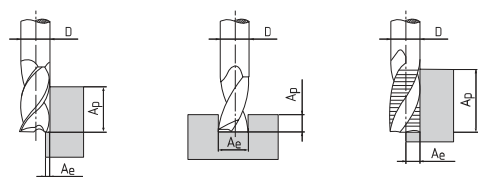
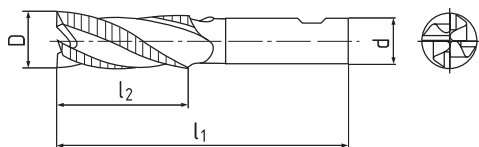
| Material                        | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |       |       |      |      |      |  |
|---------------------------------|----------------|----------------|----------------|-----------------------|-------|-------|-------|-------|-------|------|------|------|--|
|                                 |                |                |                | Ø 6                   | Ø 8   | Ø 10  | Ø 12  | Ø 16  | Ø 18  | Ø 20 | Ø 25 | Ø 30 |  |
| P.1 ≤ 600 N/mm <sup>2</sup>     | 1,5xD          | 0,5xD          | 114            | 0,022                 | 0,028 | 0,039 | 0,044 | 0,077 | 0,088 | 0,1  | 0,11 | 0,12 |  |
| P.2 ≤ 850 N/mm <sup>2</sup>     | 1,5xD          | 0,5xD          | 99             | 0,022                 | 0,028 | 0,039 | 0,044 | 0,077 | 0,088 | 0,1  | 0,11 | 0,12 |  |
| P.4 ≤ 900 N/mm <sup>2</sup>     | 1,5xD          | 0,5xD          | 76,5           | 0,022                 | 0,028 | 0,039 | 0,044 | 0,077 | 0,088 | 0,1  | 0,11 | 0,12 |  |
| M.2 750 – 850 N/mm <sup>2</sup> | 1,5xD          | 0,5xD          | 37,5           | 0,022                 | 0,028 | 0,039 | 0,044 | 0,077 | 0,088 | 0,1  | 0,11 | 0,12 |  |
| K.1 < 240 HB                    | 1,5xD          | 0,5xD          | 88,5           | 0,022                 | 0,028 | 0,039 | 0,044 | 0,077 | 0,088 | 0,1  | 0,11 | 0,12 |  |

- EN End mills | NR, 1 tooth cut over centre  
 DE Schafffräser | NR, 1 Schneide über die Mitte  
 RU Фрезы концевые с цилиндрическим хвостовиком | NR, с центрорежущим зубом



1245

1255



| D<br>k 12 | d<br>h 6 | l <sub>1</sub><br>1245 | l <sub>1</sub><br>1255 | l <sub>2</sub><br>1245 | l <sub>2</sub><br>1255 | Z | 124518 | 124518       | 125518 | 125518       |
|-----------|----------|------------------------|------------------------|------------------------|------------------------|---|--------|--------------|--------|--------------|
| 6         | 6        | 57                     | 68                     | 13                     | 24                     | 4 | .060   | .060 TIALN   | .060   | .060 TIALN   |
| 7         | 10       | 66                     | 80                     | 16                     | 30                     | 4 | .070   | .070 TIALN   | .070   | .070 TIALN   |
| 8         | 10       | 69                     | 88                     | 19                     | 38                     | 4 | .080   | .080 TIALN   | .080   | .080 TIALN   |
| 9         | 10       | 69                     | 88                     | 19                     | 38                     | 4 | .090   | .090 TIALN   | .090   | .090 TIALN   |
| 10        | 10       | 72                     | 95                     | 22                     | 45                     | 4 | .100   | .100 TIALN   | .100   | .100 TIALN   |
| 11        | 12       | 79                     | 102                    | 22                     | 45                     | 4 | .110   | .110 TIALN   | .110   | .110 TIALN   |
| 12        | 12       | 83                     | 110                    | 26                     | 53                     | 4 | .120   | .120 TIALN   | .120   | .120 TIALN   |
| 13        | 12       | 83                     |                        | 26                     |                        | 4 | .130   | .130 TIALN   |        |              |
| 14        | 12       | 83                     | 110                    | 26                     | 53                     | 4 | .140   | .140 TIALN   | .140   | .140 TIALN   |
| 15        | 12       | 83                     | 110                    | 26                     | 53                     | 4 | .150   | .150 TIALN   | .150   | .150 TIALN   |
| 16        | 16       | 92                     | 123                    | 32                     | 63                     | 4 | .160   | .160 TIALN   | .160   | .160 TIALN   |
| 17        | 16       | 92                     |                        | 32                     |                        | 4 | .170   | .170 TIALN   |        |              |
| 18        | 16       | 92                     | 123                    | 32                     | 63                     | 4 | .180   | .180 TIALN   | .180   | .180 TIALN   |
| 19        | 16       | 92                     |                        | 32                     |                        | 4 | .190   | .190 TIALN   |        |              |
| 20        | 20       | 104                    | 141                    | 38                     | 75                     | 4 | .200   | .200 TIALN   | .200   | .200 TIALN   |
| 21        | 20       | 104                    |                        | 38                     |                        | 4 | .210   | .210 TIALN   |        |              |
| 22        | 20       | 104                    | 141                    | 38                     | 75                     | 5 | .220   | .220 TIALN   | .220   | .220 TIALN   |
| 24        | 25       | 121                    | 166                    | 45                     | 90                     | 5 | .240   | .240 TIALN   | .240   | .240 TIALN   |
| 25        | 25       | 121                    | 166                    | 45                     | 90                     | 5 | .250   | .250 TIALN   | .250   | .250 TIALN   |
| 26        | 25       | 121                    | 166                    | 45                     | 90                     | 5 | .260   | .260 TIALN   | .260   | .260 TIALN   |
| 28        | 25       | 121                    | 166                    | 45                     | 90                     | 5 | .280   | .280 TIALN   | .280   | .280 TIALN   |
| 30        | 25       | 121                    | 166                    | 45                     | 90                     | 5 | .300   | .300 TIALN   | .300   | .300 TIALN   |
| 32        | 32       | 133                    | 186                    | 53                     | 106                    | 6 | .320   | .320 TIALN   | .320   | .320 TIALN   |
| 36        | 32       | 133                    | 186                    | 53                     | 106                    | 6 | .360   | .360 TIALN   | .360   | .360 TIALN   |
| 40*       | 32       | 143                    | 205                    | 63                     | 125                    | 6 | .40032 | .40032 TIALN | .40032 | .40032 TIALN |

\*) ≠ DIN 844

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                        | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | fz (mm/z) |       | Ø 10  | Ø 12 | Ø 16 | Ø 18 | Ø 20 | Ø 25 | Ø 30  | Ø 40 |
|---------------------------------|----------------|----------------|----------------|-----------|-------|-------|------|------|------|------|------|-------|------|
|                                 |                |                |                | Ø 6       | Ø 8   |       |      |      |      |      |      |       |      |
| P.1 ≤ 600 N/mm <sup>2</sup>     | 1,5xD          | 0,5xD          | 45             | 0,02      | 0,025 | 0,035 | 0,04 | 0,07 | 0,08 | 0,09 | 0,1  | 0,115 | 0,14 |
| P.2 ≤ 850 N/mm <sup>2</sup>     | 1,5xD          | 0,5xD          | 39             | 0,02      | 0,025 | 0,035 | 0,04 | 0,07 | 0,08 | 0,09 | 0,1  | 0,115 | 0,14 |
| P.4 ≤ 900 N/mm <sup>2</sup>     | 1,5xD          | 0,5xD          | 30             | 0,02      | 0,025 | 0,035 | 0,04 | 0,07 | 0,08 | 0,09 | 0,1  | 0,115 | 0,14 |
| M.2 750 - 850 N/mm <sup>2</sup> | 1,5xD          | 0,5xD          | 15             | 0,02      | 0,025 | 0,035 | 0,04 | 0,07 | 0,08 | 0,09 | 0,1  | 0,115 | 0,14 |
| K.1 < 240 HB                    | 1,5xD          | 0,5xD          | 35             | 0,02      | 0,025 | 0,035 | 0,04 | 0,07 | 0,08 | 0,09 | 0,1  | 0,115 | 0,14 |

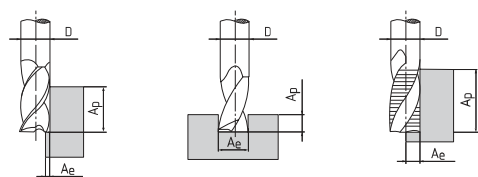
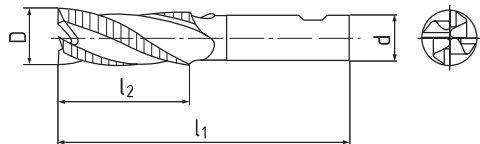
TiAlN: V<sub>c</sub> + 50 %

- EN End mills | NR-F, 1 tooth cut over centre  
 DE Schafffräser | NR-F, 1 Schneide über die Mitte  
 RU Фрезы концевые с цилиндрическим хвостовиком | NR-F, с центроврежущим зубом



1245P

1255P

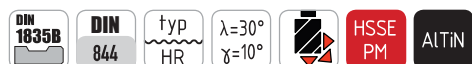


| D<br>k 12 | d<br>h 6 | l <sub>1</sub><br>1245P | l <sub>1</sub><br>1255P | l <sub>2</sub><br>1245P | l <sub>2</sub><br>1255P | Z | 124518P | 125518P |
|-----------|----------|-------------------------|-------------------------|-------------------------|-------------------------|---|---------|---------|
| 6         | 6        | 57                      | 68                      | 13                      | 24                      | 4 | .060    | .060    |
| 7         | 10       | 66                      |                         | 16                      |                         | 4 | .070    |         |
| 8         | 10       | 69                      | 88                      | 19                      | 38                      | 4 | .080    | .080    |
| 9         | 10       | 69                      | 88                      | 19                      | 38                      | 4 | .090    | .090    |
| 10        | 10       | 72                      | 95                      | 22                      | 45                      | 4 | .100    | .100    |
| 11        | 12       | 79                      | 102                     | 22                      | 45                      | 4 | .110    | .110    |
| 12        | 12       | 83                      | 110                     | 26                      | 53                      | 4 | .120    | .120    |
| 13        | 12       | 83                      |                         | 26                      |                         | 4 | .130    |         |
| 14        | 12       | 83                      | 110                     | 26                      | 53                      | 4 | .140    | .140    |
| 15        | 12       | 83                      |                         | 26                      |                         | 4 | .150    |         |
| 16        | 16       | 92                      | 123                     | 32                      | 63                      | 4 | .160    | .160    |
| 17        | 16       | 92                      |                         | 32                      |                         | 4 | .170    |         |
| 18        | 16       | 92                      | 123                     | 32                      | 63                      | 4 | .180    | .180    |
| 20        | 20       | 104                     | 141                     | 38                      | 75                      | 4 | .200    | .200    |
| 22        | 20       | 104                     | 141                     | 38                      | 75                      | 5 | .220    | .220    |
| 24        | 25       | 121                     | 166                     | 45                      | 90                      | 5 | .240    | .240    |
| 25        | 25       | 121                     | 166                     | 45                      | 90                      | 5 | .250    | .250    |
| 26        | 25       | 121                     | 166                     | 45                      | 90                      | 5 | .260    | .260    |
| 28        | 25       | 121                     | 166                     | 45                      | 90                      | 5 | .280    | .280    |
| 30        | 25       | 121                     | 166                     | 45                      | 90                      | 5 | .300    | .300    |
| 32        | 32       | 133                     | 186                     | 53                      | 106                     | 6 | .320    | .320    |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

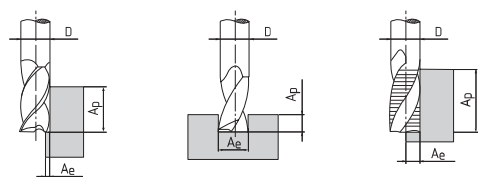
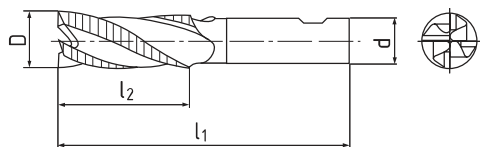
| Material                        | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |      |      |      |      |      |      |  |
|---------------------------------|----------------|----------------|----------------|-----------------------|-------|-------|------|------|------|------|------|------|--|
|                                 |                |                |                | Ø 6                   | Ø 8   | Ø 10  | Ø 12 | Ø 16 | Ø 18 | Ø 20 | Ø 25 | Ø 32 |  |
| P.1 ≤ 600 N/mm <sup>2</sup>     | 1,5xD          | 0,5xD          | 45             | 0,02                  | 0,025 | 0,035 | 0,04 | 0,07 | 0,08 | 0,09 | 0,1  | 0,12 |  |
| P.2 ≤ 850 N/mm <sup>2</sup>     | 1,5xD          | 0,5xD          | 39             | 0,02                  | 0,025 | 0,035 | 0,04 | 0,07 | 0,08 | 0,09 | 0,1  | 0,12 |  |
| P.4 ≤ 900 N/mm <sup>2</sup>     | 1,5xD          | 0,5xD          | 30             | 0,02                  | 0,025 | 0,035 | 0,04 | 0,07 | 0,08 | 0,09 | 0,1  | 0,12 |  |
| P.5 ≤ 1100 N/mm <sup>2</sup>    | 1,5xD          | 0,5xD          | 24             | 0,02                  | 0,025 | 0,035 | 0,04 | 0,07 | 0,08 | 0,09 | 0,1  | 0,12 |  |
| M.2 750 - 850 N/mm <sup>2</sup> | 1,5xD          | 0,5xD          | 15             | 0,02                  | 0,025 | 0,035 | 0,04 | 0,07 | 0,08 | 0,09 | 0,1  | 0,12 |  |
| K.1 < 240 HB                    | 1,5xD          | 0,5xD          | 35             | 0,02                  | 0,025 | 0,035 | 0,04 | 0,07 | 0,08 | 0,09 | 0,1  | 0,12 |  |

- EN End mills | HR, 1 tooth cut over centre  
 DE Schafffräser | HR, 1 Schneide über die Mitte  
 RU Фрезы концевые с цилиндрическим хвостовиком | HR, с центрорежущим зубом



1285

1295



| D<br>k 12 | d<br>h 6 | l <sub>1</sub><br>1285 | l <sub>1</sub><br>1295 | l <sub>2</sub><br>1285 | l <sub>2</sub><br>1295 | z | 128517 | 129517 |
|-----------|----------|------------------------|------------------------|------------------------|------------------------|---|--------|--------|
| 6         | 6        | 57                     | 68                     | 13                     | 24                     | 4 | .060   | .060   |
| 7         | 10       | 66                     |                        | 16                     |                        | 4 | .070   |        |
| 8         | 10       | 69                     | 88                     | 19                     | 38                     | 4 | .080   | .080   |
| 9         | 10       | 69                     |                        | 19                     |                        | 4 | .090   |        |
| 10        | 10       | 72                     | 95                     | 22                     | 45                     | 4 | .100   | .100   |
| 12        | 12       | 83                     | 110                    | 26                     | 53                     | 4 | .120   | .120   |
| 14        | 12       | 83                     | 110                    | 26                     | 53                     | 4 | .140   | .140   |
| 16        | 16       | 92                     | 123                    | 32                     | 63                     | 4 | .160   | .160   |
| 18        | 16       | 92                     | 123                    | 32                     | 63                     | 4 | .180   | .180   |
| 20        | 20       | 104                    | 141                    | 38                     | 75                     | 4 | .200   | .200   |
| 22        | 20       | 104                    |                        | 38                     |                        | 5 | .220   |        |
| 25        | 25       | 121                    |                        | 45                     |                        | 5 | .250   |        |
| 30        | 25       | 121                    |                        | 45                     |                        | 5 | .300   |        |
| 32        | 32       | 133                    |                        | 53                     |                        | 6 | .320   |        |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

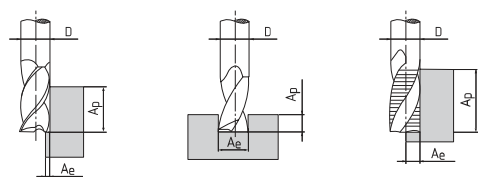
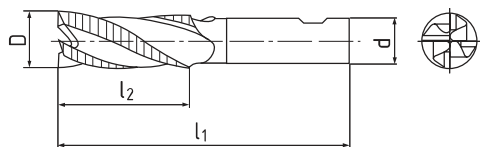
| Material | A <sub>p</sub>              | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |       |       |       |      |       |       |
|----------|-----------------------------|----------------|----------------|-----------------------|-------|-------|-------|-------|-------|-------|------|-------|-------|
|          |                             |                |                | Ø 6                   | Ø 8   | Ø 10  | Ø 12  | Ø 16  | Ø 18  | Ø 20  | Ø 25 | Ø 32  |       |
| P.3      | ≤ 1100 N/mm <sup>2</sup>    | 1,5xD          | 0,5xD          | 61,5                  | 0,022 | 0,028 | 0,039 | 0,044 | 0,077 | 0,088 | 0,1  | 0,110 | 0,132 |
| P.5      | ≤ 1100 N/mm <sup>2</sup>    | 1,5xD          | 0,5xD          | 61,5                  | 0,022 | 0,028 | 0,039 | 0,044 | 0,077 | 0,088 | 0,1  | 0,110 | 0,132 |
| P.6      | > 1100 N/mm <sup>2</sup>    | 1,5xD          | 0,5xD          | 51                    | 0,022 | 0,028 | 0,039 | 0,044 | 0,077 | 0,088 | 0,1  | 0,077 | 0,092 |
| M.2      | 750 - 850 N/mm <sup>2</sup> | 1,5xD          | 0,5xD          | 37,5                  | 0,022 | 0,028 | 0,039 | 0,044 | 0,077 | 0,088 | 0,1  | 0,077 | 0,092 |
| K.2      | > 240 HB                    | 1,5xD          | 0,5xD          | 66                    | 0,022 | 0,028 | 0,039 | 0,044 | 0,077 | 0,088 | 0,1  | 0,110 | 0,132 |
| S.1      | ≤ 1500 N/mm <sup>2</sup>    | 1,5xD          | 0,5xD          | 31,5                  | 0,022 | 0,028 | 0,039 | 0,044 | 0,077 | 0,088 | 0,1  | 0,077 | 0,092 |
| S.2      | ≤ 1250 N/mm <sup>2</sup>    | 1,5xD          | 0,5xD          | 30                    | 0,022 | 0,028 | 0,039 | 0,044 | 0,077 | 0,088 | 0,1  | 0,077 | 0,092 |



EN End mills | short, HR, 1 tooth cut over centre

DE Schafffräser | Kurz, HR, 1 Schneide über die Mitte

RU Фрезы концевые с цилиндрическим хвостовиком | короткие, HR, с центрорежущим зубом

**1285X**

| D<br>k 12 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z |
|-----------|----------|----------------|----------------|---|
| 9         | 10       | 69             | 19             | 5 |
| 10        | 10       | 72             | 22             | 5 |
| 11        | 12       | 79             | 22             | 5 |
| 12        | 12       | 83             | 26             | 5 |
| 13        | 12       | 83             | 26             | 5 |
| 14        | 12       | 83             | 26             | 5 |
| 15        | 12       | 83             | 26             | 5 |
| 16        | 16       | 92             | 32             | 5 |
| 18        | 16       | 92             | 32             | 5 |
| 20        | 20       | 104            | 38             | 5 |

**128517X**

.090

.100

.110

.120

.130

.140

.150

.160

.180

.200

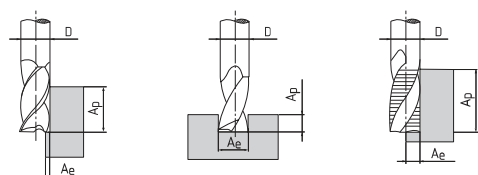
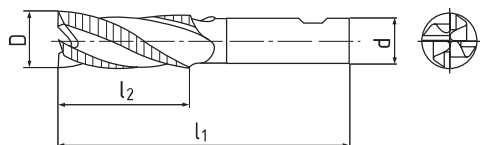
## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                               | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |      |
|----------------------------------------|----------------|----------------|----------------|-----------------------|-------|-------|-------|------|
|                                        |                |                |                | Ø 10                  | Ø 12  | Ø 16  | Ø 18  | Ø 20 |
| <b>P.3</b> ≤ 1100 N/mm <sup>2</sup>    | 1,5xD          | 0,5xD          | 61,5           | 0,039                 | 0,044 | 0,077 | 0,088 | 0,1  |
| <b>P.5</b> ≤ 1100 N/mm <sup>2</sup>    | 1,5xD          | 0,5xD          | 61,5           | 0,039                 | 0,044 | 0,077 | 0,088 | 0,1  |
| <b>P.6</b> > 1100 N/mm <sup>2</sup>    | 1,5xD          | 0,5xD          | 51             | 0,039                 | 0,044 | 0,077 | 0,088 | 0,1  |
| <b>M.2</b> 750 - 850 N/mm <sup>2</sup> | 1,5xD          | 0,5xD          | 37,5           | 0,039                 | 0,044 | 0,077 | 0,088 | 0,1  |
| <b>K.2</b> > 240 HB                    | 1,5xD          | 0,5xD          | 66             | 0,039                 | 0,044 | 0,077 | 0,088 | 0,1  |
| <b>S.1</b> ≤ 1500 N/mm <sup>2</sup>    | 1,5xD          | 0,5xD          | 31,5           | 0,039                 | 0,044 | 0,077 | 0,088 | 0,1  |
| <b>S.2</b> ≤ 1250 N/mm <sup>2</sup>    | 1,5xD          | 0,5xD          | 30             | 0,039                 | 0,044 | 0,077 | 0,088 | 0,1  |

EN End mills | short, HR-F, 1 tooth cut over centre

DE Schafffräser | Kurz, HR-F, 1 Schneide über die Mitte

RU Фрезы концевые с цилиндрическим хвостовиком | короткие, HR-F, с центрорежущим зубом

**1285P**

| D<br>k 12 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z | 128517P |
|-----------|----------|----------------|----------------|---|---------|
| 6         | 6        | 57             | 13             | 4 | .060    |
| 8         | 10       | 69             | 19             | 4 | .080    |
| 10        | 10       | 72             | 22             | 4 | .100    |
| 11        | 12       | 79             | 22             | 4 | .110    |
| 12        | 12       | 83             | 26             | 4 | .120    |
| 13        | 12       | 83             | 26             | 4 | .130    |
| 14        | 12       | 83             | 26             | 4 | .140    |
| 15        | 12       | 83             | 26             | 4 | .150    |
| 16        | 16       | 92             | 32             | 4 | .160    |
| 17        | 16       | 92             | 32             | 4 | .170    |
| 18        | 16       | 92             | 32             | 4 | .180    |
| 20        | 20       | 104            | 38             | 4 | .200    |
| 22        | 20       | 104            | 38             | 5 | .220    |
| 25        | 25       | 121            | 45             | 5 | .250    |
| 28        | 25       | 121            | 45             | 5 | .280    |
| 30        | 25       | 121            | 45             | 5 | .300    |
| 32        | 32       | 133            | 53             | 6 | .320    |

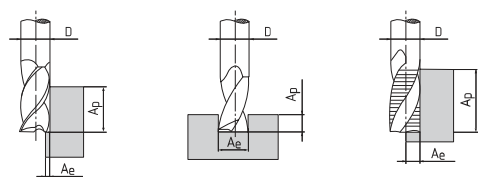
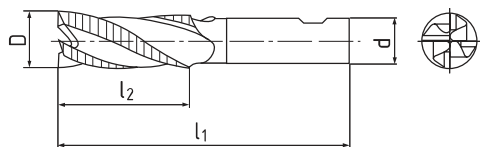
## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                               | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |       |       |      |       |       |
|----------------------------------------|----------------|----------------|----------------|-----------------------|-------|-------|-------|-------|-------|------|-------|-------|
|                                        |                |                |                | Ø 6                   | Ø 8   | Ø 10  | Ø 12  | Ø 16  | Ø 18  | Ø 20 | Ø 25  | Ø 32  |
| <b>P.3</b> ≤ 1100 N/mm <sup>2</sup>    | 1,5xD          | 0,5xD          | 61,5           | 0,022                 | 0,028 | 0,039 | 0,044 | 0,077 | 0,088 | 0,1  | 0,11  | 0,132 |
| <b>P.5</b> ≤ 1100 N/mm <sup>2</sup>    | 1,5xD          | 0,5xD          | 61,5           | 0,022                 | 0,028 | 0,039 | 0,044 | 0,077 | 0,088 | 0,1  | 0,11  | 0,132 |
| <b>P.6</b> > 1100 N/mm <sup>2</sup>    | 1,5xD          | 0,5xD          | 51             | 0,022                 | 0,028 | 0,039 | 0,044 | 0,077 | 0,088 | 0,1  | 0,077 | 0,924 |
| <b>M.2</b> 750 - 850 N/mm <sup>2</sup> | 1,5xD          | 0,5xD          | 37,5           | 0,022                 | 0,028 | 0,039 | 0,044 | 0,077 | 0,088 | 0,1  | 0,077 | 0,924 |
| <b>K.2</b> > 240 HB                    | 1,5xD          | 0,5xD          | 66             | 0,022                 | 0,028 | 0,039 | 0,044 | 0,077 | 0,088 | 0,1  | 0,11  | 0,132 |
| <b>S.1</b> ≤ 1500 N/mm <sup>2</sup>    | 1,5xD          | 0,5xD          | 31,5           | 0,022                 | 0,028 | 0,039 | 0,044 | 0,077 | 0,088 | 0,1  | 0,077 | 0,924 |
| <b>S.2</b> ≤ 1250 N/mm <sup>2</sup>    | 1,5xD          | 0,5xD          | 30             | 0,022                 | 0,028 | 0,039 | 0,044 | 0,077 | 0,088 | 0,1  | 0,077 | 0,924 |

- EN End mills | extrashort, HR, 1 tooth cut over centre  
 DE Schafffräser | Extra Kurz, HR, 1 Schneide über die Mitte  
 RU Фрезы концевые с цилиндрическим хвостовиком | экстра короткие, HR, с центрорежущим зубом



1285S

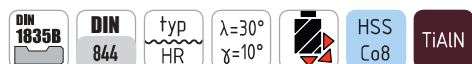


| D<br>k 12 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z | 128518S | 128518S    |
|-----------|----------|----------------|----------------|---|---------|------------|
| 6         | 6        | 52             | 8              | 4 | .060    | .060 TIALN |
| 8         | 10       | 61             | 11             | 4 | .080    | .080 TIALN |
| 10        | 10       | 63             | 13             | 4 | .100    | .100 TIALN |
| 12        | 12       | 73             | 16             | 4 | .120    | .120 TIALN |
| 14        | 12       | 73             | 16             | 4 | .140    | .140 TIALN |
| 16        | 16       | 79             | 19             | 4 | .160    | .160 TIALN |
| 18        | 16       | 79             | 19             | 4 | .180    | .180 TIALN |
| 20        | 20       | 88             | 22             | 4 | .200    | .200 TIALN |
| 25        | 25       | 102            | 26             | 5 | .250    | .250 TIALN |
| 30        | 25       | 102            | 26             | 5 | .300    | .300 TIALN |

### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

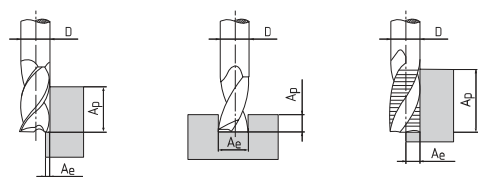
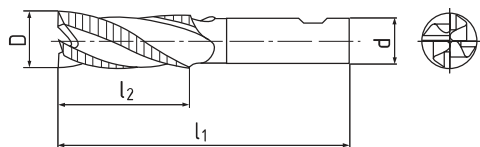
| Material                     | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |        |        |       |       |       |       |
|------------------------------|----------------|----------------|----------------|-----------------------|--------|--------|-------|-------|-------|-------|
|                              |                |                |                | Ø 6                   | Ø 8    | Ø 10   | Ø 12  | Ø 16  | Ø 18  | Ø 20  |
| P.3 ≤ 1100 N/mm <sup>2</sup> | 1,5xD          | 0,5xD          | 24             | 0,02                  | 0,025  | 0,035  | 0,04  | 0,07  | 0,08  | 0,09  |
| P.5 ≤ 1100 N/mm <sup>2</sup> | 1,5xD          | 0,5xD          | 24             | 0,02                  | 0,025  | 0,035  | 0,04  | 0,07  | 0,08  | 0,09  |
| K.2 > 240 HB                 | 1,5xD          | 0,5xD          | 25             | 0,02                  | 0,025  | 0,035  | 0,04  | 0,07  | 0,08  | 0,09  |
| S.1 ≤ 1500 N/mm <sup>2</sup> | 1,5xD          | 0,5xD          | 12             | 0,014                 | 0,0175 | 0,0245 | 0,028 | 0,049 | 0,056 | 0,063 |

EN End mills | HR, 1 tooth cut over centre  
 DE Schafffräser | HR, 1 Schneide über die Mitte  
 RU Фрезы концевые с цилиндрическим хвостовиком | HR, с центрорежущим зубом



1285

1295



| D<br>k 12 | d<br>h 6 | l <sub>1</sub><br>1285 | l <sub>1</sub><br>1295 | l <sub>2</sub><br>1285 | l <sub>2</sub><br>1295 | z | 128518 | 128518     | 129518 | 129518     |
|-----------|----------|------------------------|------------------------|------------------------|------------------------|---|--------|------------|--------|------------|
| 6         | 6        | 57                     | 68                     | 13                     | 24                     | 4 | .060   | .060 TIALN | .060   | .060 TIALN |
| 7         | 10       | 66                     |                        | 16                     |                        | 4 | .070   | .070 TIALN |        |            |
| 8         | 10       | 69                     | 88                     | 19                     | 38                     | 4 | .080   | .080 TIALN | .080   | .080 TIALN |
| 9         | 10       | 69                     |                        | 19                     |                        | 4 | .090   | .090 TIALN |        |            |
| 10        | 10       | 72                     | 95                     | 22                     | 45                     | 4 | .100   | .100 TIALN | .100   | .100 TIALN |
| 11        | 12       | 79                     | 102                    | 22                     | 45                     | 4 | .110   | .110 TIALN | .110   | .110 TIALN |
| 12        | 12       | 83                     | 110                    | 26                     | 53                     | 4 | .120   | .120 TIALN | .120   | .120 TIALN |
| 13        | 12       | 83                     | 110                    | 26                     | 53                     | 4 | .130   | .130 TIALN | .130   | .130 TIALN |
| 14        | 12       | 83                     | 110                    | 26                     | 53                     | 4 | .140   | .140 TIALN | .140   | .140 TIALN |
| 15        | 12       | 83                     |                        | 26                     |                        | 4 | .150   | .150 TIALN |        |            |
| 16        | 16       | 92                     | 123                    | 32                     | 63                     | 4 | .160   | .160 TIALN | .160   | .160 TIALN |
| 17        | 16       | 92                     |                        | 32                     |                        | 4 | .170   | .170 TIALN |        |            |
| 18        | 16       | 92                     | 123                    | 32                     | 63                     | 4 | .180   | .180 TIALN | .180   | .180 TIALN |
| 20        | 20       | 104                    | 141                    | 38                     | 75                     | 4 | .200   | .200 TIALN | .200   | .200 TIALN |
| 22        | 20       | 104                    | 141                    | 38                     | 75                     | 5 | .220   | .220 TIALN | .220   | .220 TIALN |
| 24        | 25       | 121                    | 166                    | 45                     | 90                     | 5 | .240   | .240 TIALN | .240   | .240 TIALN |
| 25        | 25       | 121                    | 166                    | 45                     | 90                     | 5 | .250   | .250 TIALN | .250   | .250 TIALN |
| 26        | 25       | 121                    | 166                    | 45                     | 90                     | 5 | .260   | .260 TIALN | .260   | .260 TIALN |
| 28        | 25       | 121                    | 166                    | 45                     | 90                     | 5 | .280   | .280 TIALN | .280   | .280 TIALN |
| 30        | 25       | 121                    | 166                    | 45                     | 90                     | 5 | .300   | .300 TIALN | .300   | .300 TIALN |
| 32        | 32       | 133                    | 186                    | 53                     | 106                    | 6 | .320   | .320 TIALN | .320   | .320 TIALN |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material | A <sub>p</sub>           | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |        |        |       |       |       |       |      |       |
|----------|--------------------------|----------------|----------------|-----------------------|-------|--------|--------|-------|-------|-------|-------|------|-------|
|          |                          |                |                | Ø 6                   | Ø 8   | Ø 10   | Ø 12   | Ø 16  | Ø 18  | Ø 20  | Ø 25  | Ø 32 |       |
| P.3      | ≤ 1100 N/mm <sup>2</sup> | 1,5xD          | 0,5xD          | 24                    | 0,02  | 0,025  | 0,035  | 0,04  | 0,07  | 0,08  | 0,09  | 0,1  | 0,12  |
| P.5      | ≤ 1100 N/mm <sup>2</sup> | 1,5xD          | 0,5xD          | 24                    | 0,02  | 0,025  | 0,035  | 0,04  | 0,07  | 0,08  | 0,09  | 0,1  | 0,12  |
| K.2      | > 240 HB                 | 1,5xD          | 0,5xD          | 25                    | 0,02  | 0,025  | 0,035  | 0,04  | 0,07  | 0,08  | 0,09  | 0,1  | 0,12  |
| S.1      | ≤ 1500 N/mm <sup>2</sup> | 1,5xD          | 0,5xD          | 12                    | 0,014 | 0,0175 | 0,0245 | 0,028 | 0,049 | 0,056 | 0,063 | 0,07 | 0,084 |

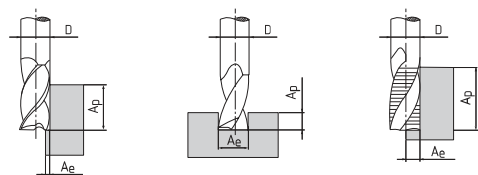
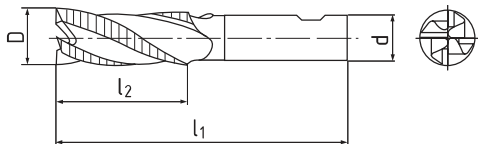
TiAlN: V<sub>c</sub> + 50 %

- EN End mills | HR-F, 1 tooth cut over centre  
 DE Schafffräser | HR-F, 1 Schneide über die Mitte  
 RU Фрезы концевые с цилиндрическим хвостовиком | HR-F, с центрорежущим зубом



1285P

1295P



| D<br>k 12 | d<br>h 6 | l <sub>1</sub><br>1285P | l <sub>1</sub><br>1295P | l <sub>2</sub><br>1285P | l <sub>2</sub><br>1295P | Z |
|-----------|----------|-------------------------|-------------------------|-------------------------|-------------------------|---|
| 6         | 6        | 57                      | 68                      | 13                      | 24                      | 4 |
| 7         | 10       | 66                      |                         | 16                      |                         | 4 |
| 8         | 10       | 69                      | 88                      | 19                      | 38                      | 4 |
| 9         | 10       | 69                      |                         | 19                      |                         | 4 |
| 10        | 10       | 72                      | 95                      | 22                      | 45                      | 4 |
| 11        | 12       | 79                      | 102                     | 22                      | 45                      | 4 |
| 12        | 12       | 83                      | 110                     | 26                      | 53                      | 4 |
| 13        | 12       | 83                      |                         | 26                      |                         | 4 |
| 14        | 12       | 83                      | 110                     | 26                      | 53                      | 4 |
| 15        | 12       | 83                      |                         | 26                      |                         | 4 |
| 16        | 16       | 92                      | 123                     | 32                      | 63                      | 4 |
| 17        | 16       | 92                      |                         | 32                      |                         | 4 |
| 18        | 16       | 92                      | 123                     | 32                      | 63                      | 4 |
| 20        | 20       | 104                     | 141                     | 38                      | 75                      | 4 |
| 22        | 20       | 104                     | 141                     | 38                      | 75                      | 5 |
| 24        | 25       | 121                     | 166                     | 45                      | 90                      | 5 |
| 25        | 25       | 121                     | 166                     | 45                      | 90                      | 5 |
| 26        | 25       | 121                     | 166                     | 45                      | 90                      | 5 |
| 28        | 25       | 121                     | 166                     | 45                      | 90                      | 5 |
| 30        | 25       | 121                     | 166                     | 45                      | 90                      | 5 |
| 32        | 32       | 133                     | 186                     | 53                      | 106                     | 6 |

128518P

129518P

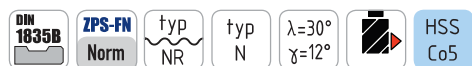
.060  
.070  
.080  
.090  
.100  
.110  
.120  
.130  
.140  
.150  
.160  
.170  
.180  
.200  
.220  
.240  
.250  
.260  
.280  
.300  
.320

.060  
  
.080  
  
.100  
.110  
.120  
  
.140  
  
.160  
  
.180  
.200  
.220  
.240  
.250  
.260  
.280  
.300  
.320

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

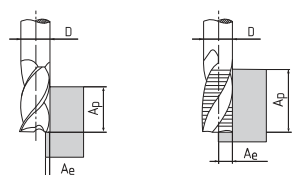
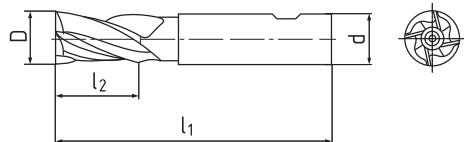
| Material | A <sub>p</sub>           | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |        |        |       |       |       |       |      |       |
|----------|--------------------------|----------------|----------------|-----------------------|-------|--------|--------|-------|-------|-------|-------|------|-------|
|          |                          |                |                | Ø 6                   | Ø 8   | Ø 10   | Ø 12   | Ø 16  | Ø 18  | Ø 20  | Ø 25  | Ø 32 |       |
| P.3      | ≤ 1100 N/mm <sup>2</sup> | 1,5xD          | 0,5xD          | 24                    | 0,02  | 0,025  | 0,035  | 0,04  | 0,07  | 0,08  | 0,09  | 0,1  | 0,12  |
| P.5      | ≤ 1100 N/mm <sup>2</sup> | 1,5xD          | 0,5xD          | 24                    | 0,02  | 0,025  | 0,035  | 0,04  | 0,07  | 0,08  | 0,09  | 0,1  | 0,12  |
| P.6      | > 1100 N/mm <sup>2</sup> | 1,5xD          | 0,5xD          | 20                    | 0,014 | 0,0175 | 0,0245 | 0,028 | 0,049 | 0,056 | 0,063 | 0,07 | 0,084 |
| K.2      | > 240 HB                 | 1,5xD          | 0,5xD          | 25                    | 0,02  | 0,025  | 0,035  | 0,04  | 0,07  | 0,08  | 0,09  | 0,1  | 0,12  |
| S.1      | ≤ 1500 N/mm <sup>2</sup> | 1,5xD          | 0,5xD          | 12                    | 0,014 | 0,0175 | 0,0245 | 0,028 | 0,049 | 0,056 | 0,063 | 0,07 | 0,084 |

EN End mills | extralong  
 DE Schafffräser | Extra lang  
 RU Фрезы цилиндрические торцевые | экстра длинные



1252E

1212E



| D<br>k 10 | d<br>h 6 | l <sub>1</sub><br>1252E | l <sub>1</sub><br>1212E | l <sub>2</sub><br>1252E | l <sub>2</sub><br>1212E | Z<br>1252E | Z<br>1212E |
|-----------|----------|-------------------------|-------------------------|-------------------------|-------------------------|------------|------------|
| 10        | 10       | 110                     | 110                     | 60                      | 60                      | 4          | 4          |
| 12        | 12       | 137                     | 137                     | 80                      | 80                      | 4          | 4          |
| 14        | 12       | 137                     | 137                     | 80                      | 80                      | 4          | 4          |
| 16        | 16       | 160                     | 160                     | 100                     | 100                     | 4          | 4          |
| 18        | 16       | 160                     | 160                     | 100                     | 100                     | 4          | 5          |
| 20        | 20       | 191                     | 191                     | 125                     | 125                     | 4          | 5          |
| 22        | 20       | 191                     | 191                     | 125                     | 125                     | 5          | 5          |
| 25        | 25       | 216                     | 216                     | 140                     | 140                     | 5          | 6          |
| 28        | 25       | 216                     | 216                     | 140                     | 140                     | 5          | 6          |
| 30        | 25       | 216                     | 216                     | 140                     | 140                     | 5          | 6          |
| 32        | 32       | 260                     | 260                     | 180                     | 180                     | 6          | 6          |

125215E

121215E

|      |      |
|------|------|
| .100 | .100 |
| .120 | .120 |
| .140 | .140 |
| .160 | .160 |
| .180 | .180 |
| .200 | .200 |
| .220 | .220 |
| .250 | .250 |
| .280 | .280 |
| .300 | .300 |
| .320 | .320 |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

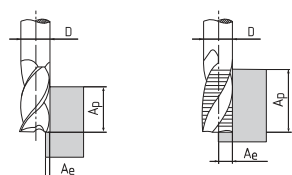
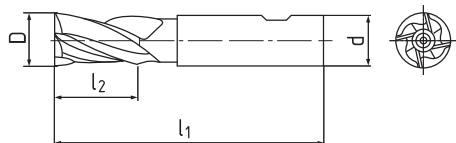
| Material                        | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |        |        |       |       |       |
|---------------------------------|----------------|----------------|----------------|-----------------------|--------|--------|-------|-------|-------|
|                                 |                |                |                | Ø 10                  | Ø 12   | Ø 16   | Ø 20  | Ø 25  | Ø 32  |
| P.1 ≤ 600 N/mm <sup>2</sup>     | 3xD            | 0,1xD          |                | 0,04                  | 0,047  | 0,055  | 0,07  | 0,13  | 0,14  |
| P.2 ≤ 850 N/mm <sup>2</sup>     | 3xD            | 0,1xD          |                | 0,04                  | 0,047  | 0,055  | 0,07  | 0,13  | 0,14  |
| P.3 ≤ 1100 N/mm <sup>2</sup>    | 3xD            | 0,1xD          |                | 0,04                  | 0,047  | 0,055  | 0,07  | 0,13  | 0,14  |
| P.4 ≤ 900 N/mm <sup>2</sup>     | 3xD            | 0,1xD          |                | 0,04                  | 0,047  | 0,055  | 0,07  | 0,13  | 0,14  |
| P.5 ≤ 1100 N/mm <sup>2</sup>    | 3xD            | 0,1xD          |                | 0,04                  | 0,047  | 0,055  | 0,07  | 0,13  | 0,14  |
| M.1 ≤ 750 N/mm <sup>2</sup>     | 3xD            | 0,1xD          |                | 0,04                  | 0,047  | 0,055  | 0,07  | 0,13  | 0,14  |
| M.2 750 - 850 N/mm <sup>2</sup> | 3xD            | 0,1xD          |                | 0,04                  | 0,047  | 0,055  | 0,07  | 0,13  | 0,14  |
| M.3 > 850 N/mm <sup>2</sup>     | 3xD            | 0,1xD          |                | 0,04                  | 0,047  | 0,055  | 0,07  | 0,13  | 0,14  |
| N.4 ≤ 850 N/mm <sup>2</sup>     | 3xD            | 0,1xD          |                | 0,04                  | 0,047  | 0,055  | 0,07  | 0,13  | 0,14  |
| K.1 < 240 HB                    | 3xD            | 0,1xD          |                | 0,04                  | 0,047  | 0,055  | 0,07  | 0,13  | 0,14  |
| S.2 ≤ 1250 N/mm <sup>2</sup>    | 3xD            | 0,1xD          |                | 0,028                 | 0,0329 | 0,0385 | 0,049 | 0,091 | 0,098 |

- EN End mills | extra short, NR, N  
 DE Schafffräser | extra kurz, NR, N  
 RU Фрезы концевые с цилиндрическим хвостовиком | экстра короткие, NR, N



1242K

1202K



| D<br>k 12* | d<br>h 6 | l <sub>1</sub><br>1202K | l <sub>1</sub><br>1242K | l <sub>2</sub><br>1202K | l <sub>2</sub><br>1242K | z |
|------------|----------|-------------------------|-------------------------|-------------------------|-------------------------|---|
| 30         | 20       | 90                      | 90                      | 30                      | 30                      | 6 |
| 32         | 20       | 90                      |                         | 30                      |                         | 6 |
| 35         | 20       | 90                      | 90                      | 30                      | 30                      | 6 |
| 40         | 25       | 95                      | 95                      | 32                      | 32                      | 8 |
| 50         | 32       | 100                     | 100                     | 36                      | 36                      | 8 |

\*) 120218K = k 10

124218K

120218K

.300030

.300030

.320030

.320030

.350030

.350030

.400032

.400032

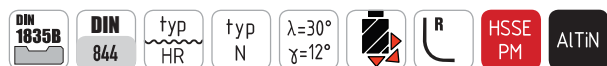
.500036

.500036

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material |                 | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |
|----------|-----------------|----------------|----------------|----------------|-----------------------|-------|-------|
|          |                 |                |                |                | Ø 30                  | Ø 35  | Ø 40  |
| 120218K  |                 |                |                |                |                       |       |       |
| P.1      | ≤ 600 N/mm²     | 1xD            | 0,1xD          | 45             | 0,085                 | 0,098 | 0,100 |
| P.2      | ≤ 850 N/mm²     | 1xD            | 0,1xD          | 39             | 0,085                 | 0,098 | 0,100 |
| P.3      | ≤ 1100 N/mm²    | 1xD            | 0,1xD          | 24             | 0,085                 | 0,098 | 0,100 |
| P.4      | ≤ 900 N/mm²     | 1xD            | 0,1xD          | 30             | 0,085                 | 0,098 | 0,100 |
| M.2      | 750 - 850 N/mm² | 1xD            | 0,1xD          | 15             | 0,085                 | 0,098 | 0,100 |
| N.4      | ≤ 800 N/mm²     | 1xD            | 0,1xD          | 80-120         | 0,085                 | 0,098 | 0,100 |
| 124218K  |                 |                |                |                |                       |       |       |
| P.1      | ≤ 600 N/mm²     | 1,5xD          | 0,5xD          | 45             | 0,115                 | 0,130 | 0,140 |
| P.2      | ≤ 850 N/mm²     | 1,5xD          | 0,5xD          | 39             | 0,115                 | 0,130 | 0,140 |
| P.3      | ≤ 1100 N/mm²    | 1,5xD          | 0,5xD          | 24             | 0,115                 | 0,130 | 0,140 |
| P.4      | ≤ 900 N/mm²     | 1,5xD          | 0,5xD          | 30             | 0,115                 | 0,130 | 0,140 |
| M.2      | 750 - 850 N/mm² | 1,5xD          | 0,5xD          | 15             | 0,115                 | 0,130 | 0,140 |
| N.4      | ≤ 800 N/mm²     | 1,5xD          | 0,5xD          | 80-120         | 0,115                 | 0,130 | 0,140 |

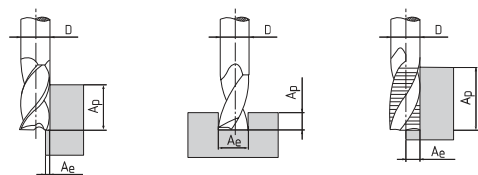
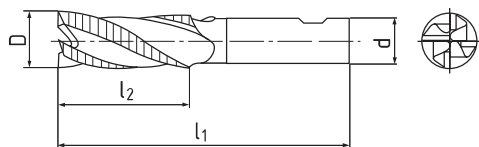
- EN End mills | with corner radius  
 DE Schafffräser | mit dem Eckenradius  
 RU Фрезы цилиндрические торцевые | с радиусом



1485R

1205R

SSH



| D<br>k 12 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | r | Z |
|-----------|----------|----------------|----------------|---|---|
| 6         | 6        | 57             | 16*            | 1 | 4 |
| 6         | 6        | 57             | 16*            | 2 | 4 |
| 10        | 10       | 72             | 22             | 1 | 4 |
| 10        | 10       | 72             | 22             | 2 | 4 |
| 12        | 12       | 83             | 25*            | 1 | 4 |
| 12        | 12       | 83             | 25*            | 2 | 4 |
| 16        | 16       | 92             | 32             | 2 | 4 |
| 16        | 16       | 92             | 32             | 4 | 4 |
| 20        | 20       | 104            | 38             | 2 | 4 |
| 20        | 20       | 104            | 38             | 4 | 4 |

\*) ≠ DIN 844

148517R

120517R

|         |         |
|---------|---------|
| .060010 | .060010 |
| .060020 | .060020 |
| .100010 | .100010 |
| .100020 | .100020 |
| .120010 | .120010 |
| .120020 | .120020 |
| .160020 | .160020 |
| .160040 | .160040 |
| .200020 | .200020 |
| .200040 | .200040 |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

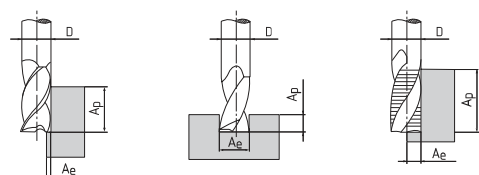
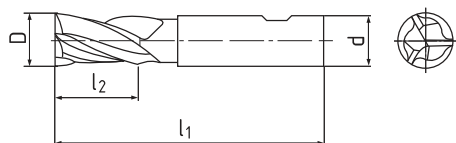
| Material                     | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |       |       |
|------------------------------|----------------|----------------|----------------|-----------------------|-------|-------|-------|-------|-------|
|                              |                |                |                | Ø 6                   | Ø 8   | Ø 10  | Ø 12  | Ø 16  | Ø 20  |
| P.1 ≤ 600 N/mm <sup>2</sup>  | 1xD            | 0,1xD          | 78             | 0,03                  | 0,036 | 0,043 | 0,051 | 0,068 | 0,085 |
| P.3 ≤ 1100 N/mm <sup>2</sup> | 1xD            | 0,1xD          | 51             | 0,03                  | 0,036 | 0,043 | 0,051 | 0,068 | 0,085 |
| P.6 > 1100 N/mm <sup>2</sup> | 1xD            | 0,1xD          | 20             | 0,021                 | 0,025 | 0,031 | 0,036 | 0,048 | 0,06  |
| M.3 > 850 N/mm <sup>2</sup>  | 1xD            | 0,1xD          | 37             | 0,03                  | 0,036 | 0,043 | 0,051 | 0,081 | 0,111 |
| N.4 ≤ 800 N/mm <sup>2</sup>  | 1xD            | 0,1xD          | 70             | 0,03                  | 0,036 | 0,043 | 0,051 | 0,081 | 0,111 |
| S.1 ≤ 1500 N/mm <sup>2</sup> | 1xD            | 0,1xD          | 23             | 0,03                  | 0,036 | 0,043 | 0,051 | 0,081 | 0,111 |
| S.2 ≤ 1250 N/mm <sup>2</sup> | 1xD            | 0,1xD          | 23             | 0,021                 | 0,025 | 0,031 | 0,036 | 0,048 | 0,06  |



EN End mills | short, 1 tooth cut over centre  
 DE Schafffräser | Kurz, 1 Schneide über Mitte  
 RU Фрезы концевые с цилиндрическим хвостовиком | короткие, с центрорежущим зубом



1204



| D<br>k 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z |
|-----------|----------|----------------|----------------|---|
| 2         | 6        | 51             | 7              | 3 |
| 3         | 6        | 52             | 8              | 3 |
| 4         | 6        | 55             | 11             | 3 |
| 5         | 6        | 57             | 13             | 3 |
| 6         | 6        | 57             | 13             | 3 |
| 7         | 10       | 66             | 16             | 3 |
| 8         | 10       | 69             | 19             | 3 |
| 10        | 10       | 72             | 22             | 3 |
| 12        | 12       | 83             | 26             | 3 |
| 16        | 16       | 92             | 32             | 3 |
| 18        | 16       | 92             | 32             | 3 |
| 20        | 20       | 104            | 38             | 3 |

120417

.020  
 .030  
 .040  
 .050  
 .060  
 .070  
 .080  
 .100  
 .120  
 .160  
 .180  
 .200

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                        | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |        |        |        |        |        |        |
|---------------------------------|----------------|----------------|----------------|-----------------------|--------|--------|--------|--------|--------|--------|
|                                 |                |                |                | Ø 6                   | Ø 8    | Ø 10   | Ø 12   | Ø 16   | Ø 18   | Ø 20   |
| P.2 ≤ 850 N/mm <sup>2</sup>     | 1xD            | 0,1xD          | 99             | 0,017                 | 0,023  | 0,031  | 0,037  | 0,048  | 0,056  | 0,063  |
| P.3 ≤ 1100 N/mm <sup>2</sup>    | 1xD            | 0,1xD          | 61,5           | 0,017                 | 0,023  | 0,031  | 0,037  | 0,048  | 0,056  | 0,063  |
| P.4 ≤ 900 N/mm <sup>2</sup>     | 1xD            | 0,1xD          | 76,5           | 0,017                 | 0,023  | 0,031  | 0,037  | 0,048  | 0,056  | 0,063  |
| P.5 ≤ 1100 N/mm <sup>2</sup>    | 1xD            | 0,1xD          | 61,5           | 0,017                 | 0,023  | 0,031  | 0,037  | 0,048  | 0,056  | 0,063  |
| M.2 750 – 850 N/mm <sup>2</sup> | 1xD            | 0,1xD          | 37,5           | 0,017                 | 0,023  | 0,031  | 0,037  | 0,048  | 0,056  | 0,063  |
| K.1 < 240 HB                    | 1xD            | 0,1xD          | 88,5           | 0,017                 | 0,023  | 0,031  | 0,037  | 0,048  | 0,056  | 0,063  |
| S.1 ≤ 1500 N/mm <sup>2</sup>    | 1xD            | 0,1xD          | 31,5           | 0,0119                | 0,0161 | 0,0217 | 0,0259 | 0,0336 | 0,0392 | 0,0441 |
| S.2 ≤ 1250 N/mm <sup>2</sup>    | 1xD            | 0,1xD          | 30             | 0,0119                | 0,0161 | 0,0217 | 0,0259 | 0,0336 | 0,0392 | 0,0441 |

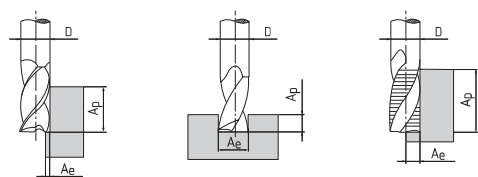
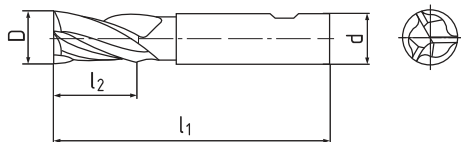
EN End mills | short, 1 tooth cut over centre

DE Schafffräser | Kurz, 1 Schneide über Mitte

RU Фрезы концевые с цилиндрическим хвостовиком | короткие, с центрорежущим зубом



1404



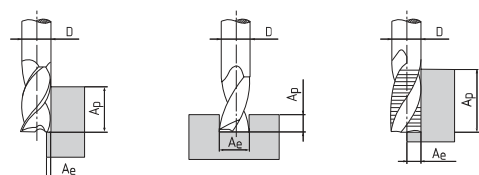
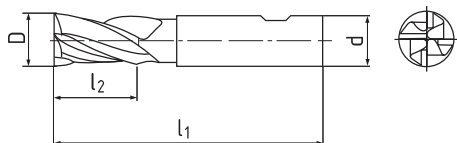
| D<br>k 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z | 140418 | 140418     |
|-----------|----------|----------------|----------------|---|--------|------------|
| 2         | 6        | 51             | 7              | 3 | .020   | .020 TIALN |
| 2,5       | 6        | 52             | 8              | 3 | .025   | .025 TIALN |
| 3         | 6        | 52             | 8              | 3 | .030   | .030 TIALN |
| 3,5       | 6        | 54             | 10             | 3 | .035   | .035 TIALN |
| 4         | 6        | 55             | 11             | 3 | .040   | .040 TIALN |
| 4,5       | 6        | 55             | 11             | 3 | .045   | .045 TIALN |
| 5         | 6        | 57             | 13             | 3 | .050   | .050 TIALN |
| 6         | 6        | 57             | 13             | 3 | .060   | .060 TIALN |
| 7         | 10       | 66             | 16             | 3 | .070   | .070 TIALN |
| 8         | 10       | 69             | 19             | 3 | .080   | .080 TIALN |
| 9         | 10       | 69             | 19             | 3 | .090   | .090 TIALN |
| 10        | 10       | 72             | 22             | 3 | .100   | .100 TIALN |
| 11        | 12       | 79             | 22             | 3 | .110   | .110 TIALN |
| 12        | 12       | 83             | 26             | 3 | .120   | .120 TIALN |
| 13        | 12       | 83             | 26             | 3 | .130   | .130 TIALN |
| 14        | 12       | 83             | 26             | 3 | .140   | .140 TIALN |
| 15        | 12       | 83             | 26             | 3 | .150   | .150 TIALN |
| 16        | 16       | 92             | 32             | 3 | .160   | .160 TIALN |
| 17        | 16       | 92             | 32             | 3 | .170   | .170 TIALN |
| 18        | 16       | 92             | 32             | 3 | .180   | .180 TIALN |
| 19        | 16       | 92             | 32             | 3 | .190   | .190 TIALN |
| 20        | 20       | 104            | 38             | 3 | .200   | .200 TIALN |
| 22        | 20       | 104            | 38             | 3 | .220   | .220 TIALN |
| 25        | 25       | 121            | 45             | 3 | .250   | .250 TIALN |
| 28        | 25       | 121            | 45             | 3 | .280   | .280 TIALN |
| 32        | 32       | 133            | 53             | 3 | .320   | .320 TIALN |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

|          |                 |     |       |      | fz (mm/z) |        |        |        |        |        |        |      |       |
|----------|-----------------|-----|-------|------|-----------|--------|--------|--------|--------|--------|--------|------|-------|
| Material |                 | Ap  | Ae    | Vc   | Ø 6       | Ø 8    | Ø 10   | Ø 12   | Ø 16   | Ø 18   | Ø 20   | Ø 25 | Ø 32  |
| P.2      | ≤ 850 N/mm²     | 1xD | 0,1xD | 99   | 0,017     | 0,023  | 0,031  | 0,037  | 0,048  | 0,056  | 0,063  | 0,1  | 0,12  |
| P.3      | ≤ 1100 N/mm²    | 1xD | 0,1xD | 61,5 | 0,017     | 0,023  | 0,031  | 0,037  | 0,048  | 0,056  | 0,063  | 0,1  | 0,12  |
| P.4      | ≤ 900 N/mm²     | 1xD | 0,1xD | 76,5 | 0,017     | 0,023  | 0,031  | 0,037  | 0,048  | 0,056  | 0,063  | 0,1  | 0,12  |
| P.5      | ≤ 1100 N/mm²    | 1xD | 0,1xD | 61,5 | 0,017     | 0,023  | 0,031  | 0,037  | 0,048  | 0,056  | 0,063  | 0,1  | 0,12  |
| M.2      | 750 – 850 N/mm² | 1xD | 0,1xD | 37,5 | 0,017     | 0,023  | 0,031  | 0,037  | 0,048  | 0,056  | 0,063  | 0,1  | 0,12  |
| K.1      | < 240 HB        | 1xD | 0,1xD | 88,5 | 0,017     | 0,023  | 0,031  | 0,037  | 0,048  | 0,056  | 0,063  | 0,1  | 0,12  |
| S.1      | ≤ 1500 N/mm²    | 1xD | 0,1xD | 31,5 | 0,0119    | 0,0161 | 0,0217 | 0,0259 | 0,0336 | 0,0392 | 0,0441 | 0,1  | 0,12  |
| S.2      | ≤ 1250 N/mm²    | 1xD | 0,1xD | 30   | 0,0119    | 0,0161 | 0,0217 | 0,0259 | 0,0336 | 0,0392 | 0,0441 | 0,07 | 0,084 |

TiAlN: V<sub>c</sub> + 50 %

- EN End mills | 1 tooth cut over centre  
 DE Schafffräser | 1 Schneide über Mitte  
 RU Фрезы концевые с цилиндрическим хвостовиком | с центрорежущим зубом

**1205****1215**

| D<br>k 10 | d<br>h 6 | l <sub>1</sub><br>1205 | l <sub>1</sub><br>1215 | l <sub>2</sub><br>1205 | l <sub>2</sub><br>1215 | z |
|-----------|----------|------------------------|------------------------|------------------------|------------------------|---|
| 2         | 6        | 51                     |                        | 7                      |                        | 4 |
| 3         | 6        | 52                     | 56                     | 8                      | 12                     | 4 |
| 4         | 6        | 55                     |                        | 11                     |                        | 4 |
| 5         | 6        | 57                     |                        | 13                     |                        | 4 |
| 6         | 6        | 57                     | 68                     | 13                     | 24                     | 4 |
| 8         | 10       | 69                     | 88                     | 19                     | 38                     | 4 |
| 10        | 10       | 72                     | 95                     | 22                     | 45                     | 4 |
| 12        | 12       | 83                     | 110                    | 26                     | 53                     | 4 |
| 14        | 12       | 83                     | 110                    | 26                     | 53                     | 4 |
| 15        | 12       |                        | 110                    |                        | 53                     | 4 |
| 16        | 16       | 92                     | 123                    | 32                     | 63                     | 4 |
| 18        | 16       | 92                     | 123                    | 32                     | 63                     | 4 |
| 20        | 20       | 104                    | 141                    | 38                     | 75                     | 4 |
| 25        | 25       | 121                    |                        | 45                     |                        | 5 |
| 30        | 25       | 121                    |                        | 45                     |                        | 5 |
| 32        | 32       |                        | 186                    |                        | 106                    | 6 |

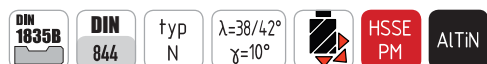
**120517****121517**

|      |      |
|------|------|
| .020 |      |
| .030 | .030 |
| .040 |      |
| .050 |      |
| .060 | .060 |
| .080 | .080 |
| .100 | .100 |
| .120 | .120 |
| .140 | .140 |
|      | .150 |
| .160 | .160 |
| .180 | .180 |
| .200 | .200 |
| .250 |      |
| .300 |      |
|      | .320 |

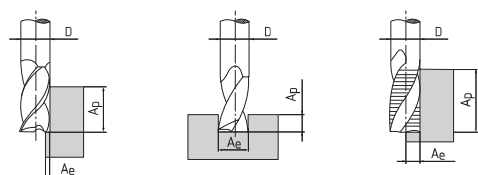
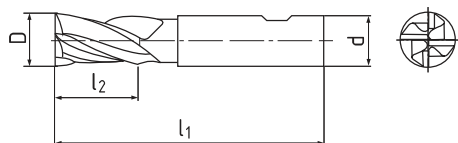
## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material | A <sub>p</sub>              | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |        |        |        |        |        |        |        |       |       |
|----------|-----------------------------|----------------|----------------|-----------------------|--------|--------|--------|--------|--------|--------|--------|-------|-------|
|          |                             |                |                | Ø 6                   | Ø 8    | Ø 10   | Ø 12   | Ø 16   | Ø 18   | Ø 20   | Ø 25   | Ø 32  |       |
| P.2      | ≤ 850 N/mm <sup>2</sup>     | 1xD            | 0,1xD          | 99                    | 0,017  | 0,023  | 0,031  | 0,037  | 0,048  | 0,056  | 0,063  | 0,852 | 0,100 |
| P.3      | ≤ 1100 N/mm <sup>2</sup>    | 1xD            | 0,1xD          | 61,5                  | 0,017  | 0,023  | 0,031  | 0,037  | 0,048  | 0,056  | 0,063  | 0,852 | 0,100 |
| P.4      | ≤ 900 N/mm <sup>2</sup>     | 1xD            | 0,1xD          | 76,5                  | 0,017  | 0,023  | 0,031  | 0,037  | 0,048  | 0,056  | 0,063  | 0,852 | 0,100 |
| P.5      | ≤ 1100 N/mm <sup>2</sup>    | 1xD            | 0,1xD          | 61,5                  | 0,017  | 0,023  | 0,031  | 0,037  | 0,048  | 0,056  | 0,063  | 0,852 | 0,100 |
| M.2      | 750 - 850 N/mm <sup>2</sup> | 1xD            | 0,1xD          | 37,5                  | 0,017  | 0,023  | 0,031  | 0,037  | 0,048  | 0,056  | 0,063  | 0,852 | 0,100 |
| K.1      | < 240 HB                    | 1xD            | 0,1xD          | 88,5                  | 0,017  | 0,023  | 0,031  | 0,037  | 0,048  | 0,056  | 0,063  | 0,852 | 0,100 |
| S.1      | ≤ 1500 N/mm <sup>2</sup>    | 1xD            | 0,1xD          | 31,5                  | 0,0119 | 0,0161 | 0,0217 | 0,0259 | 0,0336 | 0,0392 | 0,0441 | 0,596 | 0,070 |
| S.2      | ≤ 1250 N/mm <sup>2</sup>    | 1xD            | 0,1xD          | 30                    | 0,0119 | 0,0161 | 0,0217 | 0,0259 | 0,0336 | 0,0392 | 0,0441 | 0,596 | 0,070 |

- EN End mills | with variable helix angle  
 DE Schafffräser | mit ungleichen Spannwinkel  
 RU Фрезы цилиндрические торцевые | с переменной спиралью



1406X



| D<br>k 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z | 140617X |
|-----------|----------|----------------|----------------|---|---------|
| 6         | 6        | 57             | 13             | 4 | .060    |
| 8         | 10       | 69             | 19             | 4 | .080    |
| 10        | 10       | 72             | 22             | 4 | .100    |
| 12        | 12       | 83             | 26             | 4 | .120    |
| 16        | 16       | 92             | 32             | 4 | .160    |
| 20        | 20       | 104            | 38             | 4 | .200    |

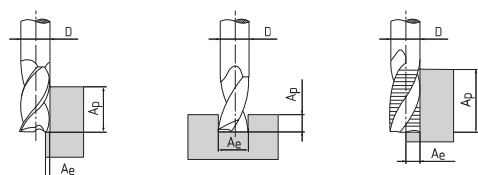
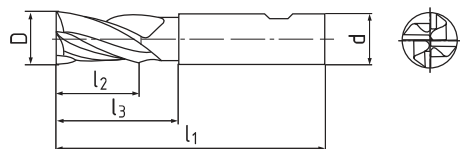
## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                        | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | fz (mm/z) |       |       |       |       |       |
|---------------------------------|----------------|----------------|----------------|-----------|-------|-------|-------|-------|-------|
|                                 |                |                |                | Ø 6       | Ø 8   | Ø 10  | Ø 12  | Ø 16  | Ø 20  |
| P.1 ≤ 600 N/mm <sup>2</sup>     | 1,5xD          | 0,15xD         | 65             | 0,02      | 0,027 | 0,038 | 0,044 | 0,054 | 0,065 |
| P.2 ≤ 850 N/mm <sup>2</sup>     | 1,5xD          | 0,15xD         | 65             | 0,02      | 0,027 | 0,038 | 0,044 | 0,054 | 0,065 |
| P.3 ≤ 1100 N/mm <sup>2</sup>    | 1,5xD          | 0,15xD         | 55             | 0,018     | 0,024 | 0,03  | 0,036 | 0,042 | 0,053 |
| P.4 ≤ 900 N/mm <sup>2</sup>     | 1,5xD          | 0,15xD         | 55             | 0,018     | 0,024 | 0,03  | 0,036 | 0,042 | 0,053 |
| P.5 ≤ 1100 N/mm <sup>2</sup>    | 1,5xD          | 0,15xD         | 55             | 0,018     | 0,024 | 0,03  | 0,036 | 0,042 | 0,053 |
| P.6 > 1100 N/mm <sup>2</sup>    | 1,5xD          | 0,15xD         | 55             | 0,018     | 0,024 | 0,03  | 0,036 | 0,042 | 0,053 |
| M.1 ≤ 750 N/mm <sup>2</sup>     | 1,5xD          | 0,15xD         | 50             | 0,018     | 0,024 | 0,03  | 0,036 | 0,042 | 0,054 |
| M.2 750 - 850 N/mm <sup>2</sup> | 1,5xD          | 0,15xD         | 40             | 0,018     | 0,024 | 0,03  | 0,036 | 0,042 | 0,054 |
| M.3 > 850 N/mm <sup>2</sup>     | 1,5xD          | 0,15xD         | 40             | 0,018     | 0,024 | 0,03  | 0,036 | 0,042 | 0,054 |
| K.2 > 240 HB                    | 1,5xD          | 0,15xD         | 55             | 0,023     | 0,03  | 0,041 | 0,049 | 0,06  | 0,071 |

EN End mills | for stainless steel  
 DE Schafffräser | für Inox  
 RU Фрезы цилиндрические торцевые | по нержавеющей



1506S



| D<br>k 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | l <sub>3</sub> | Z |
|-----------|----------|----------------|----------------|----------------|---|
| 6         | 6        | 57             | 7              | 21             | 4 |
| 8         | 8        | 63             | 9              | 27             | 4 |
| 10        | 10       | 72             | 11             | 32             | 4 |
| 12        | 12       | 83             | 13             | 38             | 4 |
| 16        | 16       | 92             | 17             | 44             | 4 |
| 20        | 20       | 104            | 21             | 53             | 4 |

| 150617S | 150617S    |
|---------|------------|
| .060    | .060 ALCRN |
| .080    | .080 ALCRN |
| .100    | .100 ALCRN |
| .120    | .120 ALCRN |
| .160    | .160 ALCRN |
| .200    | .200 ALCRN |

### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                        | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |       |       |
|---------------------------------|----------------|----------------|----------------|-----------------------|-------|-------|-------|-------|-------|
|                                 |                |                |                | Ø 6                   | Ø 8   | Ø 10  | Ø 12  | Ø 16  | Ø 20  |
| P.1 ≤ 600 N/mm <sup>2</sup>     | 1xD            | 0,1xD          | 78             | 0,02                  | 0,027 | 0,038 | 0,044 | 0,054 | 0,065 |
| P.2 ≤ 850 N/mm <sup>2</sup>     | 1xD            | 0,1xD          | 78             | 0,02                  | 0,027 | 0,038 | 0,044 | 0,054 | 0,065 |
| P.3 ≤ 1100 N/mm <sup>2</sup>    | 1xD            | 0,1xD          | 66             | 0,018                 | 0,024 | 0,03  | 0,036 | 0,042 | 0,053 |
| P.4 ≤ 900 N/mm <sup>2</sup>     | 1xD            | 0,1xD          | 66             | 0,018                 | 0,024 | 0,03  | 0,036 | 0,042 | 0,053 |
| P.5 ≤ 1100 N/mm <sup>2</sup>    | 1xD            | 0,1xD          | 66             | 0,018                 | 0,024 | 0,03  | 0,036 | 0,042 | 0,053 |
| P.6 > 1100 N/mm <sup>2</sup>    | 1xD            | 0,1xD          | 66             | 0,018                 | 0,024 | 0,03  | 0,036 | 0,042 | 0,053 |
| M.1 ≤ 750 N/mm <sup>2</sup>     | 1xD            | 0,1xD          | 60             | 0,018                 | 0,024 | 0,03  | 0,036 | 0,042 | 0,054 |
| M.2 750 - 850 N/mm <sup>2</sup> | 1xD            | 0,1xD          | 48             | 0,018                 | 0,024 | 0,03  | 0,036 | 0,042 | 0,054 |
| M.3 > 850 N/mm <sup>2</sup>     | 1xD            | 0,1xD          | 48             | 0,018                 | 0,024 | 0,03  | 0,036 | 0,042 | 0,054 |





EN End mills | short, 1 tooth cut over centre

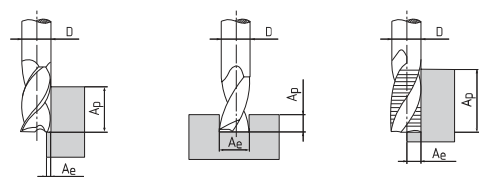
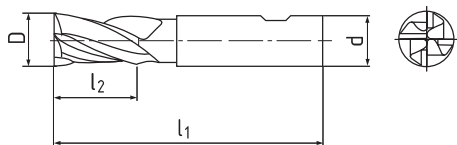
DE Schafffräser | Kurz, 1 Schneide über die Mitte

RU Фрезы концевые с цилиндрическим хвостовиком | короткие, с центрорежущим зубом



1205

1205



| D<br>k 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z | 120508 | 120518 | 120518     |
|-----------|----------|----------------|----------------|---|--------|--------|------------|
| 2         | 6        | 51             | 7              | 3 | .020   | .020   | .020 TIALN |
| 2,5       | 6        | 52             | 8              | 3 | .025   | .025   | .025 TIALN |
| 3         | 6        | 52             | 8              | 4 | .030   | .030   | .030 TIALN |
| 3,5       | 6        | 54             | 10             | 4 | .035   | .035   | .035 TIALN |
| 4         | 6        | 55             | 11             | 4 | .040   | .040   | .040 TIALN |
| 4,5       | 6        | 55             | 11             | 4 | .045   | .045   | .045 TIALN |
| 5         | 6        | 57             | 13             | 4 | .050   | .050   | .050 TIALN |
| 5,5       | 6        | 57             | 13             | 4 | .055   | .055   | .055 TIALN |
| 6         | 6        | 57             | 13             | 4 | .060   | .060   | .060 TIALN |
| 6,5       | 10       | 66             | 16             | 4 | .065   | .065   | .065 TIALN |
| 7         | 10       | 66             | 16             | 4 | .070   | .070   | .070 TIALN |
| 7,5       | 10       | 66             | 16             | 4 | .075   | .075   | .075 TIALN |
| 8         | 10       | 69             | 19             | 4 | .080   | .080   | .080 TIALN |
| 8,5       | 10       | 69             | 19             | 4 | .085   | .085   | .085 TIALN |
| 9         | 10       | 69             | 19             | 4 | .090   | .090   | .090 TIALN |
| 9,5       | 10       | 69             | 19             | 4 | .095   | .095   | .095 TIALN |
| 10        | 10       | 72             | 22             | 4 | .100   | .100   | .100 TIALN |
| 10,5      | 12       | 79             | 22             | 4 | .105   | .105   | .105 TIALN |
| 11        | 12       | 79             | 22             | 4 | .110   | .110   | .110 TIALN |
| 12        | 12       | 83             | 26             | 4 | .120   | .120   | .120 TIALN |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material |                 | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |       |
|----------|-----------------|----------------|----------------|----------------|-----------------------|-------|-------|-------|-------|
|          |                 |                |                |                | Ø 3                   | Ø 6   | Ø 8   | Ø 10  | Ø 12  |
| P.1      | ≤ 600 N/mm²     | 1xD            | 0,1xD          | 45             | 0,006                 | 0,015 | 0,021 | 0,028 | 0,034 |
| P.2      | ≤ 850 N/mm²     | 1xD            | 0,1xD          | 39             | 0,006                 | 0,015 | 0,021 | 0,028 | 0,034 |
| P.3      | ≤ 1100 N/mm²    | 1xD            | 0,1xD          | 24             | 0,006                 | 0,015 | 0,021 | 0,028 | 0,034 |
| P.4      | ≤ 900 N/mm²     | 1xD            | 0,1xD          | 30             | 0,006                 | 0,015 | 0,021 | 0,028 | 0,034 |
| P.6      | > 1100 N/mm²    | 1xD            | 0,1xD          | 20             | 0,006                 | 0,015 | 0,021 | 0,028 | 0,034 |
| M.2      | 750 - 850 N/mm² | 1xD            | 0,1xD          | 15             | 0,006                 | 0,015 | 0,021 | 0,028 | 0,034 |
| K.1      | < 240 HB        | 1xD            | 0,1xD          | 35             | 0,006                 | 0,015 | 0,021 | 0,028 | 0,034 |
| S.1      | ≤ 1500 N/mm²    | 1xD            | 0,1xD          | 12             | 0,006                 | 0,015 | 0,021 | 0,028 | 0,034 |

TiAlN: V<sub>c</sub> + 50 %

EN End mills | short, 1 tooth cut over centre

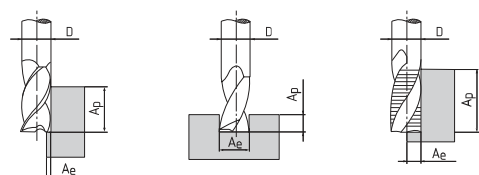
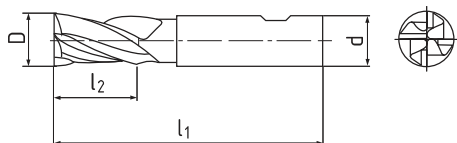
DE Schafffräser | Kurz, 1 Schneide über die Mitte

RU Фрезы концевые с цилиндрическим хвостовиком | короткие, с центрорежущим зубом



1205

1205



| D<br>k 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z | 120508 | 120518 | 120518       |
|-----------|----------|----------------|----------------|---|--------|--------|--------------|
| 13        | 12       | 83             | 26             | 4 | .130   | .130   | .130 TIALN   |
| 14        | 12       | 83             | 26             | 4 | .140   | .140   | .140 TIALN   |
| 15        | 12       | 83             | 26             | 4 | .150   | .150   | .150 TIALN   |
| 16        | 16       | 92             | 32             | 4 | .160   | .160   | .160 TIALN   |
| 17        | 16       | 92             | 32             | 4 | .170   | .170   | .170 TIALN   |
| 18        | 16       | 92             | 32             | 4 | .180   | .180   | .180 TIALN   |
| 20        | 20       | 104            | 38             | 4 | .200   | .200   | .200 TIALN   |
| 21        | 20       | 104            | 38             | 5 | .210   | .210   | .220 TIALN   |
| 22        | 20       | 104            | 38             | 5 | .220   | .220   | .220 TIALN   |
| 24        | 25       | 121            | 45             | 5 | .240   | .240   | .240 TIALN   |
| 25        | 25       | 121            | 45             | 5 | .250   | .250   | .250 TIALN   |
| 26        | 25       | 121            | 45             | 5 | .260   | .260   | .260 TIALN   |
| 27        | 25       | 121            | 45             | 5 | .270   | .270   | .270 TIALN   |
| 28        | 25       | 121            | 45             | 5 | .280   | .280   | .280 TIALN   |
| 30        | 25       | 121            | 45             | 5 | .300   | .300   | .300 TIALN   |
| 32        | 32       | 133            | 53             | 6 | .320   | .320   | .320 TIALN   |
| 34        | 32       | 133            | 53             | 6 | .340   | .340   | .340 TIALN   |
| 35        | 32       | 133            | 53             | 6 | .350   | .350   | .350 TIALN   |
| 36        | 32       | 133            | 53             | 6 | .360   | .360   | .360 TIALN   |
| 40*       | 32       | 143            | 63             | 6 | .40032 | .40032 | .40032 TIALN |

\*) ≠ DIN 844

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

|          |                 |     |       |         | fz (mm/z) |        |        |       |       |       |
|----------|-----------------|-----|-------|---------|-----------|--------|--------|-------|-------|-------|
| Material |                 | Ap  | Ae    | Vc      | Ø 16      | Ø 18   | Ø 20   | Ø 25  | Ø 32  | Ø 40  |
| P.1      | ≤ 600 N/mm²     | 1xD | 0,1xD | 45      | 0,044     | 0,051  | 0,057  | 0,710 | 0,091 | 0,110 |
| P.2      | ≤ 850 N/mm²     | 1xD | 0,1xD | 39      | 0,044     | 0,051  | 0,057  | 0,710 | 0,091 | 0,110 |
| P.3      | ≤ 1100 N/mm²    | 1xD | 0,1xD | 24      | 0,044     | 0,051  | 0,057  | 0,710 | 0,091 | 0,110 |
| P.4      | ≤ 900 N/mm²     | 1xD | 0,1xD | 30      | 0,044     | 0,051  | 0,057  | 0,710 | 0,091 | 0,110 |
| P.6      | > 1100 N/mm²    | 1xD | 0,1xD | 20      | 0,0308    | 0,0357 | 0,0399 | 0,497 | 0,064 | 0,077 |
| M.2      | 750 - 850 N/mm² | 1xD | 0,1xD | 15      | 0,044     | 0,051  | 0,057  | 0,710 | 0,091 | 0,110 |
| K.1      | < 240 HB        | 1xD | 0,1xD | 35      | 0,044     | 0,051  | 0,057  | 0,710 | 0,064 | 0,110 |
| S.1      | ≤ 1500 N/mm²    | 1xD | 0,1xD | 160-300 | 0,0572    | 0,0663 | 0,0741 | 0,497 | 0,091 | 0,077 |

TiAlN: V<sub>c</sub> + 50 %



EN

End mills | long, 1 tooth cut over centre

DE

Schaftfräser | Lang, 1 Schneide über die Mitte

RU

Фрезы концевые с цилиндрическим хвостовиком | длинные, с центроврежущим зубом

DIN 1835B

DIN 844

typ N

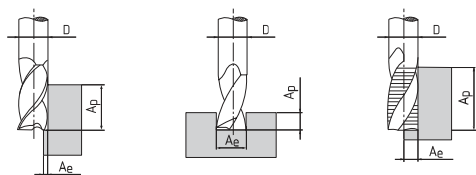
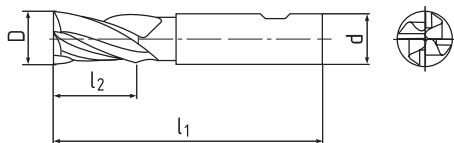
$\lambda=30^\circ$   
 $\gamma=8^\circ$

HSS Co8

TiAlN

D=2

1215



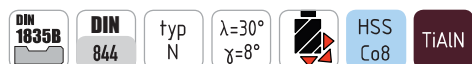
| D<br>k 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z | 121518 | 121518     |
|-----------|----------|----------------|----------------|---|--------|------------|
| 2         | 6        | 54             | 10             | 3 | .020   | .020 TiAlN |
| 3         | 6        | 56             | 12             | 4 | .030   | .030 TiAlN |
| 3,5       | 6        | 59             | 15             | 4 | .035   | .035 TiAlN |
| 4         | 6        | 63             | 19             | 4 | .040   | .040 TiAlN |
| 4,5       | 6        | 63             | 19             | 4 | .045   | .045 TiAlN |
| 5         | 6        | 68             | 24             | 4 | .050   | .050 TiAlN |
| 5,5       | 6        | 68             | 24             | 4 | .055   | .055 TiAlN |
| 6         | 6        | 68             | 24             | 4 | .060   | .060 TiAlN |
| 7         | 10       | 80             | 30             | 4 | .070   | .070 TiAlN |
| 8         | 10       | 88             | 38             | 4 | .080   | .080 TiAlN |
| 9         | 10       | 88             | 38             | 4 | .090   | .090 TiAlN |
| 10        | 10       | 95             | 45             | 4 | .100   | .100 TiAlN |
| 11        | 12       | 102            | 45             | 4 | .110   | .110 TiAlN |
| 12        | 12       | 110            | 53             | 4 | .120   | .120 TiAlN |
| 13        | 12       | 110            | 53             | 4 | .130   | .130 TiAlN |
| 14        | 12       | 110            | 53             | 4 | .140   | .140 TiAlN |
| 15        | 12       | 110            | 53             | 4 | .150   | .150 TiAlN |

Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

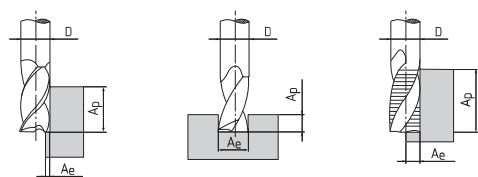
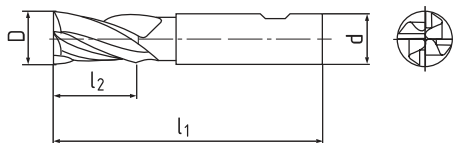
| Material |                 | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |       |
|----------|-----------------|----------------|----------------|----------------|-----------------------|-------|-------|-------|-------|
|          |                 |                |                |                | Ø 3                   | Ø 6   | Ø 8   | Ø 10  | Ø 12  |
| P.1      | ≤ 600 N/mm²     | 1xD            | 0,1xD          | 45             | 0,006                 | 0,015 | 0,021 | 0,028 | 0,034 |
| P.2      | ≤ 850 N/mm²     | 1xD            | 0,1xD          | 39             | 0,006                 | 0,015 | 0,021 | 0,028 | 0,034 |
| P.3      | ≤ 1100 N/mm²    | 1xD            | 0,1xD          | 24             | 0,006                 | 0,015 | 0,021 | 0,028 | 0,034 |
| P.4      | ≤ 900 N/mm²     | 1xD            | 0,1xD          | 30             | 0,006                 | 0,015 | 0,021 | 0,028 | 0,034 |
| P.6      | > 1100 N/mm²    | 1xD            | 0,1xD          | 30             | 0,006                 | 0,015 | 0,021 | 0,028 | 0,034 |
| M.2      | 750 - 850 N/mm² | 1xD            | 0,1xD          | 20             | 0,006                 | 0,015 | 0,021 | 0,028 | 0,034 |
| K.1      | < 240 HB        | 1xD            | 0,1xD          | 15             | 0,006                 | 0,015 | 0,021 | 0,028 | 0,034 |
| S.1      | ≤ 1500 N/mm²    | 1xD            | 0,1xD          | 012            | 0,006                 | 0,015 | 0,021 | 0,028 | 0,034 |

TiAlN: V<sub>c</sub> + 50 %

- EN End mills | long, 1 tooth cut over centre  
 DE Schafffräser | Lang, 1 Schneide über die Mitte  
 RU Фрезы концевые с цилиндрическим хвостовиком | длинные, с центроврежущим зубом



1215



| D<br>k 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z | 121518 | 121518       |
|-----------|----------|----------------|----------------|---|--------|--------------|
| 16        | 16       | 123            | 63             | 4 | .160   | .160 TIALN   |
| 18        | 16       | 123            | 63             | 4 | .180   | .180 TIALN   |
| 20        | 20       | 141            | 75             | 4 | .200   | .200 TIALN   |
| 22        | 20       | 141            | 75             | 5 | .220   | .220 TIALN   |
| 24        | 25       | 166            | 90             | 5 | .240   | .240 TIALN   |
| 25        | 25       | 166            | 90             | 5 | .250   | .250 TIALN   |
| 26        | 25       | 166            | 90             | 5 | .260   | .260 TIALN   |
| 28        | 25       | 166            | 90             | 5 | .280   | .280 TIALN   |
| 30        | 25       | 166            | 90             | 5 | .300   | .300 TIALN   |
| 32        | 32       | 186            | 106            | 6 | .320   | .320 TIALN   |
| 36        | 32       | 186            | 106            | 6 | .360   | .360 TIALN   |
| 40*       | 32       | 205            | 125            | 6 | .40032 | .40032 TIALN |
| 40        | 40       | 217            | 125            | 6 | .400   | .400 TIALN   |

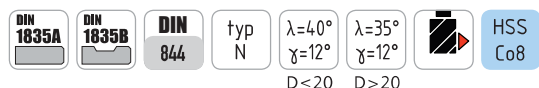
\*) ≠ DIN 844

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                        | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |        |       |
|---------------------------------|----------------|----------------|----------------|-----------------------|-------|-------|-------|--------|-------|
|                                 |                |                |                | Ø 16                  | Ø 18  | Ø 20  | Ø 25  | Ø 30   | Ø 40  |
| P.1 ≤ 600 N/mm <sup>2</sup>     | 1xD            | 0,1xD          | 45             | 0,044                 | 0,051 | 0,057 | 0,71  | 0,085  | 0,11  |
| P.2 ≤ 850 N/mm <sup>2</sup>     | 1xD            | 0,1xD          | 39             | 0,044                 | 0,051 | 0,057 | 0,71  | 0,085  | 0,11  |
| P.3 ≤ 1100 N/mm <sup>2</sup>    | 1xD            | 0,1xD          | 24             | 0,044                 | 0,051 | 0,057 | 0,71  | 0,085  | 0,11  |
| P.4 ≤ 900 N/mm <sup>2</sup>     | 1xD            | 0,1xD          | 30             | 0,044                 | 0,051 | 0,057 | 0,71  | 0,085  | 0,11  |
| P.6 > 1100 N/mm <sup>2</sup>    | 1xD            | 0,1xD          | 30             | 0,044                 | 0,051 | 0,057 | 0,497 | 0,0595 | 0,077 |
| M.2 750 - 850 N/mm <sup>2</sup> | 1xD            | 0,1xD          | 20             | 0,044                 | 0,051 | 0,057 | 0,71  | 0,085  | 0,11  |
| K.1 < 240 HB                    | 1xD            | 0,1xD          | 15             | 0,044                 | 0,051 | 0,057 | 0,71  | 0,085  | 0,11  |
| S.1 ≤ 1500 N/mm <sup>2</sup>    | 1xD            | 0,1xD          | 012            | 0,044                 | 0,051 | 0,057 | 0,497 | 0,0595 | 0,077 |

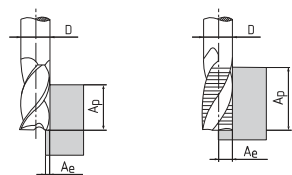
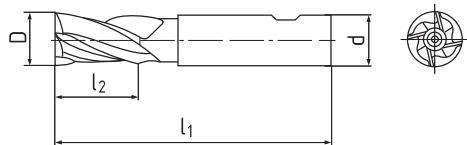
TiAlN: V<sub>c</sub> + 50 %

- EN End mills  
 DE Schafffräser  
 RU Фрезы концевые с цилиндрическим хвостовиком



1402

1412



| D<br>k 10 | d<br>h 6 | l <sub>1</sub><br>1402 | l <sub>1</sub><br>1412 | l <sub>2</sub><br>1402 | l <sub>2</sub><br>1412 | Z | 140208 | 140218 | 141208 | 141218 |
|-----------|----------|------------------------|------------------------|------------------------|------------------------|---|--------|--------|--------|--------|
| 6         | 6        | 57                     | 68                     | 13                     | 24                     | 4 | .060   | .060   | .060   | .060   |
| 7         | 10       | 66                     | 80                     | 16                     | 30                     | 4 | .070   | .070   | .070   | .070   |
| 8         | 10       | 69                     | 88                     | 19                     | 38                     | 4 | .080   | .080   | .080   | .080   |
| 9         | 10       | 69                     | 88                     | 19                     | 38                     | 4 | .090   | .090   | .090   | .090   |
| 10        | 10       | 72                     | 95                     | 22                     | 45                     | 4 | .100   | .100   | .100   | .100   |
| 11        | 12       | 79                     | 102                    | 22                     | 45                     | 4 | .110   | .110   | .110   | .110   |
| 12        | 12       | 83                     | 110                    | 26                     | 53                     | 4 | .120   | .120   | .120   | .120   |
| 13        | 12       | 83                     | 110                    | 26                     | 53                     | 4 | .130   | .130   | .130   | .130   |
| 14        | 12       | 83                     | 110                    | 26                     | 53                     | 4 | .140   | .140   | .140   | .140   |
| 15        | 12       | 83                     | 110                    | 26                     | 53                     | 4 | .150   | .150   | .150   | .150   |
| 16        | 16       | 92                     | 123                    | 32                     | 63                     | 4 | .160   | .160   | .160   | .160   |
| 17        | 16       | 92                     | 123                    | 32                     | 63                     | 4 |        | .170   | .170   | .170   |
| 18        | 16       | 92                     | 123                    | 32                     | 63                     | 4 | .180   | .180   | .180   | .180   |
| 19        | 16       | 92                     |                        | 32                     |                        | 4 |        | .190   |        |        |
| 20        | 20       | 104                    | 141                    | 38                     | 75                     | 4 | .200   | .200   | .200   | .200   |
| 21        | 20       | 104                    |                        | 38                     |                        | 5 |        | .210   |        |        |
| 22        | 20       | 104                    | 141                    | 38                     | 75                     | 5 |        | .220   |        | .220   |
| 24        | 25       | 121                    |                        | 45                     |                        | 5 |        | .240   |        |        |
| 25        | 25       | 121                    | 166                    | 45                     | 90                     | 5 |        | .250   |        | .250   |
| 28        | 25       | 121                    | 166                    | 45                     | 90                     | 5 |        | .280   |        | .280   |
| 30        | 25       | 121                    | 166                    | 45                     | 90                     | 6 |        | .300   |        | .300   |
| 32        | 32       | 133                    | 186                    | 53                     | 106                    | 6 |        | .320   |        | .320   |
| 36        | 32       | 133                    | 186                    | 53                     | 106                    | 6 |        | .360   |        | .360   |
| 40*       | 32       | 143                    | 205                    | 63                     | 125                    | 6 |        | .40032 |        | .40032 |

\*) ≠ DIN 844

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

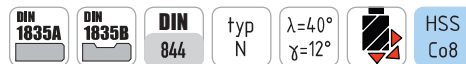
| Material                     | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |       |       |       |      |       |  |
|------------------------------|----------------|----------------|----------------|-----------------------|-------|-------|-------|-------|-------|-------|------|-------|--|
|                              |                |                |                | Ø 6                   | Ø 8   | Ø 10  | Ø 12  | Ø 16  | Ø 18  | Ø 20  | Ø 25 | Ø 32  |  |
| P.1 ≤ 600 N/mm <sup>2</sup>  | 1xD            | 0,1xD          | 45             | 0,015                 | 0,021 | 0,028 | 0,034 | 0,044 | 0,051 | 0,057 | 0,71 | 0,091 |  |
| P.2 ≤ 850 N/mm <sup>2</sup>  | 1xD            | 0,1xD          | 39             | 0,015                 | 0,021 | 0,028 | 0,034 | 0,044 | 0,051 | 0,057 | 0,71 | 0,091 |  |
| P.3 ≤ 1100 N/mm <sup>2</sup> | 1xD            | 0,1xD          | 24             | 0,015                 | 0,021 | 0,028 | 0,034 | 0,044 | 0,051 | 0,057 | 0,71 | 0,091 |  |
| P.4 ≤ 900 N/mm <sup>2</sup>  | 1xD            | 0,1xD          | 30             | 0,015                 | 0,021 | 0,028 | 0,034 | 0,044 | 0,051 | 0,057 | 0,71 | 0,091 |  |
| P.5 ≤ 1100 N/mm <sup>2</sup> | 1xD            | 0,1xD          | 24             | 0,015                 | 0,021 | 0,028 | 0,034 | 0,044 | 0,051 | 0,057 | 0,71 | 0,091 |  |

EN End mills sets  
DE Fräasersätze  
RU Наборы фрез



ZPS-FN Code:

**140618.SET4-12**

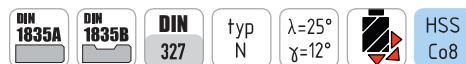


D = 4; 5; 6; 8; 10; 12



ZPS-FN Code:

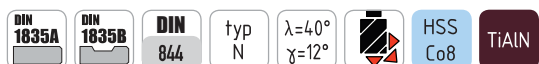
**220418.SET4-12**



D = 4; 5; 6; 8; 10; 12

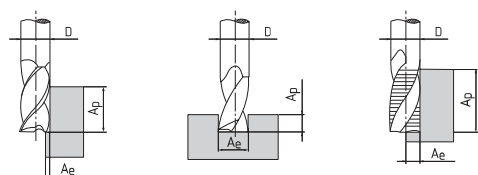
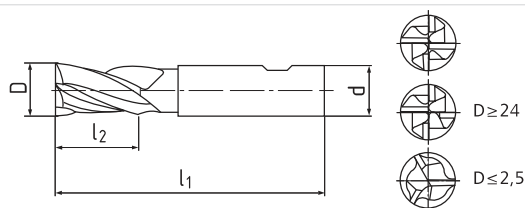
V případě zájmu vám připravíme sady fréz dle vašeho výběru.  
You can have also special custom sets – specified by yourself.  
Sie können auch die Fräasersätze genau nach Ihrer Spezifikation erhalten.  
Можно подготовить тоже другие наборы фрез по вашей спецификации.

- EN End mills | 2 teeth cut to centre  
 DE Schafffräser | bis Mitte schneidend  
 RU Фрезы концевые с цилиндрическим хвостовиком | с центрорежущим зубом



1406

1416



| D<br>k 10 | d<br>h 6 | l <sub>1</sub><br>1406 | l <sub>1</sub><br>1416 | l <sub>2</sub><br>1406 | l <sub>2</sub><br>1416 | Z |
|-----------|----------|------------------------|------------------------|------------------------|------------------------|---|
| 2         | 6        | 51                     | 54                     | 7                      | 10                     | 3 |
| 2,5       | 6        | 52                     | 56                     | 8                      | 12                     | 3 |
| 3         | 6        | 52                     | 56                     | 8                      | 12                     | 4 |
| 3,5       | 6        | 54                     | 59                     | 10                     | 15                     | 4 |
| 4         | 6        | 55                     | 63                     | 11                     | 19                     | 4 |
| 4,5       | 6        | 55                     | 63                     | 11                     | 19                     | 4 |
| 5         | 6        | 57                     | 68                     | 13                     | 24                     | 4 |
| 5,5       | 6        | 57                     | 68                     | 13                     | 24                     | 4 |
| 6         | 6        | 57                     | 68                     | 13                     | 24                     | 4 |
| 6,5       | 10       | 66                     | 80                     | 16                     | 30                     | 4 |
| 7         | 10       | 66                     | 80                     | 16                     | 30                     | 4 |
| 7,5       | 10       | 66                     | 80                     | 16                     | 30                     | 4 |
| 8         | 10       | 69                     | 88                     | 19                     | 38                     | 4 |
| 8,5       | 10       | 69                     | 88                     | 19                     | 38                     | 4 |
| 9         | 10       | 69                     | 88                     | 19                     | 38                     | 4 |
| 9,5       | 10       | 69                     | 88                     | 19                     | 38                     | 4 |
| 10        | 10       | 72                     | 95                     | 22                     | 45                     | 4 |
| 11        | 12       | 79                     | 102                    | 22                     | 45                     | 4 |
| 12        | 12       | 83                     | 110                    | 26                     | 53                     | 4 |
| 13        | 12       | 83                     | 110                    | 26                     | 53                     | 4 |
| 14        | 12       | 83                     | 110                    | 26                     | 53                     | 4 |

140618 140618 141618

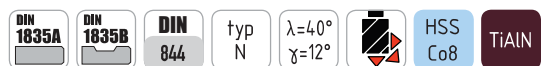
|      |            |      |
|------|------------|------|
| .020 | .020 TiAlN | .020 |
| .025 | .025 TiAlN | .025 |
| .030 | .030 TiAlN | .030 |
| .035 | .035 TiAlN | .035 |
| .040 | .040 TiAlN | .040 |
| .045 | .045 TiAlN | .045 |
| .050 | .050 TiAlN | .050 |
| .055 | .055 TiAlN | .055 |
| .060 | .060 TiAlN | .060 |
| .065 | .065 TiAlN | .065 |
| .070 | .070 TiAlN | .070 |
| .075 | .075 TiAlN | .075 |
| .080 | .080 TiAlN | .080 |
| .085 | .085 TiAlN | .085 |
| .090 | .090 TiAlN | .090 |
| .095 | .095 TiAlN | .095 |
| .100 | .100 TiAlN | .100 |
| .110 | .110 TiAlN | .110 |
| .120 | .120 TiAlN | .120 |
| .130 | .130 TiAlN | .130 |
| .140 | .140 TiAlN | .140 |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material |              | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |        |        |        |        |
|----------|--------------|----------------|----------------|----------------|-----------------------|--------|--------|--------|--------|
|          |              |                |                |                | Ø 3                   | Ø 6    | Ø 8    | Ø 10   | Ø 12   |
| P.1      | ≤ 600 N/mm²  | 1xD            | 0,1xD          | 45             | 0,006                 | 0,015  | 0,021  | 0,028  | 0,034  |
| P.2      | ≤ 850 N/mm²  | 1xD            | 0,1xD          | 39             | 0,006                 | 0,015  | 0,021  | 0,028  | 0,034  |
| P.3      | ≤ 1100 N/mm² | 1xD            | 0,1xD          | 24             | 0,006                 | 0,015  | 0,021  | 0,028  | 0,034  |
| P.4      | ≤ 900 N/mm²  | 1xD            | 0,1xD          | 30             | 0,006                 | 0,015  | 0,021  | 0,028  | 0,034  |
| P.5      | ≤ 1100 N/mm² | 1xD            | 0,1xD          | 24             | 0,006                 | 0,015  | 0,021  | 0,028  | 0,034  |
| K.1      | < 240 HB     | 1xD            | 0,1xD          | 35             | 0,006                 | 0,015  | 0,021  | 0,028  | 0,034  |
| S.1      | ≤ 1500 N/mm² | 1xD            | 0,1xD          | 12             | 0,0042                | 0,0105 | 0,0147 | 0,0196 | 0,0238 |

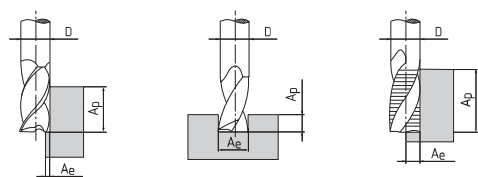
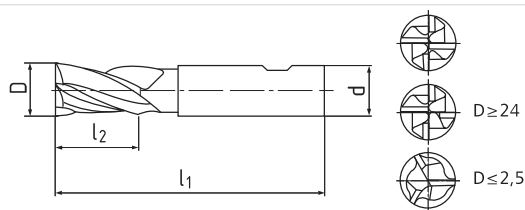
TiAlN:  $V_c + 50\%$

- EN End mills | 2 teeth cut to centre  
 DE Schafffräser | bis Mitte schneidend  
 RU Фрезы концевые с цилиндрическим хвостовиком | с центрорежущим зубом



1406

1416



| D<br>k 10 | d<br>h 6 | l <sub>1</sub><br>1406 | l <sub>1</sub><br>1416 | l <sub>2</sub><br>1406 | l <sub>2</sub><br>1416 | Z | 140618 | 140618     | 141618 |
|-----------|----------|------------------------|------------------------|------------------------|------------------------|---|--------|------------|--------|
| 15        | 12       | 83                     | 110                    | 26                     | 53                     | 4 | .150   | .150 TiAlN | .150   |
| 16        | 16       | 92                     | 123                    | 32                     | 63                     | 4 | .160   | .160 TiAlN | .160   |
| 17        | 16       | 92                     | 123                    | 32                     | 63                     | 4 | .170   | .170 TiAlN | .170   |
| 18        | 16       | 92                     | 123                    | 32                     | 63                     | 4 | .180   | .180 TiAlN | .180   |
| 19        | 16       | 92                     | 123                    | 32                     | 63                     | 4 | .190   | .190 TiAlN | .190   |
| 20        | 20       | 104                    | 141                    | 38                     | 75                     | 4 | .200   | .200 TiAlN | .200   |
| 22        | 20       | 104                    | 141                    | 38                     | 75                     | 4 | .220   | .220 TiAlN | .220   |
| 24        | 25       | 121                    | 166                    | 45                     | 90                     | 5 | .240   | .240 TiAlN | .240   |
| 25        | 25       | 121                    | 166                    | 45                     | 90                     | 5 | .250   | .250 TiAlN | .250   |
| 28        | 25       | 121                    | 166                    | 45                     | 90                     | 5 | .280   | .280 TiAlN | .280   |
| 30        | 25       | 121                    | 166                    | 45                     | 90                     | 5 | .300   | .300 TiAlN | .300   |
| 32        | 32       | 133                    | 186                    | 53                     | 106                    | 6 | .320   | .320 TiAlN | .320   |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

|          |              |                |                |                | fz (mm/z) |        |        |       |        |       |
|----------|--------------|----------------|----------------|----------------|-----------|--------|--------|-------|--------|-------|
| Material |              | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | Ø 16      | Ø 18   | Ø 20   | Ø 25  | Ø 32   |       |
| P.1      | ≤ 600 N/mm²  | 1xD            | 0,1xD          | 45             | 0,044     | 0,051  | 0,057  | 0,71  | 0,091  |       |
|          | P.2          | ≤ 850 N/mm²    | 1xD            | 0,1xD          | 39        | 0,044  | 0,051  | 0,057 | 0,71   | 0,091 |
|          | P.3          | ≤ 1100 N/mm²   | 1xD            | 0,1xD          | 24        | 0,044  | 0,051  | 0,057 | 0,71   | 0,091 |
|          | P.4          | ≤ 900 N/mm²    | 1xD            | 0,1xD          | 30        | 0,044  | 0,051  | 0,057 | 0,71   | 0,091 |
|          | P.5          | ≤ 1100 N/mm²   | 1xD            | 0,1xD          | 24        | 0,044  | 0,051  | 0,057 | 0,71   | 0,091 |
| K.1      | < 240 HB     | 1xD            | 0,1xD          | 35             | 0,044     | 0,051  | 0,057  | 0,71  | 0,091  |       |
| S.1      | ≤ 1500 N/mm² | 1xD            | 0,1xD          | 12             | 0,0308    | 0,0357 | 0,0399 | 0,497 | 0,0637 |       |

TiAlN: V<sub>c</sub> + 50 %

EN Mini end mills  
DE Minifräser  
RU Минифрезы



typ N

 $\lambda=30^\circ$   
 $\gamma=12^\circ$ 

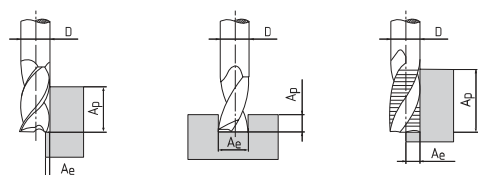
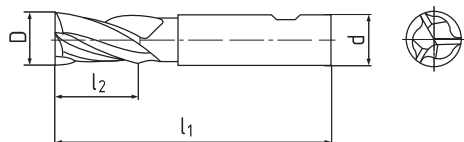
D ≤ 2,5

HSS  
Co8

TiAlN

1604

1614



| D<br>e 8 | d<br>h 6 | l <sub>1</sub><br>1604 | l <sub>1</sub><br>1614 | l <sub>2</sub><br>1604 | l <sub>2</sub><br>1614 | Z |
|----------|----------|------------------------|------------------------|------------------------|------------------------|---|
| 1,5      | 6        | 34                     | 36                     | 3                      | 5                      | 3 |
| 1,8      | 6        | 34                     |                        | 3                      |                        | 3 |
| 2        | 6        | 35                     | 38                     | 4                      | 7                      | 3 |
| 2,3      | 6        | 35                     |                        | 4                      |                        | 3 |
| 2,5      | 6        | 36                     | 39                     | 5                      | 8                      | 3 |
| 2,8      | 6        | 36                     |                        | 5                      |                        | 3 |
| 3        | 6        | 36                     | 39                     | 5                      | 8                      | 3 |
| 3,3      | 6        | 37                     |                        | 6                      |                        | 3 |
| 3,5      | 6        | 37                     | 41                     | 6                      | 10                     | 3 |
| 3,8      | 6        | 38                     |                        | 7                      |                        | 3 |
| 4        | 6        | 38                     | 42                     | 7                      | 11                     | 3 |
| 4,3      | 6        | 38                     |                        | 7                      |                        | 3 |
| 4,5      | 6        | 38                     | 42                     | 7                      | 11                     | 3 |
| 4,8      | 6        | 39                     |                        | 8                      |                        | 3 |
| 5        | 6        | 39                     | 44                     | 8                      | 13                     | 3 |
| 5,3      | 6        | 39                     |                        | 8                      |                        | 3 |
| 5,5      | 6        | 39                     | 44                     | 8                      | 13                     | 3 |
| 5,75     | 6        | 39                     |                        | 8                      |                        | 3 |

160418

160418

161418

.015  
.018  
.020  
.023  
.025  
.028  
.030  
.033  
.035  
.038  
.040  
.043  
.045  
.048  
.050  
.053  
.055  
.0575

.015 TIALN  
.020 TIALN  
.025 TIALN  
.030 TIALN  
.035 TIALN  
.040 TIALN  
.045 TIALN  
.050 TIALN  
.055 TIALN

.015  
.020  
.025  
.030  
.035  
.040  
.045  
.050  
.055

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material |                 | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |        |        |
|----------|-----------------|----------------|----------------|----------------|-----------------------|--------|--------|
|          |                 |                |                |                | Ø 3                   | Ø 5    | Ø 5    |
| P.1      | ≤ 600 N/mm²     | 1xD            | 0,1xD          | 45             | 0,0108                | 0,0144 | 0,018  |
| P.2      | ≤ 850 N/mm²     | 1xD            | 0,1xD          | 39             | 0,0099                | 0,0132 | 0,0165 |
| P.3      | ≤ 1100 N/mm²    | 1xD            | 0,1xD          | 24             | 0,0081                | 0,0108 | 0,0135 |
| P.4      | ≤ 900 N/mm²     | 1xD            | 0,1xD          | 30             | 0,0081                | 0,0108 | 0,0135 |
| P.5      | ≤ 1100 N/mm²    | 1xD            | 0,1xD          | 24             | 0,0081                | 0,0108 | 0,0135 |
| P.6      | > 1100 N/mm²    | 1xD            | 0,1xD          | 20             | 0,0081                | 0,0108 | 0,0135 |
| M.2      | 750 - 850 N/mm² | 1xD            | 0,1xD          | 15             | 0,009                 | 0,012  | 0,015  |
| K.1      | < 240 HB        | 1xD            | 0,1xD          | 35             | 0,0108                | 0,0144 | 0,018  |
| K.2      | > 240 HB        | 1xD            | 0,1xD          | 25             | 0,0099                | 0,0132 | 0,0165 |

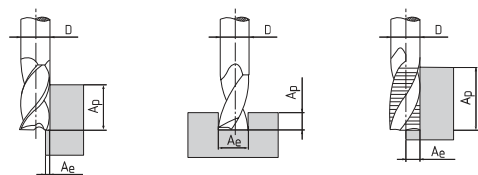
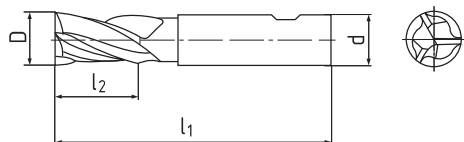
TiAlN: V<sub>c</sub> + 50 %

EN Mini end mills  
DE Minifräser  
RU Минифрезы



1604

1614



| D<br>e 8 | d<br>h 6 | l <sub>1</sub><br>1604 | l <sub>1</sub><br>1614 | l <sub>2</sub><br>1604 | l <sub>2</sub><br>1614 | Z | 160418 | 160418     | 161418 |
|----------|----------|------------------------|------------------------|------------------------|------------------------|---|--------|------------|--------|
| 6        | 6        | 39                     | 44                     | 8                      | 13                     | 3 | .060   | .060 TIALN | .060   |
| 6,5      | 8        | 42                     | 48                     | 10                     | 16                     | 3 | .065   | .065 TIALN | .065   |
| 7        | 8        | 42                     | 48                     | 10                     | 16                     | 3 | .070   | .070 TIALN | .070   |
| 7,5      | 8        | 42                     | 48                     | 10                     | 16                     | 3 | .075   | .075 TIALN | .075   |
| 8        | 8        | 43                     | 51                     | 11                     | 19                     | 3 | .080   | .080 TIALN | .080   |
| 8,5      | 10       | 48                     | 56                     | 11                     | 19                     | 3 | .085   | .085 TIALN | .085   |
| 9        | 10       | 48                     | 56                     | 11                     | 19                     | 3 | .090   | .090 TIALN | .090   |
| 9,5      | 10       | 48                     | 56                     | 11                     | 19                     | 3 | .095   | .095 TIALN | .095   |
| 10       | 10       | 50                     | 59                     | 13                     | 22                     | 3 | .100   | .100 TIALN | .100   |

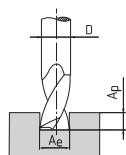
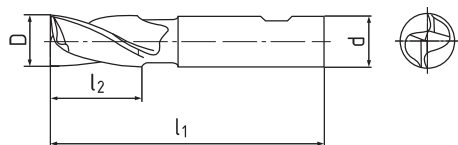
## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                        | Ap  | Ae    | Vc | fz (mm/z) |        |       |
|---------------------------------|-----|-------|----|-----------|--------|-------|
|                                 |     |       |    | Ø 6       | Ø 8    | Ø 10  |
| P.1 ≤ 600 N/mm <sup>2</sup>     | 1xD | 0,1xD | 45 | 0,0216    | 0,0288 | 0,036 |
| P.2 ≤ 850 N/mm <sup>2</sup>     | 1xD | 0,1xD | 39 | 0,0198    | 0,0264 | 0,033 |
| P.3 ≤ 1100 N/mm <sup>2</sup>    | 1xD | 0,1xD | 24 | 0,0162    | 0,0216 | 0,027 |
| P.4 ≤ 900 N/mm <sup>2</sup>     | 1xD | 0,1xD | 30 | 0,0162    | 0,0216 | 0,027 |
| P.5 ≤ 1100 N/mm <sup>2</sup>    | 1xD | 0,1xD | 24 | 0,0162    | 0,0216 | 0,027 |
| P.6 > 1100 N/mm <sup>2</sup>    | 1xD | 0,1xD | 20 | 0,00162   | 0,0216 | 0,027 |
| M.2 750 - 850 N/mm <sup>2</sup> | 1xD | 0,1xD | 15 | 0,018     | 0,024  | 0,03  |
| K.1 < 240 HB                    | 1xD | 0,1xD | 35 | 0,0216    | 0,0288 | 0,036 |
| K.2 > 240 HB                    | 1xD | 0,1xD | 25 | 0,0198    | 0,0264 | 0,033 |

TiAlN: Vc + 50 %



- EN Slot drills | short, centre cutting, 2 – fluted  
 DE Langlochfräser | Kurz, mit Zentrumschnitt, zweischneider  
 RU Фрезы шпоночные | короткие, несимметричные, двузубые

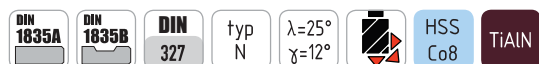
**2204**

| D<br>e 8 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z | 220417 |
|----------|----------|----------------|----------------|---|--------|
| 2        | 6        | 48             | 4              | 2 | .020   |
| 3        | 6        | 49             | 5              | 2 | .030   |
| 4        | 6        | 51             | 7              | 2 | .040   |
| 5        | 6        | 52             | 8              | 2 | .050   |
| 6        | 6        | 52             | 8              | 2 | .060   |
| 7        | 10       | 60             | 10             | 2 | .070   |
| 8        | 10       | 61             | 11             | 2 | .080   |
| 9        | 10       | 61             | 11             | 2 | .090   |
| 10       | 10       | 63             | 13             | 2 | .100   |
| 12       | 12       | 73             | 16             | 2 | .120   |
| 14       | 12       | 73             | 16             | 2 | .140   |
| 16       | 16       | 79             | 19             | 2 | .160   |
| 18       | 16       | 79             | 19             | 2 | .180   |
| 20       | 20       | 88             | 22             | 2 | .200   |
| 22       | 20       | 88             | 22             | 2 | .220   |
| 25       | 25       | 102            | 26             | 2 | .250   |
| 28       | 25       | 102            | 26             | 2 | .280   |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

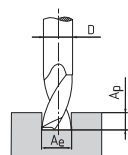
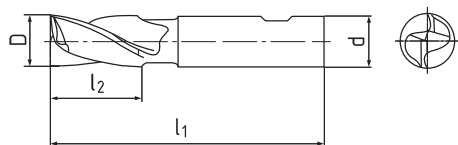
| Material |                 | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |        |       |        |        |        |       |
|----------|-----------------|----------------|----------------|----------------|-----------------------|--------|-------|--------|--------|--------|-------|
|          |                 |                |                |                | Ø 6                   | Ø 8    | Ø 10  | Ø 12   | Ø 16   | Ø 18   | Ø 20  |
| P.1      | ≤ 600 N/mm²     | 0,5xD          | 1xD            | 114            | 0,024                 | 0,032  | 0,04  | 0,048  | 0,064  | 0,072  | 0,08  |
| P.2      | ≤ 850 N/mm²     | 0,5xD          | 1xD            | 99             | 0,024                 | 0,032  | 0,04  | 0,048  | 0,064  | 0,072  | 0,08  |
| P.3      | ≤ 1100 N/mm²    | 0,5xD          | 1xD            | 62             | 0,024                 | 0,032  | 0,04  | 0,048  | 0,064  | 0,072  | 0,08  |
| P.4      | ≤ 900 N/mm²     | 0,5xD          | 1xD            | 77             | 0,024                 | 0,032  | 0,04  | 0,048  | 0,064  | 0,072  | 0,08  |
| P.5      | ≤ 1100 N/mm²    | 0,5xD          | 1xD            | 62             | 0,024                 | 0,032  | 0,04  | 0,048  | 0,064  | 0,072  | 0,08  |
| P.6      | > 1100 N/mm²    | 0,5xD          | 1xD            | 51             | 0,0168                | 0,0224 | 0,028 | 0,0336 | 0,0448 | 0,0504 | 0,056 |
| M.2      | 750 - 850 N/mm² | 0,5xD          | 1xD            | 38             | 0,024                 | 0,032  | 0,04  | 0,048  | 0,064  | 0,072  | 0,08  |
| K.1      | < 240 HB        | 0,5xD          | 1xD            | 89             | 0,024                 | 0,032  | 0,04  | 0,048  | 0,064  | 0,072  | 0,08  |
| K.2      | > 240 HB        | 0,5xD          | 1xD            | 66             | 0,024                 | 0,032  | 0,04  | 0,048  | 0,064  | 0,072  | 0,08  |

EN Slot drills | short, centre cutting, 2-fluted  
 DE Langlochfräser | Kurz, mit Zentrumschnitt, zweischneider  
 RU Фрезы шпоночные | короткие, несимметричные, двузубые



2204

2204



| D<br>e 8 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z | 220408 | 220408      | 220418 | 220418      |
|----------|----------|----------------|----------------|---|--------|-------------|--------|-------------|
| 1        | 6        | 47             | 2,5            | 2 | .010   | .010 TIALN  | .010   | .010 TIALN  |
| 1,5      | 6        | 47             | 3              | 2 | .015   | .015 TIALN  | .015   | .015 TIALN  |
| 2        | 6        | 48             | 4              | 2 | .020   | .020 TIALN  | .020   | .020 TIALN  |
| 2,5      | 6        | 49             | 5              | 2 | .025   | .025 TIALN  | .025   | .025 TIALN  |
| 2,8      | 6        | 49             | 5              | 2 | .028   | .028 TIALN  | .028   | .028 TIALN  |
| 3        | 6        | 49             | 5              | 2 | .030   | .030 TIALN  | .030   | .030 TIALN  |
| 3,5      | 6        | 50             | 6              | 2 | .035   | .035 TIALN  | .035   | .035 TIALN  |
| 3,8      | 6        | 51             | 7              | 2 | .038   | .038 TIALN  | .038   | .038 TIALN  |
| 4        | 6        | 51             | 7              | 2 | .040   | .040 TIALN  | .040   | .040 TIALN  |
| 4,5      | 6        | 51             | 7              | 2 | .045   | .045 TIALN  | .045   | .045 TIALN  |
| 4,8      | 6        | 52             | 8              | 2 | .048   | .048 TIALN  | .048   | .048 TIALN  |
| 5        | 6        | 52             | 8              | 2 | .050   | .050 TIALN  | .050   | .050 TIALN  |
| 5,5      | 6        | 52             | 8              | 2 | .055   | .055 TIALN  | .055   | .055 TIALN  |
| 5,75     | 6        | 52             | 8              | 2 | .0575  | .0575 TIALN | .0575  | .0575 TIALN |
| 6        | 6        | 52             | 8              | 2 | .060   | .060 TIALN  | .060   | .060 TIALN  |
| 6,5      | 10       | 60             | 10             | 2 | .065   | .065 TIALN  | .065   | .065 TIALN  |
| 7        | 10       | 60             | 10             | 2 | .070   | .070 TIALN  | .070   | .070 TIALN  |
| 7,5      | 10       | 60             | 10             | 2 | .075   | .075 TIALN  | .075   | .075 TIALN  |
| 7,75     | 10       | 61             | 11             | 2 | .0775  | .0775 TIALN | .0775  | .0775 TIALN |
| 8        | 10       | 61             | 11             | 2 | .080   | .080 TIALN  | .080   | .080 TIALN  |
| 8,5      | 10       | 61             | 11             | 2 | .085   | .085 TIALN  | .085   | .085 TIALN  |
| 9        | 10       | 61             | 11             | 2 | .090   | .090 TIALN  | .090   | .090 TIALN  |
| 9,5      | 10       | 61             | 11             | 2 | .095   | .095 TIALN  | .095   | .095 TIALN  |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

|          |                 |       |     |    | fz (mm/z) |       |       |       |       |       |       |       |
|----------|-----------------|-------|-----|----|-----------|-------|-------|-------|-------|-------|-------|-------|
| Material |                 | Ap    | Ae  | Vc | Ø 3       | Ø 6   | Ø 8   | Ø 10  | Ø 12  | Ø 16  | Ø 18  | Ø 20  |
| P.1      | ≤ 600 N/mm²     | 0,5xD | 1xD | 45 | 0,009     | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| P.2      | ≤ 850 N/mm²     | 0,5xD | 1xD | 39 | 0,009     | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| P.3      | ≤ 1100 N/mm²    | 0,5xD | 1xD | 24 | 0,009     | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| P.4      | ≤ 900 N/mm²     | 0,5xD | 1xD | 30 | 0,009     | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| P.5      | ≤ 1100 N/mm²    | 0,5xD | 1xD | 24 | 0,009     | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| M.2      | 750 - 850 N/mm² | 0,5xD | 1xD | 15 | 0,009     | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| K.1      | < 240 HB        | 0,5xD | 1xD | 35 | 0,009     | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| K.2      | > 240 HB        | 0,5xD | 1xD | 25 | 0,009     | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |

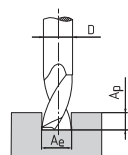
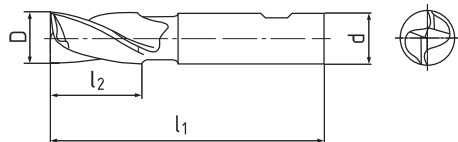
TiAlN:  $V_c + 50\%$

- EN Slot drills | short, centre cutting, 2 – fluted  
 DE Langlochfräser | Kurz, mit Zentrumschnitt, zweischneider  
 RU Фрезы шпоночные | короткие, несимметричные, двузубые



2204

2204



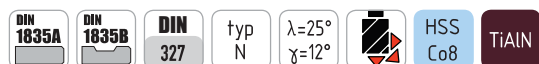
| D<br>e 8 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z | 220408 | 220408       | 220418 | 220418       |
|----------|----------|----------------|----------------|---|--------|--------------|--------|--------------|
| 9,7      | 10       | 63             | 13             | 2 | .097   | .097 TIALN   | .097   | .097 TIALN   |
| 10       | 10       | 63             | 13             | 2 | .100   | .100 TIALN   | .100   | .100 TIALN   |
| 10,5     | 12       | 70             | 13             | 2 | .105   | .105 TIALN   | .105   | .105 TIALN   |
| 11       | 12       | 70             | 13             | 2 | .110   | .110 TIALN   | .110   | .110 TIALN   |
| 11,5     | 12       | 70             | 13             | 2 | .115   | .115 TIALN   | .115   | .115 TIALN   |
| 11,7     | 12       | 70             | 13             | 2 | .117   | .117 TIALN   | .117   | .117 TIALN   |
| 12       | 12       | 73             | 16             | 2 | .120   | .120 TIALN   | .120   | .120 TIALN   |
| 12,5     | 12       | 73             | 16             | 2 | .125   | .125 TIALN   | .125   | .125 TIALN   |
| 13       | 12       | 73             | 16             | 2 | .130   | .130 TIALN   | .130   | .130 TIALN   |
| 13,5     | 12       | 73             | 16             | 2 | .135   | .135 TIALN   | .135   | .135 TIALN   |
| 13,7     | 12       | 73             | 16             | 2 | .137   | .137 TIALN   | .137   | .137 TIALN   |
| 14       | 12       | 73             | 16             | 2 | .140   | .140 TIALN   | .140   | .140 TIALN   |
| 15       | 12       | 73             | 16             | 2 | .150   | .150 TIALN   | .150   | .150 TIALN   |
| 16       | 16       | 79             | 19             | 2 | .160   | .160 TIALN   | .160   | .160 TIALN   |
| 17       | 16       | 79             | 19             | 2 | .170   | .170 TIALN   | .170   | .170 TIALN   |
| 17,7     | 16       | 79             | 19             | 2 | .177   | .177 TIALN   | .177   | .177 TIALN   |
| 18       | 16       | 79             | 19             | 2 | .180   | .180 TIALN   | .180   | .180 TIALN   |
| 19       | 16       | 79             | 19             | 2 | .190   | .190 TIALN   | .190   | .190 TIALN   |
| 20       | 20       | 88             | 22             | 2 | .200   | .200 TIALN   | .200   | .200 TIALN   |
| 21       | 20       | 88             | 22             | 2 | .210   | .210 TIALN   | .210   | .210 TIALN   |
| 22       | 20       | 88             | 22             | 2 | .220   | .220 TIALN   | .220   | .220 TIALN   |
| 24       | 25       | 102            | 26             | 2 | .240   | .240 TIALN   | .240   | .240 TIALN   |
| 24,7*    | 20       | 96             | 26             | 2 | .24720 | .24720 TIALN | .24720 | .24720 TIALN |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material |                 | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |       |       |       |       |
|----------|-----------------|----------------|----------------|----------------|-----------------------|-------|-------|-------|-------|-------|-------|-------|
|          |                 |                |                |                | Ø 3                   | Ø 6   | Ø 8   | Ø 10  | Ø 12  | Ø 16  | Ø 18  | Ø 20  |
| P.1      | ≤ 600 N/mm²     | 0,5xD          | 1xD            | 45             | 0,009                 | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| P.2      | ≤ 850 N/mm²     | 0,5xD          | 1xD            | 39             | 0,009                 | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| P.3      | ≤ 1100 N/mm²    | 0,5xD          | 1xD            | 24             | 0,009                 | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| P.4      | ≤ 900 N/mm²     | 0,5xD          | 1xD            | 30             | 0,009                 | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| P.5      | ≤ 1100 N/mm²    | 0,5xD          | 1xD            | 24             | 0,009                 | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| M.2      | 750 - 850 N/mm² | 0,5xD          | 1xD            | 15             | 0,009                 | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| K.1      | < 240 HB        | 0,5xD          | 1xD            | 35             | 0,009                 | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| K.2      | > 240 HB        | 0,5xD          | 1xD            | 25             | 0,009                 | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |

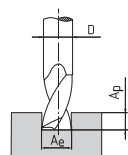
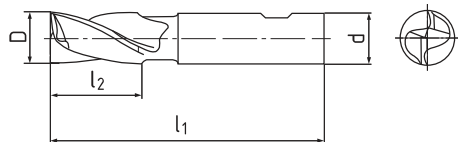
TiAlN: V<sub>c</sub> + 50 %

- EN Slot drills | short, centre cutting, 2-fluted  
 DE Langlochfräser | Kurz, mit Zentrumschnitt, zweischneider  
 RU Фрезы шпоночные | короткие, несимметричные, двузубые



2204

2204



| D<br>e 8 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z | 220408 | 220408       | 220418 | 220418       |
|----------|----------|----------------|----------------|---|--------|--------------|--------|--------------|
| 25       | 25       | 102            | 26             | 2 | .250   | .250 TIALN   | .250   | .250 TIALN   |
| 25*      | 20       | 96             | 26             | 2 | .25020 | .25020 TIALN | .25020 | .25020 TIALN |
| 26       | 25       | 102            | 26             | 2 | .260   | .260 TIALN   | .260   | .260 TIALN   |
| 28       | 25       | 102            | 26             | 2 | .280   | .280 TIALN   | .280   | .280 TIALN   |
| 28*      | 20       | 96             | 26             | 2 | .28020 | .28020 TIALN | .28020 | .28020 TIALN |
| 30       | 25       | 102            | 26             | 2 | .300   | .300 TIALN   | .300   | .300 TIALN   |
| 32       | 32       | 112            | 32             | 2 | .320   | .320 TIALN   | .320   | .320 TIALN   |
| 36       | 32       | 112            | 32             | 2 | .360   | .360 TIALN   | .360   | .360 TIALN   |
| 40       | 40       | 130            | 38             | 2 | .400   | .400 TIALN   | .400   | .400 TIALN   |
| 40*      | 32       | 118            | 38             | 2 | .40032 | .40032 TIALN | .40032 | .40032 TIALN |

\*) ≠ DIN 327

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

|          |                 |                |                |                | fz (mm/z) |       |       |       |       |       |       |       |
|----------|-----------------|----------------|----------------|----------------|-----------|-------|-------|-------|-------|-------|-------|-------|
| Material |                 | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | Ø 3       | Ø 6   | Ø 8   | Ø 10  | Ø 12  | Ø 16  | Ø 18  | Ø 20  |
| P.1      | ≤ 600 N/mm²     | 0,5xD          | 1xD            | 45             | 0,009     | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| P.2      | ≤ 850 N/mm²     | 0,5xD          | 1xD            | 39             | 0,009     | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| P.3      | ≤ 1100 N/mm²    | 0,5xD          | 1xD            | 24             | 0,009     | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| P.4      | ≤ 900 N/mm²     | 0,5xD          | 1xD            | 30             | 0,009     | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| P.5      | ≤ 1100 N/mm²    | 0,5xD          | 1xD            | 24             | 0,009     | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| M.2      | 750 - 850 N/mm² | 0,5xD          | 1xD            | 15             | 0,009     | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| K.1      | < 240 HB        | 0,5xD          | 1xD            | 35             | 0,009     | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| K.2      | > 240 HB        | 0,5xD          | 1xD            | 25             | 0,009     | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |

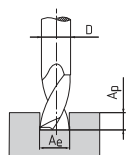
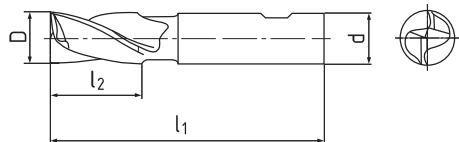
TiAlN: V<sub>c</sub> + 50 %

- EN Slot drills | long, centre cutting, 2 - fluted  
 DE Langlochfräser | Lang, mit Zentrumschnitt, zweischneider  
 RU Фрезы шпоночные | длинные, несимметричные, двузубые



2214

2214



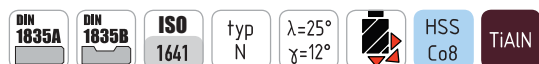
| D<br>e 8 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z | 221408 | 221418 | 221418     |
|----------|----------|----------------|----------------|---|--------|--------|------------|
| 2        | 6        | 54             | 7              | 2 | .020   | .020   | .020 TIALN |
| 3        | 6        | 56             | 8              | 2 | .030   | .030   | .030 TIALN |
| 3,5      | 6        | 59             | 10             | 2 | .035   | .035   | .035 TIALN |
| 4        | 6        | 63             | 11             | 2 | .040   | .040   | .040 TIALN |
| 4,5      | 6        | 63             | 11             | 2 | .045   | .045   | .045 TIALN |
| 5        | 6        | 68             | 13             | 2 | .050   | .050   | .050 TIALN |
| 5,5      | 6        | 68             | 13             | 2 | .055   | .055   | .055 TIALN |
| 6        | 6        | 68             | 13             | 2 | .060   | .060   | .060 TIALN |
| 6,5      | 10       | 80             | 16             | 2 | .065   | .065   | .065 TIALN |
| 7        | 10       | 80             | 16             | 2 | .070   | .070   | .070 TIALN |
| 8        | 10       | 88             | 19             | 2 | .080   | .080   | .080 TIALN |
| 8,5      | 10       | 88             | 19             | 2 | .085   | .085   | .085 TIALN |
| 9        | 10       | 88             | 19             | 2 | .090   | .090   | .090 TIALN |
| 10       | 10       | 95             | 22             | 2 | .100   | .100   | .100 TIALN |
| 11       | 12       | 102            | 22             | 2 | .110   | .110   | .110 TIALN |
| 12       | 12       | 110            | 26             | 2 | .120   | .120   | .120 TIALN |
| 13       | 12       | 110            | 26             | 2 | .130   | .130   | .130 TIALN |
| 14       | 12       | 110            | 26             | 2 | .140   | .140   | .140 TIALN |
| 15       | 12       | 110            | 26             | 2 | .150   | .150   | .150 TIALN |
| 16       | 16       | 123            | 32             | 2 | .160   | .160   | .160 TIALN |
| 18       | 16       | 123            | 32             | 2 | .180   | .180   | .180 TIALN |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material | A <sub>p</sub>              | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |       |       |       |       |
|----------|-----------------------------|----------------|----------------|-----------------------|-------|-------|-------|-------|-------|-------|-------|
|          |                             |                |                | Ø 3                   | Ø 6   | Ø 8   | Ø 10  | Ø 12  | Ø 16  | Ø 18  | Ø 20  |
| P.1      | ≤ 600 N/mm <sup>2</sup>     | 0,5xD          | 1xD            | 45                    | 0,009 | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,073 |
| P.2      | ≤ 850 N/mm <sup>2</sup>     | 0,5xD          | 1xD            | 39                    | 0,009 | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,073 |
| P.3      | ≤ 1100 N/mm <sup>2</sup>    | 0,5xD          | 1xD            | 24                    | 0,009 | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,073 |
| P.4      | ≤ 900 N/mm <sup>2</sup>     | 0,5xD          | 1xD            | 30                    | 0,009 | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,073 |
| P.5      | ≤ 1100 N/mm <sup>2</sup>    | 0,5xD          | 1xD            | 24                    | 0,009 | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,073 |
| M.2      | 750 - 850 N/mm <sup>2</sup> | 0,5xD          | 1xD            | 15                    | 0,009 | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,073 |
| K.1      | < 240 HB                    | 0,5xD          | 1xD            | 35                    | 0,009 | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,073 |
| K.2      | > 240 HB                    | 0,5xD          | 1xD            | 25                    | 0,009 | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,073 |

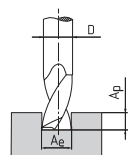
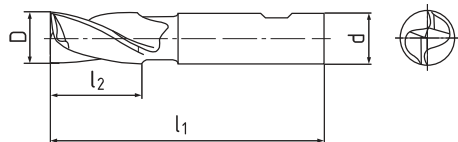
TiAlN: V<sub>c</sub> + 50 %

- EN Slot drills | long, centre cutting, 2 - fluted  
 DE Langlochfräser | Lang, mit Zentrumschnitt, zweischneider  
 RU Фрезы шпоночные | длинные, несимметричные, двузубые



2214

2214



| D<br>e 8 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z | 221408 | 221418 | 221418       |
|----------|----------|----------------|----------------|---|--------|--------|--------------|
| 19       | 16       | 123            | 32             | 2 | .190   |        |              |
| 20       | 20       | 141            | 38             | 2 | .200   | .200   | .200 TIALN   |
| 22       | 20       | 141            | 38             | 2 | .220   | .220   | .220 TIALN   |
| 24       | 25       | 166            | 45             | 2 | .240   | .240   | .240 TIALN   |
| 25       | 25       | 166            | 45             | 2 | .250   | .250   | .250 TIALN   |
| 26       | 25       | 166            | 45             | 2 | .260   | .260   | .260 TIALN   |
| 28       | 25       | 166            | 45             | 2 | .280   | .280   | .280 TIALN   |
| 30       | 25       | 166            | 45             | 2 | .300   | .300   | .300 TIALN   |
| 32       | 32       | 186            | 53             | 2 | .320   | .320   | .320 TIALN   |
| 35       | 32       | 186            | 53             | 2 | .350   |        |              |
| 36       | 32       | 186            | 53             | 2 | .360   | .360   | .360 TIALN   |
| 40*      | 32       | 196            | 63             | 2 | .40032 | .40032 | .40032 TIALN |

\*) ≠ ISO 1641

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                        | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | fz (mm/z) |       |       |       |       |       |       |       |
|---------------------------------|----------------|----------------|----------------|-----------|-------|-------|-------|-------|-------|-------|-------|
|                                 |                |                |                | Ø 3       | Ø 6   | Ø 8   | Ø 10  | Ø 12  | Ø 16  | Ø 18  | Ø 20  |
| P.1 ≤ 600 N/mm <sup>2</sup>     | 0,5xD          | 1xD            | 45             | 0,009     | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| P.2 ≤ 850 N/mm <sup>2</sup>     | 0,5xD          | 1xD            | 39             | 0,009     | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| P.3 ≤ 1100 N/mm <sup>2</sup>    | 0,5xD          | 1xD            | 24             | 0,009     | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| P.4 ≤ 900 N/mm <sup>2</sup>     | 0,5xD          | 1xD            | 30             | 0,009     | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| P.5 ≤ 1100 N/mm <sup>2</sup>    | 0,5xD          | 1xD            | 24             | 0,009     | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| M.2 750 - 850 N/mm <sup>2</sup> | 0,5xD          | 1xD            | 15             | 0,009     | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| K.1 < 240 HB                    | 0,5xD          | 1xD            | 35             | 0,009     | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| K.2 > 240 HB                    | 0,5xD          | 1xD            | 25             | 0,009     | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |

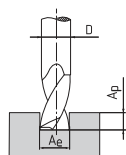
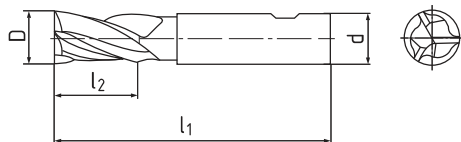
TiAlN: V<sub>c</sub> + 50 %

- EN Slot drills | short, 3 - fluted centre cutting  
 DE Langlochfräser | Kurz, dreischneider mit Zentrumschnitt  
 RU Фрезы шпоночные | короткие, трехзубые, несимметричные



2304

2304



| D<br>e 8 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z | 230417 | 230418 | 230418     |
|----------|----------|----------------|----------------|---|--------|--------|------------|
| 2        | 6        | 48             | 4              | 3 |        | .020   | .020 TIALN |
| 3        | 6        | 49             | 5              | 3 |        | .030   | .030 TIALN |
| 3,5      | 6        | 50             | 6              | 3 |        | .035   | .035 TIALN |
| 4        | 6        | 51             | 7              | 3 |        | .040   | .040 TIALN |
| 4,5      | 6        | 51             | 7              | 3 |        | .045   | .045 TIALN |
| 5        | 6        | 52             | 8              | 3 |        | .050   | .050 TIALN |
| 5,5      | 6        | 52             | 8              | 3 |        | .055   | .055 TIALN |
| 6        | 6        | 52             | 8              | 3 | .060   | .060   | .060 TIALN |
| 6,5      | 10       | 60             | 10             | 3 |        | .065   | .065 TIALN |
| 7        | 10       | 60             | 10             | 3 |        | .070   | .070 TIALN |
| 7,5      | 10       | 60             | 10             | 3 |        | .075   | .075 TIALN |
| 8        | 10       | 61             | 11             | 3 | .080   | .080   | .080 TIALN |
| 9        | 10       | 61             | 11             | 3 |        | .090   | .090 TIALN |
| 9,5      | 10       | 61             | 11             | 3 |        | .095   | .095 TIALN |
| 10       | 10       | 63             | 13             | 3 | .100   | .100   | .100 TIALN |
| 11       | 12       | 70             | 13             | 3 |        | .110   | .110 TIALN |
| 12       | 12       | 73             | 16             | 3 | .120   | .120   | .120 TIALN |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                        | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | fz (mm/z) |        |        |        |        |        |        |        |
|---------------------------------|----------------|----------------|----------------|-----------|--------|--------|--------|--------|--------|--------|--------|
|                                 |                |                |                | Ø 3       | Ø 6    | Ø 8    | Ø 10   | Ø 12   | Ø 16   | Ø 18   | Ø 20   |
| P.1 ≤ 600 N/mm <sup>2</sup>     | 0,5xD          | 1xD            | 45             | 0,009     | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
| P.2 ≤ 850 N/mm <sup>2</sup>     | 0,5xD          | 1xD            | 39             | 0,009     | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
| P.3 ≤ 1100 N/mm <sup>2</sup>    | 0,5xD          | 1xD            | 24             | 0,009     | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
| P.4 ≤ 900 N/mm <sup>2</sup>     | 0,5xD          | 1xD            | 30             | 0,009     | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
| M.2 750 - 850 N/mm <sup>2</sup> | 0,5xD          | 1xD            | 15             | 0,009     | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
| K.1 < 240 HB                    | 0,5xD          | 1xD            | 35             | 0,009     | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
| K.2 > 240 HB                    | 0,5xD          | 1xD            | 25             | 0,009     | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
| S.2 ≤ 1250 N/mm <sup>2</sup>    | 0,5xD          | 1xD            | 12             | 0,0063    | 0,0154 | 0,0203 | 0,0252 | 0,0308 | 0,0406 | 0,0455 | 0,0511 |

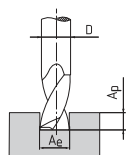
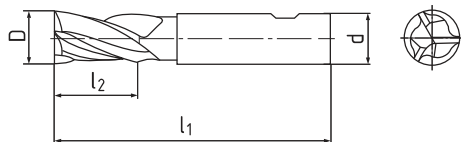
TiAlN: V<sub>c</sub> + 50 %

- EN Slot drills | short, 3 - fluted centre cutting  
 DE Langlochfräser | Kurz, dreischneider mit Zentrumschnitt  
 RU Фрезы шпоночные | короткие, трехзубые, несимметричные



2304

2304



| D<br>e 8 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z | 230417 | 230418 | 230418     |
|----------|----------|----------------|----------------|---|--------|--------|------------|
| 13       | 12       | 73             | 16             | 3 |        | .130   | .130 TIALN |
| 14       | 12       | 73             | 16             | 3 | .140   | .140   | .140 TIALN |
| 15       | 12       | 73             | 16             | 3 |        | .150   | .150 TIALN |
| 16       | 16       | 79             | 19             | 3 | .160   | .160   | .160 TIALN |
| 18       | 16       | 79             | 19             | 3 | .180   | .180   | .180 TIALN |
| 19,7     | 20       | 88             | 22             | 3 |        | .197   | .197 TIALN |
| 20       | 20       | 88             | 22             | 3 | .200   | .200   | .200 TIALN |
| 21,7     | 20       | 88             | 22             | 3 |        | .217   | .217 TIALN |
| 22       | 20       | 88             | 22             | 3 |        | .220   | .220 TIALN |
| 24,7     | 25       | 102            | 26             | 3 |        | .247   | .247 TIALN |
| 25       | 25       | 102            | 26             | 3 |        | .250   | .250 TIALN |
| 28       | 25       | 102            | 26             | 3 |        | .280   | .280 TIALN |
| 30       | 25       | 102            | 26             | 3 |        | .300   | .300 TIALN |
| 32       | 32       | 112            | 32             | 3 |        | .320   | .320 TIALN |

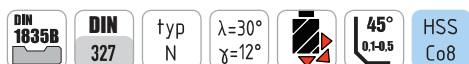
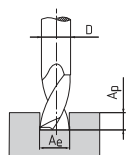
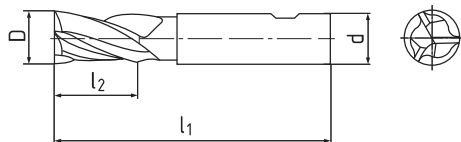
## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                        | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |        |        |        |        |        |        |        |
|---------------------------------|----------------|----------------|----------------|-----------------------|--------|--------|--------|--------|--------|--------|--------|
|                                 |                |                |                | Ø 3                   | Ø 6    | Ø 8    | Ø 10   | Ø 12   | Ø 16   | Ø 18   | Ø 20   |
| P.1 ≤ 600 N/mm <sup>2</sup>     | 0,5xD          | 1xD            | 45             | 0,009                 | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
| P.2 ≤ 850 N/mm <sup>2</sup>     | 0,5xD          | 1xD            | 39             | 0,009                 | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
| P.3 ≤ 1100 N/mm <sup>2</sup>    | 0,5xD          | 1xD            | 24             | 0,009                 | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
| P.4 ≤ 900 N/mm <sup>2</sup>     | 0,5xD          | 1xD            | 30             | 0,009                 | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
| M.2 750 - 850 N/mm <sup>2</sup> | 0,5xD          | 1xD            | 15             | 0,009                 | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
| K.1 < 240 HB                    | 0,5xD          | 1xD            | 35             | 0,009                 | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
| K.2 > 240 HB                    | 0,5xD          | 1xD            | 25             | 0,009                 | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
| S.2 ≤ 1250 N/mm <sup>2</sup>    | 0,5xD          | 1xD            | 12             | 0,0063                | 0,0154 | 0,0203 | 0,0252 | 0,0308 | 0,0406 | 0,0455 | 0,0511 |

TiAlN: V<sub>c</sub> + 50 %



- EN Slot drills | short, 3 - fluted centre cutting  
 DE Langlochfräser | Kurz, dreischneider mit Zentrumschnitt  
 RU Фрезы шпоночные | короткие, трехзубые, несимметричные

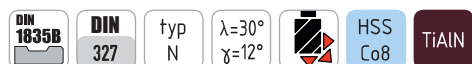
**2304H**

| D<br>e 8 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z | 230418H |
|----------|----------|----------------|----------------|---|---------|
| 11,7     | 12       | 70             | 13             | 3 | .117    |
| 13,7     | 12       | 73             | 16             | 3 | .137    |
| 15,7     | 16       | 79             | 19             | 3 | .157    |
| 17,7     | 16       | 79             | 19             | 3 | .177    |
| 19,7     | 20       | 88             | 22             | 3 | .197    |
| 21,7     | 20       | 88             | 22             | 3 | .217    |
| 24,7     | 25       | 102            | 26             | 3 | .247    |

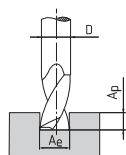
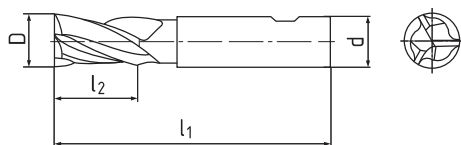
## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                               | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |        |        |        |
|----------------------------------------|----------------|----------------|----------------|-----------------------|--------|--------|--------|
|                                        |                |                |                | Ø 12                  | Ø 16   | Ø 18   | Ø 20   |
| <b>P.1</b> ≤ 600 N/mm <sup>2</sup>     | 0,5xD          | 1xD            | 45             | 0,044                 | 0,058  | 0,065  | 0,073  |
| <b>P.2</b> ≤ 850 N/mm <sup>2</sup>     | 0,5xD          | 1xD            | 39             | 0,044                 | 0,058  | 0,065  | 0,073  |
| <b>P.3</b> ≤ 1100 N/mm <sup>2</sup>    | 0,5xD          | 1xD            | 24             | 0,044                 | 0,058  | 0,065  | 0,073  |
| <b>P.4</b> ≤ 900 N/mm <sup>2</sup>     | 0,5xD          | 1xD            | 30             | 0,044                 | 0,058  | 0,065  | 0,073  |
| <b>M.2</b> 750 - 850 N/mm <sup>2</sup> | 0,5xD          | 1xD            | 15             | 0,044                 | 0,058  | 0,065  | 0,073  |
| <b>K.1</b> < 240 HB                    | 0,5xD          | 1xD            | 35             | 0,044                 | 0,058  | 0,065  | 0,073  |
| <b>K.2</b> > 240 HB                    | 0,5xD          | 1xD            | 25             | 0,044                 | 0,058  | 0,065  | 0,073  |
| <b>S.2</b> ≤ 1250 N/mm <sup>2</sup>    | 0,5xD          | 1xD            | 12             | 0,0308                | 0,0406 | 0,0455 | 0,0511 |

- EN Slot drills | long, 3 - fluted centre cutting  
 DE Langlochfräser | Lang, dreischneider mit Zentrumschnitt  
 RU Фрезы шпоночные | длинные, трехзубые, несимметричные



2314



| D<br>e 8 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z | 231418 | 231418     |
|----------|----------|----------------|----------------|---|--------|------------|
| 2,8      | 6        | 52             | 8              | 3 | .028   | .028 TIALN |
| 3        | 6        | 52             | 8              | 3 | .030   | .030 TIALN |
| 3,8      | 6        | 55             | 11             | 3 | .038   | .038 TIALN |
| 4        | 6        | 55             | 11             | 3 | .040   | .040 TIALN |
| 5        | 6        | 57             | 13             | 3 | .050   | .050 TIALN |
| 6        | 6        | 57             | 13             | 3 | .060   | .060 TIALN |
| 7        | 10       | 66             | 16             | 3 | .070   | .070 TIALN |
| 8        | 10       | 69             | 19             | 3 | .080   | .080 TIALN |
| 9        | 10       | 69             | 19             | 3 | .090   | .090 TIALN |
| 10       | 10       | 72             | 22             | 3 | .100   | .100 TIALN |
| 11       | 12       | 79             | 22             | 3 | .110   | .110 TIALN |
| 12       | 12       | 83             | 26             | 3 | .120   | .120 TIALN |
| 13       | 12       | 83             | 26             | 3 | .130   | .130 TIALN |
| 14       | 12       | 83             | 26             | 3 | .140   | .140 TIALN |
| 15       | 12       | 83             | 26             | 3 | .150   | .150 TIALN |
| 16       | 16       | 92             | 32             | 3 | .160   | .160 TIALN |
| 18       | 16       | 92             | 32             | 3 | .180   | .180 TIALN |
| 20       | 20       | 104            | 38             | 3 | .200   | .200 TIALN |
| 22       | 20       | 104            | 38             | 3 | .220   | .220 TIALN |
| 24       | 25       | 121            | 45             | 3 | .240   | .240 TIALN |
| 25       | 25       | 121            | 45             | 3 | .250   | .250 TIALN |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

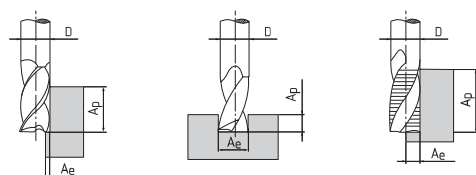
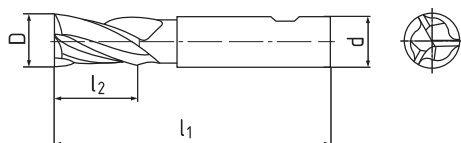
|          |     |                 |       |     | fz (mm/z) |        |        |        |        |        |        |        |        |
|----------|-----|-----------------|-------|-----|-----------|--------|--------|--------|--------|--------|--------|--------|--------|
| Material |     |                 | Ap    | Ae  | Vc        | Ø 3    | Ø 6    | Ø 8    | Ø 10   | Ø 12   | Ø 16   | Ø 18   | Ø 20   |
|          | P.1 | ≤ 600 N/mm²     | 0,5xD | 1xD | 45        | 0,009  | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
|          | P.2 | ≤ 850 N/mm²     | 0,5xD | 1xD | 39        | 0,009  | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
|          | P.3 | ≤ 1100 N/mm²    | 0,5xD | 1xD | 24        | 0,009  | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
|          | P.4 | ≤ 900 N/mm²     | 0,5xD | 1xD | 30        | 0,009  | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
|          | M.2 | 750 - 850 N/mm² | 0,5xD | 1xD | 15        | 0,009  | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
|          | K.1 | < 240 HB        | 0,5xD | 1xD | 35        | 0,009  | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
|          | K.2 | > 240 HB        | 0,5xD | 1xD | 25        | 0,009  | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
|          | S.2 | ≤ 1250 N/mm²    | 0,5xD | 1xD | 12        | 0,0063 | 0,0154 | 0,0203 | 0,0252 | 0,0308 | 0,0406 | 0,0455 | 0,0511 |

TiAlN: V<sub>c</sub> + 50 %

- EN Slot drills | extra long, 3 - fluted centre cutting  
 DE Langlochfräser | extra lang, dreischneider mit Zentrumschnitt  
 RU Фрезы шпоночные | экстремально длинные, трехзубые, несимметричные



2334

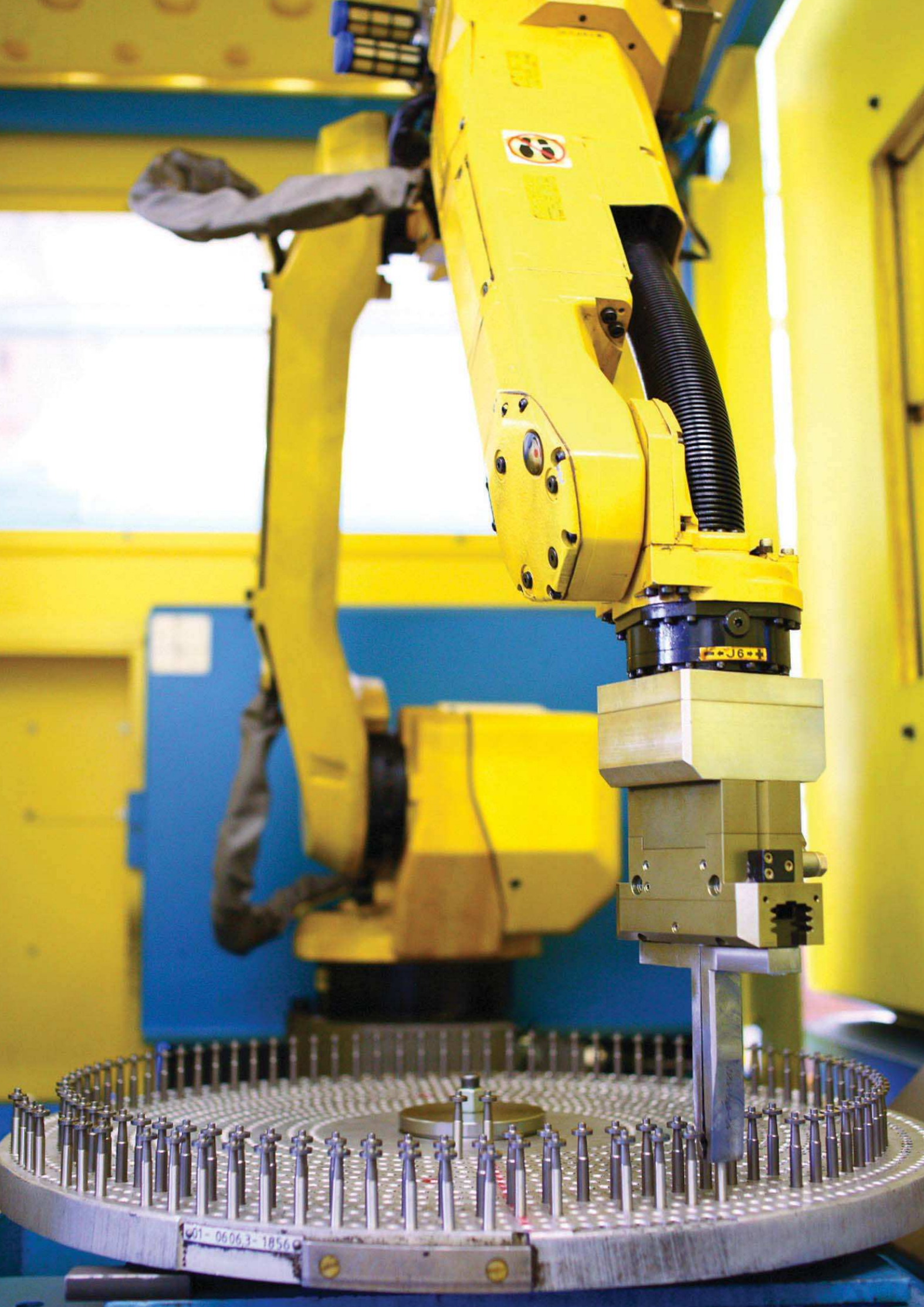


| D<br>e 8 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z | 233418 | 233418     |
|----------|----------|----------------|----------------|---|--------|------------|
| 2        | 6        | 54             | 10             | 3 | .020   | .020 TIALN |
| 3        | 6        | 56             | 12             | 3 | .030   | .030 TIALN |
| 4        | 6        | 63             | 19             | 3 | .040   | .040 TIALN |
| 5        | 6        | 68             | 24             | 3 | .050   | .050 TIALN |
| 6        | 6        | 68             | 24             | 3 | .060   | .060 TIALN |
| 8        | 10       | 88             | 38             | 3 | .080   | .080 TIALN |
| 9        | 10       | 88             | 38             | 3 | .090   | .090 TIALN |
| 10       | 10       | 95             | 45             | 3 | .100   | .100 TIALN |
| 12       | 12       | 110            | 53             | 3 | .120   | .120 TIALN |
| 14       | 12       | 110            | 53             | 3 | .140   | .140 TIALN |
| 16       | 16       | 123            | 63             | 3 | .160   | .160 TIALN |
| 18       | 16       | 123            | 63             | 3 | .180   | .180 TIALN |
| 20       | 20       | 141            | 75             | 3 | .200   | .200 TIALN |
| 22       | 20       | 141            | 75             | 3 | .220   | .220 TIALN |
| 25       | 25       | 166            | 90             | 3 | .250   | .250 TIALN |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material | A <sub>p</sub>              | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |        |        |        |        |        |        |        |
|----------|-----------------------------|----------------|----------------|-----------------------|--------|--------|--------|--------|--------|--------|--------|
|          |                             |                |                | Ø 3                   | Ø 6    | Ø 8    | Ø 10   | Ø 12   | Ø 16   | Ø 18   | Ø 20   |
| P.1      | ≤ 600 N/mm <sup>2</sup>     | 0,5xD          | 1xD            | 45                    | 0,009  | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,073  |
| P.2      | ≤ 850 N/mm <sup>2</sup>     | 0,5xD          | 1xD            | 39                    | 0,009  | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,073  |
| P.3      | ≤ 1100 N/mm <sup>2</sup>    | 0,5xD          | 1xD            | 24                    | 0,009  | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,073  |
| P.4      | ≤ 900 N/mm <sup>2</sup>     | 0,5xD          | 1xD            | 30                    | 0,009  | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,073  |
| M.2      | 750 - 850 N/mm <sup>2</sup> | 0,5xD          | 1xD            | 15                    | 0,009  | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,073  |
| K.1      | < 240 HB                    | 0,5xD          | 1xD            | 35                    | 0,009  | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,073  |
| K.2      | > 240 HB                    | 0,5xD          | 1xD            | 25                    | 0,009  | 0,022  | 0,029  | 0,036  | 0,044  | 0,058  | 0,073  |
| N.2      | Si ≤ 12%                    | 0,5xD          | 1xD            | 160-300               | 0,0117 | 0,0286 | 0,0377 | 0,0468 | 0,0572 | 0,0754 | 0,0949 |
| S.2      | ≤ 1250 N/mm <sup>2</sup>    | 0,5xD          | 1xD            | 12                    | 0,0063 | 0,0154 | 0,0203 | 0,0252 | 0,0308 | 0,0406 | 0,0511 |

TiAlN: V<sub>c</sub> + 50 %







| Code           | C1604  | C1004 | C1204 | C1206 | S1006 | S1116 | S1114 | S1114N | S1115 | S1154 |
|----------------|--------|-------|-------|-------|-------|-------|-------|--------|-------|-------|
| DIN            |        |       |       |       |       |       |       |        |       |       |
| Type           | N      | N     | N     | N     | W     | W     | W     | W      | W     | WR    |
| Material       | K30    | K30   | K30   | K30   | K30   | K30   | K30   | K30    | K30   | K30   |
| Dimension (mm) | 0,5-12 | 3-20  | 3-20  | 3-20  | 3-12  | 3-20  | 3-20  | 6-25   | 4-20  | 6-20  |
| Page           | 65     | 66    | 67    | 68    | 69    | 70    | 71    | 72     | 73    | 74    |

|          |     |   |   |   |   |   |   |   |   |   |  |
|----------|-----|---|---|---|---|---|---|---|---|---|--|
| <b>P</b> | P.1 | • | • | • | • |   |   |   |   |   |  |
|          | P.2 |   |   |   |   |   |   |   |   |   |  |
|          | P.3 | • | • | • | • |   |   |   |   |   |  |
|          | P.4 |   |   |   |   |   |   |   |   |   |  |
|          | P.5 | • | • | • | • |   |   |   |   |   |  |
|          | P.6 |   |   |   |   |   |   |   |   |   |  |
| <b>M</b> | M.1 | • | • | • | • |   |   |   |   |   |  |
|          | M.2 | • | • | • | • |   |   |   |   |   |  |
|          | M.3 |   |   |   |   |   |   |   |   |   |  |
| <b>K</b> | K.1 | • | • | • | • |   |   |   |   |   |  |
|          | K.2 | • | • | • | • |   |   |   |   |   |  |
| <b>N</b> | N.1 |   |   |   |   | • | • | • | • | • |  |
|          | N.2 |   |   |   |   | • | • | • | • | • |  |
|          | N.3 |   |   |   |   |   |   |   |   |   |  |
|          | N.4 |   |   |   |   | • | • | • | • | • |  |
| <b>S</b> | S.1 | • | • | • | • |   |   |   |   |   |  |
|          | S.2 |   |   |   |   |   |   |   |   |   |  |
| <b>H</b> | H.1 |   |   |   |   |   |   |   |   |   |  |
|          | H.2 |   |   |   |   |   |   |   |   |   |  |



| Code           | S1004 | S1014 | S1014N | S1014R | S1204 | S1214 | S1404 | S1414 | S1206 | S1216 |
|----------------|-------|-------|--------|--------|-------|-------|-------|-------|-------|-------|
| DIN            | 6527K | 6527L | 6527L  | 6527L  | 6527K | 6527L | 6527K | 6527L | 6527K | 6527L |
| Type           | N     | N     | N      | N      | N     | N     | N     | N     | N     | N     |
| Material       | K30   | K30   | K30    | K30    | K30   | K30   | K30   | K30   | K30   | K30   |
| Dimension (mm) | 3-20  | 3-20  | 2-20   | 2-20   | 3-20  | 3-20  | 3-20  | 3-20  | 3-20  | 3-20  |
| Page           | 75    | 76    | 77     | 77     | 78    | 79    | 80    | 81    | 82    | 83    |

|          |     |   |   |   |   |   |   |   |   |   |
|----------|-----|---|---|---|---|---|---|---|---|---|
| <b>P</b> | P.1 | • | • | • | • | • | • | • | • | • |
|          | P.2 |   |   | • | • |   |   |   |   |   |
|          | P.3 | • | • | • | • | • | • | • | • | • |
|          | P.4 |   |   | • | • |   |   |   |   |   |
|          | P.5 | • | • | • | • | • | • | • | • | • |
|          | P.6 |   |   |   |   |   |   |   |   |   |
| <b>M</b> | M.1 | • | • |   |   | • | • | • | • | • |
|          | M.2 | • | • |   |   | • | • | • | • | • |
|          | M.3 |   |   |   |   |   |   |   |   |   |
| <b>K</b> | K.1 | • | • | • | • | • | • | • | • | • |
|          | K.2 | • | • |   |   | • | • | • | • | • |
| <b>N</b> | N.1 |   |   |   |   |   |   |   |   |   |
|          | N.2 |   |   |   |   |   |   |   |   |   |
|          | N.3 |   |   |   |   |   |   |   |   |   |
|          | N.4 |   |   |   |   |   |   |   |   |   |
| <b>S</b> | S.1 | • | • |   |   | • | • | • | • | • |
|          | S.2 |   |   | • | • |   |   |   |   |   |
| <b>H</b> | H.1 |   |   | • | • |   |   | • |   |   |
|          | H.2 |   |   | • | • |   |   |   |   |   |



| Code           | S1316 | S1316L | S1316E | S1416X | S1416D | S1406N | S1416N | S1416R | S1516 | S1235T |
|----------------|-------|--------|--------|--------|--------|--------|--------|--------|-------|--------|
| DIN            | 6527L |        |        | 6527L  | 6527L  | 6527K  | 6527L  | 6527L  | 6527L |        |
| Type           | H     | H      | H      | N      | N      | N      | N      | N      | N     | T      |
| Material       | K30   | K30    | K30    | K30    | K30    | K30    | K30    | K30    | K30   | K30    |
| Dimension (mm) | 6-20  | 6-20   | 6-20   | 3-20   | 5,7-20 | 3-20   | 3-20   | 6-16   | 3-20  | 6-25   |
| Page           | 84    | 85     | 86     | 87     | 88     | 89     | 90     | 91     | 92    | 93     |

|          |     |   |   |   |   |   |   |   |   |   |  |
|----------|-----|---|---|---|---|---|---|---|---|---|--|
| <b>P</b> | P.1 | • | • | • | • | • | • | • | • | • |  |
|          | P.2 |   |   |   | • |   |   |   |   | • |  |
|          | P.3 | • | • | • | • | • | • | • | • | • |  |
|          | P.4 |   |   |   | • |   |   |   |   | • |  |
|          | P.5 | • | • | • | • | • | • | • | • | • |  |
|          | P.6 |   |   |   |   |   |   |   |   |   |  |
| <b>M</b> | M.1 | • | • | • | • | • | • | • | • | • |  |
|          | M.2 | • | • | • | • | • | • | • | • | • |  |
|          | M.3 |   |   |   |   |   |   |   |   |   |  |
| <b>K</b> | K.1 | • | • | • | • | • | • | • | • | • |  |
|          | K.2 | • | • | • | • | • | • | • | • | • |  |
| <b>N</b> | N.1 |   |   |   |   |   |   |   |   |   |  |
|          | N.2 |   |   |   |   |   |   |   |   |   |  |
|          | N.3 |   |   |   |   |   |   |   |   |   |  |
|          | N.4 |   |   |   |   |   |   |   |   |   |  |
| <b>S</b> | S.1 | • | • | • | • | • | • | • | • | • |  |
|          | S.2 |   |   |   |   | • |   |   |   |   |  |
| <b>H</b> | H.1 | • | • | • | • | • | • | • | • | • |  |
|          | H.2 |   |   |   |   | • | • | • |   | • |  |



|                |        |       |          |          |          |       |          |        |
|----------------|--------|-------|----------|----------|----------|-------|----------|--------|
| Code           | S1435T | S1517 | S1517R   | S1136    | S1096    | S1196 | S1186N   | S1196N |
| DIN            | 6527L  |       | DIN6527L | DIN6527L | DIN6527L |       | DIN6527L |        |
| Type           | T      | H     | H        | CB       | HR       | HR    | HR       | HR     |
| Material       | K30    | K30   | K30      | K30      | K30      | K30   | K30      | K30    |
| Dimension (mm) | 6-25   | 6-20  | 6-20     | 4-20     | 6-20     | 4-20  | 4-20     | 4-20   |
| Page           | 94     | 95    | 96       | 97       | 98       | 99    | 100      | 101    |

|          |     |   |   |   |   |   |   |   |   |  |  |
|----------|-----|---|---|---|---|---|---|---|---|--|--|
| <b>P</b> | P.1 |   |   | • | • | • | • | • | • |  |  |
|          | P.2 |   |   |   |   |   |   |   |   |  |  |
|          | P.3 |   | • | • | • | • | • | • | • |  |  |
|          | P.4 |   |   |   |   |   |   |   |   |  |  |
|          | P.5 |   | • | • | • | • | • | • | • |  |  |
|          | P.6 |   |   |   |   |   |   |   |   |  |  |
| <b>M</b> | M.1 | • |   |   | • |   | • | • | • |  |  |
|          | M.2 | • |   |   | • |   | • | • | • |  |  |
|          | M.3 |   |   |   |   |   |   |   |   |  |  |
| <b>K</b> | K.1 |   | • | • | • | • | • | • | • |  |  |
|          | K.2 |   | • | • | • | • | • | • | • |  |  |
| <b>N</b> | N.1 |   |   |   |   |   |   |   |   |  |  |
|          | N.2 |   |   |   |   |   |   |   |   |  |  |
|          | N.3 |   |   |   |   |   |   |   |   |  |  |
|          | N.4 |   |   |   |   |   |   |   |   |  |  |
| <b>S</b> | S.1 |   |   | • | • | • | • | • | • |  |  |
|          | S.2 | • |   |   |   |   |   |   |   |  |  |
| <b>H</b> | H.1 |   | • | • |   |   |   | • | • |  |  |
|          | H.2 |   | • | • |   |   |   | • | • |  |  |

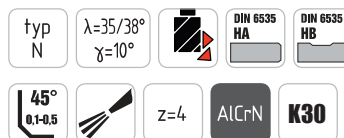


- EN End mills sets  
 DE Fräasersätze  
 RU Наборы фрез



ZPS-FN Code:

**S141602N.1**  
**S141612N.2**



D = 6; 8; 10; 12



ZPS-FN Code:

**S119602N.1**  
**S119612N.2**



D = 6; 8; 10; 12

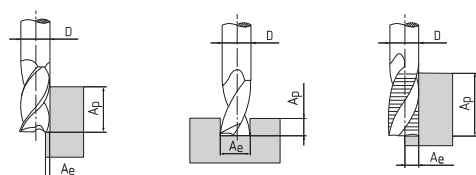
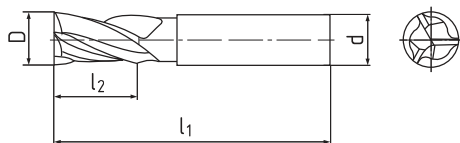
V případě zájmu vám připravíme sady fréz dle vašeho výběru.  
 You can have also special custom sets – specified by yourself.  
 Sie können auch die Fräasersätze genau nach Ihrer Spezifikation erhalten.  
 Можно подготовить тоже другие наборы фрез по вашей спецификации.

EN Mini End Mills  
DE Minifräser  
RU Минифрезы



C1604

SC



| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | z | C160402 |
|-----------|----------|----------------|----------------|---|---------|
| 0,5       | 3        | 40             | 1,5            | 3 | .005    |
| 0,6       | 3        | 40             | 1,5            | 3 | .006    |
| 0,8       | 3        | 40             | 2              | 3 | .008    |
| 1         | 3        | 40             | 2              | 3 | .010    |
| 1,2       | 3        | 40             | 2              | 3 | .012    |
| 1,5       | 3        | 40             | 2              | 3 | .015    |
| 1,8       | 3        | 40             | 2              | 3 | .018    |
| 2         | 6        | 40             | 4              | 3 | .020    |
| 2,5       | 6        | 40             | 5              | 3 | .025    |
| 3         | 6        | 40             | 5              | 3 | .030    |
| 3,5       | 6        | 40             | 6              | 3 | .035    |
| 4         | 6        | 40             | 7              | 3 | .040    |
| 4,5       | 6        | 40             | 8              | 3 | .045    |
| 5         | 6        | 40             | 8              | 3 | .050    |
| 5,5       | 6        | 40             | 8              | 3 | .055    |
| 5,8       | 6        | 40             | 8              | 3 | .058    |
| 6         | 6        | 40             | 8              | 3 | .060    |
| 6,8       | 8        | 45             | 10             | 3 | .068    |
| 7         | 8        | 45             | 10             | 3 | .070    |
| 7,8       | 8        | 45             | 10             | 3 | .078    |
| 8         | 8        | 45             | 11             | 3 | .080    |
| 8,7       | 10       | 50             | 11             | 3 | .087    |
| 9         | 10       | 50             | 11             | 3 | .090    |
| 9,7       | 10       | 50             | 11             | 3 | .097    |
| 10        | 10       | 50             | 13             | 3 | .100    |
| 12        | 12       | 55             | 15             | 3 | .120    |

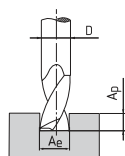
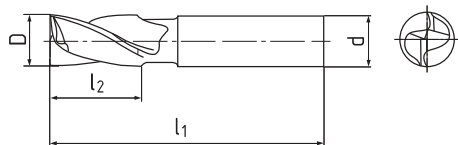
Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

|          |     |                 |       |       | fz (mm/z) |       |       |       |       |       |
|----------|-----|-----------------|-------|-------|-----------|-------|-------|-------|-------|-------|
| Material |     | ap              | ae    | vc    | Ø 3       | Ø 6   | Ø 8   | Ø 10  | Ø 12  |       |
| P        | P.1 | ≤ 600 N/mm²     | 0,5xD | 0,1xD | 140       | 0,011 | 0,021 | 0,028 | 0,035 | 0,042 |
|          | P.3 | ≤ 1100 N/mm²    | 0,5xD | 0,1xD | 85        | 0,011 | 0,021 | 0,028 | 0,035 | 0,042 |
|          | P.5 | ≤ 1100 N/mm²    | 0,5xD | 0,1xD | 65        | 0,011 | 0,021 | 0,028 | 0,035 | 0,042 |
| M        | M.1 | ≤ 750 N/mm²     | 0,5xD | 0,1xD | 70        | 0,011 | 0,021 | 0,028 | 0,035 | 0,042 |
|          | M.2 | 750 - 850 N/mm² | 0,5xD | 0,1xD | 60        | 0,011 | 0,021 | 0,028 | 0,035 | 0,042 |
| K        | K.1 | < 240 HB        | 0,5xD | 0,1xD | 105       | 0,011 | 0,021 | 0,028 | 0,035 | 0,042 |
|          | K.2 | > 240 HB        | 0,5xD | 0,1xD | 85        | 0,011 | 0,021 | 0,028 | 0,035 | 0,042 |
| S        | S.1 | ≤ 1500 N/mm²    | 0,5xD | 0,1xD | 45        | 0,011 | 0,021 | 0,028 | 0,035 | 0,042 |

- EN End Mills | short, 1 tooth cut over centre, 30°
- DE Schafffräser | Kurz, Zentrumschnitt, 30°
- RU Фрезы концевые с цилиндрическим хвостовиком | короткие с центрорежущим зубом, 30°



## C1004



| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | z |
|-----------|----------|----------------|----------------|---|
| 3         | 3        | 40             | 12             | 2 |
| 4         | 4        | 40             | 12             | 2 |
| 5         | 5        | 50             | 14             | 2 |
| 6         | 6        | 50             | 16             | 2 |
| 8         | 8        | 60             | 20             | 2 |
| 10        | 10       | 70             | 22             | 2 |
| 12        | 12       | 70             | 22             | 2 |
| 16        | 16       | 75             | 25             | 2 |
| 20        | 20       | 100            | 32             | 2 |

C100402

.030  
.040  
.050  
.060  
.080  
.100  
.120  
.160  
.200

### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material | a <sub>p</sub>              | a <sub>e</sub> | v <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |       |       |       |       |
|----------|-----------------------------|----------------|----------------|-----------------------|-------|-------|-------|-------|-------|-------|-------|
|          |                             |                |                | Ø 3                   | Ø 6   | Ø 8   | Ø 10  | Ø 12  | Ø 16  | Ø 20  |       |
| P.1      | ≤ 600 N/mm <sup>2</sup>     | 0,75xD         | 1xD            | 130                   | 0,007 | 0,014 | 0,019 | 0,023 | 0,028 | 0,037 | 0,047 |
| P.3      | ≤ 1100 N/mm <sup>2</sup>    | 0,75xD         | 1xD            | 70                    | 0,007 | 0,014 | 0,019 | 0,023 | 0,028 | 0,037 | 0,047 |
| P.5      | ≤ 1100 N/mm <sup>2</sup>    | 0,75xD         | 1xD            | 60                    | 0,007 | 0,014 | 0,019 | 0,023 | 0,028 |       | 0,047 |
| M.1      | ≤ 750 N/mm <sup>2</sup>     | 0,75xD         | 1xD            | 65                    | 0,007 | 0,014 | 0,019 | 0,023 | 0,028 | 0,037 | 0,047 |
| M.2      | 750 - 850 N/mm <sup>2</sup> | 0,75xD         | 1xD            | 60                    | 0,007 | 0,014 | 0,019 | 0,023 | 0,028 | 0,037 | 0,047 |
| K.1      | < 240 HB                    | 0,75xD         | 1xD            | 100                   | 0,007 | 0,014 | 0,019 | 0,023 | 0,028 | 0,037 | 0,047 |
| K.2      | > 240 HB                    | 0,75xD         | 1xD            | 70                    | 0,007 | 0,014 | 0,019 | 0,023 | 0,028 | 0,037 | 0,047 |
| S.1      | ≤ 1500 N/mm <sup>2</sup>    | 0,75xD         | 1xD            | 35                    | 0,007 | 0,014 | 0,019 | 0,023 | 0,028 | 0,037 | 0,047 |

EN End Mills | short, 1 tooth cut over centre, 30°

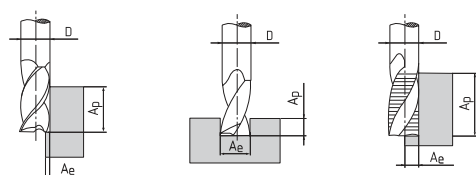
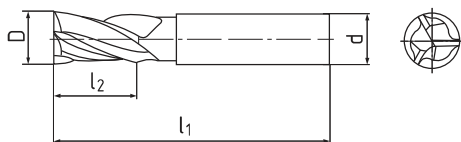
DE Schafffräser | Kurz, Zentrumschnitt, 30°

RU Фрезы концевые с цилиндрическим хвостовиком | короткие с центрорежущим зубом, 30°



C1204

SC



| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | z |
|-----------|----------|----------------|----------------|---|
| 3         | 3        | 40             | 12             | 3 |
| 4         | 4        | 40             | 12             | 3 |
| 5         | 5        | 50             | 14             | 3 |
| 6         | 6        | 50             | 16             | 3 |
| 8         | 8        | 60             | 20             | 3 |
| 10        | 10       | 70             | 22             | 3 |
| 12        | 12       | 70             | 22             | 3 |
| 16        | 16       | 75             | 25             | 3 |
| 20        | 20       | 100            | 32             | 3 |

C120402

.030  
.040  
.050  
.060  
.080  
.100  
.120  
.160  
.200

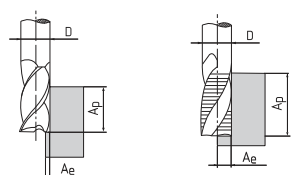
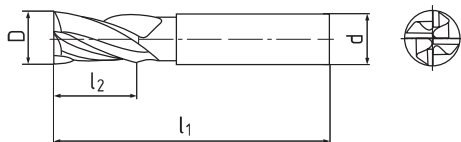
## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

|          |                 |       |       |     | fz (mm/z) |       |       |       |       |       |       |
|----------|-----------------|-------|-------|-----|-----------|-------|-------|-------|-------|-------|-------|
| Material |                 | ap    | ae    | vc  | Ø 3       | Ø 6   | Ø 8   | Ø 10  | Ø 12  | Ø 16  | Ø 20  |
| P.1      | ≤ 600 N/mm²     | 1,5xD | 0,2xD | 130 | 0,007     | 0,014 | 0,019 | 0,023 | 0,028 | 0,037 | 0,047 |
| P.3      | ≤ 1100 N/mm²    | 1,5xD | 0,2xD | 70  | 0,007     | 0,014 | 0,019 | 0,023 | 0,028 | 0,037 | 0,047 |
| P.5      | ≤ 1100 N/mm²    | 1,5xD | 0,2xD | 60  | 0,007     | 0,014 | 0,019 | 0,023 | 0,028 | 0,037 | 0,047 |
| M.1      | ≤ 750 N/mm²     | 1,5xD | 0,2xD | 65  | 0,007     | 0,014 | 0,019 | 0,023 | 0,028 | 0,037 | 0,047 |
| M.2      | 750 - 850 N/mm² | 1,5xD | 0,2xD | 60  | 0,007     | 0,014 | 0,019 | 0,023 | 0,028 | 0,037 | 0,047 |
| K.1      | < 240 HB        | 1,5xD | 0,2xD | 100 | 0,007     | 0,014 | 0,019 | 0,023 | 0,028 | 0,037 | 0,047 |
| K.2      | > 240 HB        | 1,5xD | 0,2xD | 70  | 0,007     | 0,014 | 0,019 | 0,023 | 0,028 | 0,037 | 0,047 |
| S.1      | ≤ 1500 N/mm²    | 1,5xD | 0,2xD | 35  | 0,007     | 0,014 | 0,019 | 0,023 | 0,028 | 0,037 | 0,047 |

- EN End Mills | short, 2 teeth cut to centre, 30°
- DE Schafffräser | Kurz, bis Mitte Schneidend, 30°
- RU Фрезы концевые с цилиндрическим хвостовиком | короткие, с центрорежущим зубом, 30°



## C1206



| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | z |
|-----------|----------|----------------|----------------|---|
| 3         | 3        | 40             | 12             | 4 |
| 4         | 4        | 40             | 12             | 4 |
| 5         | 5        | 50             | 14             | 4 |
| 6         | 6        | 50             | 16             | 4 |
| 8         | 8        | 60             | 20             | 4 |
| 10        | 10       | 70             | 22             | 4 |
| 12        | 12       | 70             | 22             | 4 |
| 16        | 16       | 75             | 25             | 4 |
| 20        | 20       | 100            | 32             | 4 |

C120602

.030  
.040  
.050  
.060  
.080  
.100  
.120  
.160  
.200

### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                        | ap     | ae    | vc  | fz (mm/z) |       |       |       |       |       |       |
|---------------------------------|--------|-------|-----|-----------|-------|-------|-------|-------|-------|-------|
|                                 |        |       |     | Ø 3       | Ø 6   | Ø 8   | Ø 10  | Ø 12  | Ø 16  | Ø 20  |
| P.1 ≤ 600 N/mm <sup>2</sup>     | 1,75xD | 0,2xD | 130 | 0,007     | 0,014 | 0,019 | 0,023 | 0,028 | 0,037 | 0,047 |
| P.3 ≤ 1100 N/mm <sup>2</sup>    | 1,75xD | 0,2xD | 70  | 0,007     | 0,014 | 0,019 | 0,023 | 0,028 | 0,037 | 0,047 |
| P.5 ≤ 1100 N/mm <sup>2</sup>    | 1,75xD | 0,2xD | 60  | 0,007     | 0,014 | 0,019 | 0,023 | 0,028 | 0,037 | 0,047 |
| M.1 ≤ 750 N/mm <sup>2</sup>     | 1,75xD | 0,2xD | 65  | 0,007     | 0,014 | 0,019 | 0,023 | 0,028 | 0,037 | 0,047 |
| M.2 750 - 850 N/mm <sup>2</sup> | 1,75xD | 0,2xD | 60  | 0,007     | 0,014 | 0,019 | 0,023 | 0,028 | 0,037 | 0,047 |
| K.1 < 240 HB                    | 1,75xD | 0,2xD | 100 | 0,007     | 0,014 | 0,019 | 0,023 | 0,028 | 0,037 | 0,047 |
| K.2 > 240 HB                    | 1,75xD | 0,2xD | 70  | 0,007     | 0,014 | 0,019 | 0,023 | 0,028 | 0,037 | 0,047 |
| S.1 ≤ 1500 N/mm <sup>2</sup>    | 1,75xD | 0,2xD | 35  | 0,007     | 0,014 | 0,019 | 0,023 | 0,028 | 0,037 | 0,047 |

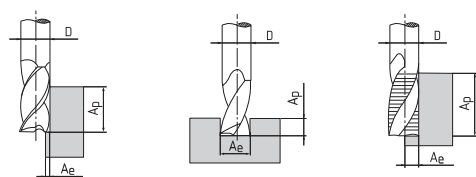
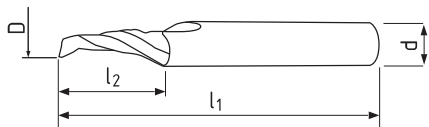
EN End Mills | short, 1 tooth cut over centre, 30°

DE Schafftfräser | Kurz, Zentrumschnitt, 30°

RU Фрезы концевые с цилиндрическим хвостовиком | короткие, с центрорежущим зубом, 30°

**S1006**

SC

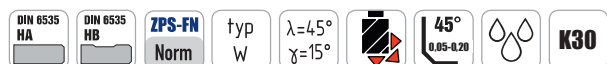


| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | z | S100602 |
|-----------|----------|----------------|----------------|---|---------|
| 3         | 6        | 50             | 8              | 1 | .030    |
| 4         | 6        | 54             | 11             | 1 | .040    |
| 5         | 6        | 54             | 13             | 1 | .050    |
| 6         | 6        | 54             | 13             | 1 | .060    |
| 8         | 8        | 58             | 19             | 1 | .080    |
| 10        | 10       | 66             | 22             | 1 | .100    |
| 12        | 12       | 73             | 26             | 1 | .120    |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

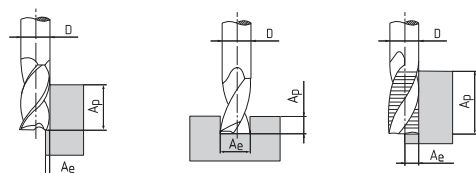
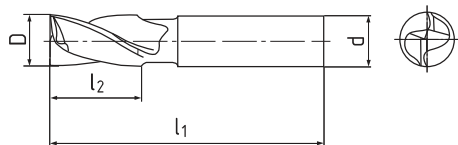
| Material                           | a <sub>p</sub> | a <sub>e</sub> | v <sub>c</sub> | f <sub>z</sub> (mm/z) |        |       |      |       |
|------------------------------------|----------------|----------------|----------------|-----------------------|--------|-------|------|-------|
|                                    |                |                |                | Ø 3                   | Ø 6    | Ø 8   | Ø 10 | Ø 12  |
| <b>N.1</b> Si ≤ 6%                 | 1,5xD          | 0,2xD          | 160            | 0,015                 | 0,033  | 0,04  | 0,05 | 0,06  |
| <b>N.2</b> Si ≤ 12%                | 1,5xD          | 0,2xD          | 220            | 0,015                 | 0,033  | 0,04  | 0,05 | 0,06  |
| <b>N.4</b> ≤ 850 N/mm <sup>2</sup> | 1,5xD          | 0,2xD          | 176            | 0,012                 | 0,0264 | 0,032 | 0,04 | 0,048 |

- EN End Mills | long, 1 tooth cut over centre, 45°
- DE Schafffräser | Lang, Zentrumschnitt, 45°
- RU Фрезы концевые с цилиндрическим хвостовиком | длинные, с центрорежущим зубом, 45°



## S1116

## S1116



| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z |
|-----------|----------|----------------|----------------|---|
| 3         | 6        | 57             | 8              | 2 |
| 3,5       | 6        | 57             | 10             | 2 |
| 4         | 6        | 57             | 11             | 2 |
| 4,5       | 6        | 57             | 11             | 2 |
| 5         | 6        | 57             | 13             | 2 |
| 6         | 6        | 57             | 13             | 2 |
| 7         | 8        | 63             | 16             | 2 |
| 8         | 8        | 63             | 19             | 2 |
| 9         | 10       | 72             | 19             | 2 |
| 10        | 10       | 72             | 22             | 2 |
| 12        | 12       | 83             | 26             | 2 |
| 14        | 14       | 83             | 26             | 2 |
| 16        | 16       | 92             | 32             | 2 |
| 18        | 18       | 92             | 32             | 2 |
| 20        | 20       | 104            | 38             | 2 |

| S111602 | S111612 |
|---------|---------|
| .030    | .030    |
| .035    | .035    |
| .040    | .040    |
| .045    | .045    |
| .050    | .050    |
| .060    | .060    |
| .070    | .070    |
| .080    | .080    |
| .090    | .090    |
| .100    | .100    |
| .120    | .120    |
| .140    | .140    |
| .160    | .160    |
| .180    | .180    |
| .200    | .200    |

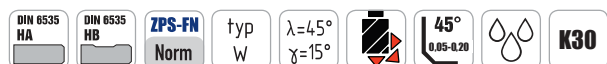
### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material |             | a <sub>p</sub> | a <sub>e</sub> | v <sub>c</sub> | f <sub>z</sub> (mm/z) |       |        |        |       |        |       |        |
|----------|-------------|----------------|----------------|----------------|-----------------------|-------|--------|--------|-------|--------|-------|--------|
|          |             |                |                |                | Ø 3                   | Ø 6   | Ø 8    | Ø 10   | Ø 12  | Ø 16   | Ø 18  | Ø 20   |
| S111602  |             |                |                |                |                       |       |        |        |       |        |       |        |
| N.1      | Si ≤ 6%     | 1,5xD          | 0,2xD          | 160            | 0,02                  | 0,04  | 0,053  | 0,067  | 0,08  | 0,107  | 0,13  | 0,135  |
| N.2      | Si ≤ 12%    | 1,5xD          | 0,2xD          | 220            | 0,02                  | 0,04  | 0,053  | 0,067  | 0,08  | 0,107  | 0,13  | 0,135  |
| N.4      | ≤ 850 N/mm² | 1,5xD          | 0,2xD          | 176            | 0,016                 | 0,032 | 0,0424 | 0,0536 | 0,064 | 0,0856 | 0,096 | 0,1064 |
| S111612  |             |                |                |                |                       |       |        |        |       |        |       |        |
| N.1      | Si ≤ 6%     | 1,5xD          | 0,2xD          | 160            | 0,02                  | 0,04  | 0,053  | 0,067  | 0,08  | 0,107  | 0,12  | 0,133  |
| N.2      | Si ≤ 12%    | 1,5xD          | 0,2xD          | 220            | 0,02                  | 0,04  | 0,053  | 0,067  | 0,08  | 0,107  | 0,12  | 0,133  |
| N.4      | ≤ 850 N/mm² | 1,5xD          | 0,2xD          | 176            | 0,016                 | 0,032 | 0,0424 | 0,0536 | 0,064 | 0,0856 | 0,096 | 0,1064 |

EN End Mills | long, 1 tooth cut over centre, 45°

DE Schafffräser | Lang, Zentrumschnitt, 45°

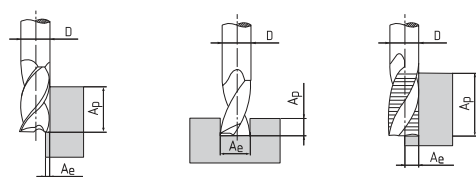
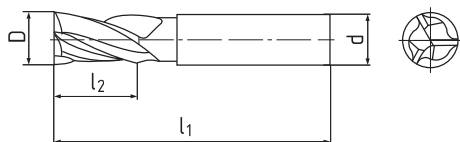
RU Фрезы концевые с цилиндрическим хвостовиком | длинные, с центрорежущим зубом, 45°



S1114

S1114

SC



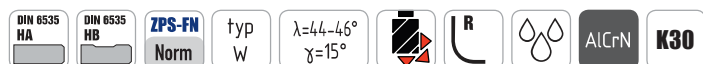
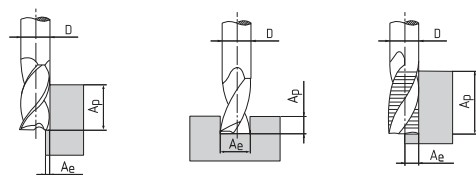
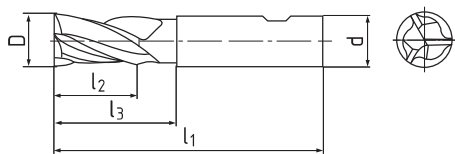
| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z | S111402 | S111412 |
|-----------|----------|----------------|----------------|---|---------|---------|
| 3         | 6        | 57             | 8              | 3 | .030    | .030    |
| 3,5       | 6        | 57             | 10             | 3 | .035    | .035    |
| 4         | 6        | 57             | 11             | 3 | .040    | .040    |
| 4,5       | 6        | 57             | 11             | 3 | .045    | .045    |
| 5         | 6        | 57             | 13             | 3 | .050    | .050    |
| 6         | 6        | 57             | 13             | 3 | .060    | .060    |
| 8         | 8        | 63             | 19             | 3 | .080    | .080    |
| 10        | 10       | 72             | 22             | 3 | .100    | .100    |
| 12        | 12       | 83             | 26             | 3 | .120    | .120    |
| 14        | 14       | 83             | 26             | 3 | .140    | .140    |
| 16        | 16       | 92             | 32             | 3 | .160    | .160    |
| 18        | 18       | 92             | 32             | 3 | .180    | .180    |
| 20        | 20       | 104            | 38             | 3 | .200    | .200    |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material        | ap    | ae    | vc  | fz (mm/z) |       |        |        |       |        |       |        |
|-----------------|-------|-------|-----|-----------|-------|--------|--------|-------|--------|-------|--------|
|                 |       |       |     | Ø 3       | Ø 6   | Ø 8    | Ø 10   | Ø 12  | Ø 16   | Ø 18  | Ø 20   |
| N.1 Si ≤ 6%     | 1,5xD | 0,2xD | 160 | 0,02      | 0,04  | 0,053  | 0,067  | 0,08  | 0,107  | 0,12  | 0,133  |
| N.2 Si ≤ 12%    | 1,5xD | 0,2xD | 220 | 0,02      | 0,04  | 0,053  | 0,067  | 0,08  | 0,107  | 0,12  | 0,133  |
| N.4 ≤ 850 N/mm² | 1,5xD | 0,2xD | 176 | 0,016     | 0,032 | 0,0424 | 0,0536 | 0,064 | 0,0856 | 0,096 | 0,1064 |



- EN End Mills | long, 1 tooth cut over centre, 44°, 45°, 46°  
 DE Schafffräser | Lang, bis Mitte Schneidend, 44°, 45°, 46°  
 RU Фрезы концевые с цилиндрическим хвостовиком | длинные, с центрорежущим зубом, 44°, 45°, 46°

**S1114N****S1114N**

| D<br>k 12 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | l <sub>3</sub> | Dn | R   | Z |
|-----------|----------|----------------|----------------|----------------|----|-----|---|
| 6         | 6        | 62             | 7              | 24             | 5  | 0,2 | 3 |
| 8         | 8        | 68             | 9              | 30             | 7  | 0,2 | 3 |
| 10        | 10       | 80             | 11             | 38             | 9  | 0,3 | 3 |
| 12        | 12       | 93             | 13             | 46             | 11 | 0,4 | 3 |
| 14        | 14       | 93             | 15             | 46             | 13 | 0,4 | 3 |
| 16        | 16       | 108            | 17             | 58             | 15 | 0,5 | 3 |
| 18        | 18       | 108            | 19             | 58             | 17 | 0,5 | 3 |
| 20        | 20       | 126            | 21             | 74             | 19 | 0,6 | 3 |
| 25        | 25       | 150            | 26             | 92             | 24 | 0,6 | 3 |

**S111402N****S111412N**

.060  
.080  
.100  
.120  
.140  
.160  
.180  
.200  
.250

.060  
.080  
.100  
.120  
.140  
.160  
.180  
.200  
.250

### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material               | ap    | ae    | vc  | fz (mm/z) |      |      |      |      |      |      |      |
|------------------------|-------|-------|-----|-----------|------|------|------|------|------|------|------|
|                        |       |       |     | Ø 6       | Ø 8  | Ø 10 | Ø 12 | Ø 14 | Ø 16 | Ø 18 | Ø 20 |
| <b>N.1</b> Si ≤ 6%     | 0,5xD | 0,3xD | 200 | 0,06      | 0,08 | 0,1  | 0,12 | 0,14 | 0,16 | 0,18 | 0,2  |
| <b>N.2</b> Si ≤ 12%    | 0,5xD | 0,3xD | 200 | 0,06      | 0,08 | 0,1  | 0,12 | 0,14 | 0,16 | 0,18 | 0,2  |
| <b>N.4</b> ≤ 850 N/mm² | 0,5xD | 0,3xD | 500 | 0,06      | 0,08 | 0,1  | 0,12 | 0,14 | 0,16 | 0,18 | 0,2  |

EN End Mills | long, 2 teeth cut to centre, 30°

DE Schafffräser | Lang, bis Mitte Schneidend, 30°

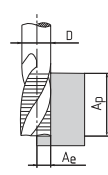
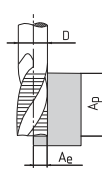
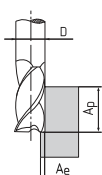
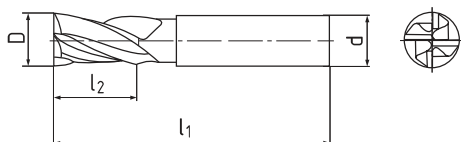
RU Фрезы концевые с цилиндрическим хвостовиком | длинные с центрорежущим зубом, 30°



S1115

S1115

SC

D  
h 10d  
h 6l<sub>1</sub>l<sub>2</sub>

z

S111502

S111512

4

6

62

15

4

.040

.040

5

6

62

18

4

.050

.050

6

6

62

18

4

.060

.060

8

8

68

24

4

.080

.080

10

10

80

30

4

.100

.100

12

12

93

36

4

.120

.120

16

16

108

48

4

.160

.160

20

20

126

60

4

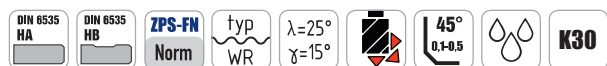
.200

.200

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

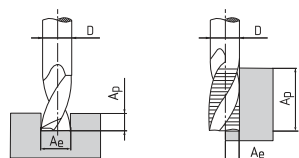
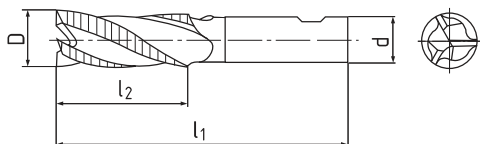
| Material                           | a <sub>p</sub> | a <sub>e</sub> | v <sub>c</sub> | f <sub>z</sub> (mm/z) |        |        |       |        |        |
|------------------------------------|----------------|----------------|----------------|-----------------------|--------|--------|-------|--------|--------|
|                                    |                |                |                | Ø 6                   | Ø 8    | Ø 10   | Ø 12  | Ø 16   | Ø 20   |
| <b>N.1</b> Si ≤ 6%                 | 2,5xD          | 0,1xD          | 160            | 0,04                  | 0,053  | 0,067  | 0,08  | 0,107  | 0,133  |
| <b>N.2</b> Si ≤ 12%                | 2,5xD          | 0,1xD          | 220            | 0,04                  | 0,053  | 0,067  | 0,08  | 0,107  | 0,133  |
| <b>N.4</b> ≤ 850 N/mm <sup>2</sup> | 2,5xD          | 0,1xD          | 176            | 0,032                 | 0,0424 | 0,0536 | 0,064 | 0,0856 | 0,1064 |

- EN End Mills | long, WR, 1 tooth cut over centre, 25°
- DE Schafffräser | Lang, WR, Zentrumschnitt, 25°
- RU Фрезы концевые с цилиндрическим хвостовиком | длинные, WR, с центрорежущим зубом, 25°



## S1154

## S1154



| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | z |
|-----------|----------|----------------|----------------|---|
| 6         | 6        | 57             | 13             | 3 |
| 8         | 8        | 63             | 19             | 3 |
| 10        | 10       | 72             | 22             | 3 |
| 12        | 12       | 83             | 26             | 3 |
| 14        | 14       | 83             | 26             | 3 |
| 16        | 16       | 92             | 32             | 3 |
| 18        | 18       | 92             | 32             | 3 |
| 20        | 20       | 104            | 38             | 3 |

| S115402 | S115412 |
|---------|---------|
| .060    | .060    |
| .080    | .080    |
| .100    | .100    |
| .120    | .120    |
| .140    | .140    |
| .160    | .160    |
| .180    | .180    |
| .200    | .200    |

### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material     | a <sub>p</sub> | a <sub>e</sub> | v <sub>c</sub> | fz (mm/z) |       |       |      |       |       |       |
|--------------|----------------|----------------|----------------|-----------|-------|-------|------|-------|-------|-------|
|              |                |                |                | Ø 6       | Ø 8   | Ø 10  | Ø 12 | Ø 16  | Ø 18  | Ø 20  |
| N.1 Si ≤ 6%  | 2xD            | 0,4xD          | 160            | 0,055     | 0,073 | 0,092 | 0,11 | 0,147 | 0,165 | 0,183 |
| N.2 Si ≤ 12% | 2xD            | 0,4xD          | 220            | 0,055     | 0,073 | 0,092 | 0,11 | 0,147 | 0,165 | 0,183 |

EN End Mills | short, 1 tooth cut over centre, 30°

DE Schafffräser | Kurz, Zentrumschnitt, 30°

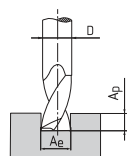
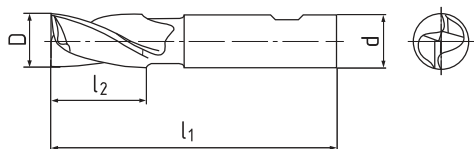
RU Фрезы концевые с цилиндрическим хвостовиком | короткие с центрорежущим зубом, 30°



S1004

S1004

SC



| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | z | S100402 | S100412 |
|-----------|----------|----------------|----------------|---|---------|---------|
| 3         | 6        | 50             | 4              | 2 | .030    | .030    |
| 3,5       | 6        | 50             | 4              | 2 | .035    | .035    |
| 4         | 6        | 54             | 5              | 2 | .040    | .040    |
| 4,5       | 6        | 54             | 5              | 2 | .045    | .045    |
| 5         | 6        | 54             | 6              | 2 | .050    | .050    |
| 6         | 6        | 54             | 7              | 2 | .060    | .060    |
| 7         | 8        | 58             | 8              | 2 | .070    | .070    |
| 8         | 8        | 58             | 9              | 2 | .080    | .080    |
| 9         | 10       | 66             | 10             | 2 | .090    | .090    |
| 10        | 10       | 66             | 11             | 2 | .100    | .100    |
| 12        | 12       | 73             | 12             | 2 | .120    | .120    |
| 14        | 14       | 75             | 14             | 2 | .140    | .140    |
| 16        | 16       | 82             | 16             | 2 | .160    | .160    |
| 18        | 18       | 84             | 18             | 2 | .180    | .180    |
| 20        | 20       | 92             | 20             | 2 | .200    | .200    |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

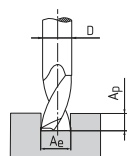
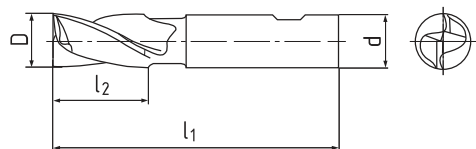
|          |     |                 |       |     | fz (mm/z) |      |      |       |       |      |       |      |       |
|----------|-----|-----------------|-------|-----|-----------|------|------|-------|-------|------|-------|------|-------|
| Material |     | ap              | ae    | vc  | Ø 3       | Ø 6  | Ø 8  | Ø 10  | Ø 12  | Ø 16 | Ø 18  | Ø 20 |       |
| P        | P.1 | ≤ 600 N/mm²     | 0,5xD | 1xD | 200       | 0,01 | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
|          | P.3 | ≤ 1100 N/mm²    | 0,5xD | 1xD | 120       | 0,01 | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
|          | P.5 | ≤ 1100 N/mm²    | 0,5xD | 1xD | 90        | 0,01 | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
| M        | M.1 | ≤ 750 N/mm²     | 0,5xD | 1xD | 100       | 0,01 | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
|          | M.2 | 750 - 850 N/mm² | 0,5xD | 1xD | 80        | 0,01 | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
| K        | K.1 | < 240 HB        | 0,5xD | 1xD | 150       | 0,01 | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
|          | K.2 | > 240 HB        | 0,5xD | 1xD | 120       | 0,01 | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
| S        | S.1 | ≤ 1500 N/mm²    | 0,5xD | 1xD | 60        | 0,01 | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |

- EN End Mills | long, 1 tooth cut over centre, 30°
- DE Schafffräser | Lang, Zentrumschnitt, 30°
- RU Фрезы концевые с цилиндрическим хвостовиком | длинные с центрорежущим зубом, 30°



## S1014

## S1014



| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | z | S101402 | S101412 |
|-----------|----------|----------------|----------------|---|---------|---------|
| 3         | 6        | 57             | 7              | 2 | .030    | .030    |
| 3,5       | 6        | 57             | 7              | 2 | .035    | .035    |
| 4         | 6        | 57             | 8              | 2 | .040    | .040    |
| 4,5       | 6        | 57             | 8              | 2 | .045    | .045    |
| 5         | 6        | 57             | 10             | 2 | .050    | .050    |
| 6         | 6        | 57             | 10             | 2 | .060    | .060    |
| 7         | 8        | 63             | 13             | 2 | .070    | .070    |
| 8         | 8        | 63             | 16             | 2 | .080    | .080    |
| 9         | 10       | 72             | 16             | 2 | .090    | .090    |
| 10        | 10       | 72             | 19             | 2 | .100    | .100    |
| 12        | 12       | 83             | 22             | 2 | .120    | .120    |
| 14        | 14       | 83             | 22             | 2 | .140    | .140    |
| 16        | 16       | 92             | 26             | 2 | .160    | .160    |
| 18        | 18       | 92             | 26             | 2 | .180    | .180    |
| 20        | 20       | 104            | 32             | 2 | .200    | .200    |

### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material |                 | a <sub>p</sub> | a <sub>e</sub> | v <sub>c</sub> | f <sub>z</sub> (mm/z) |      |       |       |      |       |      |       |
|----------|-----------------|----------------|----------------|----------------|-----------------------|------|-------|-------|------|-------|------|-------|
|          |                 |                |                |                | Ø 3                   | Ø 6  | Ø 8   | Ø 10  | Ø 12 | Ø 16  | Ø 18 | Ø 20  |
| P.1      | ≤ 600 N/mm²     | 0,75xD         | 1xD            | 200            | 0,01                  | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
| P.3      | ≤ 1100 N/mm²    | 0,75xD         | 1xD            | 120            | 0,01                  | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
| P.5      | ≤ 1100 N/mm²    | 0,75xD         | 1xD            | 90             | 0,01                  | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
| M.1      | ≤ 750 N/mm²     | 0,75xD         | 1xD            | 100            | 0,01                  | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
| M.2      | 750 - 850 N/mm² | 0,75xD         | 1xD            | 80             | 0,01                  | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
| K.1      | < 240 HB        | 0,75xD         | 1xD            | 150            | 0,01                  | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
| K.2      | > 240 HB        | 0,75xD         | 1xD            | 120            | 0,01                  | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
| S.1      | ≤ 1500 N/mm²    | 0,75xD         | 1xD            | 60             | 0,01                  | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |

EN End Mills | long, 1 tooth cut over centre, 30°

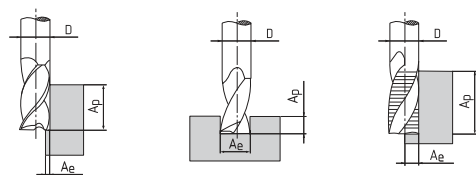
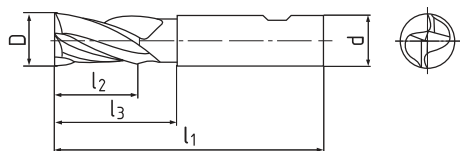
DE Schafffräser | Lang, Zentrumschnitt, 30°

RU Фрезы концевые с цилиндрическим хвостовиком | длинные с центрорежущим зубом, 30°



S1014N

S1014R



| D<br>k 12 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | l <sub>3</sub> | Dn  | R<br>S1014R | Z | S101402N | S101412N | S101402R | S101412R |
|-----------|----------|----------------|----------------|----------------|-----|-------------|---|----------|----------|----------|----------|
| 2         | 6        | 54             | 3              | 9              | 1,8 |             | 2 | .020     | .020     |          |          |
| 3         | 6        | 54             | 4              | 11             | 2,7 |             | 2 | .030     | .030     |          |          |
| 4         | 6        | 57             | 5              | 15             | 3,6 | 0,3         | 2 | .040     | .040     | .04003   | .04003   |
| 4         | 6        | 57             | 5              | 15             | 3,6 | 0,5         | 2 |          |          | .04005   | .04005   |
| 5         | 6        | 62             | 6              | 23             | 4,5 |             | 2 | .050     | .050     |          |          |
| 6         | 6        | 62             | 7              | 24             | 5,4 | 0,3         | 2 | .060     | .060     | .06003   | .06003   |
| 6         | 6        | 62             | 7              | 24             | 5,4 | 0,5         | 2 |          |          | .06005   | .06005   |
| 6         | 6        | 62             | 7              | 24             | 5,4 | 1           | 2 |          |          | .06010   | .06010   |
| 7         | 8        | 68             | 8              | 28             | 6,3 |             | 2 | .070     | .070     |          |          |
| 8         | 8        | 68             | 9              | 30             | 7,2 | 0,5         | 2 | .080     | .080     | .08005   | .08005   |
| 8         | 8        | 68             | 9              | 30             | 7,2 | 1           | 2 |          |          | .08010   | .08010   |
| 9         | 10       | 80             | 10             | 36             | 8,2 |             | 2 | .090     | .090     |          |          |
| 10        | 10       | 80             | 11             | 38             | 9   | 0,5         | 2 | .100     | .100     | .10005   | .10005   |
| 10        | 10       | 80             | 11             | 38             | 9   | 1           | 2 |          |          | .10010   | .10010   |
| 11        | 12       | 93             | 12             | 44             | 10  |             | 2 | .110     | .110     |          |          |
| 12        | 12       | 93             | 13             | 46             | 11  | 0,5         | 2 | .120     | .120     | .12005   | .12005   |
| 12        | 12       | 93             | 13             | 46             | 11  | 1           | 2 |          |          | .12010   | .12010   |
| 12        | 12       | 93             | 13             | 46             | 11  | 2           | 2 |          |          | .12020   | .12020   |
| 14        | 14       | 93             | 15             | 46             | 13  |             | 2 | .140     | .140     |          |          |
| 16        | 16       | 108            | 17             | 58             | 15  | 1           | 2 | .160     | .160     | .16010   | .16010   |
| 16        | 16       | 108            | 17             | 58             | 15  | 2           | 2 |          |          | .16020   | .16020   |
| 16        | 16       | 108            | 17             | 58             | 15  | 3           | 2 |          |          | .16030   | .16030   |
| 18        | 18       | 108            | 19             | 58             | 17  |             | 2 | .180     | .180     |          |          |
| 20        | 20       | 126            | 21             | 74             | 19  |             | 2 | .200     | .200     |          |          |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

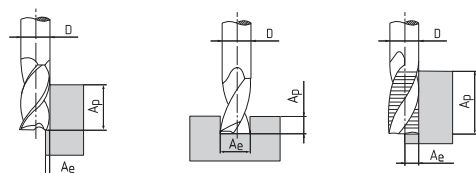
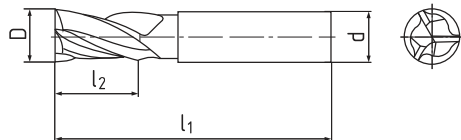
|          |              |     |       |     | fz (mm/z) |        |        |       |        |        |        |        |       |
|----------|--------------|-----|-------|-----|-----------|--------|--------|-------|--------|--------|--------|--------|-------|
| Material |              | ap  | ae    | vc  | Ø 3       | Ø 6    | Ø 8    | Ø 10  | Ø 12   | Ø 14   | Ø 16   | Ø 18   | Ø 20  |
| P.1      | ≤ 600 N/mm²  | 1xD | 0,4xD | 240 | 0,018     | 0,036  | 0,048  | 0,06  | 0,072  | 0,084  | 0,096  | 0,108  | 0,12  |
|          | ≤ 850 N/mm²  | 1xD | 0,4xD | 210 | 0,018     | 0,036  | 0,048  | 0,06  | 0,072  | 0,084  | 0,096  | 0,108  | 0,12  |
|          | ≤ 1100 N/mm² | 1xD | 0,4xD | 175 | 0,018     | 0,036  | 0,048  | 0,06  | 0,072  | 0,084  | 0,096  | 0,108  | 0,12  |
|          | ≤ 900 N/mm²  | 1xD | 0,4xD | 120 | 0,018     | 0,036  | 0,048  | 0,06  | 0,072  | 0,084  | 0,096  | 0,108  | 0,12  |
|          | ≤ 1100 N/mm² | 1xD | 0,4xD | 100 | 0,018     | 0,036  | 0,048  | 0,06  | 0,072  | 0,084  | 0,096  | 0,108  | 0,12  |
| K.1      | < 240 HB     | 1xD | 0,4xD | 150 | 0,018     | 0,036  | 0,048  | 0,06  | 0,072  | 0,084  | 0,096  | 0,108  | 0,12  |
| S.2      | ≤ 1250 N/mm² | 1xD | 0,4xD | 50  | 0,0126    | 0,0252 | 0,0336 | 0,042 | 0,0504 | 0,0588 | 0,0672 | 0,0756 | 0,084 |
| H.1      | < 54 HRC     | 1xD | 0,4xD | 120 | 0,018     | 0,036  | 0,048  | 0,06  | 0,072  | 0,084  | 0,096  | 0,108  | 0,12  |
| H.2      | 54 - 60 HRC  | 1xD | 0,4xD | 100 | 0,018     | 0,036  | 0,048  | 0,06  | 0,072  | 0,084  | 0,096  | 0,108  | 0,12  |

- EN** End Mills | short, 1 tooth cut over centre, 30°  
**DE** Schafffräser | Kurz, Zentrumschnitt, 30°  
**RU** Фрезы концевые с цилиндрическим хвостовиком | короткие с центрорежущим зубом, 30°



## S1204

## S1204



| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z |
|-----------|----------|----------------|----------------|---|
| 3         | 6        | 50             | 4              | 3 |
| 3,5       | 6        | 50             | 4              | 3 |
| 4         | 6        | 54             | 5              | 3 |
| 4,5       | 6        | 54             | 5              | 3 |
| 5         | 6        | 54             | 6              | 3 |
| 6         | 6        | 54             | 7              | 3 |
| 8         | 8        | 58             | 9              | 3 |
| 10        | 10       | 66             | 11             | 3 |
| 12        | 12       | 73             | 12             | 3 |
| 14        | 14       | 75             | 14             | 3 |
| 16        | 16       | 82             | 16             | 3 |
| 18        | 18       | 84             | 18             | 3 |
| 20        | 20       | 92             | 20             | 3 |

| S120402 | S120412 |
|---------|---------|
| .030    | .030    |
| .035    | .035    |
| .040    | .040    |
| .045    | .045    |
| .050    | .050    |
| .060    | .060    |
| .080    | .080    |
| .100    | .100    |
| .120    | .120    |
| .140    | .140    |
| .160    | .160    |
| .180    | .180    |
| .200    | .200    |

### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material |                 | ap     | ae    | vc  | fz (mm/z) |      |      |      |      |      |      |      |
|----------|-----------------|--------|-------|-----|-----------|------|------|------|------|------|------|------|
|          |                 |        |       |     | Ø 3       | Ø 6  | Ø 8  | Ø 10 | Ø 12 | Ø 16 | Ø 18 | Ø 20 |
| P.1      | ≤ 600 N/mm²     | 0,75xD | 0,2xD | 200 | 0,015     | 0,03 | 0,04 | 0,05 | 0,03 | 0,08 | 0,09 | 0,1  |
| P.3      | ≤ 1100 N/mm²    | 0,75xD | 0,2xD | 120 | 0,015     | 0,03 | 0,04 | 0,05 | 0,03 | 0,08 | 0,09 | 0,1  |
| P.5      | ≤ 1100 N/mm²    | 0,75xD | 0,2xD | 90  | 0,015     | 0,03 | 0,04 | 0,05 | 0,03 | 0,08 | 0,09 | 0,1  |
| M.1      | ≤ 750 N/mm²     | 0,75xD | 0,2xD | 100 | 0,015     | 0,03 | 0,04 | 0,05 | 0,03 | 0,08 | 0,09 | 0,1  |
| M.2      | 750 - 850 N/mm² | 0,75xD | 0,2xD | 80  | 0,015     | 0,03 | 0,04 | 0,05 | 0,03 | 0,08 | 0,09 | 0,1  |
| K.1      | < 240 HB        | 0,75xD | 0,2xD | 150 | 0,015     | 0,03 | 0,04 | 0,05 | 0,03 | 0,08 | 0,09 | 0,1  |
| K.2      | > 240 HB        | 0,75xD | 0,2xD | 120 | 0,015     | 0,03 | 0,04 | 0,05 | 0,03 | 0,08 | 0,09 | 0,1  |
| S.1      | ≤ 1500 N/mm²    | 0,75xD | 0,2xD | 60  | 0,015     | 0,03 | 0,04 | 0,05 | 0,03 | 0,08 | 0,09 | 0,1  |

EN End Mills | long, 1 tooth cut over centre, 30°

DE Schafffräser | Lang, Zentrumschnitt, 30°

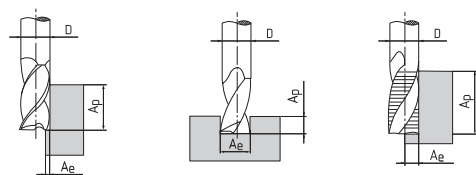
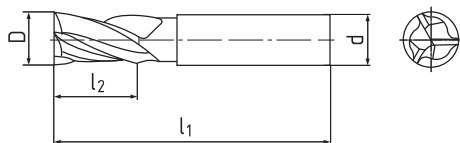
RU Фрезы концевые с цилиндрическим хвостовиком | длинные с центрорежущим зубом, 30°



S1214

S1214

SC



| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z | S121402 | S121412 |
|-----------|----------|----------------|----------------|---|---------|---------|
| 3         | 6        | 57             | 7              | 3 | .030    | .030    |
| 3,5       | 6        | 57             | 7              | 3 | .035    | .035    |
| 4         | 6        | 57             | 8              | 3 | .040    | .040    |
| 4,5       | 6        | 57             | 8              | 3 | .045    | .045    |
| 5         | 6        | 57             | 10             | 3 | .050    | .050    |
| 6         | 6        | 57             | 10             | 3 | .060    | .060    |
| 8         | 8        | 63             | 16             | 3 | .080    | .080    |
| 10        | 10       | 72             | 19             | 3 | .100    | .100    |
| 12        | 12       | 83             | 22             | 3 | .120    | .120    |
| 14        | 14       | 83             | 22             | 3 | .140    | .140    |
| 16        | 16       | 92             | 26             | 3 | .160    | .160    |
| 18        | 18       | 92             | 26             | 3 | .180    | .180    |
| 20        | 20       | 104            | 32             | 3 | .200    | .200    |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

|          |     |                 |       |       | fz (mm/z) |      |      |       |       |      |       |      |       |
|----------|-----|-----------------|-------|-------|-----------|------|------|-------|-------|------|-------|------|-------|
| Material |     | ap              | ae    | vc    | Ø 3       | Ø 6  | Ø 8  | Ø 10  | Ø 12  | Ø 16 | Ø 18  | Ø 20 |       |
|          | P.1 | ≤ 600 N/mm²     | 1,5xD | 0,2xD | 180       | 0,01 | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
|          | P.3 | ≤ 1100 N/mm²    | 1,5xD | 0,2xD | 100       | 0,01 | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
|          | P.5 | ≤ 1100 N/mm²    | 1,5xD | 0,2xD | 80        | 0,01 | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
|          | M.1 | ≤ 750 N/mm²     | 1,5xD | 0,2xD | 90        | 0,01 | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
|          | M.2 | 750 - 850 N/mm² | 1,5xD | 0,2xD | 80        | 0,01 | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
|          | K.1 | < 240 HB        | 1,5xD | 0,2xD | 140       | 0,01 | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
|          | K.2 | > 240 HB        | 1,5xD | 0,2xD | 100       | 0,01 | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
|          | S.1 | ≤ 1500 N/mm²    | 1,5xD | 0,2xD | 50        | 0,01 | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |

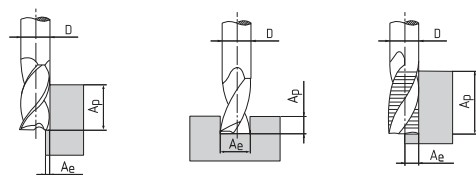
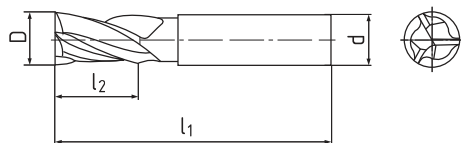


- EN** End Mills | short, 1 tooth cut over centre, 45°  
**DE** Schafffräser | Kurz, Zentrumschnitt, 45°  
**RU** Фрезы концевые с цилиндрическим хвостовиком | короткие с центрорежущим зубом, 45°



## S1404

## S1404



| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z |
|-----------|----------|----------------|----------------|---|
| 3         | 6        | 50             | 4              | 3 |
| 3,5       | 6        | 50             | 4              | 3 |
| 4         | 6        | 54             | 5              | 3 |
| 4,5       | 6        | 54             | 5              | 3 |
| 5         | 6        | 54             | 6              | 3 |
| 6         | 6        | 54             | 7              | 3 |
| 8         | 8        | 58             | 9              | 3 |
| 10        | 10       | 66             | 11             | 3 |
| 12        | 12       | 73             | 12             | 3 |
| 14        | 14       | 75             | 14             | 3 |
| 16        | 16       | 82             | 16             | 3 |
| 18        | 18       | 84             | 18             | 3 |
| 20        | 20       | 92             | 20             | 3 |

| S140402 | S140412 |
|---------|---------|
| .030    | .030    |
| .035    | .035    |
| .040    | .040    |
| .045    | .045    |
| .050    | .050    |
| .060    | .060    |
| .080    | .080    |
| .100    | .100    |
| .120    | .120    |
| .140    | .140    |
| .160    | .160    |
| .180    | .180    |
| .200    | .200    |

### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material |                 | ap     | ae    | vc  | fz (mm/z) |      |       |       |      |       |      |       |
|----------|-----------------|--------|-------|-----|-----------|------|-------|-------|------|-------|------|-------|
|          |                 |        |       |     | Ø 3       | Ø 6  | Ø 8   | Ø 10  | Ø 12 | Ø 16  | Ø 18 | Ø 20  |
| P.1      | ≤ 600 N/mm²     | 0,75xD | 0,2xD | 200 | 0,025     | 0,05 | 0,067 | 0,083 | 0,1  | 0,133 | 0,15 | 0,167 |
| P.3      | ≤ 1100 N/mm²    | 0,75xD | 0,2xD | 120 | 0,025     | 0,05 | 0,067 | 0,083 | 0,1  | 0,133 | 0,15 | 0,167 |
| P.5      | ≤ 1100 N/mm²    | 0,75xD | 0,2xD | 90  | 0,025     | 0,05 | 0,067 | 0,083 | 0,1  | 0,133 | 0,15 | 0,167 |
| M.1      | ≤ 750 N/mm²     | 0,75xD | 0,2xD | 100 | 0,025     | 0,05 | 0,067 | 0,083 | 0,1  | 0,133 | 0,15 | 0,167 |
| M.2      | 750 - 850 N/mm² | 0,75xD | 0,2xD | 80  | 0,025     | 0,05 | 0,067 | 0,083 | 0,1  | 0,133 | 0,15 | 0,167 |
| K.1      | < 240 HB        | 0,75xD | 0,2xD | 150 | 0,025     | 0,05 | 0,067 | 0,083 | 0,1  | 0,133 | 0,15 | 0,167 |
| K.2      | > 240 HB        | 0,75xD | 0,2xD | 120 | 0,025     | 0,05 | 0,067 | 0,083 | 0,1  | 0,133 | 0,15 | 0,167 |
| S.1      | ≤ 1500 N/mm²    | 0,75xD | 0,2xD | 60  | 0,025     | 0,05 | 0,067 | 0,083 | 0,1  | 0,133 | 0,15 | 0,167 |
| H.1      | < 54 HRC        | 0,75xD | 0,2xD | 60  | 0,025     | 0,05 | 0,067 | 0,083 | 0,1  | 0,133 | 0,15 | 0,167 |

EN End Mills | long, 1 tooth cut over centre, 45°

DE Schafffräser | Lang, Zentrumschnitt, 45°

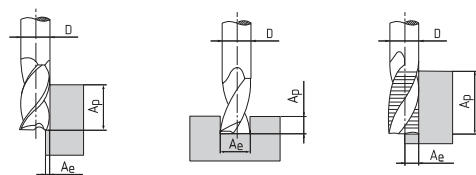
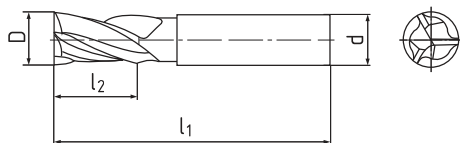
RU Фрезы концевые с цилиндрическим хвостовиком | длинные с центроврежущим зубом, 45°



S1414

S1414

SC



| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z |
|-----------|----------|----------------|----------------|---|
| 3         | 6        | 57             | 7              | 3 |
| 3,5       | 6        | 57             | 7              | 3 |
| 4         | 6        | 57             | 8              | 3 |
| 4,5       | 6        | 57             | 8              | 3 |
| 5         | 6        | 57             | 10             | 3 |
| 6         | 6        | 57             | 10             | 3 |
| 8         | 8        | 63             | 16             | 3 |
| 10        | 10       | 72             | 19             | 3 |
| 12        | 12       | 83             | 22             | 3 |
| 14        | 14       | 83             | 22             | 3 |
| 16        | 16       | 92             | 26             | 3 |
| 18        | 18       | 92             | 26             | 3 |
| 20        | 20       | 104            | 32             | 3 |

S141402

S141412

|      |      |
|------|------|
| .030 | .030 |
| .035 | .035 |
| .040 | .040 |
| .045 | .045 |
| .050 | .050 |
| .060 | .060 |
| .080 | .080 |
| .100 | .100 |
| .120 | .120 |
| .140 | .140 |
| .160 | .160 |
| .180 | .180 |
| .200 | .200 |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material | ap                          | ae    | vc    | fz (mm/z) |      |      |       |       |      |       |       |
|----------|-----------------------------|-------|-------|-----------|------|------|-------|-------|------|-------|-------|
|          |                             |       |       | Ø 3       | Ø 6  | Ø 8  | Ø 10  | Ø 12  | Ø 16 | Ø 18  | Ø 20  |
| P.1      | ≤ 600 N/mm <sup>2</sup>     | 1,5xD | 0,2xD | 180       | 0,02 | 0,04 | 0,053 | 0,067 | 0,08 | 0,107 | 0,133 |
| P.3      | ≤ 1100 N/mm <sup>2</sup>    | 1,5xD | 0,2xD | 100       | 0,02 | 0,04 | 0,053 | 0,067 | 0,08 | 0,107 | 0,133 |
| P.5      | ≤ 1100 N/mm <sup>2</sup>    | 1,5xD | 0,2xD | 80        | 0,02 | 0,04 | 0,053 | 0,067 | 0,08 | 0,107 | 0,133 |
| M.1      | ≤ 750 N/mm <sup>2</sup>     | 1,5xD | 0,2xD | 90        | 0,02 | 0,04 | 0,053 | 0,067 | 0,08 | 0,107 | 0,133 |
| M.2      | 750 - 850 N/mm <sup>2</sup> | 1,5xD | 0,2xD | 140       | 0,02 | 0,04 | 0,053 | 0,067 | 0,08 | 0,107 | 0,133 |
| K.1      | < 240 HB                    | 1,5xD | 0,2xD | 100       | 0,02 | 0,04 | 0,053 | 0,067 | 0,08 | 0,107 | 0,133 |
| K.2      | > 240 HB                    | 1,5xD | 0,2xD | 50        | 0,02 | 0,04 | 0,053 | 0,067 | 0,08 | 0,107 | 0,133 |
| S.1      | ≤ 1500 N/mm <sup>2</sup>    | 1,5xD | 0,2xD | 70        | 0,02 | 0,04 | 0,053 | 0,067 | 0,08 | 0,107 | 0,133 |

EN End Mills | short, 2 teeth cut to centre, 30°

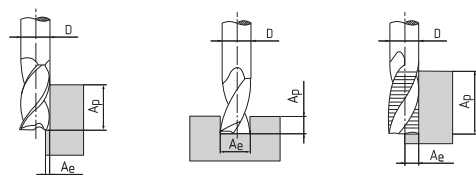
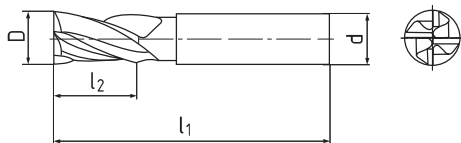
DE Schafffräser | Kurz, bis Mitte Schneidend, 30°

RU Фрезы концевые с цилиндрическим хвостовиком | короткие с центрорежущим зубом, 30°



## S1206

## S1206



| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z |
|-----------|----------|----------------|----------------|---|
| 3         | 6        | 50             | 5              | 4 |
| 3,5       | 6        | 50             | 6              | 4 |
| 4         | 6        | 54             | 8              | 4 |
| 4,5       | 6        | 54             | 8              | 4 |
| 5         | 6        | 54             | 9              | 4 |
| 6         | 6        | 54             | 10             | 4 |
| 8         | 8        | 58             | 12             | 4 |
| 10        | 10       | 66             | 14             | 4 |
| 12        | 12       | 73             | 16             | 4 |
| 14        | 14       | 75             | 18             | 4 |
| 16        | 16       | 82             | 22             | 4 |
| 18        | 18       | 84             | 24             | 4 |
| 20        | 20       | 92             | 26             | 4 |

| S120602 | S120612 |
|---------|---------|
| .030    | .030    |
| .035    | .035    |
| .040    | .040    |
| .045    | .045    |
| .050    | .050    |
| .060    | .060    |
| .080    | .080    |
| .100    | .100    |
| .120    | .120    |
| .140    | .140    |
| .160    | .160    |
| .180    | .180    |
| .200    | .200    |

### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material |                 | a <sub>p</sub> | a <sub>e</sub> | v <sub>c</sub> | f <sub>z</sub> (mm/z) |      |      |      |      |      |      |      |
|----------|-----------------|----------------|----------------|----------------|-----------------------|------|------|------|------|------|------|------|
|          |                 |                |                |                | Ø 3                   | Ø 6  | Ø 8  | Ø 10 | Ø 12 | Ø 16 | Ø 18 | Ø 20 |
| P.1      | ≤ 600 N/mm²     | 1xD            | 0,2xD          | 200            | 0,015                 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,09 | 0,1  |
| P.3      | ≤ 1100 N/mm²    | 1xD            | 0,2xD          | 120            | 0,015                 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,09 | 0,1  |
| P.5      | ≤ 1100 N/mm²    | 1xD            | 0,2xD          | 90             | 0,015                 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,09 | 0,1  |
| M.1      | ≤ 750 N/mm²     | 1xD            | 0,2xD          | 100            | 0,015                 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,09 | 0,1  |
| M.2      | 750 - 850 N/mm² | 1xD            | 0,2xD          | 80             | 0,015                 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,09 | 0,1  |
| K.1      | < 240 HB        | 1xD            | 0,2xD          | 150            | 0,015                 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,09 | 0,1  |
| K.2      | > 240 HB        | 1xD            | 0,2xD          | 120            | 0,015                 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,09 | 0,1  |
| S.1      | ≤ 1500 N/mm²    | 1xD            | 0,2xD          | 60             | 0,015                 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,09 | 0,1  |

EN End Mills | long, 2 teeth cut to centre, 30°

DE Schafffräser | Lang, bis Mitte Schneidend, 30°

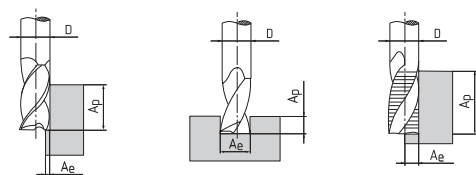
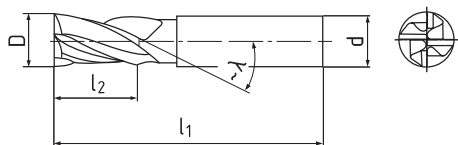
RU Фрезы концевые с цилиндрическим хвостовиком | длинные с центрорежущим зубом, 30°



S1216

S1216

SC



| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z |
|-----------|----------|----------------|----------------|---|
| 3         | 6        | 57             | 8              | 4 |
| 3,5       | 6        | 57             | 10             | 4 |
| 4         | 6        | 57             | 11             | 4 |
| 4,5       | 6        | 57             | 11             | 4 |
| 5         | 6        | 57             | 13             | 4 |
| 6         | 6        | 57             | 13             | 4 |
| 8         | 8        | 63             | 19             | 4 |
| 10        | 10       | 72             | 22             | 4 |
| 12        | 12       | 83             | 26             | 4 |
| 14        | 14       | 83             | 26             | 4 |
| 16        | 16       | 92             | 32             | 4 |
| 18        | 18       | 92             | 32             | 4 |
| 20        | 20       | 104            | 38             | 4 |

S121602

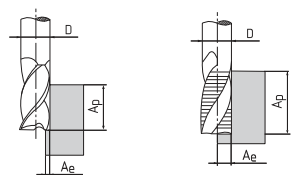
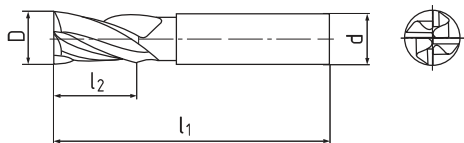
S121612

|      |      |
|------|------|
| .030 | .030 |
| .035 | .035 |
| .040 | .040 |
| .045 | .045 |
| .050 | .050 |
| .060 | .060 |
| .080 | .080 |
| .100 | .100 |
| .120 | .120 |
| .140 | .140 |
| .160 | .160 |
| .180 | .180 |
| .200 | .200 |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

|          |     |                 |        |       | fz (mm/z) |      |      |       |       |      |       |      |       |
|----------|-----|-----------------|--------|-------|-----------|------|------|-------|-------|------|-------|------|-------|
| Material |     | ap              | ae     | vc    | Ø 3       | Ø 6  | Ø 8  | Ø 10  | Ø 12  | Ø 16 | Ø 18  | Ø 20 |       |
|          | P.1 | ≤ 600 N/mm²     | 1,75xD | 0,2xD | 180       | 0,01 | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
|          | P.3 | ≤ 1100 N/mm²    | 1,75xD | 0,2xD | 100       | 0,01 | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
|          | P.5 | ≤ 1100 N/mm²    | 1,75xD | 0,2xD | 80        | 0,01 | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
|          | M.1 | ≤ 750 N/mm²     | 1,75xD | 0,2xD | 90        | 0,01 | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
|          | M.2 | 750 - 850 N/mm² | 1,75xD | 0,2xD | 80        | 0,01 | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
|          | K.1 | < 240 HB        | 1,75xD | 0,2xD | 140       | 0,01 | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
|          | K.2 | > 240 HB        | 1,75xD | 0,2xD | 100       | 0,01 | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
|          | S.1 | ≤ 1500 N/mm²    | 1,75xD | 0,2xD | 50        | 0,01 | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |

- EN End Mills | long, fine teeth, 45°  
 DE Schafffräser | Lang, feingezahnt, 45°  
 RU Фрезы концевые с цилиндрическим хвостовиком | длинные, мелкозубые, 45°

**S1316****S1316**

| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | z |
|-----------|----------|----------------|----------------|---|
| 6         | 6        | 57             | 13             | 6 |
| 8         | 8        | 63             | 19             | 6 |
| 10        | 10       | 72             | 22             | 6 |
| 12        | 12       | 83             | 26             | 6 |
| 14        | 14       | 83             | 26             | 6 |
| 16        | 16       | 92             | 32             | 6 |
| 18        | 18       | 92             | 32             | 8 |
| 20        | 20       | 104            | 38             | 8 |

**S131602****S131612**

|      |      |
|------|------|
| .060 | .060 |
| .080 | .080 |
| .100 | .100 |
| .120 | .120 |
| .140 | .140 |
| .160 | .160 |
| .180 | .180 |
| .200 | .200 |

### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material |                 | ap     | ae    | vc  | fz (mm/z) |      |      |      |      |      |      |
|----------|-----------------|--------|-------|-----|-----------|------|------|------|------|------|------|
|          |                 |        |       |     | Ø 6       | Ø 8  | Ø 10 | Ø 12 | Ø 16 | Ø 18 | Ø 20 |
| P.1      | ≤ 600 N/mm²     | 1,75xD | 0,5XD | 180 | 0,03      | 0,04 | 0,05 | 0,06 | 0,08 | 0,09 | 0,1  |
| P.3      | ≤ 1100 N/mm²    | 1,75xD | 0,5XD | 100 | 0,03      | 0,04 | 0,05 | 0,06 | 0,08 | 0,09 | 0,1  |
| P.5      | ≤ 1100 N/mm²    | 1,75xD | 0,5XD | 80  | 0,03      | 0,04 | 0,05 | 0,06 | 0,08 | 0,09 | 0,1  |
| M.1      | ≤ 750 N/mm²     | 1,75xD | 0,5XD | 90  | 0,03      | 0,04 | 0,05 | 0,06 | 0,08 | 0,09 | 0,1  |
| M.2      | 750 - 850 N/mm² | 1,75xD | 0,5XD | 80  | 0,03      | 0,04 | 0,05 | 0,06 | 0,08 | 0,09 | 0,1  |
| K.1      | < 240 HB        | 1,75xD | 0,5XD | 140 | 0,03      | 0,04 | 0,05 | 0,06 | 0,08 | 0,09 | 0,1  |
| K.2      | > 240 HB        | 1,75xD | 0,5XD | 100 | 0,03      | 0,04 | 0,05 | 0,06 | 0,08 | 0,09 | 0,1  |
| S.1      | ≤ 1500 N/mm²    | 1,75xD | 0,5XD | 50  | 0,03      | 0,04 | 0,05 | 0,06 | 0,08 | 0,09 | 0,1  |
| H.1      | < 54 HRC        | 1,75xD | 0,5XD | 80  | 0,03      | 0,04 | 0,05 | 0,06 | 0,08 | 0,09 | 0,1  |

EN End Mills | extra long, fine teeth, 45°

DE Schafffräser | Extra Lang, feingezahnt, 45°

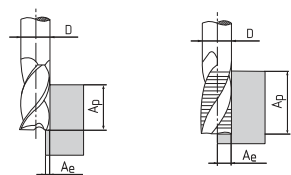
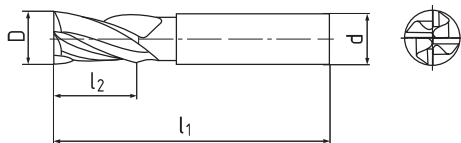
RU Фрезы концевые с цилиндрическим хвостовиком | экстра длинные, мелкозубые, 45°



S1316L

S1316L

SC



| D<br>k 12 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | z |
|-----------|----------|----------------|----------------|---|
| 6         | 6        | 62             | 18             | 6 |
| 8         | 8        | 68             | 24             | 6 |
| 10        | 10       | 80             | 30             | 6 |
| 12        | 12       | 93             | 36             | 6 |
| 14        | 14       | 100            | 45             | 6 |
| 16        | 16       | 108            | 48             | 6 |
| 18        | 18       | 115            | 55             | 8 |
| 20        | 20       | 126            | 60             | 8 |

S131602L

S131612L

|      |      |
|------|------|
| .060 | .060 |
| .080 | .080 |
| .100 | .100 |
| .120 | .120 |
| .140 | .140 |
| .160 | .160 |
| .180 | .180 |
| .200 | .200 |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

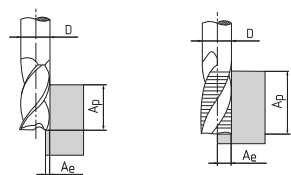
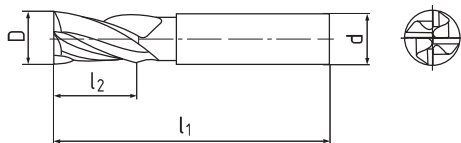
| Material | ap                          | ae     | vc     | fz (mm/z) |      |       |       |      |       |      |       |
|----------|-----------------------------|--------|--------|-----------|------|-------|-------|------|-------|------|-------|
|          |                             |        |        | Ø 6       | Ø 8  | Ø 10  | Ø 12  | Ø 16 | Ø 18  | Ø 20 |       |
| P.1      | ≤ 600 N/mm <sup>2</sup>     | 2,75xD | 0,05xD | 180       | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
| P.3      | ≤ 1100 N/mm <sup>2</sup>    | 2,75xD | 0,05xD | 100       | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
| P.5      | ≤ 1100 N/mm <sup>2</sup>    | 2,75xD | 0,05xD | 80        | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
| M.1      | ≤ 750 N/mm <sup>2</sup>     | 2,75xD | 0,05xD | 90        | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
| M.2      | 750 - 850 N/mm <sup>2</sup> | 2,75xD | 0,05xD | 80        | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
| K.1      | < 240 HB                    | 2,75xD | 0,05xD | 140       | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
| K.2      | > 240 HB                    | 2,75xD | 0,05xD | 100       | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
| S.1      | ≤ 1500 N/mm <sup>2</sup>    | 2,75xD | 0,05xD | 50        | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |
| H.1      | < 54 HRC                    | 2,75xD | 0,05xD | 80        | 0,02 | 0,027 | 0,033 | 0,04 | 0,053 | 0,06 | 0,067 |

- EN End Mills | extra<sup>X</sup> long, fine teeth, 45°
- DE Schafffräser | Extra<sup>X</sup> Lang, feingezahnt, 45°
- RU Фрезы концевые с цилиндрическим хвостовиком | экстра<sup>X</sup> длинные, мелкозубые, 45°



## S1316E

## S1316E



| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z |
|-----------|----------|----------------|----------------|---|
| 6         | 6        | 80             | 36             | 6 |
| 8         | 8        | 90             | 46             | 6 |
| 10        | 10       | 100            | 50             | 6 |
| 12        | 12       | 120            | 65             | 6 |
| 16        | 16       | 140            | 80             | 6 |
| 20        | 20       | 160            | 94             | 8 |

| S131602E | S131612E |
|----------|----------|
| .060     | .060     |
| .080     | .080     |
| .100     | .100     |
| .120     | .120     |
| .160     | .160     |
| .200     | .200     |

### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                        | a <sub>p</sub> | a <sub>e</sub> | v <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |      |       |       |
|---------------------------------|----------------|----------------|----------------|-----------------------|-------|-------|------|-------|-------|
|                                 |                |                |                | Ø 6                   | Ø 8   | Ø 10  | Ø 12 | Ø 16  | Ø 20  |
| P.1 ≤ 600 N/mm <sup>2</sup>     | 3,5xD          | 0,05xD         | 180            | 0,02                  | 0,027 | 0,033 | 0,04 | 0,053 | 0,067 |
| P.3 ≤ 1100 N/mm <sup>2</sup>    | 3,5xD          | 0,05xD         | 100            | 0,02                  | 0,027 | 0,033 | 0,04 | 0,053 | 0,067 |
| P.5 ≤ 1100 N/mm <sup>2</sup>    | 3,5xD          | 0,05xD         | 80             | 0,02                  | 0,027 | 0,033 | 0,04 | 0,053 | 0,067 |
| M.1 ≤ 750 N/mm <sup>2</sup>     | 3,5xD          | 0,05xD         | 90             | 0,02                  | 0,027 | 0,033 | 0,04 | 0,053 | 0,067 |
| M.2 750 - 850 N/mm <sup>2</sup> | 3,5xD          | 0,05xD         | 80             | 0,02                  | 0,027 | 0,033 | 0,04 | 0,053 | 0,067 |
| K.1 < 240 HB                    | 3,5xD          | 0,05xD         | 140            | 0,02                  | 0,027 | 0,033 | 0,04 | 0,053 | 0,067 |
| K.2 > 240 HB                    | 3,5xD          | 0,05xD         | 100            | 0,02                  | 0,027 | 0,033 | 0,04 | 0,053 | 0,067 |
| S.1 ≤ 1500 N/mm <sup>2</sup>    | 3,5xD          | 0,05xD         | 50             | 0,02                  | 0,027 | 0,033 | 0,04 | 0,053 | 0,067 |
| H.1 < 54 HRC                    | 3,5xD          | 0,05xD         | 80             | 0,02                  | 0,027 | 0,033 | 0,04 | 0,053 | 0,067 |

EN End Mills | long, 2 teeth cut to centre, 35°-38°

DE Schafffräser | Lang, bis Mitte Schneidend, 35°-38°

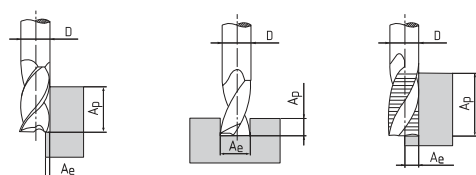
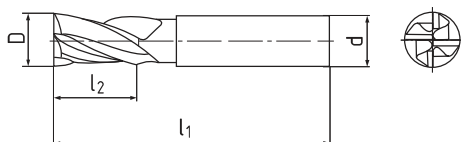
RU Фрезы концевые с цилиндрическим хвостовиком | длинные с центрорежущим зубом, 35°-38°



S1416X

S1416X

SC



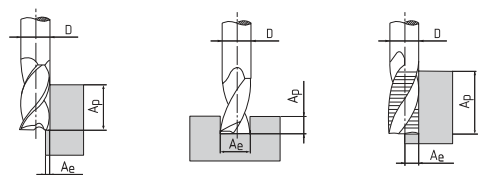
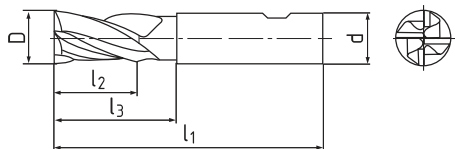
| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z | S141602X | S141612X |
|-----------|----------|----------------|----------------|---|----------|----------|
| 3         | 6        | 57             | 8              | 4 | .030     | .030     |
| 3,5       | 6        | 57             | 10             | 4 | .035     | .035     |
| 4         | 6        | 57             | 11             | 4 | .040     | .040     |
| 4,5       | 6        | 57             | 11             | 4 | .045     | .045     |
| 5         | 6        | 57             | 13             | 4 | .050     | .050     |
| 6         | 6        | 57             | 13             | 4 | .060     | .060     |
| 8         | 8        | 63             | 19             | 4 | .080     | .080     |
| 10        | 10       | 72             | 22             | 4 | .100     | .100     |
| 12        | 12       | 83             | 26             | 4 | .120     | .120     |
| 14        | 14       | 83             | 26             | 4 | .140     | .140     |
| 16        | 16       | 92             | 32             | 4 | .160     | .160     |
| 18        | 18       | 92             | 32             | 4 | .180     | .180     |
| 20        | 20       | 104            | 38             | 4 | .200     | .200     |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material | ap                          | ae    | vc    | fz (mm/z) |       |       |       |      |       |       |      |
|----------|-----------------------------|-------|-------|-----------|-------|-------|-------|------|-------|-------|------|
|          |                             |       |       | Ø 3       | Ø 6   | Ø 8   | Ø 10  | Ø 12 | Ø 16  | Ø 18  | Ø 20 |
| P.1      | ≤ 600 N/mm <sup>2</sup>     | 1,5xD | 0,3xD | 180       | 0,012 | 0,024 | 0,032 | 0,04 | 0,048 | 0,064 | 0,08 |
| P.3      | ≤ 1100 N/mm <sup>2</sup>    | 1,5xD | 0,3xD | 100       | 0,012 | 0,024 | 0,032 | 0,04 | 0,048 | 0,064 | 0,08 |
| P.5      | ≤ 1100 N/mm <sup>2</sup>    | 1,5xD | 0,3xD | 80        | 0,012 | 0,024 | 0,032 | 0,04 | 0,048 | 0,064 | 0,08 |
| M.1      | ≤ 750 N/mm <sup>2</sup>     | 1,5xD | 0,3xD | 90        | 0,012 | 0,024 | 0,032 | 0,04 | 0,048 | 0,064 | 0,08 |
| M.2      | 750 - 850 N/mm <sup>2</sup> | 1,5xD | 0,3xD | 80        | 0,012 | 0,024 | 0,032 | 0,04 | 0,048 | 0,064 | 0,08 |
| K.1      | < 240 HB                    | 1,5xD | 0,3xD | 140       | 0,012 | 0,024 | 0,032 | 0,04 | 0,048 | 0,064 | 0,08 |
| K.2      | > 240 HB                    | 1,5xD | 0,3xD | 100       | 0,012 | 0,024 | 0,032 | 0,04 | 0,048 | 0,064 | 0,08 |
| S.1      | ≤ 1500 N/mm <sup>2</sup>    | 1,5xD | 0,3xD | 50        | 0,012 | 0,024 | 0,032 | 0,04 | 0,048 | 0,064 | 0,08 |
| H.1      | < 54 HRC                    | 1,5xD | 0,3xD | 80        | 0,012 | 0,024 | 0,032 | 0,04 | 0,048 | 0,064 | 0,08 |



- EN End Mills | short, 2 teeth cut to centre, 35°-38° | suitable for drilling  
 DE Schafffräser | Kurz, bis Mitte Schneidend, 35°-38° | geeignet für Bohren  
 RU Фрезы концевые с цилиндрическим хвостовиком | короткие с центрорежущим зубом, 35°-38°

**S1416D****S1416D**

| D<br>k 12 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | l <sub>3</sub> | Dn   | Z | S141602D | S141612D |
|-----------|----------|----------------|----------------|----------------|------|---|----------|----------|
| 5,7       | 6        | 57             | 13             | 19             | 5,4  | 4 | .057     | .057     |
| 6,0       | 6        | 57             | 13             | 19             | 5,7  | 4 | .060     | .060     |
| 7,7       | 8        | 63             | 19             | 25             | 7,3  | 4 | .077     | .077     |
| 8,0       | 8        | 63             | 19             | 25             | 7,6  | 4 | .080     | .080     |
| 9,7       | 10       | 72             | 22             | 30             | 9,2  | 4 | .097     | .097     |
| 10,0      | 10       | 72             | 22             | 30             | 9,5  | 4 | .100     | .100     |
| 11,7      | 12       | 83             | 26             | 36             | 11,2 | 4 | .117     | .117     |
| 12,0      | 12       | 83             | 26             | 36             | 11,5 | 4 | .120     | .120     |
| 13,7      | 14       | 83             | 26             | 36             | 13,2 | 4 | .137     | .137     |
| 14,0      | 14       | 83             | 26             | 36             | 13,5 | 4 | .140     | .140     |
| 15,6      | 16       | 92             | 32             | 42             | 15,1 | 4 | .156     | .156     |
| 16,0      | 16       | 92             | 32             | 42             | 15,5 | 4 | .160     | .160     |
| 19,5      | 20       | 104            | 38             | 52             | 19   | 4 | .195     | .195     |
| 20,0      | 20       | 104            | 38             | 52             | 19,5 | 4 | .200     | .200     |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material |                 | ap    | ae    | vc  | fz (mm/z) |       |       |       |       |        |
|----------|-----------------|-------|-------|-----|-----------|-------|-------|-------|-------|--------|
|          |                 |       |       |     | Ø 6       | Ø 8   | Ø 10  | Ø 12  | Ø 16  | Ø 16,5 |
| P.1      | ≤ 600 N/mm²     | 0,3xD | 1,5xD | 240 | 0,045     | 0,06  | 0,07  | 0,085 | 0,115 | 0,14   |
| P.2      | ≤ 850 N/mm²     | 0,3xD | 1,5xD | 200 | 0,045     | 0,06  | 0,07  | 0,085 | 0,115 | 0,14   |
| P.3      | ≤ 1100 N/mm²    | 0,3xD | 1,5xD | 175 | 0,04      | 0,055 | 0,065 | 0,08  | 0,1   | 0,12   |
| P.4      | ≤ 900 N/mm²     | 0,3xD | 1,5xD | 156 | 0,035     | 0,05  | 0,06  | 0,075 | 0,085 | 0,1    |
| P.5      | ≤ 1100 N/mm²    | 0,3xD | 1,5xD | 100 | 0,035     | 0,05  | 0,06  | 0,075 | 0,085 | 0,1    |
| M.1      | ≤ 750 N/mm²     | 0,3xD | 1,5xD | 110 | 0,03      | 0,04  | 0,055 | 0,07  | 0,075 | 0,085  |
| M.2      | 750 - 850 N/mm² | 0,3xD | 1,5xD | 90  | 0,03      | 0,04  | 0,05  | 0,055 | 0,07  | 0,08   |
| K.1      | < 240 HB        | 0,3xD | 1,5xD | 150 | 0,03      | 0,045 | 0,06  | 0,075 | 0,09  | 0,11   |
| S.2      | ≤ 1250 N/mm²    | 0,3xD | 1,5xD | 70  | 0,03      | 0,04  | 0,05  | 0,075 | 0,07  | 0,08   |

EN End Mills | short, 2 teeth cut to centre, 35°-38°

DE Schafffräser | Kurz, bis Mitte Schneidend, 35°-38°

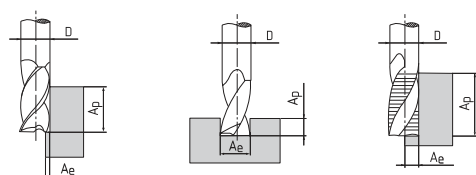
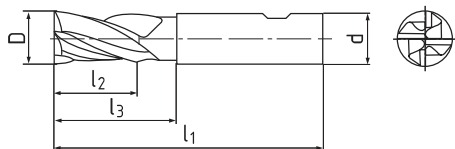
RU Фрезы концевые с цилиндрическим хвостовиком | короткие с центрорежущим зубом, 35°-38°



S1406N

S1406N

SC



| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | l <sub>3</sub> | Dn   | Z | S140602N | S140612N |
|-----------|----------|----------------|----------------|----------------|------|---|----------|----------|
| 3         | 6        | 50             | 5              | 9              | 2,8  | 4 | .030     | .030     |
| 3,5       | 6        | 50             | 6              | 10             | 3,3  | 4 | .035     | .035     |
| 4         | 6        | 54             | 8              | 13             | 3,8  | 4 | .040     | .040     |
| 4,5       | 6        | 54             | 8              | 15             | 4,3  | 4 | .045     | .045     |
| 5         | 6        | 54             | 9              | 16             | 4,8  | 4 | .050     | .050     |
| 6         | 6        | 54             | 10             | 17             | 5,7  | 4 | .060     | .060     |
| 8         | 8        | 58             | 12             | 22             | 7,8  | 4 | .080     | .080     |
| 10        | 10       | 66             | 14             | 26             | 9,5  | 4 | .100     | .100     |
| 12        | 12       | 73             | 16             | 28             | 11,5 | 4 | .120     | .120     |
| 14        | 14       | 75             | 18             | 30             | 13,5 | 4 | .140     | .140     |
| 16        | 16       | 82             | 22             | 34             | 15,5 | 4 | .160     | .160     |
| 18        | 18       | 84             | 24             | 36             | 17,5 | 4 | .180     | .180     |
| 20        | 20       | 92             | 26             | 42             | 19,5 | 4 | .200     | .200     |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material | ap                          | ae  | vc    | fz (mm/z) |       |      |      |      |      |      |      |
|----------|-----------------------------|-----|-------|-----------|-------|------|------|------|------|------|------|
|          |                             |     |       | Ø 3       | Ø 6   | Ø 8  | Ø 10 | Ø 12 | Ø 16 | Ø 18 | Ø 20 |
| P.1      | ≤ 600 N/mm <sup>2</sup>     | 1xD | 0,3xD | 210       | 0,015 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |
| P.3      | ≤ 1100 N/mm <sup>2</sup>    | 1xD | 0,3xD | 175       | 0,015 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |
| P.5      | ≤ 1100 N/mm <sup>2</sup>    | 1xD | 0,3xD | 120       | 0,015 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |
| M.1      | ≤ 750 N/mm <sup>2</sup>     | 1xD | 0,3xD | 110       | 0,015 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |
| M.2      | 750 - 850 N/mm <sup>2</sup> | 1xD | 0,3xD | 90        | 0,015 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |
| K.1      | < 240 HB                    | 1xD | 0,3xD | 150       | 0,015 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |
| K.2      | > 240 HB                    | 1xD | 0,3xD | 110       | 0,015 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |
| S.1      | ≤ 1500 N/mm <sup>2</sup>    | 1xD | 0,3xD | 50        | 0,015 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |
| H.1      | < 54 HRC                    | 1xD | 0,3xD | 120       | 0,015 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |
| H.2      | 54 - 60 HRC                 | 1xD | 0,3xD | 100       | 0,015 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |

EN End Mills | long, 2 teeth cut to centre, 35°-38°

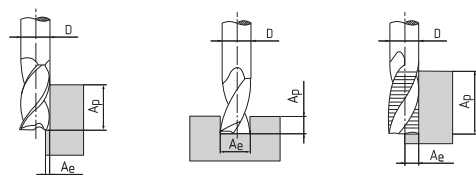
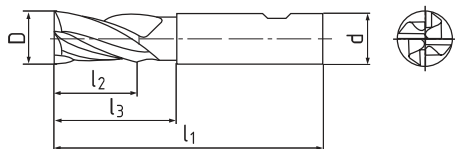
DE Schafffräser | Lang, bis Mitte Schneidend, 35°-38°

RU Фрезы концевые с цилиндрическим хвостовиком | длинные с центрорежущим зубом, 35°-38°



S1416N

S1416N



| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | l <sub>3</sub> | Dn   | Z |
|-----------|----------|----------------|----------------|----------------|------|---|
| 3         | 6        | 57             | 8              | 14             | 2,8  | 4 |
| 3,5       | 6        | 57             | 10             | 16             | 3,3  | 4 |
| 4         | 6        | 57             | 11             | 16             | 3,8  | 4 |
| 4,5       | 6        | 57             | 11             | 18             | 4,3  | 4 |
| 5         | 6        | 57             | 13             | 18             | 4,8  | 4 |
| 6         | 6        | 57             | 13             | 19             | 5,7  | 4 |
| 8         | 8        | 63             | 19             | 25             | 7,8  | 4 |
| 10        | 10       | 72             | 22             | 30             | 9,5  | 4 |
| 12        | 12       | 83             | 26             | 36             | 11,5 | 4 |
| 14        | 14       | 83             | 26             | 36             | 13,5 | 4 |
| 16        | 16       | 92             | 32             | 42             | 15,5 | 4 |
| 18        | 18       | 92             | 32             | 42             | 17,5 | 4 |
| 20        | 20       | 104            | 38             | 52             | 19,5 | 4 |

S141602N

141612N

|      |      |
|------|------|
| .030 | .030 |
| .035 | .035 |
| .040 | .040 |
| .045 | .045 |
| .050 | .050 |
| .060 | .060 |
| .080 | .080 |
| .100 | .100 |
| .120 | .120 |
| .140 | .140 |
| .160 | .160 |
| .180 | .180 |
| .200 | .200 |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material | ap                          | ae    | vc    | fz (mm/z) |       |      |      |      |      |      |      |
|----------|-----------------------------|-------|-------|-----------|-------|------|------|------|------|------|------|
|          |                             |       |       | Ø 3       | Ø 6   | Ø 8  | Ø 10 | Ø 12 | Ø 16 | Ø 18 | Ø 20 |
| P.1      | ≤ 600 N/mm <sup>2</sup>     | 1,5xD | 0,3xD | 210       | 0,015 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |
| P.3      | ≤ 1100 N/mm <sup>2</sup>    | 1,5xD | 0,3xD | 175       | 0,015 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |
| P.5      | ≤ 1100 N/mm <sup>2</sup>    | 1,5xD | 0,3xD | 120       | 0,015 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |
| M.1      | ≤ 750 N/mm <sup>2</sup>     | 1,5xD | 0,3xD | 110       | 0,015 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |
| M.2      | 750 - 850 N/mm <sup>2</sup> | 1,5xD | 0,3xD | 90        | 0,015 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |
| K.1      | < 240 HB                    | 1,5xD | 0,3xD | 150       | 0,015 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |
| K.2      | > 240 HB                    | 1,5xD | 0,3xD | 110       | 0,015 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |
| S.1      | ≤ 1500 N/mm <sup>2</sup>    | 1,5xD | 0,3xD | 50        | 0,015 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |
| H.1      | < 54 HRC                    | 1,5xD | 0,3xD | 120       | 0,015 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |
| H.2      | 54 - 60 HRC                 | 1,5xD | 0,3xD | 100       | 0,015 | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |

EN End Mills | long, 2 teeth cut to centre, 35°-38°

DE Schafffräser | Lang, bis Mitte Schneidend, 35°-38°

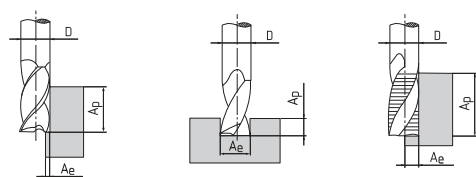
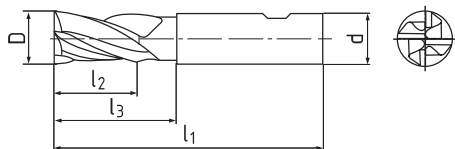
RU Фрезы концевые с цилиндрическим хвостовиком | длинные с центрорежущим зубом, 35°-38°



S1416R

S1416R

SC



| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | l <sub>3</sub> | Dn   | R   | Z | S141602R | S141612R |
|-----------|----------|----------------|----------------|----------------|------|-----|---|----------|----------|
| 6         | 6        | 57             | 13             | 19             | 5,7  | 0,5 | 4 | .06005   | .06005   |
| 6         | 6        | 57             | 13             | 19             | 5,7  | 1   | 4 | .06010   | .06010   |
| 8         | 8        | 63             | 19             | 25             | 7,6  | 0,5 | 4 | .08005   | .08005   |
| 8         | 8        | 63             | 19             | 25             | 7,6  | 1   | 4 | .08010   | .08010   |
| 10        | 10       | 72             | 22             | 30             | 9,5  | 0,5 | 4 | .10005   | .10005   |
| 10        | 10       | 72             | 22             | 30             | 9,5  | 1   | 4 | .10010   | .10010   |
| 10        | 10       | 72             | 22             | 30             | 9,5  | 2   | 4 | .10020   | .10020   |
| 12        | 12       | 83             | 26             | 36             | 11,5 | 0,5 | 4 | .12005   | .12005   |
| 12        | 12       | 83             | 26             | 36             | 11,5 | 1   | 4 | .12010   | .12010   |
| 12        | 12       | 83             | 26             | 36             | 11,5 | 2   | 4 | .12020   | .12020   |
| 16        | 16       | 92             | 32             | 42             | 15,5 | 0,5 | 4 | .16005   | .16005   |
| 16        | 16       | 92             | 32             | 42             | 15,5 | 1   | 4 | .16010   | .16010   |
| 16        | 16       | 92             | 32             | 42             | 15,5 | 2   | 4 | .16020   | .16020   |

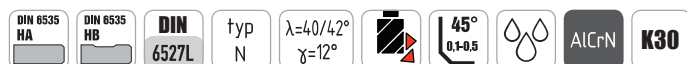
## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material | a <sub>p</sub>              | a <sub>e</sub> | v <sub>c</sub> | fz (mm/z) |       |       |      |       |
|----------|-----------------------------|----------------|----------------|-----------|-------|-------|------|-------|
|          |                             |                |                | Ø 6       | Ø 8   | Ø 10  | Ø 12 | Ø 16  |
| P.1      | ≤ 600 N/mm <sup>2</sup>     | 1,5xD          | 0,3xD          | 210       | 0,015 | 0,015 | 0,02 | 0,025 |
| P.3      | ≤ 1100 N/mm <sup>2</sup>    | 1,5xD          | 0,3xD          | 175       | 0,015 | 0,015 | 0,02 | 0,025 |
| P.5      | ≤ 1100 N/mm <sup>2</sup>    | 1,5xD          | 0,3xD          | 120       | 0,015 | 0,015 | 0,02 | 0,025 |
| M.1      | ≤ 750 N/mm <sup>2</sup>     | 1,5xD          | 0,3xD          | 110       | 0,015 | 0,015 | 0,02 | 0,025 |
| M.2      | 750 - 850 N/mm <sup>2</sup> | 1,5xD          | 0,3xD          | 90        | 0,015 | 0,015 | 0,02 | 0,025 |
| K.1      | < 240 HB                    | 1,5xD          | 0,3xD          | 150       | 0,015 | 0,015 | 0,02 | 0,025 |
| K.2      | > 240 HB                    | 1,5xD          | 0,3xD          | 110       | 0,015 | 0,015 | 0,02 | 0,025 |
| S.1      | ≤ 1500 N/mm <sup>2</sup>    | 1,5xD          | 0,3xD          | 50        | 0,015 | 0,015 | 0,02 | 0,025 |
| H.1      | < 54 HRC                    | 1,5xD          | 0,3xD          | 120       | 0,015 | 0,015 | 0,02 | 0,025 |
| H.2      | 54 - 60 HRC                 | 1,5xD          | 0,3xD          | 100       | 0,015 | 0,015 | 0,02 | 0,025 |

EN End Mills | long, 2 teeth cut to centre, 40°-42°

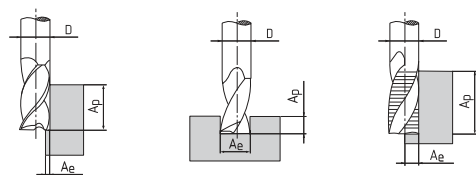
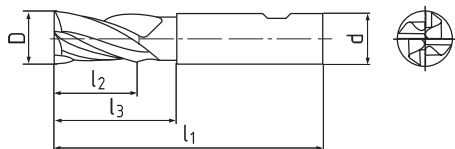
DE Schafffräser | Lang, bis Mitte Schneidend, 40°-42°

RU Фрезы концевые с цилиндрическим хвостовиком | длинные с центрорежущим зубом, 40°-42°



S1516

S1516



| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | l <sub>3</sub> | Dn   | Z |
|-----------|----------|----------------|----------------|----------------|------|---|
| 3         | 6        | 57             | 8              | 14             | 2,8  | 4 |
| 3,5       | 6        | 57             | 10             | 16             | 3,3  | 4 |
| 4         | 6        | 57             | 11             | 16             | 3,8  | 4 |
| 4,5       | 6        | 57             | 11             | 18             | 4,3  | 4 |
| 5         | 6        | 57             | 13             | 18             | 4,8  | 4 |
| 6         | 6        | 57             | 13             | 19             | 5,7  | 4 |
| 8         | 8        | 63             | 19             | 25             | 7,6  | 4 |
| 10        | 10       | 72             | 22             | 30             | 9,5  | 4 |
| 12        | 12       | 83             | 26             | 36             | 11,5 | 4 |
| 14        | 14       | 83             | 26             | 36             | 13,5 | 4 |
| 16        | 16       | 92             | 32             | 42             | 15,5 | 4 |
| 18        | 18       | 92             | 32             | 42             | 17,5 | 4 |
| 20        | 20       | 104            | 38             | 52             | 19,5 | 4 |

S151602

S151612

|      |      |
|------|------|
| .030 | .030 |
| .035 | .035 |
| .040 | .040 |
| .045 | .045 |
| .050 | .050 |
| .060 | .060 |
| .080 | .080 |
| .100 | .100 |
| .120 | .120 |
| .140 | .140 |
| .160 | .160 |
| .180 | .180 |
| .200 | .200 |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                                 | $a_p$ | $a_e$ | $v_c$ | $f_z$ (mm/z) |      |      |      |      |      |      |      |
|------------------------------------------|-------|-------|-------|--------------|------|------|------|------|------|------|------|
|                                          |       |       |       | Ø 3          | Ø 6  | Ø 8  | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 |
| <b>M.1</b> $\leq 750$ N/mm <sup>2</sup>  | 1,5xD | 0,3xD | 120   | 0,015        | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,09 | 0,1  |
| <b>M.2</b> 750 - 850 N/mm <sup>2</sup>   | 1,5xD | 0,3xD | 100   | 0,015        | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,09 | 0,1  |
| <b>S.1</b> $\leq 1500$ N/mm <sup>2</sup> | 1,5xD | 0,3xD | 70    | 0,015        | 0,03 | 0,04 | 0,05 | 0,06 | 0,08 | 0,09 | 0,1  |

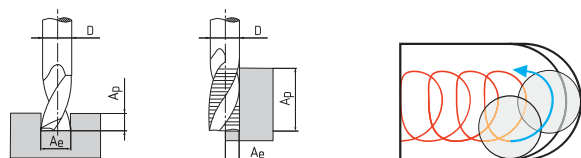
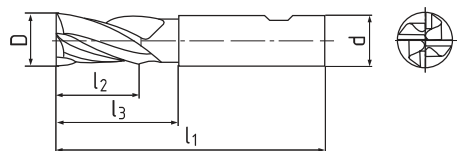
- EN End Mills | long, 2 teeth cut to centre, 37°-38° | trochoidal milling  
 DE Schafffräser | Lang, bis Mitte Schneidend, 37°-38° | trochoide Fräsen  
 RU Фрезы концевые с цилиндрическим хвостовиком | длинные с центрорежущим зубом, 37°-38°



S1235T

S1235T

SC



| D<br>k 12 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | l <sub>3</sub> | Dn   | R   | Z | S123502T | S123502T | S123512T | S123512T |
|-----------|----------|----------------|----------------|----------------|------|-----|---|----------|----------|----------|----------|
| 6         | 6        | 62             | 18             | 24             | 5,7  |     | 5 | .060     |          | .060     |          |
| 6         | 6        | 62             | 18             | 24             | 5,7  | 0,5 | 5 |          | .06005   |          | .06005   |
| 6         | 6        | 62             | 18             | 24             | 5,7  | 1   | 5 |          | .06010   |          | .06010   |
| 8         | 8        | 68             | 24             | 30             | 7,6  |     | 5 | .080     |          | .080     |          |
| 8         | 8        | 68             | 24             | 30             | 7,6  | 0,5 | 5 |          | .08005   |          | .08005   |
| 8         | 8        | 68             | 24             | 30             | 7,6  | 1   | 5 |          | .08010   |          | .08010   |
| 10        | 10       | 80             | 30             | 38             | 9,5  |     | 5 | .100     |          | .100     |          |
| 10        | 10       | 80             | 30             | 38             | 9,5  | 0,5 | 5 |          | .10005   |          | .10005   |
| 10        | 10       | 80             | 30             | 38             | 9,5  | 1   | 5 |          | .10010   |          | .10010   |
| 10        | 10       | 80             | 30             | 38             | 9,5  | 2   | 5 |          | .10020   |          | .10020   |
| 12        | 12       | 93             | 36             | 46             | 11,5 |     | 5 | .120     |          | .120     |          |
| 12        | 12       | 93             | 36             | 46             | 11,5 | 0,5 | 5 |          | .12005   |          | .12005   |
| 12        | 12       | 93             | 36             | 46             | 11,5 | 1   | 5 |          | .12010   |          | .12010   |
| 12        | 12       | 93             | 36             | 46             | 11,5 | 2   | 5 |          | .12020   |          | .12020   |
| 16        | 16       | 108            | 48             | 58             | 15,5 |     | 5 | .160     |          | .160     |          |
| 16        | 16       | 108            | 48             | 58             | 15,5 | 0,5 | 5 |          | .16005   |          | .16005   |
| 16        | 16       | 108            | 48             | 58             | 15,5 | 1   | 5 |          | .16010   |          | .16010   |
| 16        | 16       | 108            | 48             | 58             | 15,5 | 2   | 5 |          | .16020   |          | .16020   |
| 20        | 20       | 126            | 60             | 74             | 19,5 |     | 5 | .200     |          | .200     |          |
| 20        | 20       | 126            | 60             | 74             | 19,5 | 1   | 5 |          | .20010   |          | .20010   |
| 20        | 20       | 126            | 60             | 74             | 19,5 | 2   | 5 |          | .20020   |          | .20020   |
| 20        | 20       | 126            | 60             | 74             | 19,5 | 3   | 5 |          | .20030   |          | .20030   |
| 25        | 25       | 150            | 75             | 92             | 24   |     | 5 | .250     |          | .250     |          |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

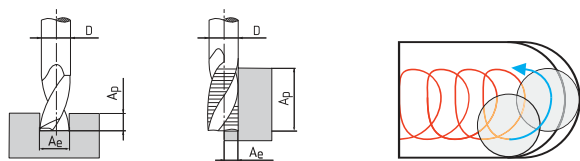
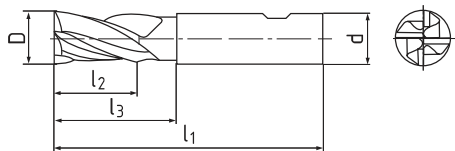
| Material                     | a <sub>p</sub> | a <sub>e</sub> | v <sub>c</sub> | f <sub>z</sub> (mm/z) |      |      |      |      |      |      |      |       |
|------------------------------|----------------|----------------|----------------|-----------------------|------|------|------|------|------|------|------|-------|
|                              |                |                |                | Ø 6                   | Ø 8  | Ø 10 | Ø 12 | Ø 14 | Ø 16 | Ø 18 | Ø 20 | Ø 25  |
| P.1 ≤ 600 N/mm <sup>2</sup>  | 3xD            | 0,1xD          | 450            | 0,09                  | 0,12 | 0,15 | 0,18 | 0,21 | 0,24 | 0,27 | 0,3  | 0,375 |
| P.2 ≤ 850 N/mm <sup>2</sup>  | 3xD            | 0,1xD          | 350            | 0,09                  | 0,12 | 0,15 | 0,18 | 0,21 | 0,24 | 0,27 | 0,3  | 0,375 |
| P.3 ≤ 1100 N/mm <sup>2</sup> | 3xD            | 0,1xD          | 260            | 0,09                  | 0,12 | 0,15 | 0,18 | 0,21 | 0,24 | 0,27 | 0,3  | 0,375 |
| P.4 ≤ 900 N/mm <sup>2</sup>  | 3xD            | 0,1xD          | 325            | 0,09                  | 0,12 | 0,15 | 0,18 | 0,21 | 0,24 | 0,27 | 0,3  | 0,375 |
| P.5 ≤ 1100 N/mm <sup>2</sup> | 3xD            | 0,1xD          | 223            | 0,09                  | 0,12 | 0,15 | 0,18 | 0,21 | 0,24 | 0,27 | 0,3  | 0,375 |
| H.1 < 54 HRC                 | 3xD            | 0,1xD          | 100            | 0,09                  | 0,12 | 0,15 | 0,18 | 0,21 | 0,24 | 0,27 | 0,3  | 0,375 |
| H.2 54 - 60 HRC              | 3xD            | 0,1xD          | 90             | 0,09                  | 0,12 | 0,15 | 0,18 | 0,21 | 0,24 | 0,27 | 0,3  | 0,375 |

- EN End Mills | long, 2 teeth cut to centre, 37°-38° | trochoidal milling  
 DE Schafffräser | Lang, bis Mitte Schneidend, 37°-38° | trochoide fräsen  
 RU Фрезы концевые с цилиндрическим хвостовиком | длинные с центрорежущим зубом, 37°-38°



S1435T

S1435T



| D<br>k 12 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | l <sub>3</sub> | Dn   | R   | Z | S143502T | S143502T | S143512T | S143512T |
|-----------|----------|----------------|----------------|----------------|------|-----|---|----------|----------|----------|----------|
| 6         | 6        | 62             | 18             | 24             | 5,7  |     | 5 | .060     |          | .060     |          |
| 6         | 6        | 62             | 18             | 24             | 5,7  | 0,5 | 5 |          | .06005   |          | .06005   |
| 6         | 6        | 62             | 18             | 24             | 5,7  | 1   | 5 |          | .06010   |          | .06010   |
| 8         | 8        | 68             | 24             | 30             | 7,6  |     | 5 | .080     |          | .080     |          |
| 8         | 8        | 68             | 24             | 30             | 7,6  | 0,5 | 5 |          | .08005   |          | .08005   |
| 8         | 8        | 68             | 24             | 30             | 7,6  | 1   | 5 |          | .08010   |          | .08010   |
| 10        | 10       | 80             | 30             | 38             | 9,5  |     | 5 | .100     |          | .100     |          |
| 10        | 10       | 80             | 30             | 38             | 9,5  | 0,5 | 5 |          | .10005   |          | .10005   |
| 10        | 10       | 80             | 30             | 38             | 9,5  | 1   | 5 |          | .10010   |          | .10010   |
| 10        | 10       | 80             | 30             | 38             | 9,5  | 2   | 5 |          | .10020   |          | .10020   |
| 12        | 12       | 93             | 36             | 46             | 11,5 |     | 5 | .120     |          | .120     |          |
| 12        | 12       | 93             | 36             | 46             | 11,5 | 0,5 | 5 |          | .12005   |          | .12005   |
| 12        | 12       | 93             | 36             | 46             | 11,5 | 1   | 5 |          | .12010   |          | .12010   |
| 12        | 12       | 93             | 36             | 46             | 11,5 | 2   | 5 |          | .12020   |          | .12020   |
| 16        | 16       | 108            | 48             | 58             | 15,5 |     | 5 | .160     |          | .160     |          |
| 16        | 16       | 108            | 48             | 58             | 15,5 | 0,5 | 5 |          | .16005   |          | .16005   |
| 16        | 16       | 108            | 48             | 58             | 15,5 | 1   | 5 |          | .16010   |          | .16010   |
| 16        | 16       | 108            | 48             | 58             | 15,5 | 2   | 5 |          | .16020   |          | .16020   |
| 20        | 20       | 126            | 60             | 74             | 19,5 |     | 5 | .200     |          | .200     |          |
| 20        | 20       | 126            | 60             | 74             | 19,5 | 1   | 5 |          | .20010   |          | .20010   |
| 20        | 20       | 126            | 60             | 74             | 19,5 | 2   | 5 |          | .20020   |          | .20020   |
| 20        | 20       | 126            | 60             | 74             | 19,5 | 3   | 5 |          | .20030   |          | .20030   |
| 25        | 25       | 150            | 75             | 92             | 24   |     | 5 | .250     |          | .250     |          |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material | a <sub>p</sub>              | a <sub>e</sub> | v <sub>c</sub> | f <sub>z</sub> (mm/z) |  | Ø 6   | Ø 8   | Ø 10  | Ø 12  | Ø 14  | Ø 16  | Ø 18  | Ø 20 | Ø 25  |
|----------|-----------------------------|----------------|----------------|-----------------------|--|-------|-------|-------|-------|-------|-------|-------|------|-------|
|          |                             |                |                |                       |  |       |       |       |       |       |       |       |      |       |
| M.1      | ≤ 750 N/mm <sup>2</sup>     | 3xD            | 0,06xD         | 190                   |  | 0,03  | 0,04  | 0,05  | 0,06  | 0,07  | 0,08  | 0,09  | 0,1  | 0,125 |
| M.2      | 750 - 850 N/mm <sup>2</sup> | 3xD            | 0,06xD         | 170                   |  | 0,03  | 0,04  | 0,05  | 0,06  | 0,07  | 0,08  | 0,09  | 0,1  | 0,125 |
| S.2      | ≤ 1250 N/mm <sup>2</sup>    | 3xD            | 0,06xD         | 130                   |  | 0,021 | 0,028 | 0,035 | 0,042 | 0,049 | 0,056 | 0,063 | 0,07 | 0,125 |

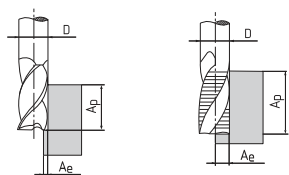
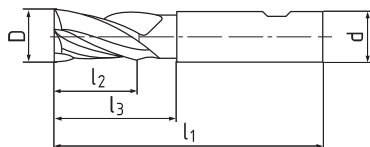
- EN End Mills | long, fine teeth, 45°  
 DE Schafffräser | Lang, feingezahnt, 45°  
 RU Фрезы концевые с цилиндрическим хвостовиком | длинные, мелкозубые, 45°



S1517

S1517

SC



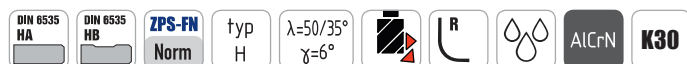
| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | l <sub>3</sub> | Dn   | Z | S151702 | S151712 |
|-----------|----------|----------------|----------------|----------------|------|---|---------|---------|
| 6         | 6        | 57             | 13             | 19             | 5,7  | 6 | .060    | .060    |
| 8         | 8        | 63             | 19             | 25             | 7,6  | 6 | .080    | .080    |
| 10        | 10       | 72             | 22             | 30             | 9,5  | 6 | .100    | .100    |
| 12        | 12       | 83             | 26             | 36             | 11,5 | 6 | .120    | .120    |
| 16        | 16       | 92             | 32             | 42             | 15,5 | 6 | .160    | .160    |
| 20        | 20       | 104            | 38             | 52             | 19,5 | 8 | .200    | .200    |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                     | ap    | ae      | vc  | fz (mm/z) |      |       |       |       |      |
|------------------------------|-------|---------|-----|-----------|------|-------|-------|-------|------|
|                              |       |         |     | Ø 6       | Ø 8  | Ø 10  | Ø 12  | Ø 16  | Ø 20 |
| P.3 ≤ 1100 N/mm <sup>2</sup> | 1,5xD | 0,015xD | 175 | 0,03      | 0,04 | 0,045 | 0,055 | 0,075 | 0,09 |
| P.5 ≤ 1100 N/mm <sup>2</sup> | 1,5xD | 0,015xD | 120 | 0,03      | 0,04 | 0,045 | 0,055 | 0,075 | 0,09 |
| K.1 < 240 HB                 | 1,5xD | 0,015xD | 150 | 0,03      | 0,04 | 0,045 | 0,055 | 0,075 | 0,09 |
| K.2 > 240 HB                 | 1,5xD | 0,015xD | 110 | 0,03      | 0,04 | 0,045 | 0,055 | 0,075 | 0,09 |
| H.1 < 54 HRC                 | 1,5xD | 0,015xD | 180 | 0,03      | 0,04 | 0,045 | 0,055 | 0,075 | 0,09 |
| H.2 54 - 60 HRC              | 1,5xD | 0,015xD | 150 | 0,03      | 0,04 | 0,045 | 0,055 | 0,075 | 0,09 |

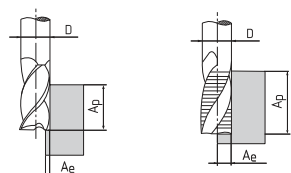
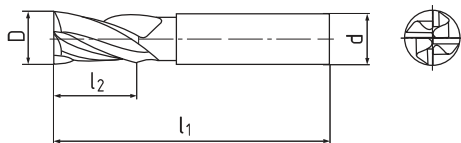


- EN** End Mills | extra long, fine teeth, 50°-35°  
**DE** Schafffräser | Extra Lang, feingezahnt, 50°-35°  
**RU** Фрезы концевые с цилиндрическим хвостовиком | экстра длинные, мелкозубые, 50°-35°



## S1517R

## S1517R



| D<br>e 8 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | R   | Z | S151702R | S151712R |
|----------|----------|----------------|----------------|-----|---|----------|----------|
| 6        | 6        | 62             | 13             | 0,5 | 6 | .06005   | .06005   |
| 6        | 6        | 62             | 13             | 1   | 6 | .06010   | .06010   |
| 8        | 8        | 68             | 19             | 0,5 | 6 | .08005   | .08005   |
| 8        | 8        | 68             | 19             | 1   | 6 | .08010   | .08010   |
| 10       | 10       | 80             | 22             | 0,5 | 6 | .10005   | .10005   |
| 10       | 10       | 80             | 22             | 1   | 6 | .10010   | .10010   |
| 10       | 10       | 80             | 22             | 1,5 | 6 | .10015   | .10015   |
| 10       | 10       | 80             | 22             | 2   | 6 | .10020   | .10020   |
| 12       | 12       | 93             | 26             | 0,5 | 6 | .12005   | .12005   |
| 12       | 12       | 93             | 26             | 1   | 6 | .12010   | .12010   |
| 12       | 12       | 93             | 26             | 1,5 | 6 | .12015   | .12015   |
| 12       | 12       | 93             | 26             | 2   | 6 | .12020   | .12020   |
| 16       | 16       | 108            | 32             | 0,5 | 6 | .16005   | .16005   |
| 16       | 16       | 108            | 32             | 1   | 6 | .16010   | .16010   |
| 16       | 16       | 108            | 32             | 1,5 | 6 | .16015   | .16015   |
| 16       | 16       | 108            | 32             | 2   | 6 | .16020   | .16020   |
| 20       | 20       | 126            | 38             | 0,5 | 8 | .20005   | .20005   |
| 20       | 20       | 126            | 38             | 1   | 8 | .20010   | .20010   |
| 20       | 20       | 126            | 38             | 1,5 | 8 | .20015   | .20015   |
| 20       | 20       | 126            | 38             | 2   | 8 | .20020   | .20020   |

### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material |              | a <sub>p</sub> | a <sub>e</sub> | v <sub>c</sub> | f <sub>z</sub> (mm/z) |      |      |      |      |      |
|----------|--------------|----------------|----------------|----------------|-----------------------|------|------|------|------|------|
|          |              |                |                |                | Ø 6                   | Ø 8  | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| P.1      | ≤ 600 N/mm²  | 2xD            | 0,06xD         | 210            | 0,03                  | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |
| P.3      | ≤ 1100 N/mm² | 2xD            | 0,06xD         | 175            | 0,03                  | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |
| P.5      | ≤ 1100 N/mm² | 2xD            | 0,06xD         | 120            | 0,03                  | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |
| K.1      | < 240 HB     | 2xD            | 0,06xD         | 150            | 0,03                  | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |
| K.2      | > 240 HB     | 2xD            | 0,06xD         | 110            | 0,03                  | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |
| S.1      | ≤ 1500 N/mm² | 2xD            | 0,06xD         | 50             | 0,03                  | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |
| H.1      | < 54 HRC     | 2xD            | 0,06xD         | 120            | 0,03                  | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |
| H.2      | 54 - 60 HRC  | 2xD            | 0,06xD         | 100            | 0,03                  | 0,04 | 0,05 | 0,06 | 0,08 | 0,1  |

EN End Mills | long, CB, 2 teeth cut to centre, 45°

DE Schafffräser | Lang, CB, bis Mitte schneidend, 45°

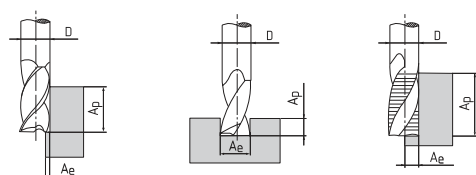
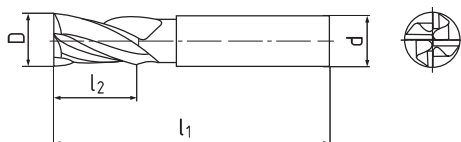
RU Фрезы концевые с цилиндрическим хвостовиком | длинные, CB, с центрорежущим зубом, 45°



S1136

S1136

SC



| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z | S113602 | S113612 |
|-----------|----------|----------------|----------------|---|---------|---------|
| 4         | 6        | 57             | 11             | 4 | .040    | .040    |
| 5         | 6        | 57             | 13             | 4 | .050    | .050    |
| 6         | 6        | 57             | 13             | 4 | .060    | .060    |
| 8         | 8        | 63             | 19             | 4 | .080    | .080    |
| 10        | 10       | 72             | 22             | 4 | .100    | .100    |
| 12        | 12       | 83             | 26             | 4 | .120    | .120    |
| 14        | 14       | 83             | 26             | 4 | .140    | .140    |
| 16        | 16       | 92             | 32             | 4 | .160    | .160    |
| 18        | 18       | 92             | 32             | 4 | .180    | .180    |
| 20        | 20       | 104            | 38             | 4 | .200    | .200    |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

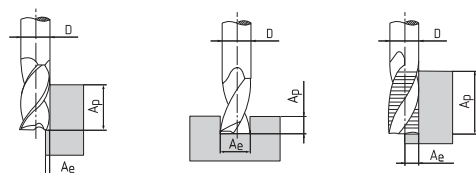
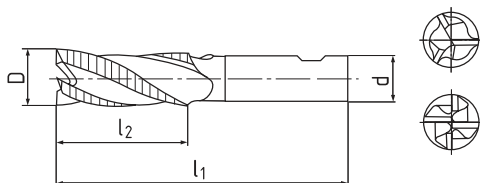
| Material                        | ap     | ae    | vc  | fz (mm/z) |      |       |      |      |       |      |
|---------------------------------|--------|-------|-----|-----------|------|-------|------|------|-------|------|
|                                 |        |       |     | Ø 6       | Ø 8  | Ø 10  | Ø 12 | Ø 16 | Ø 18  | Ø 20 |
| P.1 ≤ 600 N/mm <sup>2</sup>     | 1,75xD | 0,3xD | 180 | 0,015     | 0,02 | 0,025 | 0,03 | 0,04 | 0,045 | 0,05 |
| P.3 ≤ 1100 N/mm <sup>2</sup>    | 1,75xD | 0,3xD | 100 | 0,015     | 0,02 | 0,025 | 0,03 | 0,04 | 0,045 | 0,05 |
| P.5 ≤ 1100 N/mm <sup>2</sup>    | 1,75xD | 0,3xD | 80  | 0,015     | 0,02 | 0,025 | 0,03 | 0,04 | 0,045 | 0,05 |
| M.1 ≤ 750 N/mm <sup>2</sup>     | 1,75xD | 0,3xD | 90  | 0,015     | 0,02 | 0,025 | 0,03 | 0,04 | 0,045 | 0,05 |
| M.2 750 - 850 N/mm <sup>2</sup> | 1,75xD | 0,3xD | 80  | 0,015     | 0,02 | 0,025 | 0,03 | 0,04 | 0,045 | 0,05 |
| K.1 < 240 HB                    | 1,75xD | 0,3xD | 140 | 0,015     | 0,02 | 0,025 | 0,03 | 0,04 | 0,045 | 0,05 |
| K.2 > 240 HB                    | 1,75xD | 0,3xD | 100 | 0,015     | 0,02 | 0,025 | 0,03 | 0,04 | 0,045 | 0,05 |
| S.1 ≤ 1500 N/mm <sup>2</sup>    | 1,75xD | 0,3xD | 50  | 0,015     | 0,02 | 0,025 | 0,03 | 0,04 | 0,045 | 0,05 |

- EN End Mills | long, HR, 2 teeth cut to centre, 20°
- DE Schafffräser | Lang, HR, bis Mitte schneidend, 20°
- RU Фрезы концевые с цилиндрическим хвостовиком | длинные, HR, с центрорежущим зубом, 20°



## S1096

## S1096



| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z |
|-----------|----------|----------------|----------------|---|
| 6         | 6        | 57             | 13             | 3 |
| 8         | 8        | 63             | 19             | 3 |
| 10        | 10       | 72             | 22             | 4 |
| 12        | 12       | 83             | 26             | 4 |
| 14        | 14       | 83             | 26             | 4 |
| 16        | 16       | 92             | 32             | 4 |
| 18        | 18       | 92             | 32             | 4 |
| 20        | 20       | 104            | 38             | 4 |

| S109602 | S109612 |
|---------|---------|
| .060    | .060    |
| .080    | .080    |
| .100    | .100    |
| .120    | .120    |
| .140    | .140    |
| .160    | .160    |
| .180    | .180    |
| .200    | .200    |

### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                     | a <sub>p</sub> | a <sub>e</sub> | v <sub>c</sub> | f <sub>z</sub> (mm/z) |      |       |      |      |       |      |
|------------------------------|----------------|----------------|----------------|-----------------------|------|-------|------|------|-------|------|
|                              |                |                |                | Ø 6                   | Ø 8  | Ø 10  | Ø 12 | Ø 16 | Ø 18  | Ø 20 |
| P.1 ≤ 600 N/mm <sup>2</sup>  | 1xD            | 0,4xD          | 180            | 0,015                 | 0,02 | 0,025 | 0,03 | 0,04 | 0,045 | 0,05 |
| P.3 ≤ 1100 N/mm <sup>2</sup> | 1xD            | 0,4xD          | 100            | 0,015                 | 0,02 | 0,025 | 0,03 | 0,04 | 0,045 | 0,05 |
| P.5 ≤ 1100 N/mm <sup>2</sup> | 1xD            | 0,4xD          | 80             | 0,015                 | 0,02 | 0,025 | 0,03 | 0,04 | 0,045 | 0,05 |
| K.1 < 240 HB                 | 1xD            | 0,4xD          | 140            | 0,015                 | 0,02 | 0,025 | 0,03 | 0,04 | 0,045 | 0,05 |
| K.2 > 240 HB                 | 1xD            | 0,4xD          | 100            | 0,015                 | 0,02 | 0,025 | 0,03 | 0,04 | 0,045 | 0,05 |
| S.1 ≤ 1500 N/mm <sup>2</sup> | 1xD            | 0,4xD          | 50             | 0,015                 | 0,02 | 0,025 | 0,03 | 0,04 | 0,045 | 0,05 |

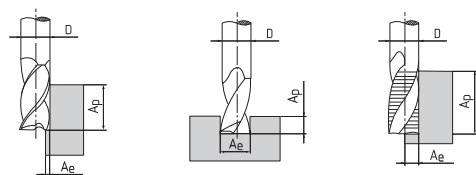
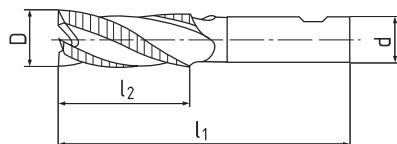
- EN End Mills | long, HR, 45°  
 DE Schafffräser | Lang, HR, 45°  
 RU Фрезы концевые с цилиндрическим хвостовиком | длинные, HR, 45°



S1196

S1196

SC



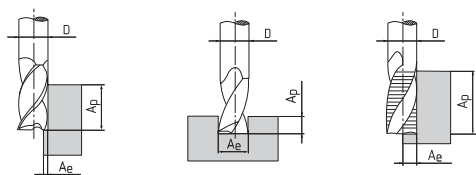
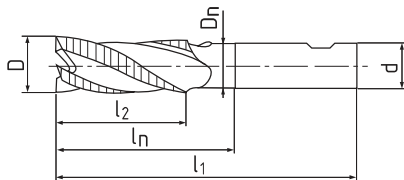
| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z |
|-----------|----------|----------------|----------------|---|
| 4         | 6        | 57             | 11             | 3 |
| 5         | 6        | 57             | 13             | 4 |
| 6         | 6        | 57             | 13             | 4 |
| 8         | 8        | 63             | 19             | 4 |
| 10        | 10       | 72             | 22             | 4 |
| 12        | 12       | 83             | 26             | 4 |
| 14        | 14       | 83             | 26             | 4 |
| 16        | 16       | 92             | 32             | 4 |
| 16        | 16       | 92             | 32             | 5 |
| 18        | 18       | 92             | 32             | 5 |
| 20        | 20       | 104            | 38             | 5 |
| 20        | 20       | 104            | 38             | 6 |

| S119602 | S119612 |
|---------|---------|
| .040    | .040    |
| .050    | .050    |
| .060    | .060    |
| .080    | .080    |
| .100    | .100    |
| .120    | .120    |
| .140    | .140    |
| .160    | .160    |
| .160Z5  | .160Z5  |
| .180    | .180    |
| .200    | .200    |
| .200Z6  | .200Z6  |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material | ap                          | ae    | vc    | fz (mm/z) |       |      |       |      |      |      |
|----------|-----------------------------|-------|-------|-----------|-------|------|-------|------|------|------|
|          |                             |       |       | Ø 6       | Ø 8   | Ø 10 | Ø 12  | Ø 16 | Ø 18 | Ø 20 |
| P.1      | ≤ 600 N/mm <sup>2</sup>     | 1,5xD | 0,4xD | 180       | 0,015 | 0,02 | 0,025 | 0,03 | 0,04 | 0,05 |
| P.3      | ≤ 1100 N/mm <sup>2</sup>    | 1,5xD | 0,4xD | 100       | 0,015 | 0,02 | 0,025 | 0,03 | 0,04 | 0,05 |
| P.5      | ≤ 1100 N/mm <sup>2</sup>    | 1,5xD | 0,4xD | 80        | 0,015 | 0,02 | 0,025 | 0,03 | 0,04 | 0,05 |
| M.1      | ≤ 750 N/mm <sup>2</sup>     | 1,5xD | 0,4xD | 90        | 0,015 | 0,02 | 0,025 | 0,03 | 0,04 | 0,05 |
| M.2      | 750 - 850 N/mm <sup>2</sup> | 1,5xD | 0,4xD | 80        | 0,015 | 0,02 | 0,025 | 0,03 | 0,04 | 0,05 |
| K.1      | < 240 HB                    | 1,5xD | 0,4xD | 140       | 0,015 | 0,02 | 0,025 | 0,03 | 0,04 | 0,05 |
| K.2      | > 240 HB                    | 1,5xD | 0,4xD | 100       | 0,015 | 0,02 | 0,025 | 0,03 | 0,04 | 0,05 |
| S.1      | ≤ 1500 N/mm <sup>2</sup>    | 1,5xD | 0,4xD | 50        | 0,015 | 0,02 | 0,025 | 0,03 | 0,04 | 0,05 |

- EN End Mills | short, HR, 45°  
 DE Schafftfräser | Kurz, HR, 45°  
 RU Фрезы концевые с цилиндрическим хвостовиком | короткие, HR, 45°

**S1186N****S1186N**

| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | l <sub>3</sub> | Dn   | Z |
|-----------|----------|----------------|----------------|----------------|------|---|
| 4         | 6        | 54             | 8              | 13             | 3,8  | 3 |
| 5         | 6        | 54             | 9              | 16             | 4,8  | 4 |
| 6         | 6        | 54             | 10             | 17             | 5,7  | 4 |
| 8         | 8        | 58             | 12             | 22             | 7,6  | 4 |
| 10        | 10       | 66             | 14             | 26             | 9,5  | 4 |
| 12        | 12       | 73             | 16             | 28             | 11,5 | 4 |
| 14        | 14       | 75             | 18             | 30             | 13,5 | 4 |
| 16        | 16       | 82             | 22             | 34             | 15,5 | 4 |
| 16        | 16       | 82             | 22             | 34             | 15,5 | 5 |
| 18        | 18       | 84             | 24             | 36             | 17,5 | 5 |
| 20        | 20       | 92             | 26             | 42             | 19,5 | 5 |
| 20        | 20       | 92             | 26             | 42             | 19,5 | 6 |

**S118602N****S118612N**

.040

.040

.050

.050

.060

.060

.080

.080

.100

.100

.120

.120

.140

.140

.160

.160

.160Z5

.160Z5

.180

.180

.200

.200

.200Z6

.200Z6

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material |                 | ap  | ae    | vc  | fz (mm/z) |      |       |       |       |      |      |
|----------|-----------------|-----|-------|-----|-----------|------|-------|-------|-------|------|------|
|          |                 |     |       |     | Ø 6       | Ø 8  | Ø 10  | Ø 12  | Ø 16  | Ø 18 | Ø 20 |
| P.1      | ≤ 600 N/mm²     | 1xD | 0,4xD | 210 | 0,03      | 0,04 | 0,055 | 0,065 | 0,085 | 0,1  | 0,11 |
| P.3      | ≤ 1100 N/mm²    | 1xD | 0,4xD | 175 | 0,03      | 0,04 | 0,055 | 0,065 | 0,085 | 0,1  | 0,11 |
| P.5      | ≤ 1100 N/mm²    | 1xD | 0,4xD | 120 | 0,03      | 0,04 | 0,055 | 0,065 | 0,085 | 0,1  | 0,11 |
| M.1      | ≤ 750 N/mm²     | 1xD | 0,4xD | 110 | 0,03      | 0,04 | 0,055 | 0,065 | 0,085 | 0,1  | 0,11 |
| M.2      | 750 - 850 N/mm² | 1xD | 0,4xD | 90  | 0,03      | 0,04 | 0,055 | 0,065 | 0,085 | 0,1  | 0,11 |
| K.1      | < 240 HB        | 1xD | 0,4xD | 150 | 0,03      | 0,04 | 0,055 | 0,065 | 0,085 | 0,1  | 0,11 |
| K.2      | > 240 HB        | 1xD | 0,4xD | 110 | 0,03      | 0,04 | 0,055 | 0,065 | 0,085 | 0,1  | 0,11 |
| S.1      | ≤ 1500 N/mm²    | 1xD | 0,4xD | 50  | 0,03      | 0,04 | 0,055 | 0,065 | 0,085 | 0,1  | 0,11 |
| H.1      | < 54 HRC        | 1xD | 0,4xD | 120 | 0,03      | 0,04 | 0,055 | 0,065 | 0,085 | 0,1  | 0,11 |
| H.2      | 54 - 60 HRC     | 1xD | 0,4xD | 100 | 0,03      | 0,04 | 0,055 | 0,065 | 0,085 | 0,1  | 0,11 |

EN End Mills | long, HR, 2 teeth cut to centre, 45°

DE Schafffräser | Lang, HR, bis Mitte schneidend, 45°

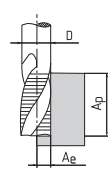
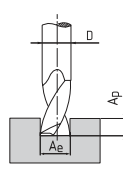
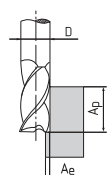
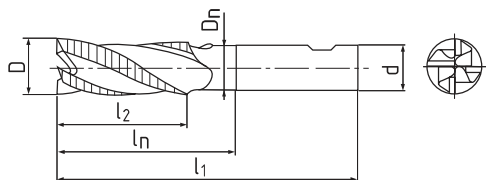
RU Фрезы концевые с цилиндрическим хвостовиком | длинные, HR, с центрорежущим зубом, 45°



S1196N

S1196N

SC



| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | l <sub>3</sub> | Dn   | Z | S119602N | S119612N |
|-----------|----------|----------------|----------------|----------------|------|---|----------|----------|
| 4         | 6        | 57             | 11             | 16             | 3,8  | 3 | .040     | .040     |
| 5         | 6        | 57             | 13             | 18             | 4,8  | 4 | .050     | .050     |
| 6         | 6        | 57             | 13             | 19             | 5,7  | 4 | .060     | .060     |
| 8         | 8        | 63             | 19             | 25             | 7,6  | 4 | .080     | .080     |
| 10        | 10       | 72             | 22             | 30             | 9,5  | 4 | .100     | .100     |
| 12        | 12       | 83             | 26             | 36             | 11,5 | 4 | .120     | .120     |
| 14        | 14       | 83             | 26             | 36             | 13,5 | 4 | .140     | .140     |
| 16        | 16       | 92             | 32             | 42             | 15,5 | 4 | .160     | .160     |
| 16        | 16       | 92             | 32             | 42             | 15,5 | 5 | .160Z5   | .160Z5   |
| 18        | 18       | 92             | 32             | 42             | 17,5 | 5 | .180     | .180     |
| 20        | 20       | 104            | 38             | 52             | 19,5 | 5 | .200     | .200     |
| 20        | 20       | 104            | 38             | 52             | 19,5 | 6 | .200Z6   | .200Z6   |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                        | ap    | ae    | vc  | fz (mm/z) |      |       |       |       |      |      |
|---------------------------------|-------|-------|-----|-----------|------|-------|-------|-------|------|------|
|                                 |       |       |     | Ø 6       | Ø 8  | Ø 10  | Ø 12  | Ø 16  | Ø 18 | Ø 20 |
| P.1 ≤ 600 N/mm <sup>2</sup>     | 1,5xD | 0,4xD | 210 | 0,03      | 0,04 | 0,055 | 0,065 | 0,085 | 0,1  | 0,11 |
| P.3 ≤ 1100 N/mm <sup>2</sup>    | 1,5xD | 0,4xD | 175 | 0,03      | 0,04 | 0,055 | 0,065 | 0,085 | 0,1  | 0,11 |
| P.5 ≤ 1100 N/mm <sup>2</sup>    | 1,5xD | 0,4xD | 120 | 0,03      | 0,04 | 0,055 | 0,065 | 0,085 | 0,1  | 0,11 |
| M.1 ≤ 750 N/mm <sup>2</sup>     | 1,5xD | 0,4xD | 110 | 0,03      | 0,04 | 0,055 | 0,065 | 0,085 | 0,1  | 0,11 |
| M.2 750 - 850 N/mm <sup>2</sup> | 1,5xD | 0,4xD | 90  | 0,03      | 0,04 | 0,055 | 0,065 | 0,085 | 0,1  | 0,11 |
| K.1 < 240 HB                    | 1,5xD | 0,4xD | 150 | 0,03      | 0,04 | 0,055 | 0,065 | 0,085 | 0,1  | 0,11 |
| K.2 > 240 HB                    | 1,5xD | 0,4xD | 110 | 0,03      | 0,04 | 0,055 | 0,065 | 0,085 | 0,1  | 0,11 |
| S.1 ≤ 1500 N/mm <sup>2</sup>    | 1,5xD | 0,4xD | 50  | 0,03      | 0,04 | 0,055 | 0,065 | 0,085 | 0,1  | 0,11 |
| H.1 < 54 HRC                    | 1,5xD | 0,4xD | 120 | 0,03      | 0,04 | 0,055 | 0,065 | 0,085 | 0,1  | 0,11 |
| H.2 54 - 60 HRC                 | 1,5xD | 0,4xD | 100 | 0,03      | 0,04 | 0,055 | 0,065 | 0,085 | 0,1  | 0,11 |



|           |         |        |         |        |          |          |         |         |         |       |
|-----------|---------|--------|---------|--------|----------|----------|---------|---------|---------|-------|
| Code      | 3142N   | 3142P  | 3142PH  | 3102   | 3200     | 3201     | 3302    | 3500    | 3600    | 3103  |
| DIN       | 851     | 851    | 851     | 851    | 850      |          | 1833    | 1833    | 6518    |       |
| Type      | NR      | NR-F   | NR-F    | N      |          |          |         |         |         | N     |
| Material  | HSSCo5  | HSSCo5 | HSSCo5  | HSSCo5 | HSSCo5   | HSS      | HSSCo5  | HSSCo5  | HSSCo8  | HSS   |
| Dimension | 12,5-40 | 21-40  | 12,5-45 | 11-60  | 4,5-45,5 | 7,5-48,6 | 45°-85° | 45°-75° | R1-R20  | 18-72 |
| Page      | 105     | 106    | 106     | 107    | 108-109  | 110-111  | 112-113 | 114     | 116-117 | 118   |

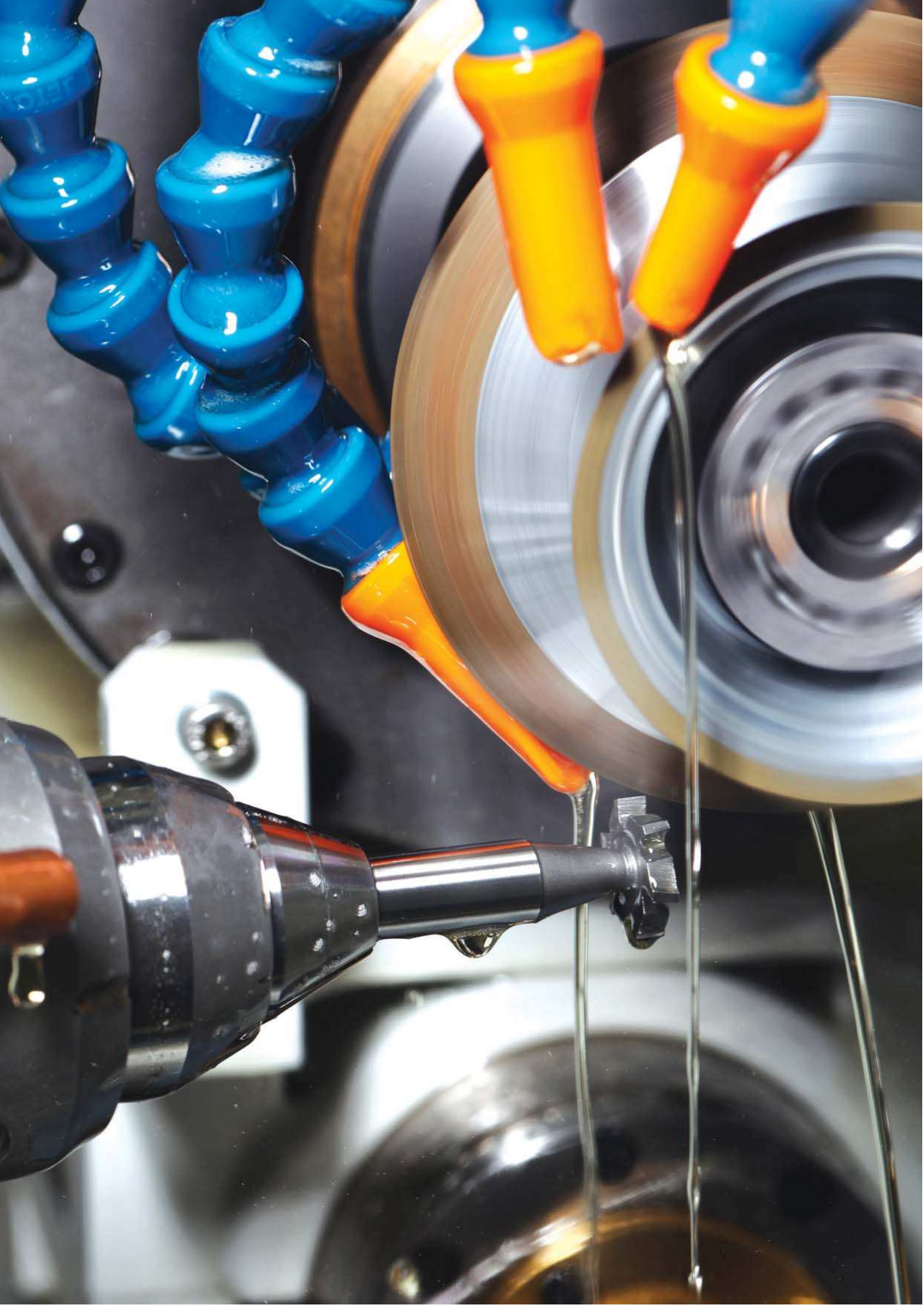
|          |     |   |   |   |   |   |   |   |   |   |
|----------|-----|---|---|---|---|---|---|---|---|---|
| <b>P</b> | P.1 | • | • | • | • | • | • | • | • | • |
|          | P.2 | • | • | • | • | • | • | • | • | • |
|          | P.3 | • | • | • | • |   | • | • | • |   |
|          | P.4 | • |   |   |   |   |   |   |   |   |
|          | P.5 | • |   |   |   |   |   |   |   |   |
|          | P.6 | • |   |   |   |   |   |   |   |   |
| <b>M</b> | M.1 |   |   |   |   |   |   |   |   |   |
|          | M.2 | • |   |   |   |   |   |   |   |   |
|          | M.3 |   |   |   |   |   |   |   |   |   |
| <b>K</b> | K.1 | • |   |   |   |   |   |   |   |   |
|          | K.2 |   |   |   |   |   |   |   |   |   |
| <b>N</b> | N.1 |   |   |   |   |   |   |   |   |   |
|          | N.2 |   |   |   |   |   |   |   |   |   |
|          | N.3 |   |   |   |   |   |   |   |   |   |
|          | N.4 |   |   |   |   |   |   |   |   |   |
| <b>S</b> | S.1 | • |   |   |   |   |   |   |   |   |
|          | S.2 |   | • | • | • | • | • | • | • |   |
| <b>H</b> | H.1 |   |   |   |   |   |   |   |   |   |
|          | H.2 |   |   |   |   |   |   |   |   |   |



| Code      | S3500     | S3600   | S3900 |
|-----------|-----------|---------|-------|
| DIN       |           |         |       |
| Type      | N         | N       | N     |
| Material  | K30       | K30     | K30   |
| Dimension | 60°   90° | R0,5-R5 | 90°   |
| Page      | 119       | 120     | 121   |
| <b>P</b>  | P.1       | •       | •     |
|           | P.2       |         | •     |
|           | P.3       | •       | •     |
|           | P.4       |         | •     |
|           | P.5       | •       | •     |
|           | P.6       |         |       |
| <b>M</b>  | M.1       | •       | •     |
|           | M.2       | •       |       |
|           | M.3       |         |       |
| <b>K</b>  | K.1       | •       | •     |
|           | K.2       | •       |       |
| <b>N</b>  | N.1       |         | •     |
|           | N.2       |         | •     |
|           | N.3       |         |       |
|           | N.4       |         |       |
| <b>S</b>  | S.1       | •       |       |
|           | S.2       |         | •     |
| <b>H</b>  | H.1       | •       |       |
|           | H.2       |         |       |



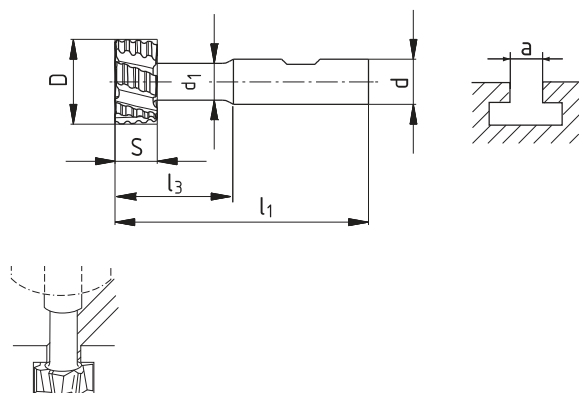




EN T - slot cutters | NR  
 DE T - Nutenfräser | NR  
 RU Фрезы для т - пазов | NR



3142N



new



| D<br>d 11 | d<br>h 6 | S<br>d 11 | l <sub>3</sub> | l <sub>1</sub> | Z | d <sub>1</sub> | a    | 314215N |
|-----------|----------|-----------|----------------|----------------|---|----------------|------|---------|
| 12,5      | 10       | 6         | 17             | 57             | 6 | 5              | 6    | .125    |
| 16        | 10       | 8         | 22             | 62             | 6 | 7              | 8    | .160    |
| 18        | 12       | 8         | 25             | 70             | 6 | 8              | 10   | .180    |
| 19**      | 12       | 9         | 26             | 71             | 6 | 8              | >8*  | .190    |
| 21        | 12       | 9         | 29             | 74             | 6 | 10             | 12   | .210    |
| 22**      | 12       | 10        | 30             | 75             | 6 | 10             | >10* | .220    |
| 25        | 16       | 11        | 34             | 82             | 8 | 12             | 14   | .250    |
| 28**      | 16       | 12        | 37             | 85             | 8 | 13             | >13* | .280    |
| 32        | 16       | 14        | 42             | 90             | 8 | 15             | 18   | .320    |
| 36**      | 25       | 16        | 47             | 103            | 8 | 17             | >17* | .360    |
| 40        | 25       | 18        | 52             | 108            | 8 | 19             | 22   | .400    |

\*) ≠ DIN 650, \*\*) ≠ DIN 851

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material |                 |  | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |        |        |        |        |        |        |        |
|----------|-----------------|--|----------------|----------------|----------------|-----------------------|--------|--------|--------|--------|--------|--------|--------|
|          |                 |  |                |                |                | Ø 3                   | Ø 6    | Ø 8    | Ø 10   | Ø 12   | Ø 16   | Ø 18   | Ø 20   |
| 120518   |                 |  |                |                |                |                       |        |        |        |        |        |        |        |
| P.1      | ≤ 600 N/mm²     |  |                |                | 45             | 0,006                 | 0,015  | 0,021  | 0,028  | 0,034  | 0,044  | 0,051  | 0,057  |
| P.2      | ≤ 850 N/mm²     |  |                |                | 39             | 0,006                 | 0,015  | 0,021  | 0,028  | 0,034  | 0,044  | 0,051  | 0,057  |
| P.3      | ≤ 1100 N/mm²    |  |                |                | 24             | 0,006                 | 0,015  | 0,021  | 0,028  | 0,034  | 0,044  | 0,051  | 0,057  |
| P.4      | ≤ 900 N/mm²     |  |                |                | 30             | 0,006                 | 0,015  | 0,021  | 0,028  | 0,034  | 0,044  | 0,051  | 0,057  |
| P.6      | > 1100 N/mm²    |  |                |                | 20             | 0,0042                | 0,0105 | 0,0147 | 0,0196 | 0,0238 | 0,0308 | 0,0357 | 0,0399 |
| M.2      | 750 - 850 N/mm² |  |                |                | 15             | 0,006                 | 0,015  | 0,021  | 0,028  | 0,034  | 0,044  | 0,051  | 0,057  |
| K.1      | < 240 HB        |  |                |                | 35             | 0,006                 | 0,015  | 0,021  | 0,028  | 0,034  | 0,044  | 0,051  | 0,057  |
| S.1      | ≤ 1500 N/mm²    |  |                |                | 160-300        | 0,0078                | 0,0195 | 0,0273 | 0,0364 | 0,0442 | 0,0572 | 0,0663 | 0,0741 |

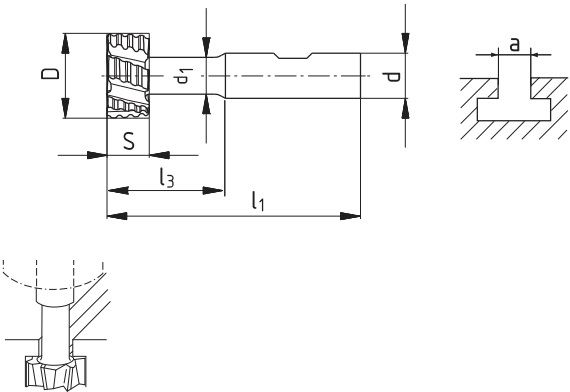
EN T - slot cutters | NR-F  
 DE T - Nutenfräser | NR-F  
 RU Фрезы для т - пазов | NR-F



3142PH

3142P

HSS/SC



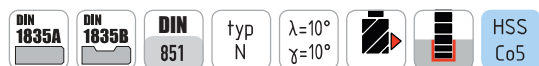
| D<br>d 11 | d<br>h 6 | S<br>d 11 | l <sub>3</sub> | l <sub>1</sub> | Z<br>3142PH | Z<br>3142P | d <sub>1</sub> | a    | 314215PH | 314215P |
|-----------|----------|-----------|----------------|----------------|-------------|------------|----------------|------|----------|---------|
| 12,5      | 10       | 6         | 17             | 57             | 6           |            | 5              | 6    | .125     |         |
| 16        | 10       | 8         | 22             | 62             | 6           |            | 7              | 8    | .160     |         |
| 18        | 12       | 8         | 25             | 70             | 6           |            | 8              | 10   | .180     |         |
| 19**      | 12       | 9         | 26             | 71             | 6           |            | 8              | >8*  | .190     |         |
| 21        | 12       | 9         | 29             | 74             | 8           | 6          | 10             | 12   | .210     | .210    |
| 22**      | 12       | 10        | 30             | 75             | 8           | 6          | 10             | >10* | .220     | .220    |
| 25        | 16       | 11        | 34             | 82             | 8           | 6          | 12             | 14   | .250     | .250    |
| 28**      | 16       | 12        | 37             | 85             | 8           |            | 13             | >13* | .280     |         |
| 32        | 16       | 14        | 42             | 90             | 8           | 6          | 15             | 18   | .320     | .320    |
| 36**      | 25       | 16        | 47             | 103            | 10          |            | 17             | >17* | .360     |         |
| 40        | 25       | 18        | 52             | 108            | 10          | 8          | 19             | 22   | .400     | .400    |
| 45**      | 25       | 20        | 57             | 113            | 10          |            | 21             | >21* | .450     |         |

\*) ≠ DIN 650, \*\*) ≠ DIN 851

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

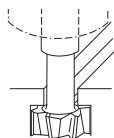
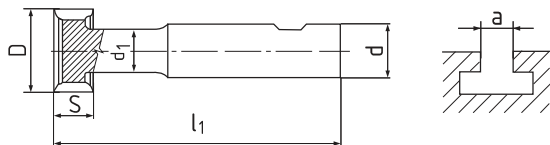
| Material | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |
|----------|----------------|----------------|----------------|-----------------------|-------|-------|-------|
|          |                |                |                | Ø 21                  | Ø 25  | Ø 40  | Ø 50  |
| P.1      | ≤ 600 N/mm²    |                | 37,5           | 0,07                  | 0,08  | 0,040 | 0,050 |
| P.2      | ≤ 850 N/mm²    |                | 32,5           | 0,07                  | 0,08  | 0,040 | 0,050 |
| P.3      | ≤ 1100 N/mm²   |                | 18             | 0,07                  | 0,08  | 0,040 | 0,050 |
| S.2      | ≤ 1250 N/mm²   |                | 9              | 0,049                 | 0,056 | 0,028 | 0,035 |

EN T - slot cutters  
 DE T - Nutenfräser  
 RU Фрезы для т - пазов



3102

3102



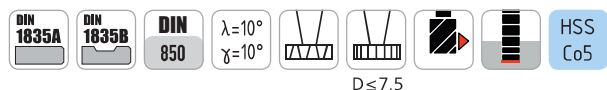
| D<br>d 11 | d<br>h 6 | S<br>d 11 | d <sub>1</sub> | l <sub>1</sub> | Z  | a    | 310205 | 310215 |
|-----------|----------|-----------|----------------|----------------|----|------|--------|--------|
| 11        | 10       | 4         | 4              | 53,5           | 6  | 5    | .110   | .110   |
| 12,5      | 10       | 6         | 5              | 57             | 6  | 6    | .125   | .125   |
| 16        | 10       | 8         | 7              | 62             | 6  | 8    | .160   | .160   |
| 18        | 12       | 8         | 8              | 70             | 6  | 10   | .180   | .180   |
| 19**      | 12       | 9         | 8              | 71             | 6  | >8*  | .190   | .190   |
| 21        | 12       | 9         | 10             | 74             | 6  | 12   | .210   | .210   |
| 22**      | 12       | 10        | 10             | 75             | 6  | >10* | .220   | .220   |
| 25        | 16       | 11        | 12             | 82             | 8  | 14   | .250   | .250   |
| 28**      | 16       | 12        | 13             | 85             | 8  | >13* | .280   | .280   |
| 32        | 16       | 14        | 15             | 90             | 8  | 18   | .320   | .320   |
| 36**      | 25       | 16        | 17             | 103            | 8  | >17* | .360   | .360   |
| 40        | 25       | 18        | 19             | 108            | 10 | 22   | .400   | .400   |
| 45**      | 25       | 20        | 21             | 113            | 10 | >21* | .450   | .450   |
| 50        | 32       | 22        | 25             | 124            | 10 | 28   | .500   | .500   |
| 60        | 32       | 28        | 30             | 139            | 10 | 36   | .600   | .600   |

\*) ≠ DIN 650, \*\*) ≠ DIN 851

### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

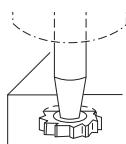
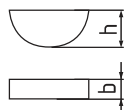
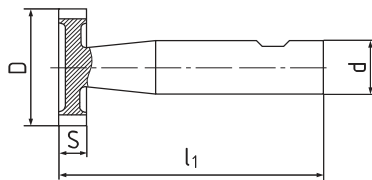
| Material                     | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |
|------------------------------|----------------|----------------|----------------|-----------------------|-------|-------|-------|
|                              |                |                |                | Ø 21                  | Ø 25  | Ø 40  | Ø 50  |
| P.1 ≤ 600 N/mm <sup>2</sup>  |                |                | 37,5           | 0,07                  | 0,08  | 0,040 | 0,050 |
| P.2 ≤ 850 N/mm <sup>2</sup>  |                |                | 32,5           | 0,07                  | 0,08  | 0,040 | 0,050 |
| P.3 ≤ 1100 N/mm <sup>2</sup> |                |                | 18             | 0,07                  | 0,08  | 0,040 | 0,050 |
| S.2 ≤ 1250 N/mm <sup>2</sup> |                |                | 9              | 0,049                 | 0,056 | 0,028 | 0,035 |

EN Woodruff keyseat cutters  
DE Schlitzfräser für Woodruffnuten  
RU Фрезы для пазов сегментных шпонок



3200

3200

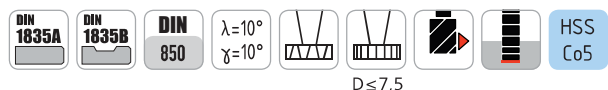


| D<br>h12 | d<br>h 6 | S<br>e 8 | l <sub>1</sub> | Z  | b   | h   | 320005  | 320015  |
|----------|----------|----------|----------------|----|-----|-----|---------|---------|
| 4,5      | 6        | 1        | 50             | 6  | 1   | 1,4 | .045010 | .045010 |
| 7,5      | 6        | 1,5      | 50             | 6  | 1,5 | 2,6 | .075015 | .075015 |
| 7,5      | 6        | 2        | 50             | 6  | 2   | 2,6 | .075020 | .075020 |
| 10,5     | 6        | 2        | 50             | 6  | 2   | 3,7 | .105020 | .105020 |
| 10,5     | 6        | 2,5      | 50             | 6  | 2,5 | 3,7 | .105025 | .105025 |
| 10,5     | 6        | 3        | 50             | 6  | 3   | 3,7 | .105030 | .105030 |
| 13,5     | 10       | 2        | 56             | 6  |     |     | .135020 | .135020 |
| 13,5     | 10       | 3        | 56             | 6  | 3   | 5   | .135030 | .135030 |
| 13,5     | 10       | 4        | 56             | 6  | 4   | 5   | .135040 | .135040 |
| 16,5     | 10       | 3        | 56             | 6  | 3   | 6,5 | .165030 | .165030 |
| 16,5     | 10       | 4        | 56             | 6  | 4   | 6,5 | .165040 | .165040 |
| 16,5     | 10       | 5        | 56             | 6  | 5   | 6,5 | .165050 | .165050 |
| 19,5     | 10       | 3        | 63             | 8  |     |     | .195030 | .195030 |
| 19,5     | 10       | 4        | 63             | 8  | 4   | 7,5 | .195040 | .195040 |
| 19,5     | 10       | 5        | 63             | 8  | 5   | 7,5 | .195050 | .195050 |
| 19,5     | 10       | 6        | 63             | 8  | 6   | 7,5 | .195060 | .195060 |
| 22,5     | 10       | 4        | 63             | 8  |     |     | .225040 | .225040 |
| 22,5     | 10       | 5        | 63             | 8  | 5   | 9   | .225050 | .225050 |
| 22,5     | 10       | 6        | 63             | 8  | 6   | 9   | .225060 | .225060 |
| 22,5     | 10       | 8        | 63             | 8  | 8   | 9   | .225080 | .225080 |
| 25,5     | 10       | 5        | 63             | 10 |     |     | .255050 | .255050 |
| 25,5     | 10       | 6        | 63             | 10 | 6   | 10  | .255060 | .255060 |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

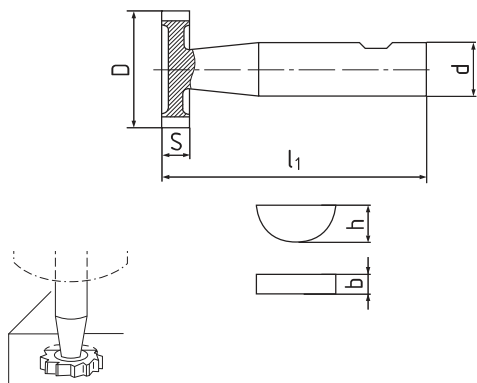
| Material                     | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |        |        |        |        |
|------------------------------|----------------|----------------|----------------|-----------------------|--------|--------|--------|--------|
|                              |                |                |                | Ø 7,5                 | Ø 16,5 | Ø 22,5 | Ø 32,5 | Ø 45,5 |
| P.1 ≤ 600 N/mm <sup>2</sup>  |                |                | 37,5           | 0,04                  | 0,07   | 0,075  | 0,090  | 0,100  |
| P.2 ≤ 850 N/mm <sup>2</sup>  |                |                | 32,5           | 0,04                  | 0,07   | 0,075  | 0,090  | 0,100  |
| P.3 ≤ 1100 N/mm <sup>2</sup> |                |                | 18             | 0,04                  | 0,07   | 0,075  | 0,090  | 0,100  |
| S.2 ≤ 1250 N/mm <sup>2</sup> |                |                | 9              | 0,028                 | 0,049  | 0,0525 | 0,063  | 0,070  |

EN Woodruff keyseat cutters  
DE Schlitzfräser für Woodruffnuten  
RU Фрезы для пазов сегментных шпонок



3200

3200



HSS/SC

| D<br>h12 | d<br>h6 | S<br>e8 | l <sub>1</sub> | z  | b  | h  |
|----------|---------|---------|----------------|----|----|----|
| 28,5     | 10      | 6       | 63             | 10 | 6  | 11 |
| 28,5     | 10      | 8       | 63             | 10 | 8  | 11 |
| 28,5     | 12      | 10      | 71             | 10 | 10 | 11 |
| 32,5     | 12      | 6       | 71             | 10 |    |    |
| 32,5     | 12      | 7       | 71             | 10 |    |    |
| 32,5     | 12      | 8       | 71             | 10 | 8  | 13 |
| 32,5     | 12      | 10      | 71             | 10 | 10 | 13 |
| 38,5     | 12      | 8       | 71             | 10 |    |    |
| 45,5     | 12      | 8       | 71             | 12 |    |    |
| 45,5     | 12      | 10      | 71             | 12 | 10 | 16 |

| 320005  | 320015  |
|---------|---------|
| .285060 | .285060 |
| .285080 | .285080 |
| .285100 | .285100 |
| .325060 | .325060 |
| .325070 | .325070 |
| .325080 | .325080 |
| .325100 | .325100 |
| .385080 | .385080 |
| .455080 | .455080 |
| .455100 | .455100 |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

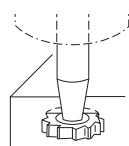
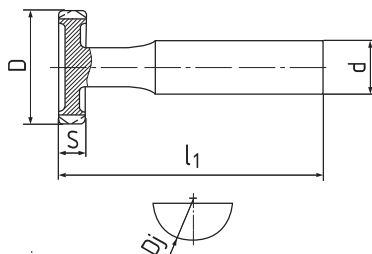
| Material                     | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | fz (mm/z) |        |        |        |        |
|------------------------------|----------------|----------------|----------------|-----------|--------|--------|--------|--------|
|                              |                |                |                | Ø 7,5     | Ø 16,5 | Ø 22,5 | Ø 32,5 | Ø 45,5 |
| P.1 ≤ 600 N/mm <sup>2</sup>  |                |                | 37,5           | 0,04      | 0,07   | 0,075  | 0,090  | 0,100  |
| P.2 ≤ 850 N/mm <sup>2</sup>  |                |                | 32,5           | 0,04      | 0,07   | 0,075  | 0,090  | 0,100  |
| P.3 ≤ 1100 N/mm <sup>2</sup> |                |                | 18             | 0,04      | 0,07   | 0,075  | 0,090  | 0,100  |
| S.2 ≤ 1250 N/mm <sup>2</sup> |                |                | 9              | 0,028     | 0,049  | 0,0525 | 0,063  | 0,070  |



- EN Woodruff keyseat cutters
- DE Schlitzfräser für Woodruffnuten
- RU Фрезы для пазов сегментных шпонок



## 3201



| D<br>h 11 | d<br>h 8 | S<br>e 8 | l <sub>1</sub> | Z  | Dj |
|-----------|----------|----------|----------------|----|----|
| 7,5       | 6        | 1,5      | 48             | 8  | 7  |
| 7,5       | 6        | 2        | 48             | 8  | 7  |
| 10,8      | 8        | 1        | 45             | 8  | 10 |
| 10,8      | 8        | 1,6      | 45             | 8  | 10 |
| 10,8      | 8        | 2,5      | 45             | 8  | 10 |
| 10,8      | 8        | 3        | 45             | 8  | 10 |
| 14        | 8        | 3        | 45             | 8  | 13 |
| 14        | 10       | 4        | 50             | 8  | 13 |
| 17,2      | 10       | 1,6      | 50             | 8  | 16 |
| 17,2      | 10       | 2        | 50             | 8  | 16 |
| 17,2      | 10       | 3        | 50             | 8  | 16 |
| 17,2      | 10       | 4        | 50             | 8  | 16 |
| 17,2      | 12       | 5        | 60             | 8  | 16 |
| 20,5      | 10       | 4        | 50             | 8  | 19 |
| 20,5      | 12       | 5        | 60             | 8  | 19 |
| 23,7      | 12       | 5        | 60             | 8  | 22 |
| 23,7      | 12       | 6        | 60             | 8  | 22 |
| 27        | 12       | 2        | 60             | 10 | 25 |

320100 320100

.070015  
.070020  
.100010  
.100016  
.100025  
.100030  
.130030  
.130040  
.160016  
.160020  
.160030  
.160040  
.160050  
.190040  
.190050  
.220050  
.220060  
.250020



### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

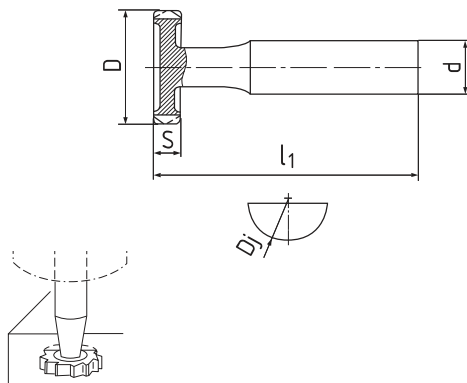
| Material                    | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |      |        |      |        |
|-----------------------------|----------------|----------------|----------------|-----------------------|------|--------|------|--------|
|                             |                |                |                | Ø 7,5                 | Ø 14 | Ø 20,5 | Ø 27 | Ø 48,6 |
| P.1 ≤ 600 N/mm <sup>2</sup> |                |                | 30             | 0,04                  | 0,06 | 0,07   | 0,08 | 0,11   |
| P.2 ≤ 850 N/mm <sup>2</sup> |                |                | 26             | 0,04                  | 0,06 | 0,07   | 0,08 | 0,11   |

- EN Woodruff keyseat cutters  
 DE Schlitzfräser für Woodruffnuten  
 RU Фрезы для пазов сегментных шпонок



HSS

3201



| D<br>h 11 | d<br>h 8 | S<br>e 8 | l <sub>1</sub> | Z  | D <sub>j</sub> | 320100  | 320100  |
|-----------|----------|----------|----------------|----|----------------|---------|---------|
| 27        | 12       | 3        | 60             | 10 | 25             |         | .250030 |
| 27        | 12       | 6        | 60             | 10 | 25             | .250060 |         |
| 30,2      | 12       | 6        | 60             | 10 | 28             | .280060 |         |
| 30,2      | 16       | 8        | 70             | 10 | 28             | .280080 |         |
| 34,5      | 16       | 6        | 70             | 10 | 32             | .320060 |         |
| 34,5      | 16       | 8        | 70             | 10 | 32             | .320080 |         |
| 41        | 16       | 8        | 70             | 10 | 38             | .380080 |         |
| 48,6      | 16       | 8        | 70             | 10 | 45             | .450080 |         |
| 48,6      | 16       | 10       | 70             | 10 | 45             | .450100 |         |



## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                    | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | fz (mm/z) |      |        |      |        |
|-----------------------------|----------------|----------------|----------------|-----------|------|--------|------|--------|
|                             |                |                |                | Ø 7,5     | Ø 14 | Ø 20,5 | Ø 27 | Ø 48,6 |
| P.1 ≤ 600 N/mm <sup>2</sup> |                |                | 30             | 0,04      | 0,06 | 0,07   | 0,08 | 0,11   |
| P.2 ≤ 850 N/mm <sup>2</sup> |                |                | 26             | 0,04      | 0,06 | 0,07   | 0,08 | 0,11   |

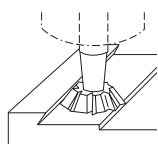
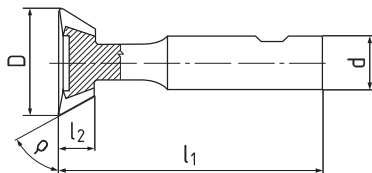


- EN Dovetail milling cutters
- DE Winkel-Stirnfräser
- RU Фрезы угловые торцовые



## 3302

## 3302



| $\rho$<br>± 30' | D<br>js 16 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z  | 330205  | 330215  |
|-----------------|------------|----------|----------------|----------------|----|---------|---------|
| 45              | 16         | 12       | 60             | 4              | 10 | .045160 | .045160 |
| 45              | 20         | 12       | 63             | 5              | 10 | .045200 | .045200 |
| 45              | 25         | 12       | 67             | 6,3            | 10 | .045250 | .045250 |
| 45              | 32         | 16       | 71             | 8              | 12 | .045320 | .045320 |
| 45              | 36         | 16       | 80             | 8              | 12 | .045360 | .045360 |
| 45              | 40         | 16       | 80             | 10             | 12 | .045400 | .045400 |
| 50              | 16         | 12       | 60             | 5              | 10 | .050160 | .050160 |
| 50              | 20         | 12       | 63             | 6,3            | 10 | .050200 | .050200 |
| 50              | 25         | 12       | 67             | 8              | 10 | .050250 | .050250 |
| 55              | 16         | 12       | 60             | 5,6            | 10 | .055160 | .055160 |
| 55              | 20         | 12       | 63             | 7,1            | 10 | .055200 | .055200 |
| 55              | 25         | 12       | 67             | 9              | 10 | .055250 | .055250 |
| 60              | 16         | 12       | 60             | 6,3            | 10 | .060160 | .060160 |
| 60              | 20         | 12       | 63             | 8              | 10 | .060200 | .060200 |
| 60              | 25         | 12       | 67             | 10             | 10 | .060250 | .060250 |
| 60              | 32         | 16       | 71             | 12,5           | 12 | .060320 | .060320 |
| 60              | 40         | 16       | 80             | 16             | 12 | .060400 | .060400 |

### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

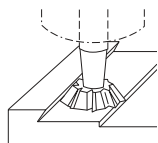
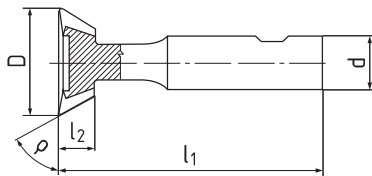
| Material | A <sub>p</sub>           | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |        |       |       |
|----------|--------------------------|----------------|----------------|-----------------------|--------|-------|-------|
|          |                          |                |                | Ø 16                  | Ø 20   | Ø 25  | Ø 32  |
| 330205   |                          |                |                |                       |        |       |       |
| P.1      | ≤ 600 N/mm <sup>2</sup>  |                | 37,5           | 0,07                  | 0,075  | 0,08  | 0,090 |
| P.2      | ≤ 850 N/mm <sup>2</sup>  |                | 32,5           | 0,07                  | 0,075  | 0,08  | 1,090 |
| P.3      | ≤ 1100 N/mm <sup>2</sup> |                | 18             | 0,07                  | 0,075  | 0,08  | 2,090 |
| S.2      | ≤ 1250 N/mm <sup>2</sup> |                | 9              | 0,049                 | 0,0525 | 0,056 | 5,090 |

EN Dovetail milling cutters  
 DE Winkel-Stirnfräser  
 RU Фрезы угловые торцовые



3302

3302



| $\rho$<br>± 30' | D<br>js 16 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z  |
|-----------------|------------|----------|----------------|----------------|----|
| 65*             | 16         | 12       | 60             | 6,3            | 10 |
| 65*             | 25         | 12       | 67             | 10             | 12 |
| 70*             | 16         | 12       | 60             | 7              | 10 |
| 70*             | 20         | 12       | 63             | 9              | 10 |
| 70*             | 25         | 16       | 67             | 11             | 10 |
| 75*             | 16         | 12       | 60             | 8              | 10 |
| 75*             | 25         | 12       | 67             | 10             | 12 |
| 80*             | 16         | 12       | 60             | 8              | 10 |
| 80*             | 25         | 12       | 67             | 10             | 12 |
| 85*             | 16         | 12       | 60             | 8              | 10 |
| 85*             | 25         | 12       | 67             | 10             | 12 |

\*) ≠ DIN 1833

330205

330215

|         |         |
|---------|---------|
| .065160 | .065160 |
| .065250 | .065250 |
| .070160 | .070160 |
| .070200 | .070200 |
| .070250 | .070250 |
| .075160 | .075160 |
| .075250 | .075250 |
| .080160 | .080160 |
| .080250 | .080250 |
| .085160 | .085160 |
| .085250 | .085250 |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

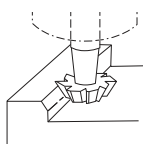
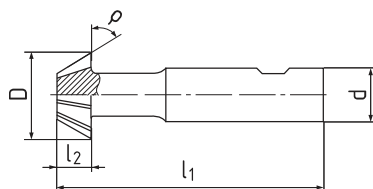
| Material |              |  | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |        |       |       |
|----------|--------------|--|----------------|----------------|----------------|-----------------------|--------|-------|-------|
|          |              |  |                |                |                | Ø 16                  | Ø 20   | Ø 25  | Ø 32  |
| 330205   |              |  |                |                |                |                       |        |       |       |
| P.1      | ≤ 600 N/mm²  |  |                |                | 37,5           | 0,07                  | 0,075  | 0,08  | 0,090 |
|          | ≤ 850 N/mm²  |  |                |                | 32,5           | 0,07                  | 0,075  | 0,08  | 1,090 |
|          | ≤ 1100 N/mm² |  |                |                | 18             | 0,07                  | 0,075  | 0,08  | 2,090 |
| S.2      | ≤ 1250 N/mm² |  |                |                | 9              | 0,049                 | 0,0525 | 0,056 | 5,090 |

EN Inverted dovetail milling cutters  
DE Winkel-Stirnfräser  
RU Фрезы угловые торцовые



3500

3500



| $\rho$<br>± 30' | D<br>js 16 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | Z  | 350005  | 350015  |
|-----------------|------------|----------|----------------|----------------|----|---------|---------|
| 45              | 16         | 12       | 60             | 4              | 10 | .045160 | .045160 |
| 45              | 20         | 12       | 63             | 5              | 10 | .045200 | .045200 |
| 45              | 25         | 12       | 67             | 6,3            | 10 | .045250 | .045250 |
| 45              | 32         | 16       | 71             | 8              | 12 | .045320 | .045320 |
| 45              | 40         | 16       | 80             | 10             | 12 | .045400 | .045400 |
| 50              | 16         | 12       | 60             | 5              | 12 | .050160 | .050160 |
| 50              | 20         | 12       | 63             | 6,3            | 12 | .050200 | .050200 |
| 50              | 25         | 12       | 67             | 8              | 12 | .050250 | .050250 |
| 55              | 16         | 12       | 60             | 5,6            | 10 | .055160 | .055160 |
| 55              | 20         | 12       | 63             | 7,1            | 10 | .055200 | .055200 |
| 55              | 25         | 12       | 67             | 9              | 12 | .055250 | .055250 |
| 60              | 16         | 12       | 60             | 6,3            | 10 | .060160 | .060160 |
| 60              | 20         | 12       | 63             | 8              | 10 | .060200 | .060200 |
| 60              | 25         | 12       | 67             | 10             | 10 | .060250 | .060250 |
| 65*             | 16         | 12       | 60             | 6,3            | 10 | .065160 | .065160 |
| 65*             | 25         | 12       | 67             | 10             | 12 | .065250 | .065250 |
| 70*             | 16         | 12       | 60             | 7              | 10 | .070160 | .070160 |
| 70*             | 20         | 12       | 63             | 9              | 10 | .070200 | .070200 |
| 70*             | 25         | 16       | 67             | 11             | 10 | .070250 | .070250 |
| 75*             | 16         | 12       | 60             | 8              | 10 | .075160 | .075160 |
| 75*             | 25         | 12       | 67             | 10             | 12 | .075250 | .075250 |

\*) ≠ DIN 1833

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

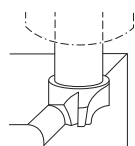
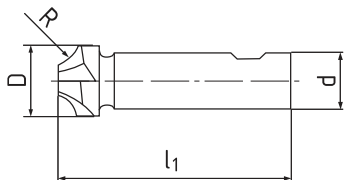
| Material                     | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |        |       |
|------------------------------|----------------|----------------|----------------|-----------------------|--------|-------|
|                              |                |                |                | Ø 16                  | Ø 20   | Ø 25  |
| P.1 ≤ 600 N/mm <sup>2</sup>  |                | 1xb            | 37,5           | 0,07                  | 0,075  | 0,08  |
| P.2 ≤ 850 N/mm <sup>2</sup>  |                | 1xb            | 32,5           | 0,07                  | 0,075  | 0,08  |
| P.3 ≤ 1100 N/mm <sup>2</sup> |                | 1xb            | 18             | 0,07                  | 0,075  | 0,08  |
| S.2 ≤ 1250 N/mm <sup>2</sup> |                | 1xb            | 9              | 0,049                 | 0,0525 | 0,056 |



- EN Corner rounding concave cutters  
 DE Viertelrund-Profilfräser konkav  
 RU Фрезы секторные выгнутые



3600



| R<br>H 11 | D<br>js 15 | d<br>h 6 | l <sub>1</sub> | Z | 360018 |
|-----------|------------|----------|----------------|---|--------|
| 1         | 8          | 10       | 60             | 4 | .010   |
| 1,25      | 9          | 10       | 60             | 4 | .0125  |
| 1,5       | 9          | 10       | 60             | 4 | .015   |
| 1,6       | 9,2        | 10       | 60             | 4 | .016   |
| 2         | 10         | 10       | 60             | 4 | .020   |
| 2,5       | 11         | 10       | 60             | 4 | .025   |
| 3         | 12         | 12       | 60             | 4 | .030   |
| 3,5       | 13         | 12       | 60             | 4 | .035   |
| 4         | 14         | 12       | 60             | 4 | .040   |
| 4,5       | 15         | 12       | 60             | 4 | .045   |
| 5         | 16         | 12       | 60             | 4 | .050   |
| 5,5       | 19         | 16       | 67             | 4 | .055   |
| 6         | 20         | 16       | 67             | 4 | .060   |
| 6,3       | 20,6       | 16       | 71             | 4 | .063   |
| 6,5       | 21         | 16       | 71             | 4 | .065   |
| 7         | 22         | 16       | 71             | 4 | .070   |
| 7,5       | 23         | 16       | 71             | 4 | .075   |
| 8         | 24         | 16       | 71             | 4 | .080   |
| 8,5       | 25         | 25       | 85             | 4 | .085   |
| 9         | 26         | 25       | 85             | 4 | .090   |

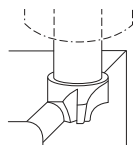
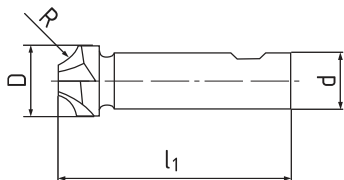
## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material | A <sub>p</sub>           | A <sub>e</sub> | V <sub>c</sub> | fz (mm/z) |       |       |        |       |
|----------|--------------------------|----------------|----------------|-----------|-------|-------|--------|-------|
|          |                          |                |                | Ø 8       | Ø 10  | Ø 12  | Ø 16   | Ø 20  |
| P.1      | ≤ 600 N/mm <sup>2</sup>  |                | 45             | 0,04      | 0,05  | 0,06  | 0,065  | 0,07  |
| P.2      | ≤ 850 N/mm <sup>2</sup>  |                | 39             | 0,04      | 0,05  | 0,06  | 0,065  | 0,07  |
| P.3      | ≤ 1100 N/mm <sup>2</sup> |                | 24             | 0,04      | 0,05  | 0,06  | 0,065  | 0,07  |
| S.2      | ≤ 1250 N/mm <sup>2</sup> |                | 12             | 0,028     | 0,035 | 0,042 | 0,0455 | 0,049 |

- EN Corner rounding concave cutters  
 DE Viertelrund-Profilfräser konkav  
 RU Фрезы секторные выгнутые



3600



| R<br>H 11 | D<br>js 15 | d<br>h 6 | l <sub>1</sub> | Z | 360018 |
|-----------|------------|----------|----------------|---|--------|
| 9,5       | 27         | 25       | 85             | 4 | .095   |
| 10        | 28         | 25       | 85             | 4 | .100   |
| 10,5      | 31         | 25       | 90             | 4 | .105   |
| 11        | 32         | 25       | 90             | 4 | .110   |
| 12        | 34         | 25       | 90             | 4 | .120   |
| 12,5      | 41         | 25       | 100            | 6 | .125   |
| 13        | 42         | 25       | 100            | 6 | .130   |
| 14        | 44         | 25       | 100            | 6 | .140   |
| 15        | 46         | 25       | 100            | 6 | .150   |
| 16        | 48         | 25       | 100            | 6 | .160   |
| 17        | 50         | 32       | 112            | 6 | .170   |
| 18        | 52         | 32       | 112            | 6 | .180   |
| 19        | 56         | 32       | 112            | 6 | .190   |
| 20        | 56         | 32       | 112            | 6 | .200   |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

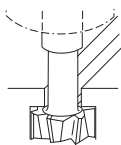
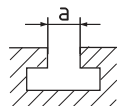
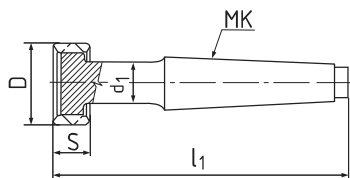
| Material                     | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | fz (mm/z) |       |       |        |       |
|------------------------------|----------------|----------------|----------------|-----------|-------|-------|--------|-------|
|                              |                |                |                | Ø 8       | Ø 10  | Ø 12  | Ø 16   | Ø 20  |
| P.1 ≤ 600 N/mm <sup>2</sup>  |                |                | 45             | 0,04      | 0,05  | 0,06  | 0,065  | 0,07  |
| P.2 ≤ 850 N/mm <sup>2</sup>  |                |                | 39             | 0,04      | 0,05  | 0,06  | 0,065  | 0,07  |
| P.3 ≤ 1100 N/mm <sup>2</sup> |                |                | 24             | 0,04      | 0,05  | 0,06  | 0,065  | 0,07  |
| S.2 ≤ 1250 N/mm <sup>2</sup> |                |                | 12             | 0,028     | 0,035 | 0,042 | 0,0455 | 0,049 |

- EN Taper shank T - slot cutters  
 DE T - Nutenfräser mit MK  
 RU Фрезы для Т-пазов с коническим хвостовиком



HSS

3103



| D<br>h 12 | MK | S<br>h 12 | d <sub>1</sub> | l <sub>1</sub> | Z  | a  |
|-----------|----|-----------|----------------|----------------|----|----|
| 18        | 1  | 8         | 8              | 82             | 8  | 10 |
| 21        | 2  | 9         | 10             | 102            | 8  | 12 |
| 25        | 2  | 11        | 12             | 104            | 8  | 14 |
| 32        | 2  | 14        | 16             | 111            | 8  | 18 |
| 40        | 3  | 18        | 20             | 138            | 8  | 22 |
| 50        | 4  | 22        | 25             | 173            | 8  | 28 |
| 60        | 4  | 28        | 31             | 188            | 10 | 36 |
| 72        | 5  | 35        | 36             | 229            | 10 | 42 |

310340

.180

.210

.250

.320

.400

.500

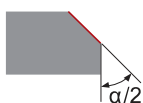
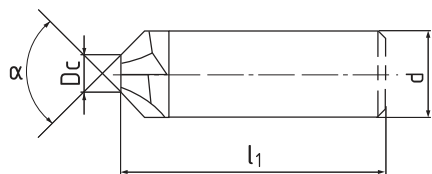
.600

.720

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                    | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |      |       |       |
|-----------------------------|----------------|----------------|----------------|-----------------------|------|-------|-------|
|                             |                |                |                | Ø 21                  | Ø 25 | Ø 40  | Ø 50  |
| P.1 ≤ 600 N/mm <sup>2</sup> | 0,1xD          | 1xb            | 37,5           | 0,07                  | 0,08 | 0,040 | 0,050 |
| P.2 ≤ 850 N/mm <sup>2</sup> | 0,1xD          | 1xb            | 32,5           | 0,07                  | 0,08 | 0,040 | 0,050 |

EN Chamfer end Mills | 90°, 60°  
 DE Entgratfräser | 90°, 60°  
 RU Фрезы одноугловые | 90°, 60°

**S3500**

| α   | Dc  | d<br>h 6 | l <sub>1</sub> | z | S350002 |
|-----|-----|----------|----------------|---|---------|
| 90° | 1,2 | 6        | 57             | 4 | .090012 |
| 90° | 1,6 | 8        | 63             | 4 | .090016 |
| 90° | 2   | 10       | 72             | 4 | .090020 |
| 90° | 2,4 | 12       | 83             | 4 | .090024 |
| 60° | 1,2 | 6        | 57             | 4 | .060012 |
| 60° | 1,6 | 8        | 63             | 4 | .060016 |
| 60° | 2   | 10       | 72             | 4 | .060020 |
| 60° | 2,4 | 12       | 83             | 4 | .060024 |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                        | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | fz (mm/z) 90° |       |     |       | 60°   |       |      |       |
|---------------------------------|----------------|----------------|----------------|---------------|-------|-----|-------|-------|-------|------|-------|
|                                 |                |                |                | Ø 1,2         | Ø 1,6 | Ø 2 | Ø 2,4 | Ø 1,2 | Ø 1,6 | Ø 2  | Ø 2,4 |
| P.1 ≤ 600 N/mm <sup>2</sup>     |                |                | 180            | 0,05          | 0,07  | 0,1 | 0,12  | 0,03  | 0,05  | 0,07 | 0,1   |
| P.3 ≤ 1100 N/mm <sup>2</sup>    |                |                | 100            | 0,05          | 0,07  | 0,1 | 0,12  | 0,03  | 0,05  | 0,07 | 0,1   |
| P.5 ≤ 1100 N/mm <sup>2</sup>    |                |                | 80             | 0,05          | 0,07  | 0,1 | 0,12  | 0,03  | 0,05  | 0,07 | 0,1   |
| M.1 ≤ 750 N/mm <sup>2</sup>     |                |                | 90             | 0,05          | 0,07  | 0,1 | 0,12  | 0,03  | 0,05  | 0,07 | 0,1   |
| M.2 750 - 850 N/mm <sup>2</sup> |                |                | 80             | 0,05          | 0,07  | 0,1 | 0,12  | 0,03  | 0,05  | 0,07 | 0,1   |
| K.1 < 240 HB                    |                |                | 140            | 0,05          | 0,07  | 0,1 | 0,12  | 0,03  | 0,05  | 0,07 | 0,1   |
| K.2 > 240 HB                    |                |                | 100            | 0,05          | 0,07  | 0,1 | 0,12  | 0,03  | 0,05  | 0,07 | 0,1   |
| S.1 ≤ 1500 N/mm <sup>2</sup>    |                |                | 50             | 0,05          | 0,07  | 0,1 | 0,12  | 0,03  | 0,05  | 0,07 | 0,1   |
| H.1 < 54 HRC                    |                |                | 60             | 0,05          | 0,07  | 0,1 | 0,12  | 0,03  | 0,05  | 0,07 | 0,1   |



EN Corner rounding | concave cutters  
 DE Viertelrund-Profilfräser | konkav  
 RU Фрезы секторные | выгнутые

ZPS-FN  
Norm

typ  
N

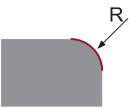
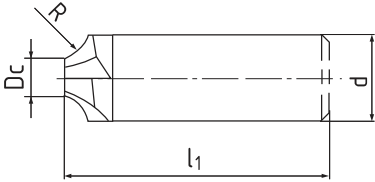
$\lambda=0^\circ$   
 $\gamma=0^\circ$

DIN 6535  
HA

AlTiN

K30

S3600



| Dc | d <sub>h 6</sub> | l <sub>1</sub> | R   | Z | S360002 |
|----|------------------|----------------|-----|---|---------|
| 5  | 6                | 57             | 0,5 | 4 | .005    |
| 4  | 6                | 57             | 1   | 4 | .010    |
| 5  | 8                | 63             | 1,5 | 4 | .015    |
| 4  | 8                | 63             | 2   | 4 | .020    |
| 5  | 10               | 72             | 2,5 | 4 | .025    |
| 4  | 10               | 72             | 3   | 4 | .030    |
| 5  | 12               | 83             | 3,5 | 4 | .035    |
| 4  | 12               | 83             | 4   | 4 | .040    |
| 4  | 14               | 83             | 5   | 4 | .050    |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material | A <sub>p</sub>              | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |      |      |       |       |      |       |      |  |
|----------|-----------------------------|----------------|----------------|-----------------------|-------|------|------|-------|-------|------|-------|------|--|
|          |                             |                |                | Ø 5                   | Ø 5,5 | Ø 6  | Ø 7  | Ø 7,5 | Ø 7,5 | Ø 8  | Ø 8,5 | Ø 9  |  |
| P.1      | ≤ 600 N/mm <sup>2</sup>     |                | 180            | 0,06                  | 0,05  | 0,07 | 0,06 | 0,09  | 0,08  | 0,12 | 0,1   | 0,14 |  |
| P.3      | ≤ 1100 N/mm <sup>2</sup>    |                | 100            | 0,06                  | 0,05  | 0,07 | 0,06 | 0,09  | 0,08  | 0,12 | 0,1   | 0,14 |  |
| P.5      | ≤ 1100 N/mm <sup>2</sup>    |                | 80             | 0,06                  | 0,05  | 0,07 | 0,06 | 0,09  | 0,08  | 0,12 | 0,1   | 0,14 |  |
| M.1      | ≤ 750 N/mm <sup>2</sup>     |                | 90             | 0,06                  | 0,05  | 0,07 | 0,06 | 0,09  | 0,08  | 0,12 | 0,1   | 0,14 |  |
| M.2      | 750 - 850 N/mm <sup>2</sup> |                | 80             | 0,06                  | 0,05  | 0,07 | 0,06 | 0,09  | 0,08  | 0,12 | 0,1   | 0,14 |  |
| K.1      | < 240 HB                    |                | 140            | 0,06                  | 0,05  | 0,07 | 0,06 | 0,09  | 0,08  | 0,12 | 0,1   | 0,14 |  |
| K.2      | > 240 HB                    |                | 100            | 0,06                  | 0,05  | 0,07 | 0,06 | 0,09  | 0,08  | 0,12 | 0,1   | 0,14 |  |
| S.1      | ≤ 1500 N/mm <sup>2</sup>    |                | 50             | 0,06                  | 0,05  | 0,07 | 0,06 | 0,09  | 0,08  | 0,12 | 0,1   | 0,14 |  |
| H.1      | < 54 HRC                    |                | 60             | 0,06                  | 0,05  | 0,07 | 0,06 | 0,09  | 0,08  | 0,12 | 0,1   | 0,14 |  |

- ENMultifunction end mills
- DEMultifräser
- RUMультифрезы

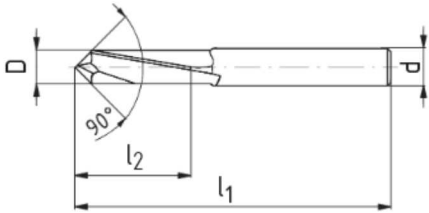
ZPS-FN  
Norm

typ  
N

DIN 6535  
HA

ALTiN

K30



S3900

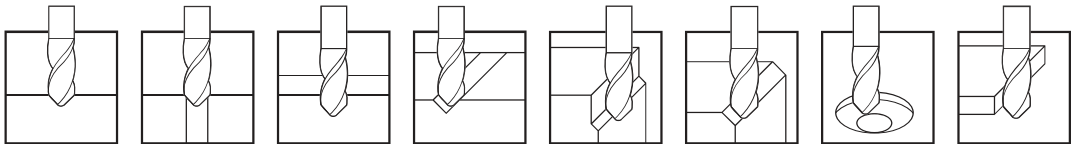
S3900



HSS/SC

| $\alpha$<br>k 12 | D<br>h 6 | d  | l <sub>1</sub> | l <sub>2</sub> | z |
|------------------|----------|----|----------------|----------------|---|
| 90°              | 3        | 6  | 50             | 6              | 2 |
| 90°              | 4        | 6  | 54             | 8              | 2 |
| 90°              | 5        | 6  | 57             | 10             | 2 |
| 90°              | 6        | 6  | 57             | 12             | 2 |
| 90°              | 8        | 8  | 63             | 16             | 2 |
| 90°              | 10       | 10 | 72             | 18             | 2 |
| 90°              | 12       | 12 | 83             | 20             | 2 |

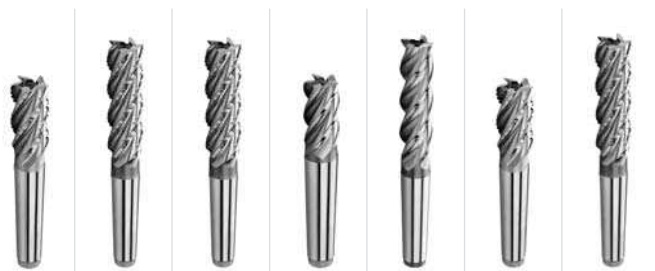
| S390002 | S390002    |
|---------|------------|
| .030    | .030 ALTIN |
| .040    | .040 ALTIN |
| .050    | .050 ALTIN |
| .060    | .060 ALTIN |
| .080    | .080 ALTIN |
| .100    | .100 ALTIN |
| .120    | .120 ALTIN |





|                |        |        |        |       |        |       |        |       |        |       |        |       |
|----------------|--------|--------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|
| Code           | 4242   | 4252   | 2605   | 4109  | 4102   | 4119  | 4112   | 4209  | 4202   | 4219  | 4212   | 4229  |
| DIN            | 845    | 845    | 326    | 845   | 845    | 845   | 845    | 845   | 845    | 845   | 845    | 845   |
| Type           | NR     | NR     | N      | W     | W      | W     | W      | N     | N      | N     | N      | CB    |
| Material       | HSSCo8 | HSSCo8 | HSSCo5 | HSS   | HSSCo5 | HSS   | HSSCo5 | HSS   | HSSCo5 | HSS   | HSSCo5 | HSS   |
| Dimension (mm) | 10-63  | 16-63  | 12-50  | 25-63 | 10-63  | 25-63 | 25-63  | 20-63 | 10-63  | 22-63 | 10-63  | 20-63 |
| Page           | 125    | 125    | 126    | 127   | 127    | 128   | 128    | 129   | 129    | 130   | 130    | 131   |

|          |     |   |   |   |   |   |   |   |   |   |   |   |
|----------|-----|---|---|---|---|---|---|---|---|---|---|---|
| <b>P</b> | P.1 | • | • | • | • | • | • | • | • | • | • | • |
|          | P.2 | • | • | • | • | • | • | • | • | • | • | • |
|          | P.3 |   |   | • |   |   |   |   | • |   | • |   |
|          | P.4 | • | • | • |   | • | • | • | • | • | • | • |
|          | P.5 |   |   |   |   |   |   |   | • |   | • |   |
|          | P.6 |   |   |   |   |   |   |   | • |   | • |   |
| <b>M</b> | M.1 |   |   |   |   |   |   |   |   |   |   |   |
|          | M.2 | • | • | • |   |   |   |   | • |   | • |   |
|          | M.3 |   |   |   |   |   |   |   |   |   |   |   |
| <b>K</b> | K.1 | • | • |   | • | • | • | • |   | • | • | • |
|          | K.2 |   |   |   |   |   |   |   | • |   | • |   |
| <b>N</b> | N.1 |   |   |   |   |   |   |   |   |   |   |   |
|          | N.2 |   |   |   | • | • | • | • |   |   |   |   |
|          | N.3 |   |   |   |   |   |   |   |   |   |   |   |
|          | N.4 |   |   |   | • | • | • | • |   |   |   |   |
| <b>S</b> | S.1 |   |   |   |   |   |   |   | • |   | • |   |
|          | S.2 |   |   |   |   |   |   |   |   |   |   |   |
| <b>H</b> | H.1 |   |   |   |   |   |   |   |   |   |   |   |
|          | H.2 |   |   |   |   |   |   |   |   |   |   |   |



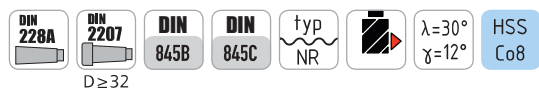
|                |        |       |        |        |        |        |        |
|----------------|--------|-------|--------|--------|--------|--------|--------|
| Code           | 4222   | 4239  | 4232   | 4402   | 4412   | 4422   | 4432   |
| DIN            | 845    | 845   | 845    | 845    | 845B   | 845B   | 845    |
| Type           | CB     | CB    | CB     | H      | H      | CB     | CB     |
| Material       | HSSCo5 | HSS   | HSSCo5 | HSSCo8 | HSSCo8 | HSSCo8 | HSSCo8 |
| Dimension (mm) | 10-63  | 22-63 | 10-63  | 10-50  | 10-50  | 10-50  | 10-50  |
| Page           | 131    | 132   | 132    | 133    | 133    | 134    | 134    |

|          |     |   |   |   |   |   |   |   |  |  |  |  |  |
|----------|-----|---|---|---|---|---|---|---|--|--|--|--|--|
| <b>P</b> | P.1 |   | • |   |   |   |   |   |  |  |  |  |  |
|          | P.2 | • | • | • |   |   |   |   |  |  |  |  |  |
|          | P.3 | • |   | • |   |   |   |   |  |  |  |  |  |
|          | P.4 | • | • | • |   |   |   |   |  |  |  |  |  |
|          | P.5 | • |   | • |   |   |   |   |  |  |  |  |  |
|          | P.6 | • |   | • | • | • | • | • |  |  |  |  |  |
| <b>M</b> | M.1 |   |   |   |   |   |   |   |  |  |  |  |  |
|          | M.2 | • |   | • |   |   |   |   |  |  |  |  |  |
|          | M.3 |   |   |   |   |   |   |   |  |  |  |  |  |
| <b>K</b> | K.1 |   | • |   |   |   |   |   |  |  |  |  |  |
|          | K.2 | • |   | • |   |   |   |   |  |  |  |  |  |
| <b>N</b> | N.1 |   |   |   |   |   |   |   |  |  |  |  |  |
|          | N.2 |   |   |   |   |   |   |   |  |  |  |  |  |
|          | N.3 |   |   |   |   |   |   |   |  |  |  |  |  |
|          | N.4 |   |   |   |   |   |   |   |  |  |  |  |  |
| <b>S</b> | S.1 | • |   | • | • | • | • | • |  |  |  |  |  |
|          | S.2 |   |   |   | • | • | • | • |  |  |  |  |  |
| <b>H</b> | H.1 |   |   |   |   |   |   |   |  |  |  |  |  |
|          | H.2 |   |   |   |   |   |   |   |  |  |  |  |  |



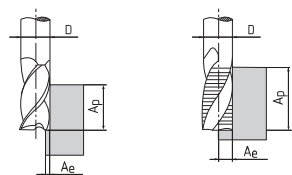
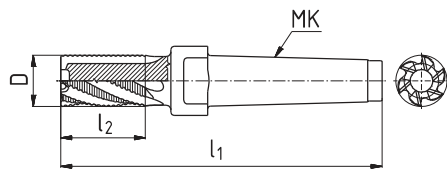


- EN Taper shank end mills, NR  
 DE Schafffräser mit MK, NR  
 RU Фрезы концевые с коническим хвостовиком, NR



4242

4252



| D<br>k 12 | MK | l <sub>1</sub><br>4242 | l <sub>1</sub><br>4252 | l <sub>2</sub><br>4242 | l <sub>2</sub><br>4252 | Z | 424248 | 425248 |
|-----------|----|------------------------|------------------------|------------------------|------------------------|---|--------|--------|
| 10        | 1  | 92                     |                        | 22                     |                        | 4 | .100   |        |
| 12        | 1  | 96                     |                        | 26                     |                        | 4 | .120   |        |
| 14        | 2  | 111                    |                        | 26                     |                        | 4 | .140   |        |
| 16        | 2  | 117                    | 148                    | 32                     | 63                     | 4 | .160   | .160   |
| 18        | 2  | 117                    |                        | 32                     |                        | 4 | .180   |        |
| 20        | 2  | 123                    | 160                    | 38                     | 75                     | 4 | .200   | .200   |
| 22        | 2  | 123                    | 160                    | 38                     | 75                     | 5 | .220   | .220   |
| 24        | 3  | 147                    | 192                    | 45                     | 90                     | 5 | .240   | .240   |
| 25        | 3  | 147                    | 192                    | 45                     | 90                     | 5 | .250   | .250   |
| 26        | 3  | 147                    | 192                    | 45                     | 90                     | 5 | .260   | .260   |
| 28        | 3  | 147                    | 192                    | 45                     | 90                     | 5 | .280   | .280   |
| 30        | 3  | 147                    | 192                    | 45                     | 90                     | 5 | .300   | .300   |
| 32        | 4  | 201                    | 254                    | 53                     | 106                    | 6 | .320   | .320   |
| 35        | 4  | 201                    |                        | 53                     |                        | 6 | .350   |        |
| 36        | 4  | 201                    | 254                    | 53                     | 106                    | 6 | .360   | .360   |
| 40        | 4  | 211                    | 273                    | 63                     | 125                    | 6 | .400   | .400   |
| 41        | 4  | 211                    |                        | 63                     |                        | 6 | .410   |        |
| 45        | 4  | 211                    | 273                    | 63                     | 125                    | 6 | .450   | .450   |
| 50        | 5  | 261                    | 336                    | 75                     | 150                    | 8 | .500   | .500   |
| 63        | 5  | 276                    | 366                    | 90                     | 180                    | 8 | .630   | .630   |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                        | Ap    | Ae    | Vc | fz (mm/z) |      |      |      |      |
|---------------------------------|-------|-------|----|-----------|------|------|------|------|
|                                 |       |       |    | Ø 10      | Ø 12 | Ø 16 | Ø 18 | Ø 20 |
| P.1 ≤ 600 N/mm <sup>2</sup>     | 1,5xD | 0,5xD | 45 | 0,035     | 0,04 | 0,07 | 0,08 | 0,09 |
| P.2 ≤ 850 N/mm <sup>2</sup>     | 1,5xD | 0,5xD | 39 | 0,035     | 0,04 | 0,07 | 0,08 | 0,09 |
| P.4 ≤ 900 N/mm <sup>2</sup>     | 1,5xD | 0,5xD | 30 | 0,035     | 0,04 | 0,07 | 0,08 | 0,09 |
| M.2 750 - 850 N/mm <sup>2</sup> | 1,5xD | 0,5xD | 15 | 0,035     | 0,04 | 0,07 | 0,08 | 0,09 |
| K.1 < 240 HB                    | 1,5xD | 0,5xD | 35 | 0,035     | 0,04 | 0,07 | 0,08 | 0,09 |

- EN Slot drills | short, centre cutting, 2 – fluted
- DE Langlochfräser mit MK | Kurz, mit Zentrumschnitt, zweischneider
- RU Фрезы шпоночные | короткие, с коническим хвостовиком

DIN 228A

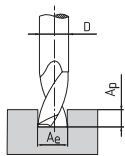
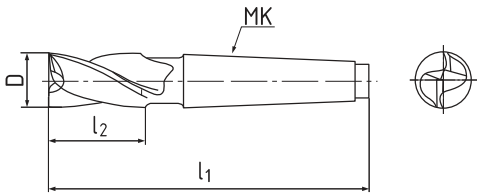
DIN ~326

typ N

$\lambda=25^\circ$   
 $\gamma=12^\circ$

HSS Co5

2605

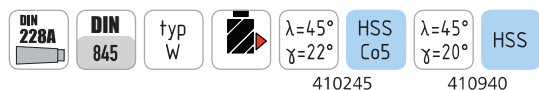


| D<br>e 8 | MK | l <sub>1</sub> | l <sub>2</sub> | Z | 260545 |
|----------|----|----------------|----------------|---|--------|
| 12       | 1  | 85             | 14             | 2 | .120   |
| 14       | 2  | 100            | 16             | 2 | .140   |
| 16       | 2  | 105            | 18             | 2 | .160   |
| 18       | 2  | 110            | 20             | 2 | .180   |
| 20       | 2  | 115            | 20             | 2 | .200   |
| 22       | 2  | 120            | 22             | 2 | .220   |
| 24       | 3  | 140            | 25             | 2 | .240   |
| 25       | 3  | 140            | 25             | 2 | .250   |
| 28       | 3  | 145            | 28             | 2 | .280   |
| 30       | 3  | 150            | 30             | 2 | .300   |
| 32       | 4  | 175            | 32             | 2 | .320   |
| 36       | 4  | 175            | 34             | 2 | .360   |
| 40       | 4  | 180            | 38             | 2 | .400   |
| 45       | 4  | 185            | 42             | 2 | .450   |
| 50       | 5  | 220            | 45             | 2 | .500   |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

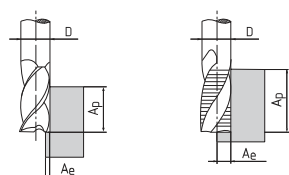
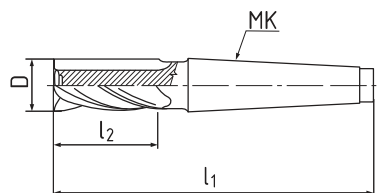
| Material                        | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |       |       |       |       |
|---------------------------------|----------------|----------------|----------------|-----------------------|-------|-------|-------|-------|-------|-------|-------|
|                                 |                |                |                | Ø 3                   | Ø 6   | Ø 8   | Ø 10  | Ø 12  | Ø 16  | Ø 18  | Ø 20  |
| P.1 ≤ 600 N/mm <sup>2</sup>     | 0,5xD          | 1xD            | 45             | 0,009                 | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| P.2 ≤ 850 N/mm <sup>2</sup>     | 0,5xD          | 1xD            | 39             | 0,009                 | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| P.3 ≤ 1100 N/mm <sup>2</sup>    | 0,5xD          | 1xD            | 24             | 0,009                 | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| P.4 ≤ 900 N/mm <sup>2</sup>     | 0,5xD          | 1xD            | 30             | 0,009                 | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |
| M.2 750 - 850 N/mm <sup>2</sup> | 0,5xD          | 1xD            | 15             | 0,009                 | 0,022 | 0,029 | 0,036 | 0,044 | 0,058 | 0,065 | 0,073 |

- EN Taper shank end mills | short, coarse teeth  
 DE Schaftfräser mit MK | Kurz, grobgezahnt  
 RU Фрезы концевые с коническим хвостовиком | короткие, крупнозубые



4102

4109



| D<br>k 10** | MK<br>h 6 | l <sub>1</sub><br>4102 | l <sub>1</sub><br>4109 | l <sub>2</sub><br>4102 | l <sub>2</sub><br>4109 | z | 410245 | 410940 |
|-------------|-----------|------------------------|------------------------|------------------------|------------------------|---|--------|--------|
| 10          | 1         | 92                     |                        | 22                     |                        | 3 | .100   |        |
| 12          | 2         | 111                    |                        | 26                     |                        | 3 | .120   |        |
| 16          | 2         | 117                    |                        | 32                     |                        | 3 | .160   |        |
| 20          | 2         | 123                    |                        | 38                     |                        | 3 | .200   |        |
| 22          | 2         | 123                    |                        | 38                     |                        | 3 | .220   |        |
| 24          | 3         | 147                    |                        | 45                     |                        | 4 | .240   |        |
| 25          | 3         | 147                    | 154*                   | 45                     | 50*                    | 4 | .250   | .250*  |
| 26          | 3         | 147                    |                        | 45                     |                        | 4 | .260   |        |
| 28          | 3         | 147                    | 154*                   | 45                     | 50*                    | 4 | .280   | .280*  |
| 30          | 3         | 147                    | 154*                   | 45                     | 50*                    | 4 | .300   | .300*  |
| 32          | 4         | 178                    | 178                    | 53                     | 53                     | 4 | .320   | .320   |
| 36          | 4         | 178                    | 178                    | 53                     | 53                     | 4 | .360   | .360   |
| 40          | 4         | 188                    | 188                    | 63                     | 63                     | 4 | .400   | .400   |
| 45          | 4         | 188                    | 188                    | 63                     | 63                     | 4 | .450   | .450   |
| 50          | 5         | 233                    | 228*                   | 75                     | 70*                    | 5 | .500   | .500*  |
| 63          | 5         | 248                    | 241*                   | 90                     | 80*                    | 6 | .630   | .630*  |

\*) ≠ DIN 845

\*\*) 410940 = js 14

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

|          |             |                |                |                | fz (mm/z) |        |        |        |        |
|----------|-------------|----------------|----------------|----------------|-----------|--------|--------|--------|--------|
| Material |             | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | Ø 10      | Ø 12   | Ø 16   | Ø 18   | Ø 20   |
| P.1      | ≤ 600 N/mm² | 1xD            | 0,1xD          | 37,5           | 0,028     | 0,034  | 0,044  | 0,051  | 0,057  |
| P.2      | ≤ 850 N/mm² | 1xD            | 0,1xD          | 32,5           | 0,028     | 0,034  | 0,044  | 0,051  | 0,057  |
| P.4      | ≤ 900 N/mm² | 1xD            | 0,1xD          | 25             | 0,028     | 0,034  | 0,044  | 0,051  | 0,057  |
| K.1      | < 240 HB    | 1xD            | 0,1xD          | 30             | 0,028     | 0,034  | 0,044  | 0,051  | 0,057  |
| N.2      | Si ≤ 12%    | 1xD            | 0,1xD          | 160-260        | 0,0364    | 0,0442 | 0,0572 | 0,0663 | 0,0741 |
| N.4      | ≤ 800 N/mm² | 1xD            | 0,1xD          | 60-100         | 0,028     | 0,034  | 0,044  | 0,051  | 0,057  |



- EN Taper shank end mills | long, coarse teeth
- DE Schafffräser mit MK | Lang, grobgezahnt
- RU Фрезы концевые с коническим хвостовиком | длинные, крупнозубые

typ

W

$\lambda=45^\circ$

$\gamma=22^\circ$

HSS

Co5

$\lambda=45^\circ$

$\gamma=20^\circ$

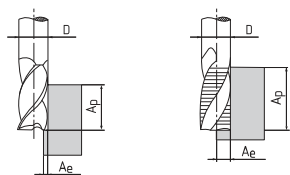
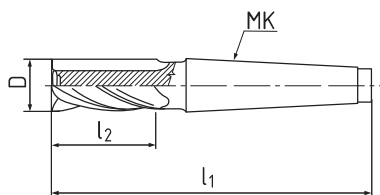
HSS

411245

411940

## 4112

## 4119



| D<br>k 10** | MK | l <sub>1</sub><br>4112 | l <sub>1</sub><br>4119 | l <sub>2</sub><br>4112 | l <sub>2</sub><br>4119 | z |
|-------------|----|------------------------|------------------------|------------------------|------------------------|---|
| 25          | 3  | 192                    | 184*                   | 90                     | 80*                    | 4 |
| 32          | 4  | 231                    | 229*                   | 106                    | 100*                   | 4 |
| 40          | 4  | 250                    | 250                    | 125                    | 125                    | 4 |
| 50          | 5  | 308                    | 308                    | 150                    | 150                    | 5 |
| 63          | 5  | 338                    | 338                    | 180                    | 180                    | 6 |

\*) ≠ DIN 845

\*\*\*) 411940 = js 14

411245

411940

.250  
.320  
.400  
.500  
.630

.250\*  
.320\*  
.400  
.500  
.630

### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

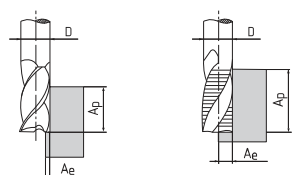
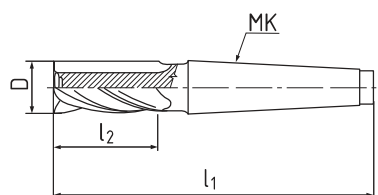
| Material                    | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |        |        |        |        |
|-----------------------------|----------------|----------------|----------------|-----------------------|--------|--------|--------|--------|
|                             |                |                |                | Ø 10                  | Ø 12   | Ø 16   | Ø 18   | Ø 20   |
| P.1 ≤ 600 N/mm <sup>2</sup> | 1xD            | 0,1xD          | 37,5           | 0,028                 | 0,034  | 0,044  | 0,051  | 0,057  |
| P.2 ≤ 850 N/mm <sup>2</sup> | 1xD            | 0,1xD          | 32,5           | 0,028                 | 0,034  | 0,044  | 0,051  | 0,057  |
| P.4 ≤ 900 N/mm <sup>2</sup> | 1xD            | 0,1xD          | 25             | 0,028                 | 0,034  | 0,044  | 0,051  | 0,057  |
| K.1 < 240 HB                | 1xD            | 0,1xD          | 30             | 0,028                 | 0,034  | 0,044  | 0,051  | 0,057  |
| N.2 Si ≤ 12%                | 1xD            | 0,1xD          | 160-260        | 0,0364                | 0,0442 | 0,0572 | 0,0663 | 0,0741 |
| N.5 ≤ 800 N/mm <sup>2</sup> | 1xD            | 0,1xD          | 60-100         | 0,028                 | 0,034  | 0,044  | 0,051  | 0,057  |

EN Taper shank end mills | short  
 DE Schafffräser mit MK | Kurz  
 RU Фрезы концевые с коническим хвостовиком | короткие, среднезубые



4202

4209



| D<br>k 10** | MK | l <sub>1</sub><br>4202 | l <sub>1</sub><br>4209 | l <sub>2</sub><br>4202 | l <sub>2</sub><br>4209 | z | 420245 | 420940 |
|-------------|----|------------------------|------------------------|------------------------|------------------------|---|--------|--------|
| 10          | 1  | 92                     |                        | 22                     |                        | 4 | .100   |        |
| 12          | 2  | 111                    |                        | 26                     |                        | 4 | .120   |        |
| 14          | 2  | 111                    |                        | 26                     |                        | 4 | .140   |        |
| 16          | 2  | 117                    |                        | 32                     |                        | 4 | .160   |        |
| 18          | 2  | 117                    |                        | 32                     |                        | 4 | .180   |        |
| 20          | 2  | 123                    | 123                    | 38                     | 38                     | 4 | .200   | .200   |
| 22          | 2  | 123                    | 123                    | 38                     | 38                     | 5 | .220   | .220   |
| 24          | 3  | 147                    |                        | 45                     |                        | 5 | .240   |        |
| 25          | 3  | 147                    | 154*                   | 45                     | 50*                    | 5 | .250   | .250*  |
| 26          | 3  | 147                    |                        | 45                     |                        | 5 | .260   |        |
| 28          | 3  | 147                    | 154*                   | 45                     | 50*                    | 5 | .280   | .280*  |
| 30          | 3  | 147                    | 154*                   | 45                     | 50*                    | 6 | .300   | .300*  |
| 32          | 4  | 178                    | 178                    | 53                     | 53                     | 6 | .320   | .320   |
| 36          | 4  | 178                    | 178                    | 53                     | 53                     | 6 | .360   | .360   |
| 40          | 4  | 188                    | 188                    | 63                     | 63                     | 6 | .400   | .400   |
| 45          | 4  | 188                    | 188                    | 63                     | 63                     | 6 | .450   | .450   |
| 50          | 5  | 233                    | 228*                   | 75                     | 70*                    | 6 | .500   | .500*  |
| 56          | 5  | 233                    |                        | 75                     |                        | 8 | .560   |        |
| 63          | 5  | 248                    | 241*                   | 90                     | 80*                    | 8 | .630   | .630*  |

\*) ≠ DIN 845

\*\*) 420940 = js 14

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

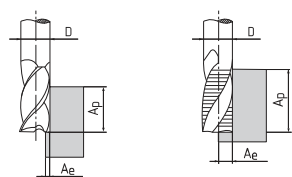
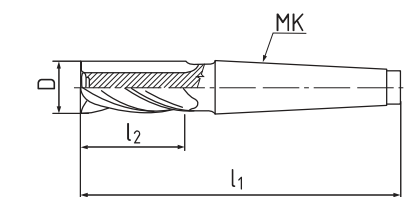
| Material | A <sub>p</sub>  | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |        |        |        |        |        |
|----------|-----------------|----------------|----------------|-----------------------|--------|--------|--------|--------|--------|
|          |                 |                |                | Ø 10                  | Ø 12   | Ø 16   | Ø 18   | Ø 20   |        |
| 420245   |                 |                |                |                       |        |        |        |        |        |
| P.1      | ≤ 600 N/mm²     | 1xD            | 0,1xD          | 37,5                  | 0,028  | 0,034  | 0,044  | 0,051  | 0,057  |
| P.2      | ≤ 850 N/mm²     | 1xD            | 0,1xD          | 32,5                  | 0,028  | 0,034  | 0,044  | 0,051  | 0,057  |
| P.3      | ≤ 1100 N/mm²    | 1xD            | 0,1xD          | 18                    | 0,028  | 0,034  | 0,044  | 0,051  | 0,057  |
| P.4      | ≤ 900 N/mm²     | 1xD            | 0,1xD          | 25                    | 0,028  | 0,034  | 0,044  | 0,051  | 0,057  |
| P.5      | ≤ 1100 N/mm²    | 1xD            | 0,1xD          | 18                    | 0,028  | 0,034  | 0,044  | 0,051  | 0,057  |
| P.6      | > 1100 N/mm²    | 1xD            | 0,1xD          | 16                    | 0,0196 | 0,0238 | 0,0308 | 0,0357 | 0,0399 |
| K.2      | > 240 HB        | 1xD            | 0,1xD          | 22                    | 0,028  | 0,034  | 0,044  | 0,051  | 0,057  |
| M.2      | 750 - 850 N/mm² | 1xD            | 0,1xD          | 10                    | 0,028  | 0,034  | 0,044  | 0,051  | 0,057  |
| S.1      | ≤ 1500 N/mm²    | 1xD            | 0,1xD          | 8                     | 0,0196 | 0,0238 | 0,0308 | 0,0357 | 0,0399 |
| 420940   |                 |                |                |                       |        |        |        |        |        |
| P.1      | ≤ 600 N/mm²     | 1xD            | 0,1xD          | 30                    | 0,028  | 0,034  | 0,044  | 0,051  | 0,057  |
| P.2      | ≤ 850 N/mm²     | 1xD            | 0,1xD          | 26                    | 0,028  | 0,034  | 0,044  | 0,051  | 0,057  |
| P.4      | ≤ 900 N/mm²     | 1xD            | 0,1xD          | 20                    | 0,028  | 0,034  | 0,044  | 0,051  | 0,057  |
| K.1      | < 240 HB        | 1xD            | 0,1xD          | 25                    | 0,028  | 0,034  | 0,044  | 0,051  | 0,057  |

**EN** Taper shank end mills | long  
**DE** Schaftfräser mit MK | Lang  
**RU** Фрезы концевые с коническим хвостовиком | длинные, среднезубые



## 4212

## 4219



| D<br>k 10** | MK | l <sub>1</sub><br>4212 | l <sub>1</sub><br>4219 | l <sub>2</sub><br>4212 | l <sub>2</sub><br>4219 | Z |
|-------------|----|------------------------|------------------------|------------------------|------------------------|---|
| 10          | 1  | 115                    |                        | 45                     |                        | 4 |
| 12          | 2  | 138                    |                        | 53                     |                        | 4 |
| 14          | 2  | 138                    |                        | 53                     |                        | 4 |
| 16          | 2  | 148                    |                        | 63                     |                        | 4 |
| 18          | 2  | 148                    |                        | 63                     |                        | 4 |
| 20          | 2  | 160                    |                        | 75                     |                        | 4 |
| 22          | 2  | 160                    | 160                    | 75                     | 75                     | 5 |
| 24          | 3  | 192                    |                        | 90                     |                        | 5 |
| 25          | 3  | 192                    | 184*                   | 90                     | 80*                    | 5 |
| 26          | 3  | 192                    |                        | 90                     |                        | 5 |
| 28          | 3  | 192                    |                        | 90                     |                        | 5 |
| 30          | 3  | 192                    |                        | 90                     |                        | 6 |
| 32          | 4  | 231                    | 229*                   | 106                    | 100*                   | 6 |
| 36          | 4  | 231                    |                        | 106                    |                        | 6 |
| 40          | 4  | 250                    | 250                    | 125                    | 125                    | 6 |
| 45          | 4  | 250                    |                        | 125                    |                        | 6 |
| 50          | 5  | 308                    | 308                    | 150                    | 150                    | 6 |
| 50          | 5  |                        | 268*                   |                        | 110*                   | 6 |
| 56          | 5  | 308                    |                        | 150                    |                        | 8 |
| 63          | 5  | 338                    | 338                    | 180                    | 180                    | 8 |

\*) ≠ DIN 845

\*\*) 421940 = js 14

421245

421940

|      |          |
|------|----------|
| .100 |          |
| .120 |          |
| .140 |          |
| .160 |          |
| .180 |          |
| .200 |          |
| .220 | .220     |
| .240 |          |
| .250 | .250*    |
| .260 |          |
| .280 |          |
| .300 |          |
| .320 | .320*    |
| .360 |          |
| .400 | .400     |
| .450 |          |
| .500 | .500     |
|      | .500110* |
| .560 |          |
| .630 | .630     |

### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

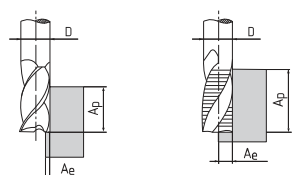
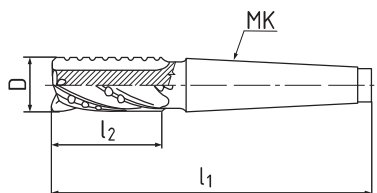
| Material |                 | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |        |        |        |        |
|----------|-----------------|----------------|----------------|----------------|-----------------------|--------|--------|--------|--------|
|          |                 |                |                |                | Ø 10                  | Ø 12   | Ø 16   | Ø 18   | Ø 20   |
| 421245   |                 |                |                |                |                       |        |        |        |        |
| P.1      | ≤ 600 N/mm²     | 1xD            | 0,1xD          | 37,5           | 0,028                 | 0,034  | 0,044  | 0,051  | 0,057  |
| P.2      | ≤ 850 N/mm²     | 1xD            | 0,1xD          | 32,5           | 0,028                 | 0,034  | 0,044  | 0,051  | 0,057  |
| P.3      | ≤ 1100 N/mm²    | 1xD            | 0,1xD          | 18             | 0,028                 | 0,034  | 0,044  | 0,051  | 0,057  |
| P.4      | ≤ 900 N/mm²     | 1xD            | 0,1xD          | 25             | 0,028                 | 0,034  | 0,044  | 0,051  | 0,057  |
| P.5      | ≤ 1100 N/mm²    | 1xD            | 0,1xD          | 18             | 0,028                 | 0,034  | 0,044  | 0,051  | 0,057  |
| P.6      | > 1100 N/mm²    | 1xD            | 0,1xD          | 16             | 0,0196                | 0,0238 | 0,0308 | 0,0357 | 0,0399 |
| K.2      | > 240 HB        | 1xD            | 0,1xD          | 22             | 0,028                 | 0,034  | 0,044  | 0,051  | 0,057  |
| M.2      | 750 - 850 N/mm² | 1xD            | 0,1xD          | 10             | 0,028                 | 0,034  | 0,044  | 0,051  | 0,057  |
| S.1      | ≤ 1500 N/mm²    | 1xD            | 0,1xD          | 8              | 0,0196                | 0,0238 | 0,0308 | 0,0357 | 0,0399 |
| 421940   |                 |                |                |                |                       |        |        |        |        |
| P.1      | ≤ 600 N/mm²     | 1xD            | 0,1xD          | 30             | 0,028                 | 0,034  | 0,044  | 0,051  | 0,057  |
| P.2      | ≤ 850 N/mm²     | 1xD            | 0,1xD          | 26             | 0,028                 | 0,034  | 0,044  | 0,051  | 0,057  |
| P.4      | ≤ 900 N/mm²     | 1xD            | 0,1xD          | 20             | 0,028                 | 0,034  | 0,044  | 0,051  | 0,057  |
| K.1      | < 240 HB        | 1xD            | 0,1xD          | 25             | 0,028                 | 0,034  | 0,044  | 0,051  | 0,057  |

EN Taper shank end mills | short  
 DE Schaftfräser mit MK | Kurz  
 RU Фрезы концевые с коническим хвостовиком | короткие, среднезубые



4222

4229



| D<br>k 10 | MK<br>h 6 | l <sub>1</sub><br>4222 | l <sub>1</sub><br>4229 | l <sub>2</sub><br>4222 | l <sub>2</sub><br>4229 | z | 422245 | 422940 |
|-----------|-----------|------------------------|------------------------|------------------------|------------------------|---|--------|--------|
| 10        | 1         | 92                     |                        | 22                     |                        | 4 | .100   |        |
| 12        | 2         | 111                    |                        | 26                     |                        | 4 | .120   |        |
| 14        | 2         | 111                    |                        | 26                     |                        | 4 | .140   |        |
| 16        | 2         | 117                    |                        | 32                     |                        | 4 | .160   |        |
| 18        | 2         | 117                    |                        | 32                     |                        | 4 | .180   |        |
| 20        | 2         | 123                    | 123                    | 38                     | 38                     | 4 | .200   | .200   |
| 22        | 2         | 123                    | 123                    | 38                     | 38                     | 5 | .220   | .220   |
| 25        | 3         | 147                    | 154*                   | 45                     | 50*                    | 5 | .250   | .250*  |
| 28        | 3         | 147                    | 154*                   | 45                     | 50*                    | 5 | .280   | .280*  |
| 30        | 3         | 147                    | 154*                   | 45                     | 50*                    | 6 | .300   | .300*  |
| 32        | 4         | 178                    | 178                    | 53                     | 53                     | 6 | .320   | .320   |
| 36        | 4         | 178                    | 178                    | 53                     | 53                     | 6 | .360   | .360   |
| 40        | 4         | 188                    | 188                    | 63                     | 63                     | 6 | .400   | .400   |
| 45        | 4         | 188                    | 188                    | 63                     | 63                     | 6 | .450   | .450   |
| 50        | 5         | 233                    | 228*                   | 75                     | 70*                    | 6 | .500   | .500*  |
| 56        | 5         | 233                    |                        | 75                     |                        | 8 | .560   |        |
| 63        | 5         | 248                    | 241*                   | 90                     | 80*                    | 8 | .630   | .630*  |

\*) ≠ DIN 845

\*\*) 422940 = js 14

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

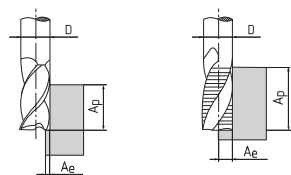
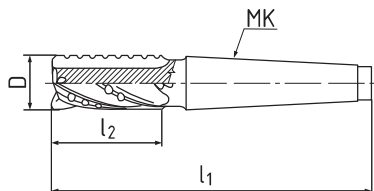
| Material |                 | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |       |
|----------|-----------------|----------------|----------------|----------------|-----------------------|-------|-------|-------|-------|
|          |                 |                |                |                | Ø 10                  | Ø 12  | Ø 16  | Ø 18  | Ø 20  |
| 422245   |                 |                |                |                |                       |       |       |       |       |
| P.2      | ≤ 850 N/mm²     | 1,5xD          | 0,5xD          | 32,5           | 0,035                 | 0,04  | 0,07  | 0,08  | 0,09  |
| P.3      | ≤ 1100 N/mm²    | 1,5xD          | 0,5xD          | 18             | 0,035                 | 0,04  | 0,07  | 0,08  | 0,09  |
| P.4      | ≤ 900 N/mm²     | 1,5xD          | 0,5xD          | 25             | 0,035                 | 0,04  | 0,07  | 0,08  | 0,09  |
| P.5      | ≤ 1100 N/mm²    | 1,5xD          | 0,5xD          | 18             | 0,035                 | 0,04  | 0,07  | 0,08  | 0,09  |
| P.6      | > 1100 N/mm²    | 1,5xD          | 0,5xD          | 16             | 0,0245                | 0,028 | 0,049 | 0,056 | 0,063 |
| M.2      | 750 - 850 N/mm² | 1,5xD          | 0,5xD          | 10             | 0,035                 | 0,04  | 0,07  | 0,08  | 0,09  |
| K.2      | > 240 HB        | 1,5xD          | 0,5xD          | 22             | 0,035                 | 0,04  | 0,07  | 0,08  | 0,09  |
| S.1      | ≤ 1500 N/mm²    | 1,5xD          | 0,5xD          | 8              | 0,0245                | 0,028 | 0,049 | 0,056 | 0,063 |
| 422940   |                 |                |                |                |                       |       |       |       |       |
| P.1      | ≤ 600 N/mm²     | 1,5xD          | 0,5xD          | 30             | 0,035                 | 0,04  | 0,07  | 0,08  | 0,09  |
| P.2      | ≤ 850 N/mm²     | 1,5xD          | 0,5xD          | 26             | 0,035                 | 0,04  | 0,07  | 0,08  | 0,09  |
| P.4      | ≤ 900 N/mm²     | 1,5xD          | 0,5xD          | 20             | 0,035                 | 0,04  | 0,07  | 0,08  | 0,09  |
| K.1      | < 240 HB        | 1,5xD          | 0,5xD          | 25             | 0,035                 | 0,04  | 0,07  | 0,08  | 0,09  |

EN Taper shank end mills | long  
DE Schafffräser mit MK | Lang  
RU Фрезы концевые с коническим хвостовиком | длинные, среднезубые



## 4232

## 4239



| D<br>k 10 | MK | l <sub>1</sub><br>4232 | l <sub>1</sub><br>4239 | l <sub>2</sub><br>4232 | l <sub>2</sub><br>4239 | z |
|-----------|----|------------------------|------------------------|------------------------|------------------------|---|
| 10        | 1  | 115                    |                        | 45                     |                        | 4 |
| 12        | 2  | 138                    |                        | 53                     |                        | 4 |
| 14        | 2  | 138                    |                        | 53                     |                        | 4 |
| 16        | 2  | 148                    |                        | 63                     |                        | 4 |
| 18        | 2  | 148                    |                        | 63                     |                        | 4 |
| 20        | 2  | 160                    |                        | 75                     |                        | 4 |
| 22        | 2  | 160                    | 160                    | 75                     | 75                     | 5 |
| 25        | 3  | 192                    | 184*                   | 90                     | 80*                    | 5 |
| 28        | 3  | 192                    |                        | 90                     |                        | 5 |
| 30        | 3  | 192                    |                        | 90                     |                        | 6 |
| 32        | 4  | 231                    | 229*                   | 106                    | 100*                   | 6 |
| 36        | 4  | 231                    |                        | 106                    |                        | 6 |
| 40        | 4  | 250                    | 250                    | 125                    | 125                    | 6 |
| 45        | 4  | 250                    |                        | 125                    |                        | 6 |
| 50        | 5  | 308                    | 308                    | 150                    | 150                    | 6 |
| 50        | 5  |                        | 268*                   |                        | 110*                   | 6 |
| 56        | 5  | 308                    |                        | 150                    |                        | 8 |
| 63        | 5  | 338                    | 338                    | 180                    | 180                    | 8 |

\*) ≠ DIN 845

### 423245

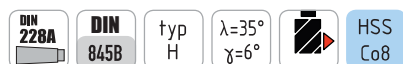
### 423940

|      |          |
|------|----------|
| .100 |          |
| .120 |          |
| .140 |          |
| .160 |          |
| .180 |          |
| .200 |          |
| .220 | .220     |
| .250 | .250*    |
| .280 |          |
| .300 |          |
| .320 | .320*    |
| .360 |          |
| .400 | .400     |
| .450 |          |
| .500 | .500     |
|      | .500110* |
| .560 |          |
| .630 | .630     |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

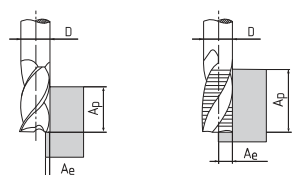
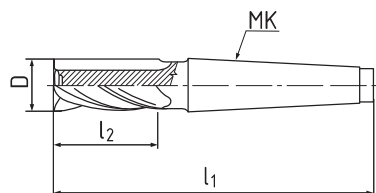
| Material |                 | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |       |
|----------|-----------------|----------------|----------------|----------------|-----------------------|-------|-------|-------|-------|
|          |                 |                |                |                | Ø 10                  | Ø 12  | Ø 16  | Ø 18  | Ø 20  |
| 423245   |                 |                |                |                |                       |       |       |       |       |
| P.2      | ≤ 850 N/mm²     | 1,5xD          | 0,5xD          | 32,5           | 0,035                 | 0,04  | 0,07  | 0,08  | 0,09  |
| P.3      | ≤ 1100 N/mm²    | 1,5xD          | 0,5xD          | 18             | 0,035                 | 0,04  | 0,07  | 0,08  | 0,09  |
| P.4      | ≤ 900 N/mm²     | 1,5xD          | 0,5xD          | 25             | 0,035                 | 0,04  | 0,07  | 0,08  | 0,09  |
| P.5      | ≤ 1100 N/mm²    | 1,5xD          | 0,5xD          | 18             | 0,035                 | 0,04  | 0,07  | 0,08  | 0,09  |
| P.6      | > 1100 N/mm²    | 1,5xD          | 0,5xD          | 16             | 0,0245                | 0,028 | 0,049 | 0,056 | 0,063 |
| M.2      | 750 - 850 N/mm² | 1,5xD          | 0,5xD          | 10             | 0,035                 | 0,04  | 0,07  | 0,08  | 0,09  |
| K.2      | > 240 HB        | 1,5xD          | 0,5xD          | 22             | 0,035                 | 0,04  | 0,07  | 0,08  | 0,09  |
| S.1      | ≤ 1500 N/mm²    | 1,5xD          | 0,5xD          | 8              | 0,0245                | 0,028 | 0,049 | 0,056 | 0,063 |
| 423940   |                 |                |                |                |                       |       |       |       |       |
| P.1      | ≤ 600 N/mm²     | 1,5xD          | 0,5xD          | 30             | 0,035                 | 0,04  | 0,07  | 0,08  | 0,09  |
| P.2      | ≤ 850 N/mm²     | 1,5xD          | 0,5xD          | 26             | 0,035                 | 0,04  | 0,07  | 0,08  | 0,09  |
| P.4      | ≤ 900 N/mm²     | 1,5xD          | 0,5xD          | 20             | 0,035                 | 0,04  | 0,07  | 0,08  | 0,09  |
| K.1      | < 240 HB        | 1,5xD          | 0,5xD          | 25             | 0,035                 | 0,04  | 0,07  | 0,08  | 0,09  |

- EN Taper shank end mills, for titanium machining  
 DE Schafffräser mit MK, für Titan Bearbeitung  
 RU Фрезы концевые с коническим хвостовиком на титан



4402

4412



| D<br>k 10 | MK | l <sub>1</sub><br>4402 | l <sub>1</sub><br>4412 | l <sub>2</sub><br>4402 | l <sub>2</sub><br>4412 | z | 440248 | 441248 |
|-----------|----|------------------------|------------------------|------------------------|------------------------|---|--------|--------|
| 10        | 1  | 92                     | 115                    | 22                     | 45                     | 4 | .100   | .100   |
| 12        | 1  | 96                     | 123                    | 26                     | 53                     | 4 | .120   | .120   |
| 14        | 2  | 111                    | 138                    | 26                     | 53                     | 4 | .140   | .140   |
| 16        | 2  | 117                    | 148                    | 32                     | 63                     | 4 | .160   | .160   |
| 18        | 2  | 117                    | 148                    | 32                     | 63                     | 4 | .180   | .180   |
| 20        | 2  | 123                    | 160                    | 38                     | 75                     | 4 | .200   | .200   |
| 22        | 2  | 123                    | 160                    | 38                     | 75                     | 5 | .220   | .220   |
| 25        | 3  | 147                    | 192                    | 45                     | 90                     | 5 | .250   | .250   |
| 28        | 3  | 147                    | 192                    | 45                     | 90                     | 5 | .280   | .280   |
| 30        | 3  | 147                    | 192                    | 45                     | 90                     | 6 | .300   | .300   |
| 32        | 4  | 178                    | 231                    | 53                     | 106                    | 6 | .320   | .320   |
| 36        | 4  | 178                    | 231                    | 53                     | 106                    | 6 | .360   | .360   |
| 40        | 4  | 188                    | 250                    | 63                     | 125                    | 6 | .400   | .400   |
| 45        | 4  | 188                    | 250                    | 63                     | 125                    | 6 | .450   | .450   |
| 50        | 5  | 233                    | 308                    | 75                     | 150                    | 6 | .500   | .500   |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

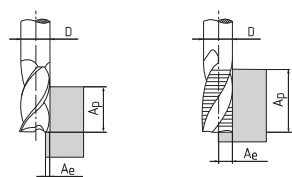
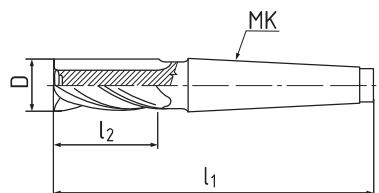
| Material |              | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |        |        |        |        |
|----------|--------------|----------------|----------------|----------------|-----------------------|--------|--------|--------|--------|
|          |              |                |                |                | Ø 10                  | Ø 12   | Ø 16   | Ø 18   | Ø 20   |
| P.6      | > 1100 N/mm² | 1xD            | 0,1xD          | 20             | 0,0196                | 0,0238 | 0,0308 | 0,0357 | 0,0399 |
| S.1      | ≤ 1500 N/mm² | 1xD            | 0,1xD          | 12             | 0,0196                | 0,0238 | 0,0308 | 0,0357 | 0,0399 |
| S.2      | ≤ 1250 N/mm² | 1xD            | 0,1xD          | 12             | 0,0196                | 0,0238 | 0,0308 | 0,0357 | 0,0399 |

- EN Taper shank end mills, for titanium machining
- DE Schafffräser mit MK, für Titan Bearbeitung
- RU Фрезы концевые с коническим хвостовиком на титан



## 4422

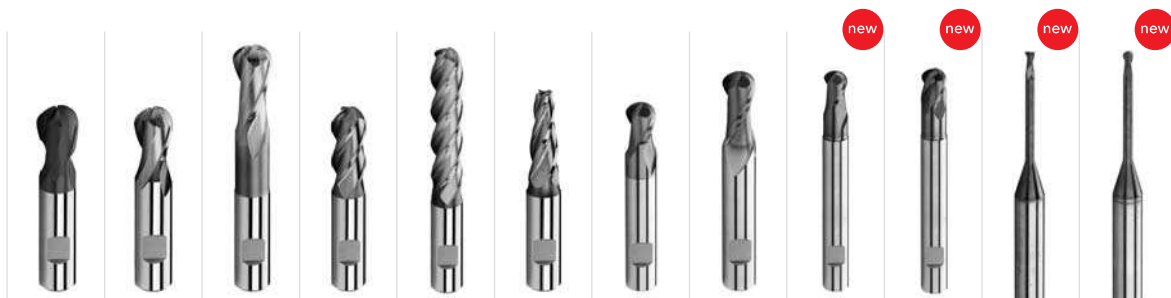
## 4432



| D<br>k 10 | MK | l <sub>1</sub><br>4422 | l <sub>1</sub><br>4432 | l <sub>2</sub><br>4422 | l <sub>2</sub><br>4432 | z | 442248 | 443248 |
|-----------|----|------------------------|------------------------|------------------------|------------------------|---|--------|--------|
| 10        | 1  | 92                     | 115                    | 22                     | 45                     | 4 | .100   | .100   |
| 12        | 1  | 96                     | 123                    | 26                     | 53                     | 4 | .120   | .120   |
| 14        | 2  | 111                    | 138                    | 26                     | 53                     | 4 | .140   | .140   |
| 16        | 2  | 117                    | 148                    | 32                     | 63                     | 4 | .160   | .160   |
| 18        | 2  | 117                    | 148                    | 32                     | 63                     | 4 | .180   | .180   |
| 20        | 2  | 123                    | 160                    | 38                     | 75                     | 4 | .200   | .200   |
| 22        | 2  | 123                    | 160                    | 38                     | 75                     | 5 | .220   | .220   |
| 25        | 3  | 147                    | 192                    | 45                     | 90                     | 5 | .250   | .250   |
| 28        | 3  | 147                    | 192                    | 45                     | 90                     | 5 | .280   | .280   |
| 30        | 3  | 147                    | 192                    | 45                     | 90                     | 6 | .300   | .300   |
| 32        | 4  | 178                    | 231                    | 53                     | 106                    | 6 | .320   | .320   |
| 36        | 4  | 178                    | 231                    | 53                     | 106                    | 6 | .360   | .360   |
| 40        | 4  | 188                    | 250                    | 63                     | 125                    | 6 | .400   | .400   |
| 45        | 4  | 188                    | 250                    | 63                     | 125                    | 6 | .450   | .450   |
| 50        | 5  | 233                    | 308                    | 75                     | 150                    | 6 | .500   | .500   |

### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material |              | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |       |
|----------|--------------|----------------|----------------|----------------|-----------------------|-------|-------|-------|-------|
|          |              |                |                |                | Ø 10                  | Ø 12  | Ø 16  | Ø 18  | Ø 20  |
| P.6      | > 1100 N/mm² | 1,5xD          | 0,5xD          | 20             | 0,0245                | 0,028 | 0,049 | 0,056 | 0,063 |
| S.1      | ≤ 1500 N/mm² | 1,5xD          | 0,5xD          | 12             | 0,0245                | 0,028 | 0,049 | 0,056 | 0,063 |
| S.2      | ≤ 1250 N/mm² | 1,5xD          | 0,5xD          | 12             | 0,0245                | 0,028 | 0,049 | 0,056 | 0,063 |



| Code           | 5104    | 5104   | 5114   | 5307   | 5317   | 5807   | S5106 | S5116 | S5116E | S5316E | S2604 | S5606 |
|----------------|---------|--------|--------|--------|--------|--------|-------|-------|--------|--------|-------|-------|
| DIN            | 1889    | 1889   | 1889   | 1889   | 1889   |        | 6527K | 6527L |        |        |       |       |
| Type           | N       | N      | N      | N      | N      | N      | N     | N     | N      | N      | N     | N     |
| Material       | HSSE-PM | HSSCo8 | HSSCo8 | HSSCo8 | HSSCo8 | HSSCo8 | K30   | K30   | K30    | K30    | K30   | K30   |
| Dimension (mm) | 4-20    | 2-32   | 2-32   | 4-20   | 4-20   | 5-20   | 3-20  | 3-20  | 2-20   | 2-20   | 0,4-3 | 0,4-3 |
| Page           | 136     | 137    | 137    | 138    | 138    | 139    | 140   | 141   | 142    | 142    | 143   | 143   |

| P | P.1 | • | • | • | • | • | • | • | • | • | • | • |
|---|-----|---|---|---|---|---|---|---|---|---|---|---|
|   | P.2 | • | • | • | • | • |   |   |   |   | • | • |
|   | P.3 |   | • | • | • | • | • | • | • | • | • | • |
|   | P.4 | • | • | • | • | • |   |   |   |   | • | • |
|   | P.5 |   | • | • | • | • | • | • | • | • | • | • |
|   | P.6 |   | • | • | • | • |   |   |   |   |   |   |
| M | M.1 |   |   |   |   |   | • | • |   |   |   |   |
|   | M.2 |   | • | • | • |   | • | • |   |   | • | • |
|   | M.3 |   |   |   |   |   |   |   |   |   |   |   |
| K | K.1 | • | • | • | • | • | • | • | • | • |   |   |
|   | K.2 |   | • | • | • | • | • | • | • | • |   |   |
| N | N.1 |   |   |   |   |   | • | • |   |   |   |   |
|   | N.2 |   |   |   |   |   |   |   |   |   |   |   |
|   | N.3 |   |   |   |   |   |   |   |   |   |   |   |
|   | N.4 |   |   |   | • | • | • | • |   |   |   |   |
| S | S.1 |   | • | • | • | • |   |   | • | • |   |   |
|   | S.2 |   |   |   |   |   |   |   | • | • |   |   |
| H | H.1 |   |   |   |   |   | • | • | • | • | • | • |
|   | H.2 |   |   |   |   |   |   |   | • | • |   |   |

HSS/SC

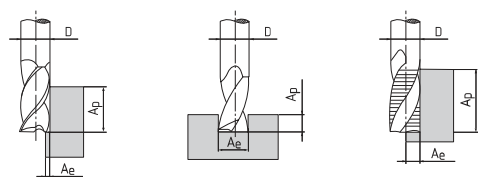
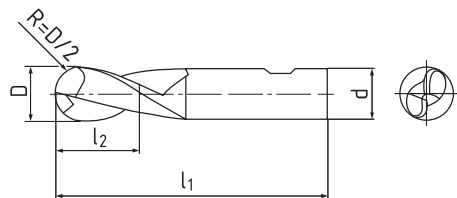




- EN Ball nose end mills | short, 2 - fluted
- DE Radiusfräser | Kurz, zweischneider
- RU Фрезы копирующие | короткие, двузубые



## 5104



HSS/SC

| D<br>h 10 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | R   | Z |
|-----------|----------|----------------|----------------|-----|---|
| 4         | 6        | 51             | 7              | 2   | 2 |
| 5         | 6        | 52             | 8              | 2,5 | 2 |
| 6         | 6        | 52             | 8              | 3   | 2 |
| 7         | 10       | 60             | 10             | 3,5 | 2 |
| 8         | 10       | 61             | 11             | 4   | 2 |
| 9         | 10       | 61             | 11             | 4,5 | 2 |
| 10        | 10       | 63             | 13             | 5   | 2 |
| 12        | 12       | 73             | 16             | 6   | 2 |
| 14        | 12       | 73             | 16             | 7   | 2 |
| 16        | 16       | 79             | 19             | 8   | 2 |
| 18        | 16       | 79             | 19             | 9   | 2 |
| 20        | 20       | 88             | 22             | 10  | 2 |

510417

.040  
.050  
.060  
.070  
.080  
.090  
.100  
.120  
.140  
.160  
.180  
.200

### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

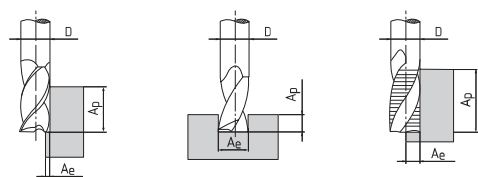
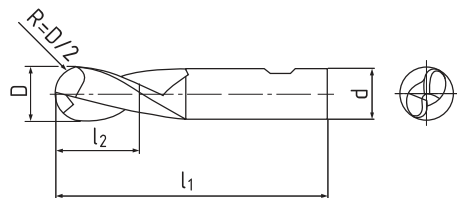
| Material                    | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |      |       |       |       |      |
|-----------------------------|----------------|----------------|----------------|-----------------------|-------|------|-------|-------|-------|------|
|                             |                |                |                | Ø 6                   | Ø 8   | Ø 10 | Ø 12  | Ø 16  | Ø 18  | Ø 20 |
| P.1 ≤ 600 N/mm <sup>2</sup> | 0,5xD          | 1xD            | 114            | 0,024                 | 0,032 | 0,04 | 0,048 | 0,064 | 0,072 | 0,08 |
| P.2 ≤ 850 N/mm <sup>2</sup> | 0,5xD          | 1xD            | 99             | 0,024                 | 0,032 | 0,04 | 0,048 | 0,064 | 0,072 | 0,08 |
| P.4 ≤ 900 N/mm <sup>2</sup> | 0,5xD          | 1xD            | 77             | 0,024                 | 0,032 | 0,04 | 0,048 | 0,064 | 0,072 | 0,08 |
| K.1 < 240 HB                | 0,5xD          | 1xD            | 89             | 0,024                 | 0,032 | 0,04 | 0,048 | 0,064 | 0,072 | 0,08 |

EN Ball nose end mills | short, 2 - fluted  
 DE Radiusfräser | Kurz, zweischneider  
 RU Фрезы копирующие | короткие, двузубые



5104

5114



| D<br>h 10 | d<br>h 6 | l <sub>1</sub><br>5104 | l <sub>1</sub><br>5114 | l <sub>2</sub><br>5104 | l <sub>2</sub><br>5114 | R    | Z |
|-----------|----------|------------------------|------------------------|------------------------|------------------------|------|---|
| 2         | 6        | 48                     | 54                     | 4                      | 7                      | 1    | 2 |
| 3         | 6        | 49                     | 56                     | 5                      | 8                      | 1,5  | 2 |
| 4         | 6        | 51                     | 63                     | 7                      | 11                     | 2    | 2 |
| 4,5       | 6        | 51                     |                        | 7                      |                        | 2,25 | 2 |
| 5         | 6        | 52                     | 68                     | 8                      | 13                     | 2,5  | 2 |
| 6         | 6        | 52                     | 68                     | 8                      | 13                     | 3    | 2 |
| 7         | 10       | 60                     | 80                     | 10                     | 16                     | 3,5  | 2 |
| 8         | 10       | 61                     | 88                     | 11                     | 19                     | 4    | 2 |
| 9         | 10       | 61                     | 88                     | 11                     | 19                     | 4,5  | 2 |
| 10        | 10       | 63                     | 95                     | 13                     | 22                     | 5    | 2 |
| 11        | 12       | 70                     | 102                    | 13                     | 22                     | 5,5  | 2 |
| 12        | 12       | 73                     | 110                    | 16                     | 26                     | 6    | 2 |
| 13        | 12       | 73                     | 110                    | 16                     | 26                     | 6,5  | 2 |
| 14        | 12       | 73                     | 110                    | 16                     | 26                     | 7    | 2 |
| 15        | 12       | 73                     | 110                    | 16                     | 26                     | 7,5  | 2 |
| 16        | 16       | 79                     | 123                    | 19                     | 32                     | 8    | 2 |
| 18        | 16       | 79                     | 123                    | 19                     | 32                     | 9    | 2 |
| 20        | 20       | 88                     | 141                    | 22                     | 38                     | 10   | 2 |
| 22        | 20       | 88                     | 141                    | 22                     | 38                     | 11   | 2 |
| 24        | 25       | 102                    | 166                    | 26                     | 45                     | 12   | 2 |
| 25        | 25       | 102                    | 166                    | 26                     | 45                     | 12,5 | 2 |
| 28        | 25       | 102                    | 166                    | 26                     | 45                     | 14   | 2 |
| 30        | 25       | 102                    | 166                    | 26                     | 45                     | 15   | 2 |
| 32        | 32       | 112                    | 186                    | 32                     | 53                     | 16   | 2 |

510418

511418

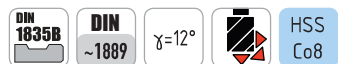
|      |      |
|------|------|
| .020 | .020 |
| .030 | .030 |
| .040 | .040 |
| .045 |      |
| .050 | .050 |
| .060 | .060 |
| .070 | .070 |
| .080 | .080 |
| .090 | .090 |
| .100 | .100 |
| .110 | .110 |
| .120 | .120 |
| .130 | .130 |
| .140 | .140 |
| .150 | .150 |
| .160 | .160 |
| .180 | .180 |
| .200 | .200 |
| .220 | .220 |
| .240 | .240 |
| .250 | .250 |
| .280 | .280 |
| .300 | .300 |
| .320 | .320 |

HSS/SC

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

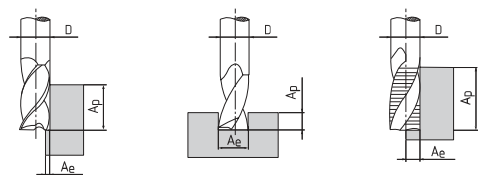
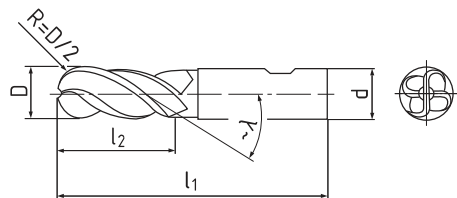
|          |                 |       |     |    | fz (mm/z) |        |        |        |        |        |        |  |
|----------|-----------------|-------|-----|----|-----------|--------|--------|--------|--------|--------|--------|--|
| Material |                 | Ap    | Ae  | Vc | Ø 3       | Ø 6    | Ø 8    | Ø 10   | Ø 12   | Ø 16   | Ø 18   |  |
| P.1      | ≤ 600 N/mm²     | 0,5xD | 1xD | 45 | 0,022     | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |  |
| P.2      | ≤ 850 N/mm²     | 0,5xD | 1xD | 39 | 0,022     | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |  |
| P.3      | ≤ 1100 N/mm²    | 0,5xD | 1xD | 24 | 0,022     | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |  |
| P.4      | ≤ 900 N/mm²     | 0,5xD | 1xD | 30 | 0,022     | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |  |
| P.5      | ≤ 1100 N/mm²    | 0,5xD | 1xD | 24 | 0,022     | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |  |
| P.6      | > 1100 N/mm²    | 0,5xD | 1xD | 20 | 0,0154    | 0,0203 | 0,0252 | 0,0308 | 0,0406 | 0,0455 | 0,0511 |  |
| M.2      | 750 - 850 N/mm² | 0,5xD | 1xD | 15 | 0,022     | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |  |
| K.2      | > 240 HB        | 0,5xD | 1xD | 25 | 0,022     | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |  |
| S.1      | ≤ 1500 N/mm²    | 0,5xD | 1xD | 1  | 0,0154    | 0,0203 | 0,0252 | 0,0308 | 0,0406 | 0,0455 | 0,0511 |  |

- EN Ball nose end mills
- DE Radiusfräser | mit runder Stirn
- RU Фрезы копирующие | с полукруглыми головками



## 5307

## 5317



HSS/SC

| D<br>k 12 | d<br>h 6 | l <sub>1</sub><br>5307 | l <sub>1</sub><br>5317 | l <sub>2</sub><br>5307 | l <sub>2</sub><br>5317 | R   | ~λ  | Z | 530718 | 531718 |
|-----------|----------|------------------------|------------------------|------------------------|------------------------|-----|-----|---|--------|--------|
| 4         | 6        | 55                     | 63                     | 11                     | 19                     | 2   | 15° | 4 | .040   | .040   |
| 5         | 6        | 57                     | 68                     | 13                     | 24                     | 2,5 | 15° | 4 | .050   | .050   |
| 6         | 6        | 57                     | 68                     | 13                     | 24                     | 3   | 25° | 4 | .060   | .060   |
| 8         | 10       | 69                     | 88                     | 19                     | 38                     | 4   | 25° | 4 | .080   | .080   |
| 10        | 10       | 72                     | 95                     | 22                     | 45                     | 5   | 35° | 4 | .100   | .100   |
| 12        | 12       | 83                     | 110                    | 26                     | 53                     | 6   | 35° | 4 | .120   | .120   |
| 16        | 16       | 92                     | 123                    | 32                     | 63                     | 8   | 35° | 4 | .160   | .160   |
| 20        | 20       | 104                    | 141                    | 38                     | 75                     | 10  | 35° | 4 | .200   | .200   |

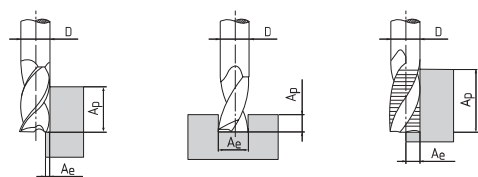
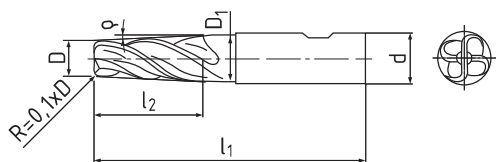
### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                        | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |        |        |        |        |        |        |
|---------------------------------|----------------|----------------|----------------|-----------------------|--------|--------|--------|--------|--------|--------|
|                                 |                |                |                | Ø 6                   | Ø 8    | Ø 10   | Ø 12   | Ø 16   | Ø 18   | Ø 20   |
| P.1 ≤ 600 N/mm <sup>2</sup>     | 0,5xD          | 1xD            | 45             | 0,022                 | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
| P.2 ≤ 850 N/mm <sup>2</sup>     | 0,5xD          | 1xD            | 39             | 0,022                 | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
| P.3 ≤ 1100 N/mm <sup>2</sup>    | 0,5xD          | 1xD            | 24             | 0,022                 | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
| P.4 ≤ 900 N/mm <sup>2</sup>     | 0,5xD          | 1xD            | 30             | 0,022                 | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
| P.5 ≤ 1100 N/mm <sup>2</sup>    | 0,5xD          | 1xD            | 24             | 0,022                 | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
| P.6 > 1100 N/mm <sup>2</sup>    | 0,5xD          | 1xD            | 20             | 0,0154                | 0,0203 | 0,0252 | 0,0308 | 0,0406 | 0,0455 | 0,0511 |
| M.2 750 - 850 N/mm <sup>2</sup> | 0,5xD          | 1xD            | 15             | 0,022                 | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
| K.1 < 240 HB                    | 0,5xD          | 1xD            | 35             | 0,022                 | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
| K.2 > 240 HB                    | 0,5xD          | 1xD            | 25             | 0,022                 | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |
| S.1 ≤ 1500 N/mm <sup>2</sup>    | 0,5xD          | 1xD            | 12             | 0,0154                | 0,0203 | 0,0252 | 0,0308 | 0,0406 | 0,0455 | 0,0511 |
| N.4 ≤ 800 N/mm <sup>2</sup>     | 0,5xD          | 1xD            | 80-120         | 0,022                 | 0,029  | 0,036  | 0,044  | 0,058  | 0,065  | 0,073  |

EN Die sinking cutters | tapered, 4 - fluted  
 DE Gesenckfräser | konisch, vierschneider  
 RU Фрезы копирующие | конические, четырехзубые



5807



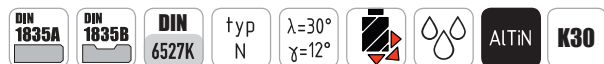
| D<br>js 14 | D1<br>~ | d<br>h 6 | l1  | l2 | p   | z | 580718 |
|------------|---------|----------|-----|----|-----|---|--------|
| 5          | 5,7     | 10       | 73  | 20 | 1°  | 4 | .0105  |
| 8          | 9,1     | 12       | 95  | 32 | 1°  | 4 | .0108  |
| 12         | 13,7    | 16       | 118 | 50 | 1°  | 4 | .0112  |
| 20         | 22,8    | 20       | 155 | 80 | 1°  | 4 | .0120  |
| 5          | 6,4     | 10       | 74  | 20 | 2°  | 4 | .0205  |
| 8          | 10,2    | 12       | 95  | 32 | 2°  | 4 | .0208  |
| 12         | 15,5    | 16       | 118 | 50 | 2°  | 4 | .0212  |
| 20         | 25,6    | 25       | 160 | 80 | 2°  | 4 | .0220  |
| 5          | 7,1     | 10       | 74  | 20 | 3°  | 4 | .0305  |
| 8          | 11,4    | 12       | 95  | 32 | 3°  | 4 | .0308  |
| 12         | 17,2    | 20       | 120 | 50 | 3°  | 4 | .0312  |
| 20         | 28,4    | 25       | 160 | 80 | 3°  | 4 | .0320  |
| 5          | 8,5     | 10       | 74  | 20 | 5°  | 4 | .0505  |
| 8          | 13,6    | 16       | 98  | 32 | 5°  | 4 | .0508  |
| 12         | 20,7    | 20       | 120 | 50 | 5°  | 4 | .0512  |
| 20         | 34      | 32       | 165 | 80 | 5°  | 4 | .0520  |
| 5          | 9,9     | 12       | 80  | 20 | 7°  | 4 | .0705  |
| 8          | 15,9    | 16       | 98  | 32 | 7°  | 4 | .0708  |
| 12         | 24,3    | 25       | 130 | 50 | 7°  | 4 | .0712  |
| 20         | 39,6    | 32       | 165 | 80 | 7°  | 4 | .0720  |
| 5          | 12,1    | 12       | 80  | 20 | 10° | 4 | .1005  |
| 8          | 19,3    | 20       | 100 | 32 | 10° | 4 | .1008  |
| 12         | 29,6    | 25       | 130 | 50 | 10° | 4 | .1012  |
| 20         | 48,2    | 32       | 165 | 80 | 10° | 4 | .1020  |

HSS/SC

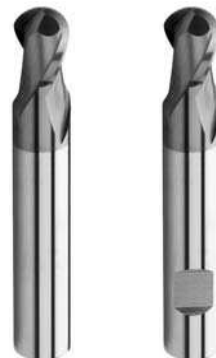
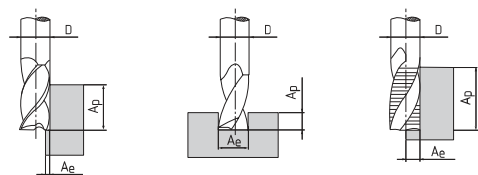
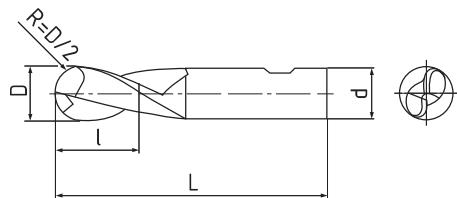
## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

|          |             |              |       |        | fz (mm/z) |        |        |        |        |
|----------|-------------|--------------|-------|--------|-----------|--------|--------|--------|--------|
| Material |             | Ap           | Ae    | Vc     | Ø 8       | Ø 10   | Ø 12   | Ø 20   |        |
| P.1      | ≤ 600 N/mm² | 0,5xl        | 0,5xD | 45     | 0,029     | 0,036  | 0,044  | 0,073  |        |
|          | P.2         | ≤ 850 N/mm²  | 0,5xl | 0,5xD  | 39        | 0,029  | 0,036  | 0,044  | 0,073  |
|          | P.3         | ≤ 1100 N/mm² | 0,5xl | 0,5xD  | 24        | 0,029  | 0,036  | 0,044  | 0,073  |
|          | P.4         | ≤ 900 N/mm²  | 0,5xl | 0,5xD  | 30        | 0,029  | 0,036  | 0,044  | 0,073  |
|          | P.5         | ≤ 1100 N/mm² | 0,5xl | 0,5xD  | 24        | 0,029  | 0,036  | 0,044  | 0,073  |
|          | P.6         | > 1100 N/mm² | 0,5xl | 0,5xD  | 20        | 0,0203 | 0,0252 | 0,0308 | 0,0511 |
| K.1      | < 240 HB    | 0,5xl        | 0,5xD | 35     | 0,029     | 0,036  | 0,044  | 0,073  |        |
|          | K.2         | > 240 HB     | 0,5xl | 0,5xD  | 25        | 0,029  | 0,036  | 0,044  | 0,073  |
| N.4      | ≤ 800 N/mm² | 0,5xl        | 0,5xD | 80-120 | 0,029     | 0,036  | 0,044  | 0,073  |        |

- EN Die sinking cutters | short, 2-fluted
- DE Radiusfräser | kurz, Zweischneider
- RU Фрезы копирующие | короткие, двузубые



## S5106



| D<br>k 12 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | R   | Z |
|-----------|----------|----------------|----------------|-----|---|
| 3         | 6        | 50             | 4              | 1,5 | 2 |
| 4         | 6        | 54             | 5              | 2   | 2 |
| 5         | 6        | 54             | 6              | 2,5 | 2 |
| 6         | 6        | 54             | 7              | 3   | 2 |
| 8         | 8        | 58             | 9              | 4   | 2 |
| 10        | 10       | 66             | 11             | 5   | 2 |
| 12        | 12       | 73             | 12             | 6   | 2 |
| 14        | 14       | 75             | 14             | 7   | 2 |
| 16        | 16       | 82             | 16             | 8   | 2 |
| 18        | 18       | 84             | 18             | 9   | 2 |
| 20        | 20       | 92             | 20             | 10  | 2 |

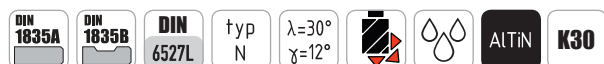
S510602 S510612

|      |      |
|------|------|
| .030 | .030 |
| .040 | .040 |
| .050 | .050 |
| .060 | .060 |
| .080 | .080 |
| .100 | .100 |
| .120 | .120 |
| .140 | .140 |
| .160 | .160 |
| .180 | .180 |
| .200 | .200 |

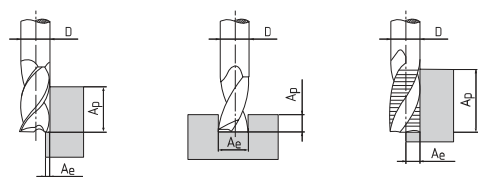
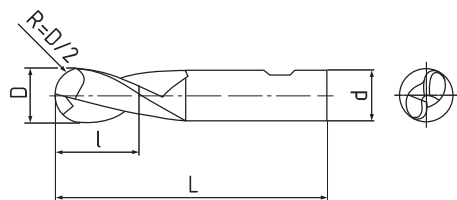
### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                        | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |      |       |       |      |       |      |       |
|---------------------------------|----------------|----------------|----------------|-----------------------|------|-------|-------|------|-------|------|-------|
|                                 |                |                |                | Ø 3                   | Ø 6  | Ø 8   | Ø 10  | Ø 12 | Ø 16  | Ø 18 | Ø 20  |
| P.1 ≤ 600 N/mm <sup>2</sup>     | 0,025xD        | 0,05xD         | 250            | 0,05                  | 0,01 | 0,133 | 0,167 | 0,2  | 0,267 | 0,3  | 0,333 |
| P.3 ≤ 1100 N/mm <sup>2</sup>    | 0,025xD        | 0,05xD         | 180            | 0,05                  | 0,01 | 0,133 | 0,167 | 0,2  | 0,267 | 0,3  | 0,333 |
| P.5 ≤ 1100 N/mm <sup>2</sup>    | 0,025xD        | 0,05xD         | 120            | 0,05                  | 0,01 | 0,133 | 0,167 | 0,2  | 0,267 | 0,3  | 0,333 |
| M.1 ≤ 750 N/mm <sup>2</sup>     | 0,025xD        | 0,05xD         | 130            | 0,05                  | 0,01 | 0,133 | 0,167 | 0,2  | 0,267 | 0,3  | 0,333 |
| M.2 750 - 850 N/mm <sup>2</sup> | 0,025xD        | 0,05xD         | 110            | 0,05                  | 0,01 | 0,133 | 0,167 | 0,2  | 0,267 | 0,3  | 0,333 |
| K.1 < 240 HB                    | 0,025xD        | 0,05xD         | 180            | 0,05                  | 0,01 | 0,133 | 0,167 | 0,2  | 0,267 | 0,3  | 0,333 |
| K.2 > 240 HB                    | 0,025xD        | 0,05xD         | 140            | 0,05                  | 0,01 | 0,133 | 0,167 | 0,2  | 0,267 | 0,3  | 0,333 |
| N.1 Si ≤ 6%                     | 0,025xD        | 0,05xD         | 350            | 0,05                  | 0,01 | 0,133 | 0,167 | 0,2  | 0,267 | 0,3  | 0,333 |
| N.4 ≤ 850 N/mm <sup>2</sup>     | 0,025xD        | 0,05xD         | 450            | 0,05                  | 0,01 | 0,133 | 0,167 | 0,2  | 0,267 | 0,3  | 0,333 |
| H.1 < 54 HRC                    | 0,025xD        | 0,05xD         | 80             | 0,05                  | 0,01 | 0,133 | 0,167 | 0,2  | 0,267 | 0,3  | 0,333 |

EN Die sinking cutters | long, 2-fluted  
 DE Radiusfräser | lang, Zweischneider  
 RU Фрезы копирующие | длинные, двузубые



S5116



| D<br>k 12 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | R   | Z | S511602 | S511612 |
|-----------|----------|----------------|----------------|-----|---|---------|---------|
| 3         | 6        | 57             | 7              | 1,5 | 2 | .030    | .030    |
| 4         | 6        | 57             | 8              | 2   | 2 | .040    | .040    |
| 5         | 6        | 57             | 10             | 2,5 | 2 | .050    | .050    |
| 6         | 6        | 57             | 10             | 3   | 2 | .060    | .060    |
| 8         | 8        | 63             | 16             | 4   | 2 | .080    | .080    |
| 10        | 10       | 72             | 19             | 5   | 2 | .100    | .100    |
| 12        | 12       | 83             | 22             | 6   | 2 | .120    | .120    |
| 14        | 14       | 83             | 22             | 7   | 2 | .140    | .140    |
| 16        | 16       | 92             | 26             | 8   | 2 | .160    | .160    |
| 18        | 18       | 92             | 26             | 9   | 2 | .180    | .180    |
| 20        | 20       | 104            | 32             | 10  | 2 | .200    | .200    |

HSS/SC

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

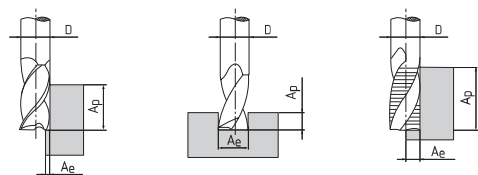
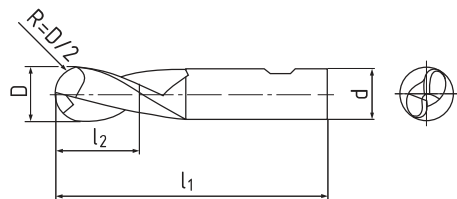
| Material | A <sub>p</sub>              | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |      |      |      |      |      |      |
|----------|-----------------------------|----------------|----------------|-----------------------|-------|------|------|------|------|------|------|
|          |                             |                |                | Ø 3                   | Ø 6   | Ø 8  | Ø 10 | Ø 12 | Ø 16 | Ø 18 | Ø 20 |
| P.1      | ≤ 600 N/mm <sup>2</sup>     | 0,025xD        | 0,05xD         | 260                   | 0,045 | 0,09 | 0,12 | 0,15 | 0,18 | 0,24 | 0,3  |
| P.3      | ≤ 1100 N/mm <sup>2</sup>    | 0,025xD        | 0,05xD         | 180                   | 0,045 | 0,09 | 0,12 | 0,15 | 0,18 | 0,24 | 0,3  |
| P.5      | ≤ 1100 N/mm <sup>2</sup>    | 0,025xD        | 0,05xD         | 120                   | 0,045 | 0,09 | 0,12 | 0,15 | 0,18 | 0,24 | 0,3  |
| M.1      | ≤ 750 N/mm <sup>2</sup>     | 0,025xD        | 0,05xD         | 130                   | 0,045 | 0,09 | 0,12 | 0,15 | 0,18 | 0,24 | 0,3  |
| M.2      | 750 - 850 N/mm <sup>2</sup> | 0,025xD        | 0,05xD         | 110                   | 0,045 | 0,09 | 0,12 | 0,15 | 0,18 | 0,24 | 0,3  |
| K.1      | < 240 HB                    | 0,025xD        | 0,05xD         | 200                   | 0,045 | 0,09 | 0,12 | 0,15 | 0,18 | 0,24 | 0,3  |
| K.2      | > 240 HB                    | 0,025xD        | 0,05xD         | 150                   | 0,045 | 0,09 | 0,12 | 0,15 | 0,18 | 0,24 | 0,3  |
| N.1      | Si ≤ 6%                     | 0,025xD        | 0,05xD         | 300                   | 0,045 | 0,09 | 0,12 | 0,15 | 0,18 | 0,24 | 0,3  |
| N.4      | ≤ 850 N/mm <sup>2</sup>     | 0,025xD        | 0,05xD         | 450                   | 0,045 | 0,09 | 0,12 | 0,15 | 0,18 | 0,24 | 0,3  |
| H.1      | < 54 HRC                    | 0,025xD        | 0,05xD         | 80                    | 0,045 | 0,09 | 0,12 | 0,15 | 0,18 | 0,24 | 0,3  |

- EN Extra long ball nose end mills
- DE Extra lange Radiusfräser
- RU Фрезы копирующие | экстра длинные, двузубые



## S5116E

## S5316E



HSS/SC

| D<br>k 12 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | l <sub>3</sub> | Dn   | Z<br>S5116 | Z<br>S5316 |
|-----------|----------|----------------|----------------|----------------|------|------------|------------|
| 2         | 6        | 62             | 3              | 7              | 1,9  | 2          | 4          |
| 3         | 6        | 62             | 4              | 9,5            | 2,8  | 2          | 4          |
| 4         | 6        | 62             | 5              | 12             | 3,8  | 2          | 4          |
| 5         | 6        | 80             | 6              | 14,5           | 4,8  | 2          | 4          |
| 6         | 6        | 80             | 7              | 17             | 5,7  | 2          | 4          |
| 8         | 8        | 90             | 9              | 22             | 7,6  | 2          | 4          |
| 10        | 10       | 100            | 11             | 27             | 9,5  | 2          | 4          |
| 12        | 12       | 120            | 13             | 32             | 11,5 | 2          | 4          |
| 14        | 14       | 120            | 15             | 37             | 13,5 | 2          | 4          |
| 16        | 16       | 140            | 17             | 42             | 15,5 | 2          | 4          |
| 18        | 18       | 140            | 19             | 47             | 17,5 | 2          | 4          |
| 20        | 20       | 160            | 21             | 52             | 19,5 | 2          | 4          |

| S511602E | S511612E | S531602E | S531612E |
|----------|----------|----------|----------|
| .020     | .020     | .020     | .020     |
| .030     | .030     | .030     | .030     |
| .040     | .040     | .040     | .040     |
| .050     | .050     | .050     | .050     |
| .060     | .060     | .060     | .060     |
| .080     | .080     | .080     | .080     |
| .100     | .100     | .100     | .100     |
| .120     | .120     | .120     | .120     |
| .140     | .140     | .140     | .140     |
| .160     | .160     | .160     | .160     |
| .180     | .180     | .180     | .180     |
| .200     | .200     | .200     | .200     |

### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

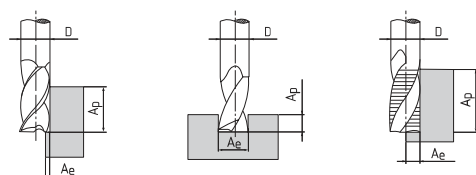
| Material |                          | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |      |      |      |      |      |      |      |
|----------|--------------------------|----------------|----------------|----------------|-----------------------|------|------|------|------|------|------|------|
|          |                          |                |                |                | Ø 3                   | Ø 6  | Ø 8  | Ø 10 | Ø 12 | Ø 16 | Ø 18 | Ø 20 |
| P.1      | ≤ 600 N/mm <sup>2</sup>  | 0,1xD          | 0,05xD         | 210            | 0,03                  | 0,06 | 0,08 | 0,1  | 0,12 | 0,16 | 0,18 | 0,2  |
| P.3      | ≤ 1100 N/mm <sup>2</sup> | 0,1xD          | 0,05xD         | 175            | 0,03                  | 0,06 | 0,08 | 0,1  | 0,12 | 0,16 | 0,18 | 0,2  |
| P.5      | ≤ 1100 N/mm <sup>2</sup> | 0,1xD          | 0,05xD         | 140            | 0,03                  | 0,06 | 0,08 | 0,1  | 0,12 | 0,16 | 0,18 | 0,2  |
| K.1      | < 240 HB                 | 0,1xD          | 0,05xD         | 150            | 0,03                  | 0,06 | 0,08 | 0,1  | 0,12 | 0,16 | 0,18 | 0,2  |
| K.2      | > 240 HB                 | 0,1xD          | 0,05xD         | 110            | 0,03                  | 0,06 | 0,08 | 0,1  | 0,12 | 0,16 | 0,18 | 0,2  |
| H.1      | < 54 HRC                 | 0,1xD          | 0,05xD         | 120            | 0,03                  | 0,06 | 0,08 | 0,1  | 0,12 | 0,16 | 0,18 | 0,2  |
| H.2      | 54 - 60 HRC              | 0,1xD          | 0,05xD         | 100            | 0,03                  | 0,06 | 0,08 | 0,1  | 0,12 | 0,16 | 0,18 | 0,2  |
| S.1      | ≤ 1500 N/mm <sup>2</sup> | 0,1xD          | 0,05xD         | 50             | 0,03                  | 0,06 | 0,08 | 0,1  | 0,12 | 0,16 | 0,18 | 0,2  |
| S.2      | ≤ 1250 N/mm <sup>2</sup> | 0,1xD          | 0,05xD         | 70             | 0,03                  | 0,06 | 0,08 | 0,1  | 0,12 | 0,16 | 0,18 | 0,2  |

- EN Mini sinking cutters
- DE Mini Kopierfräser
- RU Минифрезы копирующие



## S2604

## S5606



| D<br>k 12 | d<br>h 6 | l <sub>1</sub> | l <sub>2</sub> | l <sub>3</sub> | Dn   | r<br>S5606 | z |
|-----------|----------|----------------|----------------|----------------|------|------------|---|
| 0,4       | 3        | 50             | 0,6            | 5              | 0,35 | 0,2        | 2 |
| 0,5       | 3        | 50             | 0,7            | 6              | 0,45 | 0,25       | 2 |
| 0,6       | 3        | 50             | 0,9            | 6              | 0,55 | 0,3        | 2 |
| 0,7       | 3        | 50             | 0,8            | 7              | 0,65 | 0,35       | 2 |
| 0,8       | 3        | 50             | 1,2            | 8              | 0,75 | 0,4        | 2 |
| 0,9       | 3        | 50             | 1,3            | 9              | 0,85 | 0,45       | 2 |
| 1         | 3        | 50             | 1,5            | 12             | 0,95 | 0,5        | 2 |
| 1,2       | 3        | 50             | 1,8            | 12             | 1,15 | 0,6        | 2 |
| 1,4       | 3        | 50             | 2,1            | 16             | 1,35 | 0,7        | 2 |
| 1,5       | 3        | 50             | 2,3            | 20             | 1,45 | 0,75       | 2 |
| 1,6       | 3        | 50             | 2,4            | 20             | 1,55 | 0,8        | 2 |
| 1,8       | 3        | 50             | 2,7            | 20             | 1,75 | 0,9        | 2 |
| 2         | 3        | 50             | 3              | 20             | 1,95 | 1          | 2 |
| 2,5       | 3        | 50             | 3,7            | 20             | 2,45 | 1,25       | 2 |
| 3         | 3        | 50             | 4              | 20             | 2,95 | 1,5        | 2 |

S260402

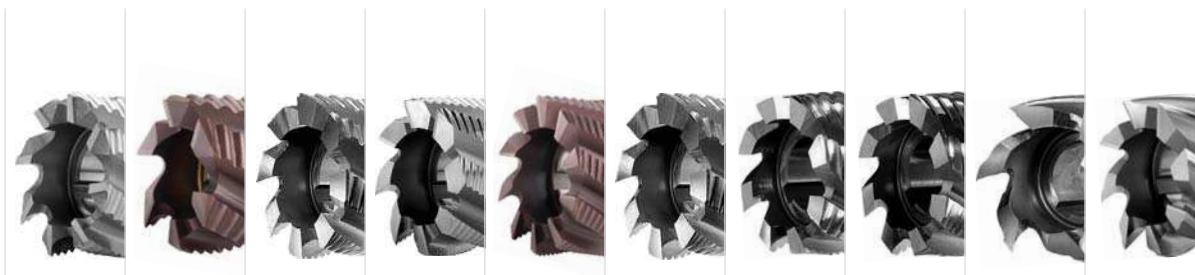
S560602

.004  
.005  
.006  
.007  
.008  
.009  
.010  
.012  
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.015  
.016  
.018  
.020  
.025  
.030

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.018  
.020  
.025  
.030

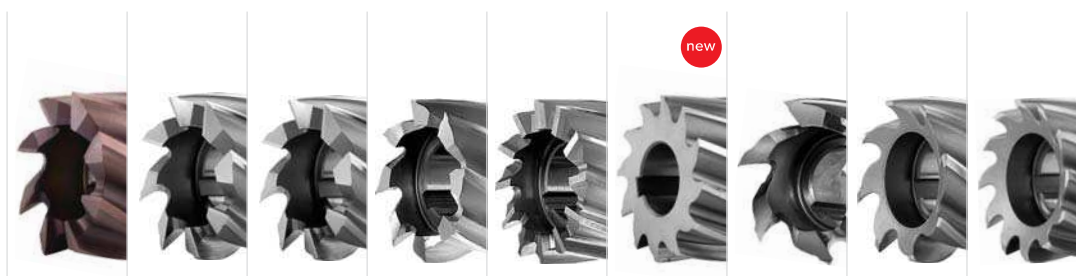
HSS/SC





|                |        |        |        |        |        |        |        |        |        |        |
|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Code           | 6242   | 6242   | 6242V  | 6282   | 6282   | 6242PV | 6842V  | 6842PV | 6102V  | 6202   |
| DIN            | 1880   | 1880   | 1880   | 1880   | 1880   | 1880   | 841    | 841    | 1880   | 1880   |
| Type           | NR     | NR     | NR     | HR     | HR     | NR-F   | NR     | NR-F   | W      | N      |
| Material       | HSSCo5 | HSSCo5 | HSSCo8 | HSSCo5 | HSSCo5 | HSSCo8 | HSSCo5 | HSSCo5 | HSSCo5 | HSSCo5 |
| Dimension (mm) | 40-100 | 40-100 | 40-160 | 40-100 | 40-100 | 40-160 | 40-90  | 30-90  | 40-100 | 40-125 |
| Page           | 147    | 147    | 148    | 149    | 149    | 150    | 151    | 152    | 153    | 154    |

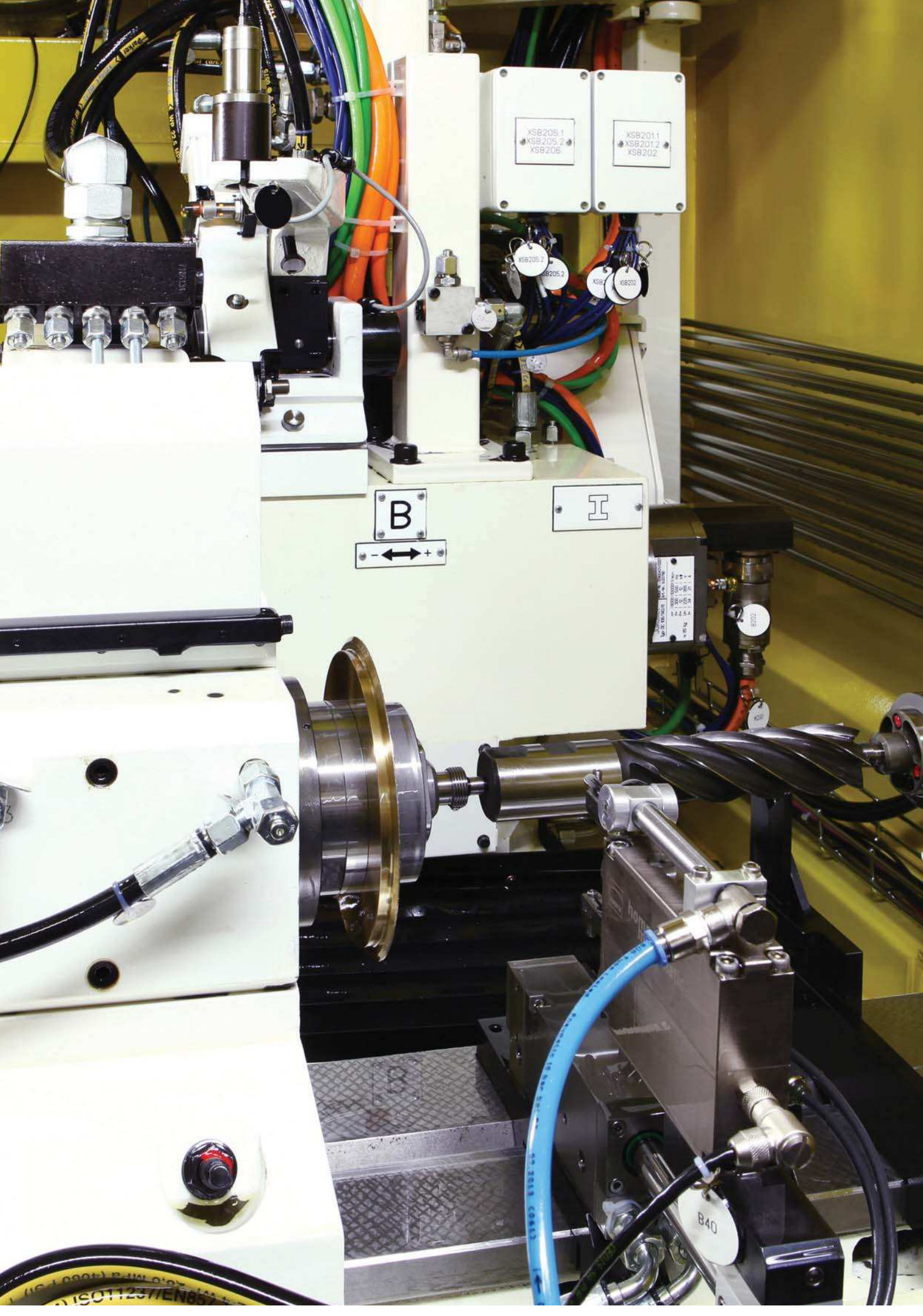
|          |     |   |   |   |   |   |   |   |   |   |  |
|----------|-----|---|---|---|---|---|---|---|---|---|--|
| <b>P</b> | P.1 | • | • | • |   |   | • | • | • | • |  |
|          | P.2 | • | • | • | • | • | • | • |   | • |  |
|          | P.3 |   |   |   | • | • |   |   |   | • |  |
|          | P.4 | • | • | • | • | • | • | • |   | • |  |
|          | P.5 |   |   |   | • | • |   |   |   | • |  |
|          | P.6 |   |   |   |   |   |   |   |   |   |  |
| <b>M</b> | M.1 |   |   |   |   |   |   |   |   |   |  |
|          | M.2 | • | • | • | • | • | • | • |   | • |  |
|          | M.3 |   |   |   |   |   |   |   |   |   |  |
| <b>K</b> | K.1 |   |   |   |   |   |   |   | • |   |  |
|          | K.2 | • | • | • | • | • | • | • |   | • |  |
| <b>N</b> | N.1 |   |   |   |   |   |   |   |   |   |  |
|          | N.2 |   |   |   |   |   |   |   | • |   |  |
|          | N.3 |   |   |   |   |   |   |   |   |   |  |
|          | N.4 |   |   |   |   |   |   |   | • |   |  |
| <b>S</b> | S.1 |   | • | • | • | • |   |   |   |   |  |
|          | S.2 |   |   |   |   |   |   |   |   |   |  |
| <b>H</b> | H.1 |   |   |   |   |   |   |   |   |   |  |
|          | H.2 |   |   |   |   |   |   |   |   |   |  |



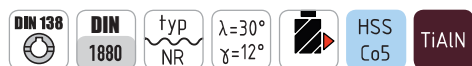
| Code           | 6202   | 6202V  | 6302V  | 6802V  | 6902V  | 6200   | 6109   | 6209   | 6309   |
|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| DIN            | 1880   | 1880   | 841    | 841    | 841    |        |        |        |        |
| Type           | N      | N      | H      | N      | H      | N      | W      | N      | H      |
| Material       | HSSCo5 | HSSCo8 | HSSCo5 | HSSCo5 | HSSCo5 | HSSCo5 | HSSE   | HSSE   | HSSE   |
| Dimension (mm) | 40-125 | 40-160 | 40-125 | 30-110 | 30-75  | 50-100 | 40-160 | 40-160 | 40-160 |
| Page           | 154    | 155    | 156    | 157    | 158    | 159    | 160    | 161    | 162    |

|          |     |   |   |   |   |   |   |   |   |  |
|----------|-----|---|---|---|---|---|---|---|---|--|
| <b>P</b> | P.1 | • | • |   | • | • | • | • | • |  |
|          | P.2 | • | • |   | • | • | • | • | • |  |
|          | P.3 | • | • | • | • | • | • |   |   |  |
|          | P.4 | • | • | • | • | • | • | • | • |  |
|          | P.5 | • | • | • | • | • | • |   |   |  |
|          | P.6 |   |   | • |   |   |   |   |   |  |
| <b>M</b> | M.1 |   |   |   |   |   |   |   |   |  |
|          | M.2 | • | • | • | • | • | • |   |   |  |
|          | M.3 |   |   |   |   |   |   |   |   |  |
| <b>K</b> | K.1 |   |   |   |   |   | • |   |   |  |
|          | K.2 | • | • | • | • | • | • | • | • |  |
| <b>N</b> | N.1 |   |   |   |   |   |   |   |   |  |
|          | N.2 |   |   |   |   |   | • |   |   |  |
|          | N.3 |   |   |   |   |   |   |   |   |  |
|          | N.4 |   |   |   |   |   | • |   |   |  |
| <b>S</b> | S.1 |   | • |   | • |   |   |   |   |  |
|          | S.2 |   |   |   |   |   |   |   |   |  |
| <b>H</b> | H.1 |   |   |   |   |   |   |   |   |  |
|          | H.2 |   |   |   |   |   |   |   |   |  |



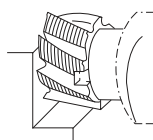
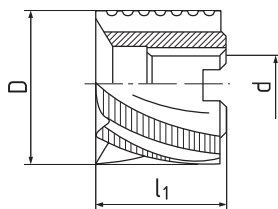


EN Shell end mills | fine teeth  
 DE Walzenstirnfräser | feingezahnt  
 RU Фрезы цилиндрические торцевые | мелкозубые



6242

6242



| D<br>js 16 | d<br>H 7 | l <sub>1</sub> | z  |
|------------|----------|----------------|----|
| 40         | 16       | 32             | 6  |
| 50         | 22       | 36             | 6  |
| 63         | 27       | 40             | 8  |
| 80         | 27       | 45             | 8  |
| 100        | 32       | 50             | 10 |

624275

624275

|      |            |
|------|------------|
| .040 | .040 TiAlN |
| .050 | .050 TiAlN |
| .063 | .063 TiAlN |
| .080 | .080 TiAlN |
| .100 | .100 TiAlN |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                        | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |
|---------------------------------|----------------|----------------|----------------|-----------------------|-------|-------|-------|
|                                 |                |                |                | Ø 40                  | Ø 50  | Ø 80  | Ø 100 |
| P.1 ≤ 600 N/mm <sup>2</sup>     | 0,05xD         | 0,75xD         | 45             | 0,080                 | 0,085 | 0,110 | 0,110 |
| P.2 ≤ 850 N/mm <sup>2</sup>     | 0,05xD         | 0,75xD         | 39             | 0,080                 | 0,085 | 0,110 | 0,110 |
| P.4 ≤ 900 N/mm <sup>2</sup>     | 0,05xD         | 0,75xD         | 30             | 0,080                 | 0,085 | 0,110 | 0,110 |
| M.2 750 - 850 N/mm <sup>2</sup> | 0,05xD         | 0,75xD         | 15             | 0,080                 | 0,085 | 0,110 | 0,110 |
| K.2 > 240 HB                    | 0,05xD         | 0,75xD         | 25             | 0,080                 | 0,085 | 0,110 | 0,110 |

TiAlN: V<sub>c</sub> + 50 %



- EN Shell end mills | NR
- DE Walzenstirnfräser | NR
- RU Фрезы цилиндрические торцевые | NR

DIN 138

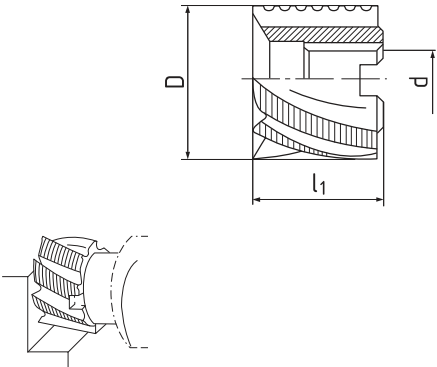
DIN 1880

typ NR

$\lambda=30^\circ$   
 $\gamma=12^\circ$

HSS Co8

## 6242V



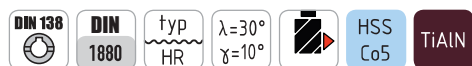
| D<br>js 16 | d<br>H 7 | l <sub>1</sub> | z  |
|------------|----------|----------------|----|
| 40         | 16       | 32             | 6  |
| 50         | 22       | 36             | 6  |
| 63         | 27       | 40             | 8  |
| 80         | 27       | 45             | 8  |
| 100        | 32       | 50             | 10 |
| 125        | 40       | 56             | 12 |
| 160        | 50       | 63             | 14 |

| 624278V |
|---------|
| .040    |
| .050    |
| .063    |
| .080    |
| .100    |
| .125    |
| .160    |

### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

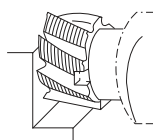
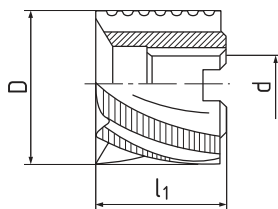
| Material |                             | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |       |
|----------|-----------------------------|----------------|----------------|----------------|-----------------------|-------|-------|-------|-------|
|          |                             |                |                |                | Ø 40                  | Ø 50  | Ø 80  | Ø 100 | Ø 160 |
| P.1      | ≤ 600 N/mm <sup>2</sup>     | 0,05xD         | 0,75xD         | 12             | 0,056                 | 0,060 | 0,077 | 0,077 | 0,12  |
| P.2      | ≤ 850 N/mm <sup>2</sup>     | 0,05xD         | 0,75xD         | 45             | 0,080                 | 0,085 | 0,110 | 0,110 | 0,120 |
| P.4      | ≤ 900 N/mm <sup>2</sup>     | 0,05xD         | 0,75xD         | 39             | 0,080                 | 0,085 | 0,110 | 0,110 | 0,120 |
| M.2      | 750 - 850 N/mm <sup>2</sup> | 0,05xD         | 0,75xD         | 30             | 0,080                 | 0,085 | 0,110 | 0,110 | 0,120 |
| K.2      | > 240 HB                    | 0,05xD         | 0,75xD         | 15             | 0,080                 | 0,085 | 0,110 | 0,110 | 0,120 |
| S.1      | ≤ 1500 N/mm <sup>2</sup>    | 0,05xD         | 0,75xD         | 25             | 0,080                 | 0,085 | 0,110 | 0,110 | 0,084 |

EN Shell end mills | HR  
 DE Walzenstirnfräser | HR  
 RU Фрезы цилиндрические торцевые | HR, среднезубые



6282

6282



| D<br>js 16 | d<br>H 7 | l <sub>1</sub> | z  | 628275 | 628275     |
|------------|----------|----------------|----|--------|------------|
| 40         | 16       | 32             | 8  | .040   | .040 TiAlN |
| 50         | 22       | 36             | 8  | .050   | .050 TiAlN |
| 63         | 27       | 40             | 10 | .063   | .063 TiAlN |
| 80         | 27       | 45             | 10 | .080   | .080 TiAlN |
| 100        | 32       | 50             | 12 | .100   | .100 TiAlN |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                        | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | fz (mm/z) |       |       |       |
|---------------------------------|----------------|----------------|----------------|-----------|-------|-------|-------|
|                                 |                |                |                | Ø 40      | Ø 50  | Ø 80  | Ø 100 |
| P.2 ≤ 850 N/mm <sup>2</sup>     | 0,05xD         | 0,75xD         | 32,5           | 0,080     | 0,085 | 0,110 | 0,110 |
| P.3 ≤ 1100 N/mm <sup>2</sup>    | 0,05xD         | 0,75xD         | 18             | 0,080     | 0,085 | 0,110 | 0,110 |
| P.4 ≤ 900 N/mm <sup>2</sup>     | 0,05xD         | 0,75xD         | 25             | 0,080     | 0,085 | 0,110 | 0,110 |
| P.5 ≤ 1100 N/mm <sup>2</sup>    | 0,05xD         | 0,75xD         | 18             | 0,080     | 0,085 | 0,110 | 0,110 |
| M.2 750 - 850 N/mm <sup>2</sup> | 0,05xD         | 0,75xD         | 10             | 0,080     | 0,085 | 0,110 | 0,110 |
| K.2 > 240 HB                    | 0,05xD         | 0,75xD         | 22             | 0,080     | 0,085 | 0,110 | 0,110 |
| S.1 ≤ 1500 N/mm <sup>2</sup>    | 0,05xD         | 0,75xD         | 8              | 0,056     | 0,060 | 0,077 | 0,077 |

TiAlN: V<sub>c</sub> + 50 %

- EN Shell end mills | NR F
- DE Walzenstirnfräser | NR F
- RU Фрезы цилиндрические торцевые | NR F

DIN 138

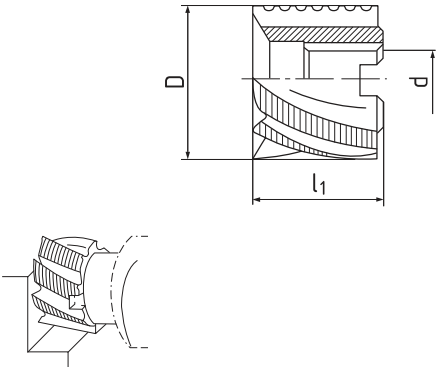
DIN 1880

typ NR-F

λ=30°  
γ=12°

HSS Co8

## 6242PV



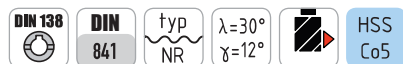
| D<br>js 16 | d<br>H 7 | l <sub>1</sub> | z  |
|------------|----------|----------------|----|
| 40         | 16       | 32             | 6  |
| 50         | 22       | 36             | 6  |
| 63         | 27       | 40             | 8  |
| 80         | 27       | 45             | 8  |
| 100        | 32       | 50             | 10 |
| 125        | 40       | 56             | 12 |
| 160        | 50       | 63             | 14 |

| 624278PV |
|----------|
| .040     |
| .050     |
| .063     |
| .080     |
| .100     |
| .125     |
| .160     |

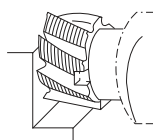
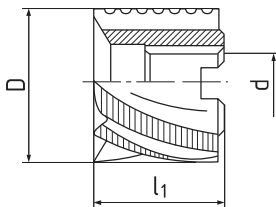
### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material |                             | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |       |
|----------|-----------------------------|----------------|----------------|----------------|-----------------------|-------|-------|-------|-------|
|          |                             |                |                |                | Ø 40                  | Ø 50  | Ø 80  | Ø 100 | Ø 160 |
| P.1      | ≤ 600 N/mm <sup>2</sup>     | 0,05xD         | 0,75xD         | 45             | 0,080                 | 0,085 | 0,110 | 0,110 | 0,120 |
| P.2      | ≤ 850 N/mm <sup>2</sup>     | 0,05xD         | 0,75xD         | 39             | 0,080                 | 0,085 | 0,110 | 0,110 | 0,120 |
| P.4      | ≤ 900 N/mm <sup>2</sup>     | 0,05xD         | 0,75xD         | 30             | 0,080                 | 0,085 | 0,110 | 0,110 | 0,120 |
| M.2      | 750 - 850 N/mm <sup>2</sup> | 0,05xD         | 0,75xD         | 15             | 0,080                 | 0,085 | 0,110 | 0,110 | 0,120 |
| K.2      | > 240 HB                    | 0,05xD         | 0,75xD         | 25             | 0,080                 | 0,085 | 0,110 | 0,110 | 0,12  |
| S.1      | ≤ 1500 N/mm <sup>2</sup>    | 0,05xD         | 0,75xD         | 12             | 0,056                 | 0,06  | 0,077 | 0,079 | 0,084 |

EN Shell end mills | NR  
 DE Walzenstirnfräser | NR  
 RU Фрезы цилиндрические торцевые | NR



6842V



| D<br>js 16 | d<br>H 7 | l <sub>1</sub> | z  | 684275V |
|------------|----------|----------------|----|---------|
| 40         | 16       | 40             | 6  | .040040 |
| 50         | 22       | 50             | 6  | .050050 |
| 60         | 27       | 30             | 8  | .060030 |
| 60         | 27       | 60             | 8  | .060060 |
| 75         | 27       | 35             | 8  | .075035 |
| 75         | 27       | 75             | 8  | .075075 |
| 90         | 27       | 35             | 10 | .090035 |



## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                        | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | fz (mm/z) |       |       |       |
|---------------------------------|----------------|----------------|----------------|-----------|-------|-------|-------|
|                                 |                |                |                | Ø 40      | Ø 50  | Ø 80  | Ø 100 |
| P.1 ≤ 600 N/mm <sup>2</sup>     | 0,05xD         | 0,75xD         | 45             | 0,080     | 0,085 | 0,110 | 0,110 |
| P.2 ≤ 850 N/mm <sup>2</sup>     | 0,05xD         | 0,75xD         | 39             | 0,080     | 0,085 | 0,110 | 0,110 |
| P.4 ≤ 900 N/mm <sup>2</sup>     | 0,05xD         | 0,75xD         | 30             | 0,080     | 0,085 | 0,110 | 0,110 |
| M.2 750 - 850 N/mm <sup>2</sup> | 0,05xD         | 0,75xD         | 15             | 0,080     | 0,085 | 0,110 | 0,110 |
| K.2 > 240 HB                    | 0,05xD         | 0,75xD         | 25             | 0,080     | 0,085 | 0,110 | 0,110 |



- EN Shell end mills | NR F
- DE Walzenstirnfräser | NR F
- RU Фрезы цилиндрические торцевые | NR F

DIN 138

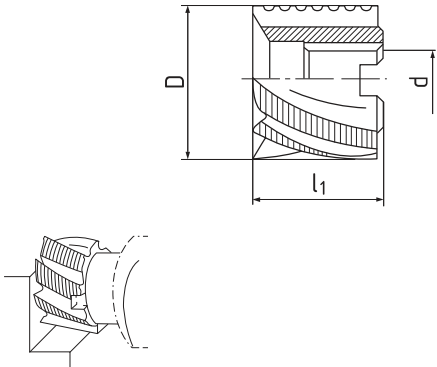
DIN 841

typ NR F

$\lambda=30^\circ$   
 $\gamma=12^\circ$

HSS Co5

## 6842PV



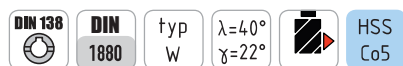
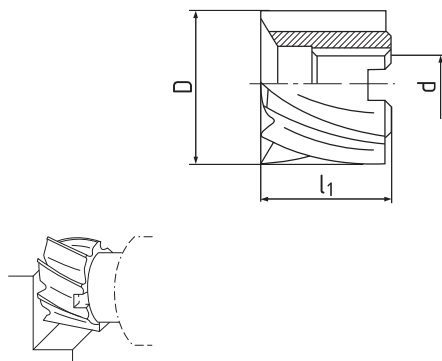
| D<br>js 16 | d<br>H 7 | l <sub>1</sub> | z  |
|------------|----------|----------------|----|
| 30         | 13       | 30             | 6  |
| 40         | 16       | 40             | 6  |
| 50         | 22       | 50             | 6  |
| 60         | 27       | 30             | 8  |
| 60         | 27       | 60             | 8  |
| 75         | 27       | 35             | 8  |
| 75         | 27       | 75             | 8  |
| 90         | 27       | 35             | 10 |

| 684275PV |
|----------|
| .030030  |
| .040040  |
| .050050  |
| .060030  |
| .060060  |
| .075035  |
| .075075  |
| .090035  |

### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material |                 | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |
|----------|-----------------|----------------|----------------|----------------|-----------------------|-------|-------|-------|
|          |                 |                |                |                | Ø 40                  | Ø 50  | Ø 80  | Ø 100 |
| P.1      | ≤ 600 N/mm²     | 0,05xD         | 0,75xD         | 45             | 0,080                 | 0,085 | 0,110 | 0,110 |
| P.2      | ≤ 850 N/mm²     | 0,05xD         | 0,75xD         | 39             | 0,080                 | 0,085 | 0,110 | 0,110 |
| P.4      | ≤ 900 N/mm²     | 0,05xD         | 0,75xD         | 30             | 0,080                 | 0,085 | 0,110 | 0,110 |
| M.2      | 750 - 850 N/mm² | 0,05xD         | 0,75xD         | 15             | 0,080                 | 0,085 | 0,110 | 0,110 |
| K.2      | > 240 HB        | 0,05xD         | 0,75xD         | 25             | 0,080                 | 0,085 | 0,110 | 0,110 |

EN Shell end mills | coarse teeth  
 DE Walzenstirnfräser | grobgezahnt  
 RU Фрезы цилиндрические торцевые | крупнозубые

**6102V**

| D<br>js 16 | d<br>H 7 | l <sub>1</sub> | z | 610275V |
|------------|----------|----------------|---|---------|
| 40         | 16       | 32             | 4 | .040    |
| 50         | 22       | 36             | 4 | .050    |
| 63         | 27       | 40             | 5 | .063    |
| 80         | 27       | 45             | 6 | .080    |
| 100        | 32       | 50             | 7 | .100    |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                           | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | fz (mm/z) |       |       |       |
|------------------------------------|----------------|----------------|----------------|-----------|-------|-------|-------|
|                                    |                |                |                | Ø 40      | Ø 50  | Ø 80  | Ø 100 |
| <b>P.1</b> ≤ 600 N/mm <sup>2</sup> | 0,05xD         | 0,75xD         | 37,5           | 0,080     | 0,085 | 0,110 | 0,110 |
| <b>K.1</b> < 240 HB                | 0,05xD         | 0,75xD         | 30             | 0,080     | 0,085 | 0,110 | 0,110 |
| <b>N.2</b> Si ≤ 12%                | 0,05xD         | 0,75xD         | 160-260        | 0,104     | 0,111 | 0,143 | 0,143 |
| <b>N.4</b> ≤ 800 N/mm <sup>2</sup> | 0,05xD         | 0,75xD         | 60-100         | 0,080     | 0,085 | 0,110 | 0,110 |

- EN Shell end mills
- DE Walzenstirnfräser
- RU Фрезы цилиндрические торцевые | среднезубые

DIN 138

DIN 1880

typ N

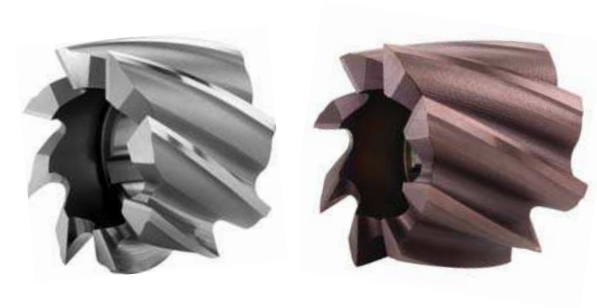
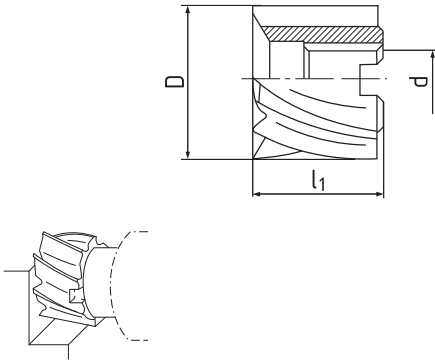
$\lambda=30^\circ$   
 $\gamma=12^\circ$

HSS Co5

TiAlN

6202

6202



| D<br>js 16 | d<br>H 7 | l <sub>1</sub> | z  |
|------------|----------|----------------|----|
| 40         | 16       | 32             | 6  |
| 50         | 22       | 36             | 8  |
| 63         | 27       | 40             | 8  |
| 80         | 27       | 45             | 10 |
| 100        | 32       | 50             | 10 |
| 125        | 40       | 56             | 14 |

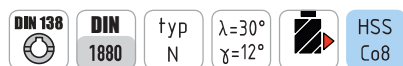
| 620275 | 620275     |
|--------|------------|
| .040   | .040 TiAlN |
| .050   | .050 TiAlN |
| .063   | .063 TiAlN |
| .080   | .080 TiAlN |
| .100   | .100 TiAlN |
| .125   | .125 TiAlN |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

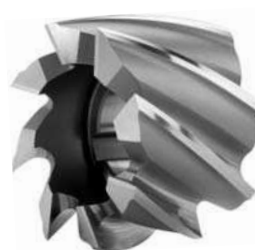
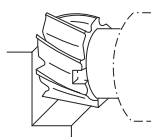
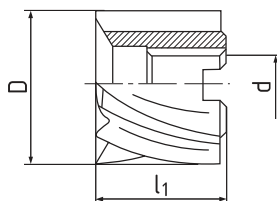
| Material            | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |
|---------------------|----------------|----------------|----------------|-----------------------|-------|-------|-------|
|                     |                |                |                | Ø 40                  | Ø 50  | Ø 80  | Ø 100 |
| P.1 ≤ 600 N/mm²     | 0,05xD         | 0,75xD         | 37,5           | 0,080                 | 0,085 | 0,110 | 0,110 |
| P.2 ≤ 850 N/mm²     | 0,05xD         | 0,75xD         | 32,5           | 0,080                 | 0,085 | 0,110 | 0,110 |
| P.3 ≤ 1100 N/mm²    | 0,05xD         | 0,75xD         | 18             | 0,080                 | 0,085 | 0,110 | 0,110 |
| P.4 ≤ 900 N/mm²     | 0,05xD         | 0,75xD         | 25             | 0,080                 | 0,085 | 0,110 | 0,110 |
| P.5 ≤ 1100 N/mm²    | 0,05xD         | 0,75xD         | 18             | 0,080                 | 0,085 | 0,110 | 0,110 |
| M.2 750 - 850 N/mm² | 0,05xD         | 0,75xD         | 10             | 0,080                 | 0,085 | 0,110 | 0,110 |
| K.2 > 240 HB        | 0,05xD         | 0,75xD         | 22             | 0,080                 | 0,085 | 0,110 | 0,110 |

TiAlN: V<sub>c</sub> + 50 %

EN Shell end mills  
 DE Walzenstirnfräser  
 RU Фрезы цилиндрические торцевые | среднезубые



6202V



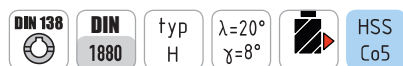
| D<br>js 16 | d<br>H 7 | l <sub>1</sub> | z  | 620278V |
|------------|----------|----------------|----|---------|
| 40         | 16       | 32             | 8  | .040    |
| 50         | 22       | 36             | 8  | .050    |
| 63         | 27       | 40             | 8  | .063    |
| 80         | 27       | 45             | 10 | .080    |
| 100        | 32       | 50             | 12 | .100    |
| 125        | 40       | 56             | 14 | .125    |
| 160        | 50       | 63             | 16 | .160    |



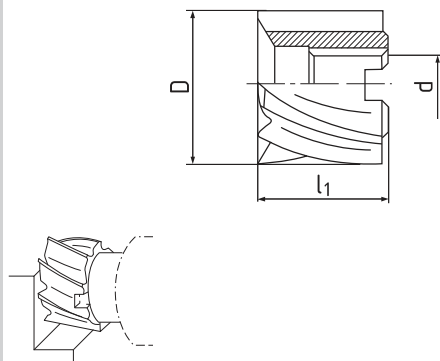
## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                        | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | fz (mm/z) |       |       |       |       |
|---------------------------------|----------------|----------------|----------------|-----------|-------|-------|-------|-------|
|                                 |                |                |                | Ø 40      | Ø 50  | Ø 80  | Ø 100 | Ø 160 |
| P.1 ≤ 600 N/mm <sup>2</sup>     | 0,05xD         | 0,75xD         | 45             | 0,080     | 0,085 | 0,110 | 0,110 | 0,120 |
| P.2 ≤ 850 N/mm <sup>2</sup>     | 0,05xD         | 0,75xD         | 39             | 0,080     | 0,085 | 0,110 | 0,110 | 0,120 |
| P.3 ≤ 1100 N/mm <sup>2</sup>    | 0,05xD         | 0,75xD         | 24             | 0,080     | 0,085 | 0,110 | 0,110 | 0,120 |
| P.4 ≤ 900 N/mm <sup>2</sup>     | 0,05xD         | 0,75xD         | 30             | 0,080     | 0,085 | 0,110 | 0,110 | 0,120 |
| P.5 ≤ 1100 N/mm <sup>2</sup>    | 0,05xD         | 0,75xD         | 24             | 0,080     | 0,085 | 0,110 | 0,110 | 0,120 |
| M.2 750 - 850 N/mm <sup>2</sup> | 0,05xD         | 0,75xD         | 15             | 0,080     | 0,085 | 0,110 | 0,110 | 0,120 |
| K.2 > 240 HB                    | 0,05xD         | 0,75xD         | 25             | 0,080     | 0,085 | 0,110 | 0,110 | 0,120 |

EN Shell end mills | fine teeth  
 DE Walzenstirnfräser | feingezahnt  
 RU Фрезы цилиндрические торцевые | мелкозубые



## 6302V

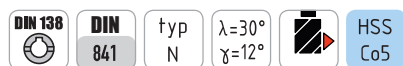
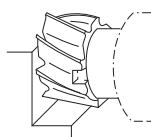
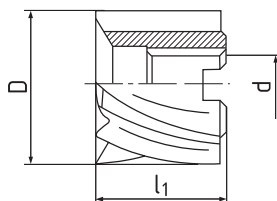


| D<br>js 16 | d<br>H 7 | l <sub>1</sub> | z  | 630275V |
|------------|----------|----------------|----|---------|
| 40         | 16       | 32             | 10 | .040    |
| 50         | 22       | 36             | 12 | .050    |
| 63         | 27       | 40             | 12 | .063    |
| 80         | 27       | 45             | 14 | .080    |
| 100        | 32       | 50             | 16 | .100    |
| 125        | 40       | 56             | 18 | .125    |

### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                               | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |
|----------------------------------------|----------------|----------------|----------------|-----------------------|-------|-------|-------|
|                                        |                |                |                | Ø 40                  | Ø 50  | Ø 80  | Ø 100 |
| <b>P.3</b> ≤ 1100 N/mm <sup>2</sup>    | 0,05xD         | 0,75xD         | 18             | 0,080                 | 0,085 | 0,110 | 0,110 |
| <b>P.4</b> ≤ 900 N/mm <sup>2</sup>     | 0,05xD         | 0,75xD         | 25             | 0,080                 | 0,085 | 0,110 | 0,110 |
| <b>P.5</b> ≤ 1100 N/mm <sup>2</sup>    | 0,05xD         | 0,75xD         | 18             | 0,080                 | 0,085 | 0,110 | 0,110 |
| <b>P.6</b> > 1100 N/mm <sup>2</sup>    | 0,05xD         | 0,75xD         | 16             | 0,056                 | 0,060 | 0,077 | 0,077 |
| <b>M.2</b> 750 - 850 N/mm <sup>2</sup> | 0,05xD         | 0,75xD         | 10             | 0,080                 | 0,085 | 0,110 | 0,110 |
| <b>K.2</b> > 240 HB                    | 0,05xD         | 0,75xD         | 22             | 0,080                 | 0,085 | 0,110 | 0,110 |
| <b>S.1</b> ≤ 1500 N/mm <sup>2</sup>    | 0,05xD         | 0,75xD         | 8              | 0,056                 | 0,060 | 0,077 | 0,077 |

EN Shell end mills  
 DE Walzenstirnfräser  
 RU Фрезы цилиндрические торцевые | среднезубые

**6802V**

| D<br>js 16 | d<br>H 7 | l <sub>1</sub> | z  | 680275V |
|------------|----------|----------------|----|---------|
| 30         | 13       | 30             | 6  | .030030 |
| 35         | 16       | 35             | 6  | .035035 |
| 40         | 16       | 20             | 8  | .040020 |
| 40         | 16       | 40             | 8  | .040040 |
| 50         | 22       | 25             | 8  | .050025 |
| 50         | 22       | 50             | 8  | .050050 |
| 60         | 27       | 30             | 8  | .060030 |
| 60         | 27       | 60             | 8  | .060060 |
| 75         | 27       | 35             | 10 | .075035 |
| 75         | 27       | 75             | 10 | .075075 |
| 80         | 27       | 35             | 10 | .080035 |
| 110        | 32       | 35             | 12 | .110035 |



## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

|          |                 |              |        |        | fz (mm/z) |       |       |       |       |
|----------|-----------------|--------------|--------|--------|-----------|-------|-------|-------|-------|
| Material |                 | Ap           | Ae     | Vc     | Ø 30      | Ø 40  | Ø 50  | Ø 80  |       |
| P.1      | ≤ 600 N/mm²     | 0,05xD       | 0,75xD | 37,5   | 0,075     | 0,080 | 0,085 | 0,110 |       |
|          | P.2             | ≤ 850 N/mm²  | 0,05xD | 0,75xD | 32,5      | 0,075 | 0,080 | 0,085 | 0,110 |
|          | P.3             | ≤ 1100 N/mm² | 0,05xD | 0,75xD | 18        | 0,075 | 0,080 | 0,085 | 0,110 |
|          | P.4             | ≤ 900 N/mm²  | 0,05xD | 0,75xD | 25        | 0,075 | 0,080 | 0,085 | 0,110 |
|          | P.5             | ≤ 1100 N/mm² | 0,05xD | 0,75xD | 18        | 0,075 | 0,080 | 0,085 | 0,110 |
| M.2      | 750 - 850 N/mm² | 0,05xD       | 0,75xD | 10     | 0,075     | 0,080 | 0,085 | 0,110 |       |
| K.2      | > 240 HB        | 0,05xD       | 0,75xD | 22     | 0,075     | 0,080 | 0,085 | 0,110 |       |

- EN Shell end mills
- DE Walzenstirnfräser
- RU Фрезы цилиндрические торцевые | среднезубые

DIN 138

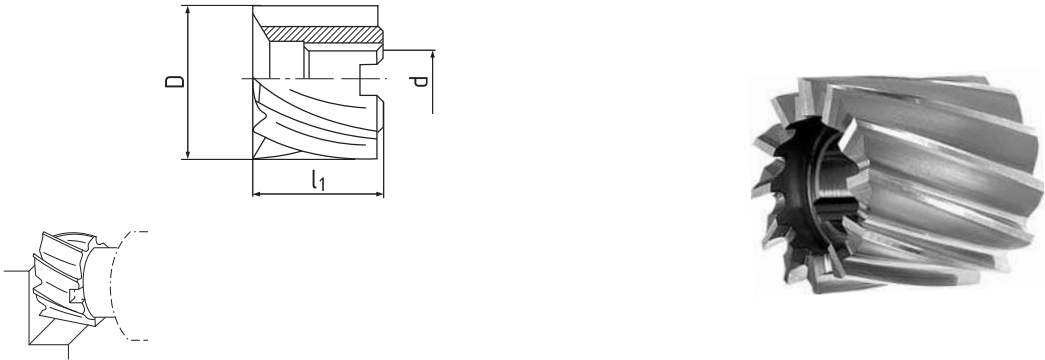
DIN 841

typ H

$\lambda=20^\circ$   
 $\gamma=8^\circ$

HSS Co5

6902V

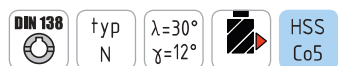


| D<br>js 16 | d<br>H 7 | l1 | z  | 690275V |
|------------|----------|----|----|---------|
| 30         | 13       | 30 | 8  | .030030 |
| 35         | 16       | 35 | 10 | .035035 |
| 40         | 16       | 40 | 10 | .040040 |
| 50         | 22       | 50 | 12 | .050050 |
| 60         | 27       | 60 | 12 | .060060 |
| 75         | 27       | 75 | 14 | .075075 |

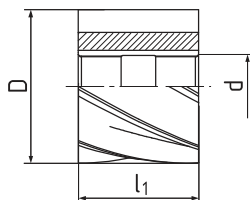
## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material            | Ap     | Ae     | Vc   | fz (mm/z) |       |      |       |
|---------------------|--------|--------|------|-----------|-------|------|-------|
|                     |        |        |      | Ø 40      | Ø 63  | Ø 90 | Ø 100 |
| P.1 ≤ 600 N/mm²     | 0,05xD | 0,75xD | 37,5 | 0,08      | 0,085 | 0,11 | 0,11  |
| P.2 ≤ 850 N/mm²     | 0,05xD | 0,75xD | 32,5 | 0,08      | 0,085 | 0,11 | 0,11  |
| P.3 ≤ 1100 N/mm²    | 0,05xD | 0,75xD | 18   | 0,08      | 0,085 | 0,11 | 0,11  |
| P.4 ≤ 900 N/mm²     | 0,05xD | 0,75xD | 25   | 0,08      | 0,085 | 0,11 | 0,11  |
| P.5 ≤ 1100 N/mm²    | 0,05xD | 0,75xD | 18   | 0,08      | 0,085 | 0,11 | 0,11  |
| M.2 750 - 850 N/mm² | 0,05xD | 0,75xD | 10   | 0,08      | 0,085 | 0,11 | 0,11  |
| K.2 > 240 HB        | 0,05xD | 0,75xD | 22   | 0,08      | 0,085 | 0,11 | 0,11  |

EN Shell end mills  
 DE Walzenstirnfräser  
 RU Фрезы цилиндрические торцевые | среднезубые



6200



| D<br>js 16 | d<br>H 7 | l <sub>1</sub> | z  | 620075  |
|------------|----------|----------------|----|---------|
| 50         | 22       | 40             | 8  | .050    |
| 50         | 22       | 63             | 8  | .050063 |
| 50         | 22       | 80             | 8  | .050080 |
| 63         | 27       | 50             | 8  | .063    |
| 63         | 27       | 70             | 8  | .063070 |
| 80         | 32       | 63             | 8  | .080    |
| 80         | 32       | 100            | 8  | .080100 |
| 100        | 40       | 70             | 10 | .100    |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                        | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | fz (mm/z) |       |      |       |
|---------------------------------|----------------|----------------|----------------|-----------|-------|------|-------|
|                                 |                |                |                | Ø 40      | Ø 63  | Ø 90 | Ø 100 |
| P.1 ≤ 600 N/mm <sup>2</sup>     | 0,05xD         | 0,75xD         | 37,5           | 0,08      | 0,085 | 0,11 | 0,11  |
| P.2 ≤ 850 N/mm <sup>2</sup>     | 0,05xD         | 0,75xD         | 32,5           | 0,08      | 0,085 | 0,11 | 0,11  |
| P.3 ≤ 1100 N/mm <sup>2</sup>    | 0,05xD         | 0,75xD         | 18             | 0,08      | 0,085 | 0,11 | 0,11  |
| P.4 ≤ 900 N/mm <sup>2</sup>     | 0,05xD         | 0,75xD         | 25             | 0,08      | 0,085 | 0,11 | 0,11  |
| P.5 ≤ 1100 N/mm <sup>2</sup>    | 0,05xD         | 0,75xD         | 18             | 0,08      | 0,085 | 0,11 | 0,11  |
| M.2 750 - 850 N/mm <sup>2</sup> | 0,05xD         | 0,75xD         | 10             | 0,08      | 0,085 | 0,11 | 0,11  |
| K.2 > 240 HB                    | 0,05xD         | 0,75xD         | 22             | 0,08      | 0,085 | 0,11 | 0,11  |

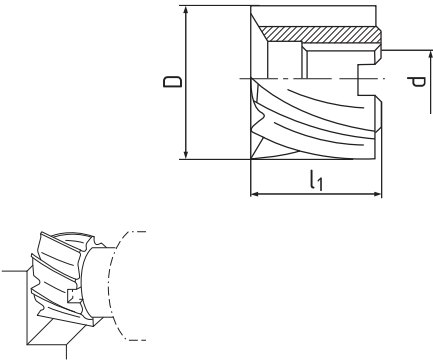


- EN Shell end mills | coarse teeth
- DE Walzenstirnfräser | grobgezahnt
- RU Фрезы цилиндрические торцевые | крупнозубые

typ W
  $\lambda=45^\circ$ 
 $\gamma=20^\circ$ 

 HSSE = litá HSS • cast HSS  
HHS fondu • литая HSS

6109



| D<br>js 16 | d<br>H 7 | l <sub>1</sub> | z  |
|------------|----------|----------------|----|
| 40         | 16       | 32             | 4  |
| 50         | 22       | 36             | 6  |
| 63         | 27       | 40             | 6  |
| 80         | 27       | 45             | 6  |
| 100        | 32       | 50             | 8  |
| 125        | 40       | 56             | 8  |
| 160        | 50       | 63             | 10 |

610973

.040  
.050  
.063  
.080  
.100  
.125  
.160

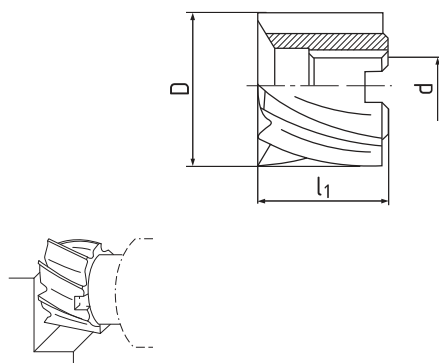
## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                           | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |       |
|------------------------------------|----------------|----------------|----------------|-----------------------|-------|-------|-------|-------|
|                                    |                |                |                | Ø 40                  | Ø 50  | Ø 80  | Ø 100 | Ø 160 |
| <b>P.1</b> ≤ 600 N/mm <sup>2</sup> | 0,05xD         | 0,75xD         | 30             | 0,080                 | 0,085 | 0,110 | 0,110 | 0,120 |
| <b>K.1</b> < 240 HB                | 0,05xD         | 0,75xD         | 25             | 0,080                 | 0,085 | 0,110 | 0,110 | 0,120 |
| <b>N.2</b> Si ≤ 12%                | 0,05xD         | 0,75xD         | 140-240        | 0,104                 | 0,111 | 0,143 | 0,143 | 0,156 |
| <b>N.4</b> ≤ 800 N/mm <sup>2</sup> | 0,05xD         | 0,75xD         | 50-90          | 0,080                 | 0,085 | 0,110 | 0,110 | 0,120 |

- EN Shell end mills  
 DE Walzenstirnfräser  
 RU Фрезы цилиндрические торцевые | среднезубые

DIN 138 ČSN 222052 typ N  $\lambda=35^\circ$   $\gamma=12^\circ$  HSSE = litá HSS • cast HSS  
 HHS fondu • литая HSS

6209



| D<br>js 16 | d<br>H 7 | l <sub>1</sub> | z  |
|------------|----------|----------------|----|
| 40         | 16       | 32             | 6  |
| 50         | 22       | 36             | 8  |
| 63         | 27       | 40             | 8  |
| 80         | 27       | 45             | 10 |
| 100        | 32       | 50             | 10 |
| 125        | 40       | 56             | 12 |
| 160        | 50       | 63             | 14 |

620973

.040  
 .050  
 .063  
 .080  
 .100  
 .125  
 .160



## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material                    | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | fz (mm/z) |       |       |       |       |
|-----------------------------|----------------|----------------|----------------|-----------|-------|-------|-------|-------|
|                             |                |                |                | Ø 40      | Ø 50  | Ø 80  | Ø 100 | Ø 160 |
| P.1 ≤ 600 N/mm <sup>2</sup> | 0,05xD         | 0,75xD         | 30             | 0,080     | 0,085 | 0,110 | 0,110 | 0,120 |
| P.2 ≤ 850 N/mm <sup>2</sup> | 0,05xD         | 0,75xD         | 26             | 0,080     | 0,085 | 0,110 | 0,110 | 0,120 |
| P.4 ≤ 900 N/mm <sup>2</sup> | 0,05xD         | 0,75xD         | 20             | 0,080     | 0,085 | 0,110 | 0,110 | 0,120 |
| K.2 > 240 HB                | 0,05xD         | 0,75xD         | 17             | 0,080     | 0,085 | 0,110 | 0,110 | 0,120 |

- EN Shell end mills | fine teeth
- DE Walzenstirnfräser | feingezahnt
- RU Фрезы цилиндрические торцевые | мелкозубые

typ

H

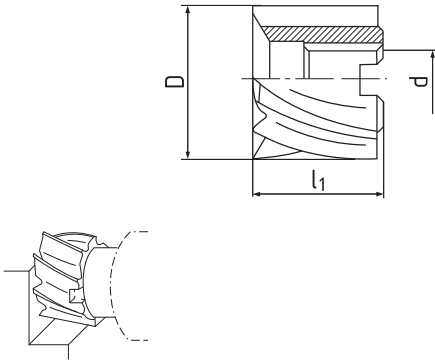
$\lambda=25^\circ$

$\gamma=12^\circ$

= litá HSS • cast HSS

HSS fondu • литая HSS

6309

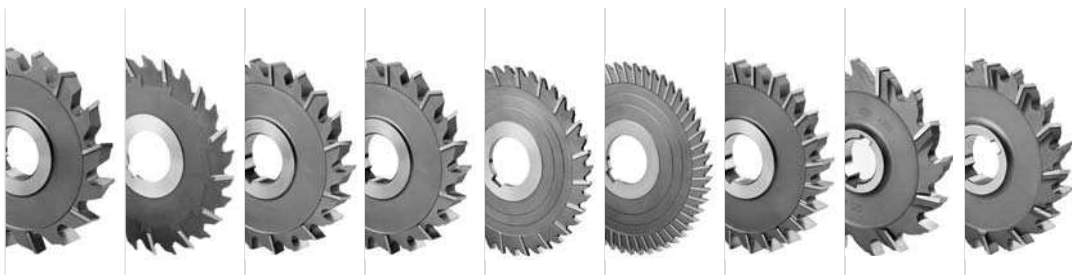


| D<br>js 16 | d<br>H 7 | l <sub>1</sub> | z  |
|------------|----------|----------------|----|
| 40         | 16       | 32             | 8  |
| 50         | 22       | 36             | 10 |
| 63         | 27       | 40             | 12 |
| 80         | 27       | 45             | 14 |
| 100        | 32       | 50             | 16 |
| 125        | 40       | 56             | 18 |
| 160        | 50       | 63             | 20 |

| 630973 |
|--------|
| .040   |
| .050   |
| .063   |
| .080   |
| .100   |
| .125   |
| .160   |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material |                         | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |       |
|----------|-------------------------|----------------|----------------|----------------|-----------------------|-------|-------|-------|-------|
|          |                         |                |                |                | Ø 40                  | Ø 50  | Ø 80  | Ø 100 | Ø 160 |
| P.2      | ≤ 850 N/mm <sup>2</sup> | 0,05xD         | 0,75xD         | 26             | 0,080                 | 0,085 | 0,110 | 0,110 | 0,120 |
| P.4      | ≤ 900 N/mm <sup>2</sup> | 0,05xD         | 0,75xD         | 20             | 0,080                 | 0,085 | 0,110 | 0,110 | 0,120 |
| K.2      | > 240 HB                | 0,05xD         | 0,75xD         | 17             | 0,080                 | 0,085 | 0,110 | 0,110 | 0,120 |



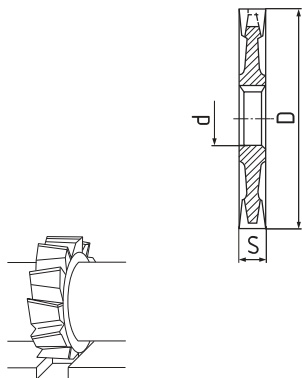
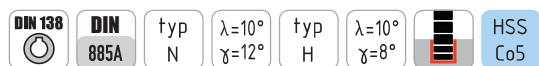
|                |         |         |         |         |         |         |         |         |         |
|----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Code           | 7202    | 7262    | 7302    | 7302    | 7362    | 7372    | 7392    | 7203    | 7303    |
| DIN            | 885A    |         | 885A    | 885A    | 1834A   | 1834B   | 885B    |         |         |
| Type           | N       | N       | H       | H       | H       | N       | H       | N       | H       |
| Material       | HSSCo5  | HSSCo5  | HSSCo5  | HSSCo8  | HSSCo5  | HSSCo5  | HSSCo5  | HSSE    | HSSE    |
| Dimension (mm) | 50-200  | 63-200  | 50-250  | 50-125  | 50-200  | 63-160  | 50-200  | 125-160 | 125-160 |
| Page           | 165-167 | 170-172 | 165-167 | 168-169 | 170-172 | 176-177 | 173-175 | 178-179 | 178-179 |

|          |     |   |   |   |   |   |   |   |   |
|----------|-----|---|---|---|---|---|---|---|---|
| <b>P</b> | P.1 | • | • | • | • | • | • | • |   |
|          | P.2 | • | • | • | • | • | • | • | • |
|          | P.3 |   |   |   | • |   |   |   |   |
|          | P.4 |   | • | • | • | • | • |   | • |
|          | P.5 |   | • | • | • | • | • |   |   |
|          | P.6 |   |   |   | • | • | • |   |   |
| <b>M</b> | M.1 |   |   |   |   |   |   |   |   |
|          | M.2 |   |   | • | • | • |   |   |   |
|          | M.3 |   |   |   |   |   |   |   |   |
| <b>K</b> | K.1 | • | • | • | • | • | • | • |   |
|          | K.2 |   | • | • | • | • | • |   | • |
| <b>N</b> | N.1 |   |   |   |   |   |   |   |   |
|          | N.2 | • |   |   |   | • |   | • |   |
|          | N.3 |   |   |   |   |   |   |   |   |
|          | N.4 | • | • | • | • | • | • | • |   |
| <b>S</b> | S.1 |   |   |   | • |   |   |   |   |
|          | S.2 |   |   |   | • |   |   |   |   |
| <b>H</b> | H.1 |   |   |   |   |   |   |   |   |
|          | H.2 |   |   |   |   |   |   |   |   |





EN Side and face milling cutters  
 DE Scheibenfräser  
 RU Фрезы дисковые трехсторонние | среднезубые



7202

7302



typ  
N

$\lambda=10^\circ$   
 $\gamma=12^\circ$

typ  
H

$\lambda=10^\circ$   
 $\gamma=8^\circ$

| D<br>js 16 | S<br>k 11 | d<br>H 7 | Z<br>7202 | Z<br>7302 |
|------------|-----------|----------|-----------|-----------|
| 50         | 3         | 16       | 12        | 16        |
| 50         | 4         | 16       | 12        | 16        |
| 50         | 5         | 16       | 12        | 16        |
| 50         | 6         | 16       | 12        | 16        |
| 50         | 8         | 16       | 12        | 16        |
| 50         | 10        | 16       | 12        | 16        |
| 63         | 3         | 22       | 12        | 18        |
| 63         | 4         | 22       | 12        | 18        |
| 63         | 5         | 22       | 12        | 18        |
| 63         | 6         | 22       | 12        | 18        |
| 63         | 8         | 22       | 12        | 18        |
| 63         | 10        | 22       | 12        | 18        |
| 63         | 12        | 22       | 12        | 18        |
| 63         | 14        | 22       | 12        | 18        |
| 63         | 16        | 22       | 12        | 18        |
| 63         | 18        | 22       | 12        |           |
| 80         | 3         | 27       | 14        |           |
| 80         | 4         | 27       | 14        | 20        |
| 80         | 5         | 27       | 14        | 20        |
| 80         | 6         | 27       | 14        | 20        |
| 80         | 8         | 27       | 14        | 20        |
| 80         | 10        | 27       | 14        | 18        |
| 80         | 12        | 27       | 14        | 18        |
| 80         | 14        | 27       | 14        | 18        |
| 80         | 16        | 27       | 14        | 18        |
| 80         | 18        | 27       | 14        | 18        |
| 80         | 20        | 27       | 14        | 18        |
| 100        | 3         | 32       | 14        | 20        |
| 100        | 4         | 32       | 14        | 20        |
| 100        | 5         | 32       | 14        | 20        |
| 100        | 6         | 32       | 14        | 20        |

720275

730275

|        |        |
|--------|--------|
| .05003 | .05003 |
| .05004 | .05004 |
| .05005 | .05005 |
| .05006 | .05006 |
| .05008 | .05008 |
| .05010 | .05010 |
| .06303 | .06303 |
| .06304 | .06304 |
| .06305 | .06305 |
| .06306 | .06306 |
| .06308 | .06308 |
| .06310 | .06310 |
| .06312 | .06312 |
| .06314 | .06314 |
| .06316 | .06316 |
| .06318 |        |
| .08003 |        |
| .08004 | .08004 |
| .08005 | .08005 |
| .08006 | .08006 |
| .08008 | .08008 |
| .08010 | .08010 |
| .08012 | .08012 |
| .08014 | .08014 |
| .08016 | .08016 |
| .08018 | .08018 |
| .08020 | .08020 |
| .10003 | .10003 |
| .10004 | .10004 |
| .10005 | .10005 |
| .10006 | .10006 |



EN

Side and face milling cutters

DE

Scheibenfräser

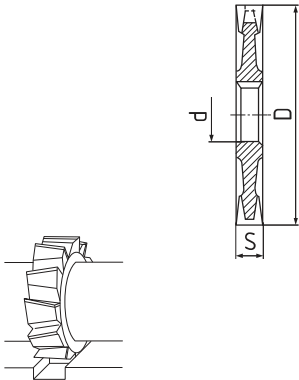
RU

Фрезы дисковые трехсторонние | среднезубые



7202

7302



typ N

λ=10°  
γ=12°



typ H

λ=10°  
γ=8°

| D<br>js 16 | S<br>k 11 | d<br>H 7 | Z<br>7202 | Z<br>7302 |
|------------|-----------|----------|-----------|-----------|
| 100        | 8         | 32       | 14        | 20        |
| 100        | 10        | 32       | 14        | 20        |
| 100        | 12        | 32       | 14        | 20        |
| 100        | 14        | 32       | 14        | 20        |
| 100        | 16        | 32       | 14        | 20        |
| 100        | 18        | 32       | 14        | 20        |
| 100        | 20        | 32       | 14        | 20        |
| 100        | 22        | 32       | 14        |           |
| 100        | 25        | 32       | 14        | 20        |
| 125        | 4         | 32       | 16        |           |
| 125        | 5         | 32       | 16        | 24        |
| 125        | 6         | 32       | 16        | 24        |
| 125        | 8         | 32       | 16        | 24        |
| 125        | 10        | 32       | 16        | 22        |
| 125        | 12        | 32       | 16        | 22        |
| 125        | 14        | 32       | 16        | 22        |
| 125        | 16        | 32       | 16        | 22        |
| 125        | 18        | 32       | 16        | 22        |
| 125        | 20        | 32       | 16        | 22        |
| 125        | 22        | 32       | 16        |           |
| 125        | 25        | 32       | 16        | 22        |
| 125        | 28        | 32       | 16        | 22        |

720275

730275

|        |        |
|--------|--------|
| .10008 | .10008 |
| .10010 | .10010 |
| .10012 | .10012 |
| .10014 | .10014 |
| .10016 | .10016 |
| .10018 | .10018 |
| .10020 | .10020 |
| .10022 |        |
| .10025 | .10025 |
| .12504 |        |
| .12505 | .12505 |
| .12506 | .12506 |
| .12508 | .12508 |
| .12510 | .12510 |
| .12512 | .12512 |
| .12514 | .12514 |
| .12516 | .12516 |
| .12518 | .12518 |
| .12520 | .12520 |
| .12522 |        |
| .12525 | .12525 |
| .12528 | .12528 |

Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |       |       |
|----------|----------------|----------------|----------------|-----------------------|-------|-------|-------|-------|-------|
|          |                |                |                | Ø 50                  | Ø 80  | Ø 100 | Ø 160 | Ø 200 |       |
| 720275   |                |                |                |                       |       |       |       |       |       |
| P.1      | ≤ 600 N/mm²    | 0,1xD          | 1xb            | 37,5                  | 0,050 | 0,070 | 0,080 | 0,090 | 0,090 |
| P.2      | ≤ 850 N/mm²    | 0,1xD          | 1xb            | 32,5                  | 0,050 | 0,070 | 0,080 | 0,090 | 0,090 |
| K.1      | < 240 HB       | 0,1xD          | 1xb            | 30                    | 0,050 | 0,070 | 0,080 | 0,090 | 0,090 |
| N.2      | Si ≤ 12%       | 0,1xD          | 1xb            | 160-260               | 0,065 | 0,091 | 0,104 | 0,117 | 0,117 |
| N.4      | ≤ 800 N/mm²    | 0,1xD          | 1xb            | 60-100                | 0,050 | 0,070 | 0,080 | 0,090 | 0,090 |

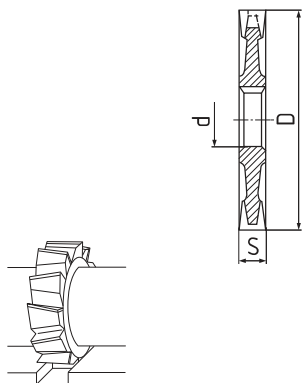


EN Side and face milling cutters  
 DE Scheibenfräser  
 RU Фрезы дисковые трехсторонние | среднезубые



7202

7302



typ  
N

λ=10°  
γ=12°

typ  
H

λ=10°  
γ=8°

| D<br>js 16 | S<br>k 11 | d<br>H 7 | Z<br>7202 | Z<br>7302 |
|------------|-----------|----------|-----------|-----------|
| 160        | 6         | 40       | 18        | 26        |
| 160        | 8         | 40       | 18        | 26        |
| 160        | 10        | 40       | 18        | 26        |
| 160        | 12        | 40       | 18        | 26        |
| 160        | 14        | 40       | 18        | 26        |
| 160        | 16        | 40       | 18        | 26        |
| 160        | 18        | 40       | 18        | 26        |
| 160        | 20        | 40       | 18        | 26        |
| 160        | 25        | 40       | 18        | 26        |
| 160        | 32        | 40       | 18        | 26        |
| 200        | 8         | 40       | 24        | 32        |
| 200        | 10        | 40       | 24        | 32        |
| 200        | 12        | 40       | 24        | 32        |
| 200        | 14        | 40       | 24        | 32        |
| 200        | 16        | 40       | 24        | 32        |
| 200        | 18        | 40       | 24        | 32        |
| 200        | 20        | 40       | 24        | 32        |
| 200        | 25        | 40       | 24        | 32        |
| 200        | 32        | 40       | 24        | 32        |
| 250*       | 8         | 40       |           | 38        |
| 250*       | 10        | 40       |           | 38        |
| 250*       | 12        | 40       |           | 38        |

\*) = HSS

720275

730275

|        |        |
|--------|--------|
| .16006 | .16006 |
| .16008 | .16008 |
| .16010 | .16010 |
| .16012 | .16012 |
| .16014 | .16014 |
| .16016 | .16016 |
| .16018 | .16018 |
| .16020 | .16020 |
| .16025 | .16025 |
| .16032 | .16032 |
| .20008 | .20008 |
| .20010 | .20010 |
| .20012 | .20012 |
| .20014 | .20014 |
| .20016 | .20016 |
| .20018 | .20018 |
| .20020 | .20020 |
| .20025 | .20025 |
| .20032 | .20032 |
|        | .25008 |
|        | .25010 |
|        | .25012 |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

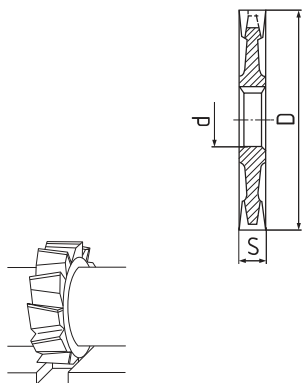
| Material | A <sub>p</sub>  | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |       |       |
|----------|-----------------|----------------|----------------|-----------------------|-------|-------|-------|-------|-------|
|          |                 |                |                | Ø 50                  | Ø 80  | Ø 100 | Ø 160 | Ø 200 |       |
| 730275   |                 |                |                |                       |       |       |       |       |       |
| P.1      | ≤ 600 N/mm²     | 0,1xD          | 1xb            | 37,5                  | 0,050 | 0,070 | 0,080 | 0,090 | 0,090 |
| P.2      | ≤ 850 N/mm²     | 0,1xD          | 1xb            | 32,5                  | 0,050 | 0,070 | 0,080 | 0,090 | 0,090 |
| P.4      | ≤ 900 N/mm²     | 0,1xD          | 1xb            | 25                    | 0,050 | 0,070 | 0,080 | 0,090 | 0,090 |
| P.5      | ≤ 1100 N/mm²    | 0,1xD          | 1xb            | 18                    | 0,050 | 0,070 | 0,080 | 0,090 | 0,090 |
| K.1      | < 240 HB        | 0,1xD          | 1xb            | 30                    | 0,050 | 0,070 | 0,080 | 0,090 | 0,090 |
| K.2      | > 240 HB        | 0,1xD          | 1xb            | 22                    | 0,050 | 0,070 | 0,080 | 0,090 | 0,090 |
| M.2      | 750 - 850 N/mm² | 0,1xD          | 1xb            | 10                    | 0,050 | 0,070 | 0,080 | 0,090 | 0,090 |
| N.4      | ≤ 800 N/mm²     | 0,1xD          | 1xb            | 60-100                | 0,050 | 0,070 | 0,080 | 0,090 | 0,090 |



EN Side and face milling cutters | fine teeth  
 DE Scheibenfräser | feingezahnt  
 RU Фрезы дисковые трехсторонние | мелкозубые

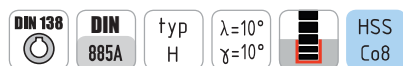


7302

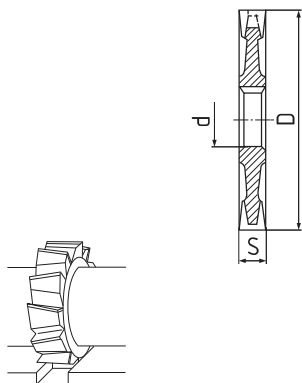


| D<br>js 16 | S<br>k 11 | d<br>H 7 | Z  | 730278 |
|------------|-----------|----------|----|--------|
| 50         | 4         | 16       | 14 | .05004 |
| 50         | 5         | 16       | 14 | .05005 |
| 50         | 6         | 16       | 14 | .05006 |
| 50         | 8         | 16       | 14 | .05008 |
| 50         | 10        | 16       | 14 | .05010 |
| 63         | 4         | 22       | 16 | .06304 |
| 63         | 5         | 22       | 16 | .06305 |
| 63         | 6         | 22       | 16 | .06306 |
| 63         | 7         | 22       | 16 | .06307 |
| 63         | 8         | 22       | 16 | .06308 |
| 63         | 9         | 22       | 16 | .06309 |
| 63         | 10        | 22       | 16 | .06310 |
| 63         | 12        | 22       | 16 | .06312 |
| 63         | 14        | 22       | 16 | .06314 |
| 63         | 16        | 22       | 16 | .06316 |
| 80         | 4         | 27       | 18 | .08004 |
| 80         | 5         | 27       | 18 | .08005 |
| 80         | 6         | 27       | 18 | .08006 |
| 80         | 7         | 27       | 18 | .08007 |
| 80         | 8         | 27       | 18 | .08008 |
| 80         | 9         | 27       | 18 | .08009 |
| 80         | 10        | 27       | 18 | .08010 |
| 80         | 12        | 27       | 18 | .08012 |
| 80         | 14        | 27       | 18 | .08014 |
| 80         | 16        | 27       | 18 | .08016 |
| 80         | 18        | 27       | 16 | .08018 |
| 80         | 20        | 27       | 16 | .08020 |
| 100        | 4         | 32       | 20 | .10004 |
| 100        | 5         | 32       | 20 | .10005 |
| 100        | 6         | 32       | 20 | .10006 |
| 100        | 7         | 32       | 20 | .10007 |
| 100        | 8         | 32       | 20 | .10008 |
| 100        | 9         | 32       | 20 | .10009 |

EN Side and face milling cutters | fine teeth  
 DE Scheibenfräser | feingezahnt  
 RU Фрезы дисковые трехсторонние | мелкозубые



7302



| D<br>js 16 | S<br>k 11 | d<br>H 7 | z  | 730278 |
|------------|-----------|----------|----|--------|
| 100        | 10        | 32       | 20 | .10010 |
| 100        | 12        | 32       | 20 | .10012 |
| 100        | 14        | 32       | 20 | .10014 |
| 100        | 16        | 32       | 20 | .10016 |
| 100        | 18        | 32       | 20 | .10018 |
| 100        | 20        | 32       | 20 | .10020 |
| 100        | 22        | 32       | 18 | .10022 |
| 100        | 25        | 32       | 18 | .10025 |
| 125        | 5         | 32       | 22 | .12505 |
| 125        | 6         | 32       | 22 | .12506 |
| 125        | 8         | 32       | 22 | .12508 |
| 125        | 10        | 32       | 22 | .12510 |
| 125        | 12        | 32       | 22 | .12512 |
| 125        | 14        | 32       | 22 | .12514 |
| 125        | 16        | 32       | 22 | .12516 |
| 125        | 18        | 32       | 22 | .12518 |
| 125        | 20        | 32       | 22 | .12520 |
| 125        | 22        | 32       | 20 | .12522 |
| 125        | 25        | 32       | 20 | .12525 |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

|          |                 |                |                |                |  | fz (mm/z) |       |       |       |
|----------|-----------------|----------------|----------------|----------------|--|-----------|-------|-------|-------|
| Material |                 | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> |  | Ø 50      | Ø 80  | Ø 100 | Ø 160 |
| P.1      | ≤ 600 N/mm²     | 0,1xD          | 1xb            | 45             |  | 0,050     | 0,070 | 0,080 | 0,090 |
| P.2      | ≤ 850 N/mm²     | 0,1xD          | 1xb            | 39             |  | 0,050     | 0,070 | 0,080 | 0,090 |
| P.3      | ≤ 1100 N/mm²    | 0,1xD          | 1xb            | 24             |  | 0,050     | 0,070 | 0,080 | 0,090 |
| P.4      | ≤ 900 N/mm²     | 0,1xD          | 1xb            | 30             |  | 0,050     | 0,070 | 0,080 | 0,090 |
| P.5      | ≤ 1100 N/mm²    | 0,1xD          | 1xb            | 24             |  | 0,050     | 0,070 | 0,080 | 0,090 |
| P.6      | > 1100 N/mm²    | 0,1xD          | 1xb            | 20             |  | 0,035     | 0,049 | 0,056 | 0,063 |
| M.2      | 750 - 850 N/mm² | 0,1xD          | 1xb            | 15             |  | 0,050     | 0,070 | 0,080 | 0,090 |
| K.1      | < 240 HB        | 0,1xD          | 1xb            | 35             |  | 0,050     | 0,070 | 0,080 | 0,090 |
| K.2      | > 240 HB        | 0,1xD          | 1xb            | 25             |  | 0,050     | 0,070 | 0,080 | 0,090 |
| N.4      | ≤ 800 N/mm²     | 0,1xD          | 1xb            | 80-120         |  | 0,050     | 0,070 | 0,080 | 0,090 |
| S.1      | ≤ 1500 N/mm²    | 0,1xD          | 1xb            | 12             |  | 0,035     | 0,049 | 0,056 | 0,063 |
| S.2      | ≤ 1250 N/mm²    | 0,1xD          | 1xb            | 12             |  | 0,035     | 0,049 | 0,056 | 0,063 |

- EN Narrow side and face milling cutters
- DE Scheibenfräser | schmal
- RU Фрезы дисковые трехсторонние | среднезубые

DIN 138

DIN 1834A

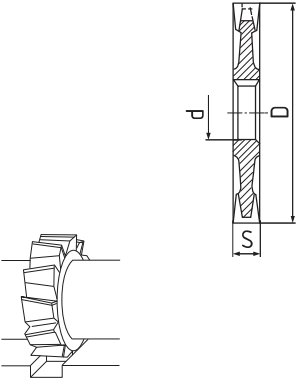
typ N

typ H

$\lambda=10^\circ$   
 $\gamma=12^\circ$

7262

7362



typ N



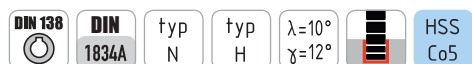
typ H

| D<br>js 16 | S<br>k 11 | d<br>H 7 | Z<br>7262 | Z<br>7362 | 726275  | 736275  |
|------------|-----------|----------|-----------|-----------|---------|---------|
| 50         | 1,6       | 16       |           | 24        |         | .050016 |
| 50         | 2         | 16       |           | 24        |         | .050020 |
| 50         | 2,5       | 16       |           | 24        |         | .050025 |
| 50         | 3         | 16       |           | 24        |         | .050030 |
| 50         | 3,5       | 16       |           | 24        |         | .050035 |
| 50         | 4         | 16       |           | 24        |         | .050040 |
| 50         | 5         | 16       |           | 22        |         | .050050 |
| 63         | 1,6       | 22       | 16        | 28        | .063016 | .063016 |
| 63         | 2         | 22       | 16        | 28        | .063020 | .063020 |
| 63         | 2,5       | 22       | 16        | 28        | .063025 | .063025 |
| 63         | 3         | 22       | 16        | 28        | .063030 | .063030 |
| 63         | 3,5       | 22       |           | 28        |         | .063035 |
| 63         | 4         | 22       | 16        | 28        | .063040 | .063040 |
| 63         | 5         | 22       | 16        | 28        | .063050 | .063050 |
| 63         | 6         | 22       | 16        | 28        | .063060 | .063060 |
| 80         | 1,6       | 27       | 20        | 32        | .080016 | .080016 |
| 80         | 2         | 27       | 20        | 32        | .080020 | .080020 |
| 80         | 2,5       | 27       | 20        | 32        | .080025 | .080025 |
| 80         | 3         | 27       | 20        | 32        | .080030 | .080030 |
| 80         | 3,5       | 27       |           | 32        |         | .080035 |
| 80         | 4         | 27       | 20        | 32        | .080040 | .080040 |
| 80         | 5         | 27       | 20        | 32        | .080050 | .080050 |
| 80         | 6         | 27       | 20        | 32        | .080060 | .080060 |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

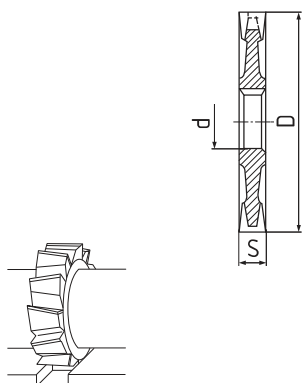
| Material | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |       |
|----------|----------------|----------------|----------------|-----------------------|-------|-------|-------|-------|
|          |                |                |                | Ø 50                  | Ø 80  | Ø 100 | Ø 160 |       |
| 726275   |                |                |                |                       |       |       |       |       |
| P.1      | ≤ 600 N/mm²    | 0,1xD          | 1xb            | 37,5                  | 0,050 | 0,070 | 0,080 | 0,090 |
| P.2      | ≤ 850 N/mm²    | 0,1xD          | 1xb            | 32,5                  | 0,050 | 0,070 | 0,080 | 0,090 |
| P.4      | ≤ 900 N/mm²    | 0,1xD          | 1xb            | 25                    | 0,050 | 0,070 | 0,080 | 0,090 |
| P.5      | ≤ 1100 N/mm²   | 0,1xD          | 1xb            | 18                    | 0,050 | 0,070 | 0,080 | 0,090 |
| K.1      | < 240 HB       | 0,1xD          | 1xb            | 30                    | 0,050 | 0,070 | 0,080 | 0,090 |
| K.2      | > 240 HB       | 0,1xD          | 1xb            | 22                    | 0,050 | 0,070 | 0,080 | 0,090 |
| N.4      | ≤ 800 N/mm²    | 0,1xD          | 1xb            | 60-100                | 0,050 | 0,070 | 0,080 | 0,090 |

EN Narrow side and face milling cutters  
 DE Scheibenfräser | schmal  
 RU Фрезы дисковые трехсторонние | среднезубые



7262

7362

typ  
Ntyp  
H

| D<br>js 16 | S<br>k 11 | d<br>H 7 | Z<br>7262 | Z<br>7362 |
|------------|-----------|----------|-----------|-----------|
| 100        | 1,6       | 32       | 24        | 36        |
| 100        | 2         | 32       | 24        | 36        |
| 100        | 2,5       | 32       | 24        | 36        |
| 100        | 3         | 32       | 24        | 36        |
| 100        | 3,5       | 32       |           | 36        |
| 100        | 4         | 32       | 24        | 36        |
| 100        | 5         | 32       | 24        | 36        |
| 100        | 6         | 32       | 24        | 36        |
| 100        | 8         | 32       | 24        | 28        |
| 125        | 1,6       | 32       | 26        | 40        |
| 125        | 2         | 32       | 26        | 40        |
| 125        | 2,5       | 32       | 26        | 40        |
| 125        | 3         | 32       | 26        | 40        |
| 125        | 3,5       | 32       |           | 40        |
| 125        | 4         | 32       | 26        | 40        |
| 125        | 5         | 32       | 26        | 40        |
| 125        | 6         | 32       | 26        | 40        |
| 125        | 7         | 32       |           | 32        |
| 125        | 8         | 32       | 26        | 32        |
| 125        | 10        | 32       | 26        | 32        |
| 160        | 2         | 40       | 30        | 48        |
| 160        | 2,5       | 40       | 30        | 48        |
| 160        | 3         | 40       | 30        | 48        |

726275

736275

|         |         |
|---------|---------|
| .100016 | .100016 |
| .100020 | .100020 |
| .100025 | .100025 |
| .100030 | .100030 |
|         | .100035 |
| .100040 | .100040 |
| .100050 | .100050 |
| .100060 | .100060 |
| .100080 | .100080 |
| .125016 | .125016 |
| .125020 | .125020 |
| .125025 | .125025 |
| .125030 | .125030 |
|         | .125035 |
| .125040 | .125040 |
| .125050 | .125050 |
| .125060 | .125060 |
|         | .125070 |
| .125080 | .125080 |
| .125100 | .125100 |
| .160020 | .160020 |
| .160025 | .160025 |
| .160030 | .160030 |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material |              | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |       |  |
|----------|--------------|----------------|----------------|----------------|-----------------------|-------|-------|-------|-------|--|
|          |              |                |                |                | Ø 50                  | Ø 80  | Ø 100 | Ø 160 | Ø 200 |  |
| 736275   |              |                |                |                |                       |       |       |       |       |  |
| P.1      | ≤ 600 N/mm²  | 0,1xD          | 1xb            | 37,5           | 0,050                 | 0,070 | 0,080 | 0,090 | 0,090 |  |
| P.2      | ≤ 850 N/mm²  | 0,1xD          | 1xb            | 32,5           | 0,050                 | 0,070 | 0,080 | 0,090 | 0,090 |  |
| P.4      | ≤ 900 N/mm²  | 0,1xD          | 1xb            | 25             | 0,050                 | 0,070 | 0,080 | 0,090 | 0,090 |  |
| P.5      | ≤ 1100 N/mm² | 0,1xD          | 1xb            | 18             | 0,050                 | 0,070 | 0,080 | 0,090 | 0,090 |  |
| P.6      | > 1100 N/mm² | 0,1xD          | 1xb            | 16             | 0,035                 | 0,049 | 0,056 | 0,063 | 0,063 |  |
| K.1      | < 240 HB     | 0,1xD          | 1xb            | 30             | 0,050                 | 0,070 | 0,080 | 0,090 | 0,090 |  |
| K.2      | > 240 HB     | 0,1xD          | 1xb            | 22             | 0,050                 | 0,070 | 0,080 | 0,090 | 0,090 |  |
| N.2      | Si ≤ 12%     | 0,1xD          | 1xb            | 160-260        | 0,065                 | 0,091 | 0,104 | 0,117 | 0,117 |  |
| N.4      | ≤ 800 N/mm²  | 0,1xD          | 1xb            | 60-100         | 0,050                 | 0,070 | 0,080 | 0,090 | 0,090 |  |

- EN Narrow side and face milling cutters | fine teeth
- DE Scheibenfräser | schmal, feingezahnt
- RU Фрезы дисковые трехсторонние | мелкозубые

DIN 138

DIN 1834A

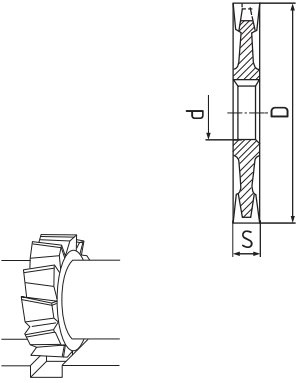
typ N

typ H

$\lambda=10^\circ$   
 $\gamma=12^\circ$

7262

7362



typ N



typ H

| D<br>js 16 | S<br>k 11 | d<br>H 7 | Z<br>7262 | Z<br>7362 |
|------------|-----------|----------|-----------|-----------|
| 160        | 3,5       | 40       |           | 48        |
| 160        | 4         | 40       | 30        | 48        |
| 160        | 5         | 40       | 30        | 48        |
| 160        | 6         | 40       | 30        | 48        |
| 160        | 8         | 40       | 30        | 36        |
| 160        | 10        | 40       | 30        | 36        |
| 160        | 12        | 40       | 30        | 36        |
| 200        | 2         | 40       |           | 52        |
| 200        | 2,5       | 40       |           | 52        |
| 200        | 3         | 40       | 36        | 52        |
| 200        | 4         | 40       |           | 52        |
| 200        | 5         | 40       |           | 52        |
| 200        | 6         | 40       |           | 52        |
| 200        | 8         | 40       |           | 40        |
| 200        | 10        | 40       |           | 40        |
| 200        | 12        | 40       |           | 40        |
| 200        | 14        | 40       |           | 40        |

| 726275  | 736275  |
|---------|---------|
|         | .160035 |
| .160040 | .160040 |
| .160050 | .160050 |
| .160060 | .160060 |
| .160080 | .160080 |
| .160100 | .160100 |
| .160120 | .160120 |
|         | .200020 |
|         | .200025 |
| .200030 | .200030 |
|         | .200040 |
|         | .200050 |
|         | .200060 |
|         | .200080 |
|         | .200100 |
|         | .200120 |
|         | .200140 |

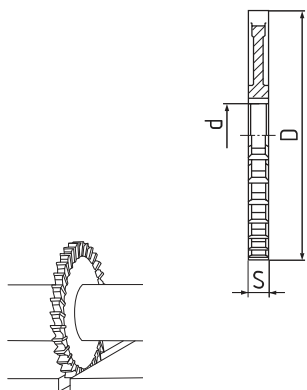
## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |       |
|----------|----------------|----------------|----------------|-----------------------|-------|-------|-------|-------|
|          |                |                |                | Ø 50                  | Ø 80  | Ø 100 | Ø 160 |       |
| 726275   |                |                |                |                       |       |       |       |       |
| P.1      | ≤ 600 N/mm²    | 0,1xD          | 1xb            | 37,5                  | 0,050 | 0,070 | 0,080 | 0,090 |
| P.2      | ≤ 850 N/mm²    | 0,1xD          | 1xb            | 32,5                  | 0,050 | 0,070 | 0,080 | 0,090 |
| P.4      | ≤ 900 N/mm²    | 0,1xD          | 1xb            | 25                    | 0,050 | 0,070 | 0,080 | 0,090 |
| P.5      | ≤ 1100 N/mm²   | 0,1xD          | 1xb            | 18                    | 0,050 | 0,070 | 0,080 | 0,090 |
| K.1      | < 240 HB       | 0,1xD          | 1xb            | 30                    | 0,050 | 0,070 | 0,080 | 0,090 |
| K.2      | > 240 HB       | 0,1xD          | 1xb            | 22                    | 0,050 | 0,070 | 0,080 | 0,090 |
| N.4      | ≤ 800 N/mm²    | 0,1xD          | 1xb            | 60-100                | 0,050 | 0,070 | 0,080 | 0,090 |

- EN Side and face milling cutters | fine teeth, straight teeth  
 DE Scheibenfräser | feingezahnt, geradeverzahnt  
 RU Фрезы дисковые трехсторонние | мелкозубые, прямые зубья



7392



| D<br>js 16 | S<br>k 11 | d<br>H 7 | z  | 739275 |
|------------|-----------|----------|----|--------|
| 50         | 4         | 16       | 16 | .05004 |
| 50         | 5         | 16       | 16 | .05005 |
| 50         | 6         | 16       | 16 | .05006 |
| 50         | 7         | 16       | 16 | .05007 |
| 50         | 8         | 16       | 16 | .05008 |
| 50         | 10        | 16       | 16 | .05010 |
| 63         | 4         | 22       | 18 | .06304 |
| 63         | 5         | 22       | 18 | .06305 |
| 63         | 6         | 22       | 18 | .06306 |
| 63         | 8         | 22       | 18 | .06308 |
| 63         | 10        | 22       | 18 | .06310 |
| 63         | 12        | 22       | 18 | .06312 |
| 63         | 14        | 22       | 18 | .06314 |
| 63         | 16        | 22       | 18 | .06316 |
| 63         | 18        | 22       | 18 | .06318 |
| 80         | 4         | 27       | 20 | .08004 |
| 80         | 5         | 27       | 20 | .08005 |
| 80         | 6         | 27       | 20 | .08006 |
| 80         | 8         | 27       | 20 | .08008 |
| 80         | 10        | 27       | 20 | .08010 |
| 80         | 12        | 27       | 20 | .08012 |
| 80         | 14        | 27       | 20 | .08014 |
| 80         | 16        | 27       | 20 | .08016 |

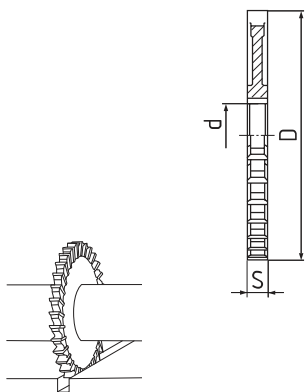
## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material | A <sub>p</sub>           | A <sub>e</sub> | V <sub>c</sub> | fz (mm/z) |       |       |       |       |
|----------|--------------------------|----------------|----------------|-----------|-------|-------|-------|-------|
|          |                          |                |                | Ø 50      | Ø 80  | Ø 100 | Ø 160 | Ø 200 |
| P.1      | ≤ 600 N/mm <sup>2</sup>  | 0,1xD          | 1xb            | 37,5      | 0,050 | 0,070 | 0,080 | 0,090 |
| P.2      | ≤ 850 N/mm <sup>2</sup>  | 0,1xD          | 1xb            | 32,5      | 0,050 | 0,070 | 0,080 | 0,090 |
| P.4      | ≤ 900 N/mm <sup>2</sup>  | 0,1xD          | 1xb            | 25        | 0,050 | 0,070 | 0,080 | 0,090 |
| P.5      | ≤ 1100 N/mm <sup>2</sup> | 0,1xD          | 1xb            | 18        | 0,050 | 0,070 | 0,080 | 0,090 |
| K.1      | < 240 HB                 | 0,1xD          | 1xb            | 30        | 0,050 | 0,070 | 0,080 | 0,090 |
| K.2      | > 240 HB                 | 0,1xD          | 1xb            | 22        | 0,050 | 0,070 | 0,080 | 0,090 |
| N.4      | ≤ 800 N/mm <sup>2</sup>  | 0,1xD          | 1xb            | 60-100    | 0,050 | 0,070 | 0,080 | 0,090 |

- EN Side and face milling cutters | fine teeth, straight teeth
- DE Scheibenfräser | feingezahnt, geradeverzahnt
- RU Фрезы дисковые трехсторонние | мелкозубые, прямые зубья



## 7392



| D<br>js 16 | S<br>k 11 | d<br>H 7 | z  | 739275 |
|------------|-----------|----------|----|--------|
| 80         | 18        | 27       | 20 | .08018 |
| 80         | 20        | 27       | 20 | .08020 |
| 100        | 6         | 32       | 24 | .10006 |
| 100        | 8         | 32       | 24 | .10008 |
| 100        | 10        | 32       | 24 | .10010 |
| 100        | 12        | 32       | 24 | .10012 |
| 100        | 14        | 32       | 24 | .10014 |
| 100        | 16        | 32       | 24 | .10016 |
| 100        | 18        | 32       | 24 | .10018 |
| 100        | 20        | 32       | 24 | .10020 |
| 100        | 22        | 32       | 24 | .10022 |
| 100        | 25        | 32       | 24 | .10025 |
| 125        | 6         | 32       | 24 | .12506 |
| 125        | 8         | 32       | 24 | .12508 |
| 125        | 10        | 32       | 24 | .12510 |
| 125        | 12        | 32       | 24 | .12512 |
| 125        | 14        | 32       | 24 | .12514 |
| 125        | 16        | 32       | 24 | .12516 |
| 125        | 18        | 32       | 24 | .12518 |
| 125        | 20        | 32       | 24 | .12520 |
| 125        | 25        | 32       | 24 | .12525 |
| 160        | 10        | 40       | 24 | .16010 |
| 160        | 12        | 40       | 24 | .16012 |

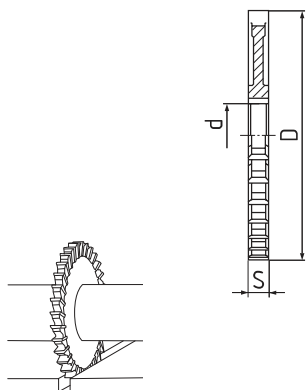
### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material | A <sub>p</sub>           | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |       |
|----------|--------------------------|----------------|----------------|-----------------------|-------|-------|-------|-------|
|          |                          |                |                | Ø 50                  | Ø 80  | Ø 100 | Ø 160 | Ø 200 |
| P.1      | ≤ 600 N/mm <sup>2</sup>  | 0,1xD          | 1xb            | 37,5                  | 0,050 | 0,070 | 0,080 | 0,090 |
| P.2      | ≤ 850 N/mm <sup>2</sup>  | 0,1xD          | 1xb            | 32,5                  | 0,050 | 0,070 | 0,080 | 0,090 |
| P.4      | ≤ 900 N/mm <sup>2</sup>  | 0,1xD          | 1xb            | 25                    | 0,050 | 0,070 | 0,080 | 0,090 |
| P.5      | ≤ 1100 N/mm <sup>2</sup> | 0,1xD          | 1xb            | 18                    | 0,050 | 0,070 | 0,080 | 0,090 |
| K.1      | < 240 HB                 | 0,1xD          | 1xb            | 30                    | 0,050 | 0,070 | 0,080 | 0,090 |
| K.2      | > 240 HB                 | 0,1xD          | 1xb            | 22                    | 0,050 | 0,070 | 0,080 | 0,090 |
| N.4      | ≤ 800 N/mm <sup>2</sup>  | 0,1xD          | 1xb            | 60-100                | 0,050 | 0,070 | 0,080 | 0,090 |

- EN Side and face milling cutters | fine teeth, straight teeth  
 DE Scheibenfräser | feingezahnt, geradeverzahnt  
 RU Фрезы дисковые трехсторонние | мелкозубые, прямые зубья



7392



| D<br>js 16 | S<br>k 11 | d<br>H 7 | z  |
|------------|-----------|----------|----|
| 160        | 14        | 40       | 24 |
| 160        | 16        | 40       | 24 |
| 160        | 18        | 40       | 24 |
| 160        | 20        | 40       | 24 |
| 200        | 10        | 40       | 32 |
| 200        | 12        | 40       | 32 |
| 200        | 14        | 40       | 32 |
| 200        | 16        | 40       | 32 |
| 200        | 18        | 40       | 32 |
| 200        | 20        | 40       | 32 |

739275

.16014  
 .16016  
 .16018  
 .16020  
 .20010  
 .20012  
 .20014  
 .20016  
 .20018  
 .20020

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

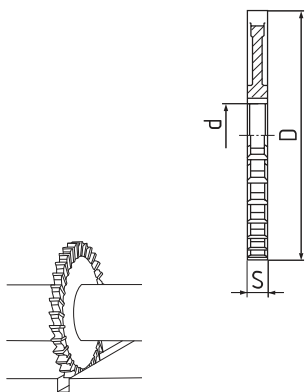
| Material                     | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | fz (mm/z) |       |       |       |       |
|------------------------------|----------------|----------------|----------------|-----------|-------|-------|-------|-------|
|                              |                |                |                | Ø 50      | Ø 80  | Ø 100 | Ø 160 | Ø 200 |
| P.1 ≤ 600 N/mm <sup>2</sup>  | 0,1xD          | 1xb            | 37,5           | 0,050     | 0,070 | 0,080 | 0,090 | 0,090 |
| P.2 ≤ 850 N/mm <sup>2</sup>  | 0,1xD          | 1xb            | 32,5           | 0,050     | 0,070 | 0,080 | 0,090 | 0,090 |
| P.4 ≤ 900 N/mm <sup>2</sup>  | 0,1xD          | 1xb            | 25             | 0,050     | 0,070 | 0,080 | 0,090 | 0,090 |
| P.5 ≤ 1100 N/mm <sup>2</sup> | 0,1xD          | 1xb            | 18             | 0,050     | 0,070 | 0,080 | 0,090 | 0,090 |
| K.1 < 240 HB                 | 0,1xD          | 1xb            | 30             | 0,050     | 0,070 | 0,080 | 0,090 | 0,090 |
| K.2 > 240 HB                 | 0,1xD          | 1xb            | 22             | 0,050     | 0,070 | 0,080 | 0,090 | 0,090 |
| N.4 ≤ 800 N/mm <sup>2</sup>  | 0,1xD          | 1xb            | 60-100         | 0,050     | 0,070 | 0,080 | 0,090 | 0,090 |



- EN Narrow side and face milling cutters | straight teeth  
 DE Scheibenfräser | schmal, geradeverzahnt  
 RU Фрезы дисковые трехсторонние | прямые зубья



7372

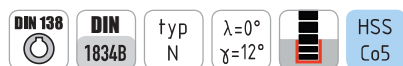


| D<br>js 16 | S<br>k 11 | d<br>H 7 | z  | 737275  |
|------------|-----------|----------|----|---------|
| 63         | 1,6       | 22       | 32 | .063016 |
| 63         | 2         | 22       | 32 | .063020 |
| 63         | 2,5       | 22       | 32 | .063025 |
| 63         | 3         | 22       | 32 | .063030 |
| 63         | 4         | 22       | 32 | .063040 |
| 63         | 5         | 22       | 32 | .063050 |
| 80         | 1,6       | 27       | 36 | .080016 |
| 80         | 2         | 27       | 36 | .080020 |
| 80         | 2,5       | 27       | 36 | .080025 |
| 80         | 3         | 27       | 36 | .080030 |
| 80         | 4         | 27       | 36 | .080040 |
| 100        | 1,6       | 32       | 40 | .100016 |
| 100        | 2         | 32       | 40 | .100020 |
| 100        | 2,5       | 32       | 40 | .100025 |
| 100        | 3         | 32       | 40 | .100030 |
| 100        | 4         | 32       | 40 | .100040 |
| 100        | 5         | 32       | 40 | .100050 |

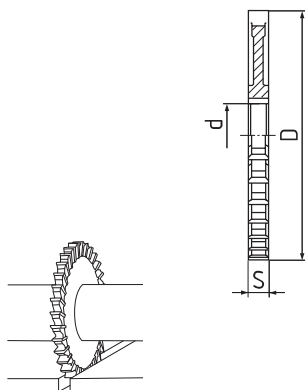
## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material |                 | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |
|----------|-----------------|----------------|----------------|----------------|-----------------------|-------|-------|-------|
|          |                 |                |                |                | Ø 50                  | Ø 80  | Ø 100 | Ø 160 |
| P.1      | ≤ 600 N/mm²     | 0,1xD          | 1xb            | 37,5           | 0,050                 | 0,070 | 0,080 | 0,090 |
| P.2      | ≤ 850 N/mm²     | 0,1xD          | 1xb            | 32,5           | 0,050                 | 0,070 | 0,080 | 0,090 |
| P.4      | ≤ 900 N/mm²     | 0,1xD          | 1xb            | 25             | 0,050                 | 0,070 | 0,080 | 0,090 |
| P.5      | ≤ 1100 N/mm²    | 0,1xD          | 1xb            | 18             | 0,050                 | 0,070 | 0,080 | 0,090 |
| P.6      | > 1100 N/mm²    | 0,1xD          | 1xb            | 16             | 0,035                 | 0,049 | 0,056 | 0,063 |
| M.2      | 750 - 850 N/mm² | 0,1xD          | 1xb            | 10             | 0,050                 | 0,070 | 0,080 | 0,090 |
| K.1      | < 240 HB        | 0,1xD          | 1xb            | 30             | 0,050                 | 0,070 | 0,080 | 0,090 |
| K.2      | > 240 HB        | 0,1xD          | 1xb            | 22             | 0,050                 | 0,070 | 0,080 | 0,090 |
| N4       | ≤ 800 N/mm²     | 0,1xD          | 1xb            | 60-100         | 0,050                 | 0,070 | 0,080 | 0,090 |

- EN Narrow side and face milling cutters | straight teeth  
 DE Scheibenfräser | schmal, geradeverzahnt  
 RU Фрезы дисковые трехсторонние | прямые зубья



7372



| D<br>js 16 | S<br>k 11 | d<br>H 7 | z  | 737275  |
|------------|-----------|----------|----|---------|
| 125        | 1,6       | 32       | 44 | .125016 |
| 125        | 2         | 32       | 44 | .125020 |
| 125        | 2,5       | 32       | 44 | .125025 |
| 125        | 3         | 32       | 44 | .125030 |
| 125        | 4         | 32       | 44 | .125040 |
| 125        | 5         | 32       | 44 | .125050 |
| 125        | 6         | 32       | 44 | .125060 |
| 160        | 2         | 40       | 52 | .160020 |
| 160        | 2,5       | 40       | 52 | .160025 |
| 160        | 3         | 40       | 52 | .160030 |
| 160        | 4         | 40       | 52 | .160040 |
| 160        | 5         | 40       | 52 | .160050 |
| 160        | 6         | 40       | 52 | .160060 |
| 160        | 8         | 40       | 40 | .160080 |



## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

|          |     |                 |       |     |        | fz (mm/z) |       |       |       |
|----------|-----|-----------------|-------|-----|--------|-----------|-------|-------|-------|
| Material |     | Ap              | Ae    | Vc  |        | Ø 50      | Ø 80  | Ø 100 | Ø 160 |
|          | P.1 | ≤ 600 N/mm²     | 0,1xD | 1xb | 37,5   | 0,050     | 0,070 | 0,080 | 0,090 |
|          | P.2 | ≤ 850 N/mm²     | 0,1xD | 1xb | 32,5   | 0,050     | 0,070 | 0,080 | 0,090 |
|          | P.4 | ≤ 900 N/mm²     | 0,1xD | 1xb | 25     | 0,050     | 0,070 | 0,080 | 0,090 |
|          | P.5 | ≤ 1100 N/mm²    | 0,1xD | 1xb | 18     | 0,050     | 0,070 | 0,080 | 0,090 |
|          | P.6 | > 1100 N/mm²    | 0,1xD | 1xb | 16     | 0,035     | 0,049 | 0,056 | 0,063 |
|          | M.2 | 750 - 850 N/mm² | 0,1xD | 1xb | 10     | 0,050     | 0,070 | 0,080 | 0,090 |
|          | K.1 | < 240 HB        | 0,1xD | 1xb | 30     | 0,050     | 0,070 | 0,080 | 0,090 |
|          | K.2 | > 240 HB        | 0,1xD | 1xb | 22     | 0,050     | 0,070 | 0,080 | 0,090 |
|          | N.4 | ≤ 800 N/mm²     | 0,1xD | 1xb | 60-100 | 0,050     | 0,070 | 0,080 | 0,090 |

EN

Side and face milling cutters

DE

Scheibenfräser

RU

Фрезы дисковые трехсторонние | среднезубые

DIN 138

typ N

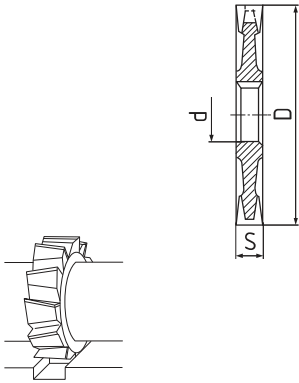
typ H

$\lambda=10^\circ$   
 $\gamma=10^\circ$

HSSE = litá HSS • cast HSS  
 HHS fondu • литая HSS

7203

7303



ČSN 222161

typ N



ČSN 222165

typ H

| D<br>js 16 | S<br>s 10 | d<br>7203 | d<br>7303 | Z<br>7203 | Z<br>7303 |
|------------|-----------|-----------|-----------|-----------|-----------|
| 50         | 4         |           | 16        |           | 18        |
| 50         | 5         |           | 16        |           | 18        |
| 50         | 6         |           | 16        |           | 18        |
| 63         | 4         |           | 22        |           | 20        |
| 63         | 5         |           | 22        |           | 20        |
| 63         | 6         |           | 22        |           | 20        |
| 63         | 8         | 22        | 22        | 12        | 20        |
| 63         | 10        | 22        | 22        | 12        | 20        |
| 63         | 12        | 22        | 22        | 12        | 20        |
| 80         | 6         |           | 22        |           | 22        |
| 80         | 8         | 27        | 22        | 14        | 22        |
| 80         | 10        | 27        | 22        | 14        | 22        |
| 80         | 10        | 22        |           | 14        |           |
| 80         | 12        | 27        | 22        | 14        | 22        |
| 100        | 8         |           | 22        |           | 24        |
| 100        | 10        | 27        | 22        | 14        | 24        |
| 100        | 12        | 27        |           | 14        |           |
| 100        | 12        | 22        |           | 14        |           |
| 100        | 14        | 27        |           | 14        |           |
| 100        | 14        | 32        | 22        | 14        | 24        |
| 100        | 14        | 27        |           | 14        |           |
| 100        | 16        | 32        | 27        | 14        | 24        |

| 720373   | 730373 |
|----------|--------|
|          | .05004 |
|          | .05005 |
|          | .05006 |
|          | .06304 |
|          | .06305 |
|          | .06306 |
| .06308   | .06308 |
| .06310   | .06310 |
| .06312   | .06312 |
|          | .08006 |
| .08008   | .08008 |
| .08010   | .08010 |
| .0801022 |        |
| .08012   | .08012 |
|          | .10008 |
| .1001027 | .10010 |
| .10012   |        |
| .1001222 |        |
| .1001227 |        |
| .10014   | .10014 |
| .1001427 |        |
| .10016   | .10016 |

Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

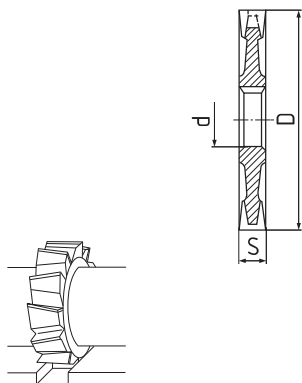
| Material | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |       |
|----------|----------------|----------------|----------------|-----------------------|-------|-------|-------|-------|
|          |                |                |                | Ø 50                  | Ø 80  | Ø 100 | Ø 160 |       |
| 720373   |                |                |                |                       |       |       |       |       |
| P.1      | ≤ 600 N/mm²    | 0,1xD          | 1xb            | 30                    | 0,050 | 0,070 | 0,080 | 0,090 |
| P.2      | ≤ 850 N/mm²    | 0,1xD          | 1xb            | 26                    | 0,050 | 0,070 | 0,080 | 0,090 |
| K.1      | < 240 HB       | 0,1xD          | 1xb            | 25                    | 0,050 | 0,070 | 0,080 | 0,090 |
| N.4      | ≤ 800 N/mm²    | 0,1xD          | 1xb            | 50-90                 | 0,050 | 0,070 | 0,080 | 0,090 |
| N.2      | Si ≤ 12%       | 0,1xD          | 1xb            | 140-240               | 0,065 | 0,091 | 0,104 | 0,117 |
| 730373   |                |                |                |                       |       |       |       |       |
| P.2      | ≤ 850 N/mm²    | 0,1xD          | 1xb            | 26                    | 0,050 | 0,070 | 0,080 | 0,090 |
| P.4      | ≤ 900 N/mm²    | 0,1xD          | 1xb            | 20                    | 0,050 | 0,070 | 0,080 | 0,090 |
| K.2      | > 240 HB       | 0,1xD          | 1xb            | 17                    | 0,050 | 0,070 | 0,080 | 0,090 |

EN Side and face milling cutters | fine teeth  
 DE Scheibenfräser | feingezahnt  
 RU Фрезы дисковые трехсторонние | мелкозубые

DIN 138 typ N typ H  $\lambda=10^\circ$   $\gamma=10^\circ$  HSSE = litá HSS • cast HSS  
 HHS fondu • литая HSS

7203

7303



ČSN 222161 typ N



ČSN 222165 typ H

| D<br>js 16 | S<br>s 10 | d<br>7203 | d<br>7303 | Z<br>7203 | Z<br>7303 |
|------------|-----------|-----------|-----------|-----------|-----------|
| 125        | 8         |           | 32        |           | 28        |
| 125        | 12        | 32        | 27        | 16        | 26        |
| 125        | 14        | 32        |           | 16        |           |
| 125        | 14        | 27        |           | 16        |           |
| 125        | 14        | 40        |           | 16        |           |
| 125        | 16        | 32        | 27        | 16        | 26        |
| 125        | 16        | 40        |           | 16        |           |
| 125        | 18        | 40        | 32        | 16        | 26        |
| 125        | 20        |           | 32        |           | 26        |
| 160        | 14        | 40        |           | 18        |           |
| 160        | 16        | 40        |           | 18        |           |
| 160        | 16        | 32        |           | 18        |           |
| 160        | 18        | 40        | 32        | 18        | 28        |
| 160        | 20        | 40        |           | 18        |           |
| 160        | 22        |           | 40        |           | 28        |

720373

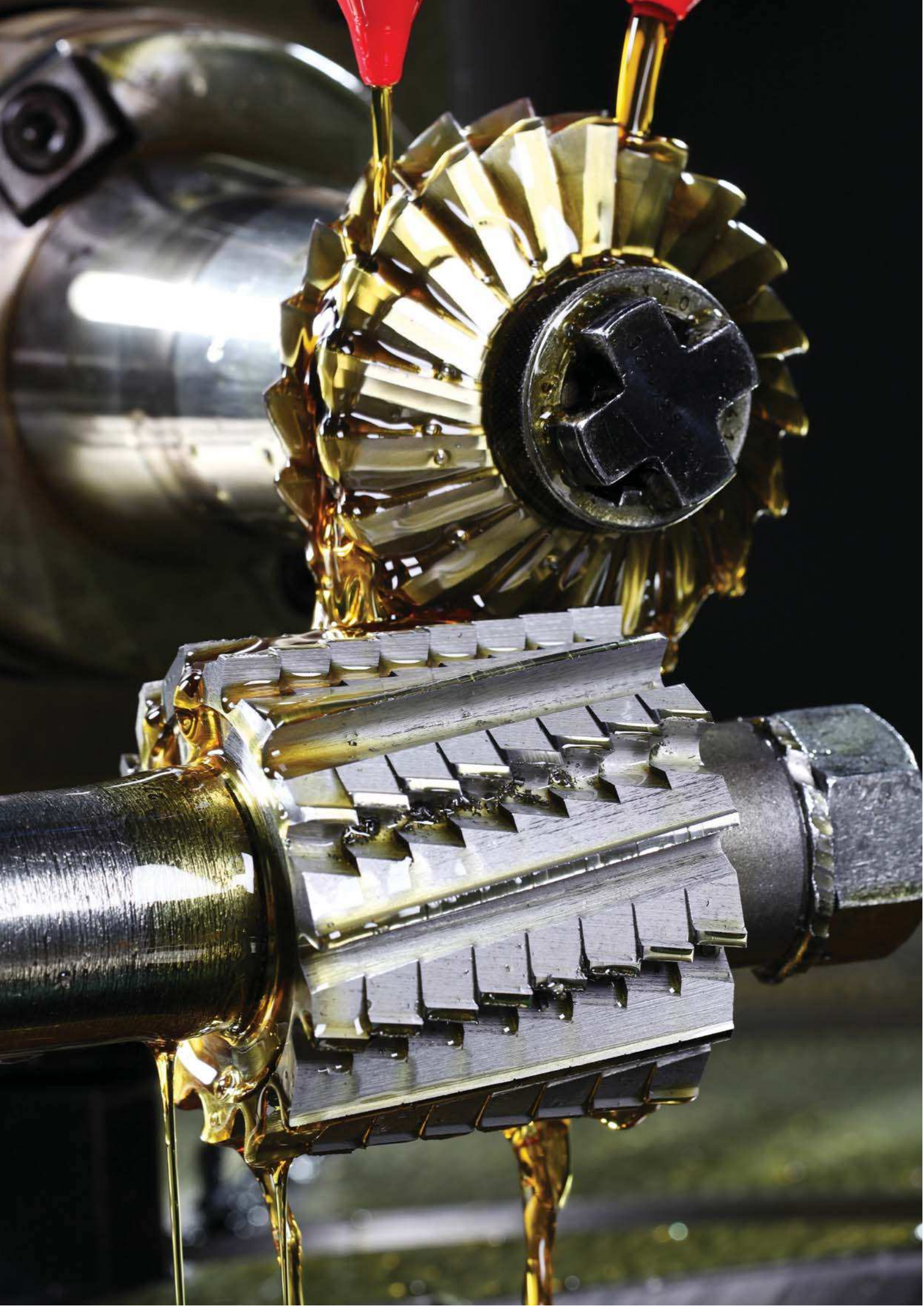
730373

|          |        |
|----------|--------|
|          | .12508 |
| .12512   | .12512 |
| .12514   |        |
| .1251427 |        |
| .1251440 |        |
| .12516   | .12516 |
| .1251640 |        |
| .1251840 | .12518 |
|          | .12520 |
| .16014   |        |
| .16016   |        |
| .1601632 |        |
| .16018   | .16018 |
| .16020   |        |
|          | .16022 |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material |             |       |     |         | fz (mm/z) |       |       |       |
|----------|-------------|-------|-----|---------|-----------|-------|-------|-------|
|          |             |       |     |         | Ø 50      | Ø 80  | Ø 100 | Ø 160 |
| 720373   |             |       |     |         |           |       |       |       |
| P.1      | ≤ 600 N/mm² | 0,1xD | 1xb | 30      | 0,050     | 0,070 | 0,080 | 0,090 |
| P.2      | ≤ 850 N/mm² | 0,1xD | 1xb | 26      | 0,050     | 0,070 | 0,080 | 0,090 |
| K.1      | < 240 HB    | 0,1xD | 1xb | 25      | 0,050     | 0,070 | 0,080 | 0,090 |
| N.4      | ≤ 800 N/mm² | 0,1xD | 1xb | 50-90   | 0,050     | 0,070 | 0,080 | 0,090 |
| N.2      | Si ≤ 12%    | 0,1xD | 1xb | 140-240 | 0,065     | 0,091 | 0,104 | 0,117 |
| 730373   |             |       |     |         |           |       |       |       |
| P.2      | ≤ 850 N/mm² | 0,1xD | 1xb | 26      | 0,050     | 0,070 | 0,080 | 0,090 |
| P.4      | ≤ 900 N/mm² | 0,1xD | 1xb | 20      | 0,050     | 0,070 | 0,080 | 0,090 |
| K.2      | > 240 HB    | 0,1xD | 1xb | 17      | 0,050     | 0,070 | 0,080 | 0,090 |







| Code      | 8100    | 8100V   | 8200   | 8200V  | 8525    | 8532    | 8532V   | 8570     | 8570V   | 8900    |
|-----------|---------|---------|--------|--------|---------|---------|---------|----------|---------|---------|
| DIN       | 856     | 856     | 855A   | 855A   | 1824A   | 842     | 842     | 847      | 847     | 3972    |
| Type      | N       | N       | N      | N      | N       | N       | N       | N        | N       |         |
| Material  | HSS     | HSSCo5  | HSS    | HSSCo5 | HSS     | HSS     | HSSCo5  | HSS      | HSSCo5  | HSSCo5  |
| Dimension | R1-R25  | R1-R12  | R1-R20 | R1-R20 | 20°-30° | 45°-60° | 45°-60° | 45°-120° | 45°-90° | M.0,5-6 |
| Page      | 182-183 | 182-183 | 184    | 184    | 185     | 186-187 | 186-187 | 188      | 188     | 189     |

|          |     |   |   |   |   |   |   |   |   |   |  |  |
|----------|-----|---|---|---|---|---|---|---|---|---|--|--|
| <b>P</b> | P.1 | • | • | • | • | • | • | • | • | • |  |  |
|          | P.2 |   |   |   |   |   |   |   |   | • |  |  |
|          | P.3 |   | • |   | • |   | • |   | • |   |  |  |
|          | P.4 | • | • | • | • | • | • | • | • |   |  |  |
|          | P.5 |   |   |   |   |   |   |   |   |   |  |  |
|          | P.6 |   | • |   | • |   | • |   | • |   |  |  |
| <b>M</b> | M.1 |   |   |   |   |   |   |   |   |   |  |  |
|          | M.2 |   | • |   | • |   | • |   | • |   |  |  |
|          | M.3 |   |   |   |   |   |   |   |   |   |  |  |
| <b>K</b> | K.1 | • | • | • | • | • | • | • | • | • |  |  |
|          | K.2 | • | • | • | • | • | • | • | • | • |  |  |
| <b>N</b> | N.1 |   |   |   |   |   |   |   |   |   |  |  |
|          | N.2 |   |   |   |   |   |   |   |   |   |  |  |
|          | N.3 |   |   |   |   |   |   |   |   |   |  |  |
|          | N.4 |   |   |   |   | • | • | • | • | • |  |  |
| <b>S</b> | S.1 |   |   |   |   |   |   |   |   |   |  |  |
|          | S.2 |   |   |   |   |   | • |   | • |   |  |  |
| <b>H</b> | H.1 |   |   |   |   |   |   |   |   |   |  |  |
|          | H.2 |   |   |   |   |   |   |   |   |   |  |  |



EN Half circle milling cutters | convex  
 DE Halbrund-Profilfräser | konvex  
 RU Фрезы полукруглые | выпуклые

typ  
N

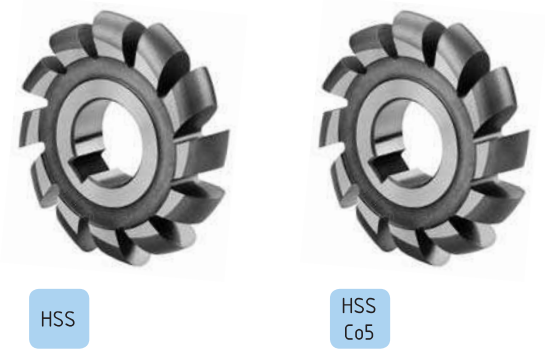
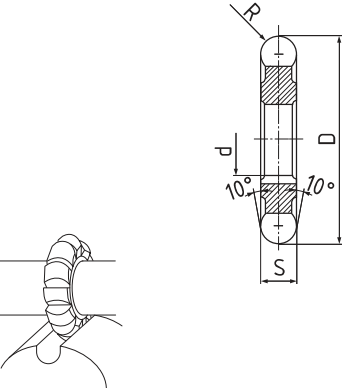
$\lambda=0^\circ$   
 $\gamma=10^\circ$

HSS

HSS  
Co5

8100

8100V



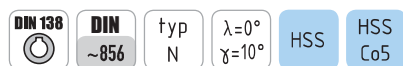
| D<br>js 16 | S<br>s 10 | d<br>H 7 | R<br>k 11 | Z<br>8100 | Z<br>8100V | 810070 | 810075V |
|------------|-----------|----------|-----------|-----------|------------|--------|---------|
| 50         | 2         | 16       | 1         | 14        | 16         | .010   | .010    |
| 50         | 2,5       | 16       | 1,25      | 14        | 16         | .0125  | .0125   |
| 50         | 3         | 16       | 1,5       | 14        | 16         | .015   | .015    |
| 50         | 3,2       | 16       | 1,6       | 14        |            | .016   |         |
| 50         | 4         | 16       | 2         | 14        | 16         | .020   | .020    |
| 63         | 5         | 22       | 2,5       | 12        | 12         | .025   | .025    |
| 63         | 6         | 22       | 3         | 12        | 12         | .030   | .030    |
| 63         | 6,3       | 22       | 3,15      | 12        |            | .0315  |         |
| 63         | 7         | 22       | 3,5       | 12        | 12         | .035   | .035    |
| 63         | 8         | 22       | 4         | 12        | 12         | .040   | .040    |
| 63         | 9         | 22       | 4,5       | 12        | 12         | .045   | .045    |
| 63         | 10        | 22       | 5         | 12        | 12         | .050   | .050    |
| 80         | 11        | 27       | 5,5       | 12        | 12         | .055   | .055    |
| 80         | 12        | 27       | 6         | 12        | 12         | .060   | .060    |
| 80         | 12,6      | 27       | 6,3       | 12        |            | .063   |         |
| 80         | 13        | 27       | 6,5       | 12        |            | .065   |         |
| 80         | 14        | 27       | 7         | 12        | 12         | .070   | .070    |
| 80         | 15        | 27       | 7,5       | 12        |            | .075   |         |
| 80         | 16        | 27       | 8         | 12        | 12         | .080   | .080    |
| 100        | 17        | 32       | 8,5       | 12        |            | .085   |         |
| 100        | 18        | 32       | 9         | 12        | 12         | .090   | .090    |
| 100        | 19        | 32       | 9,5       | 12        |            | .095   |         |
| 100        | 20        | 32       | 10        | 12        | 12         | .100   | .100    |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |
|----------|----------------|----------------|----------------|-----------------------|-------|-------|-------|
|          |                |                |                | Ø 50                  | Ø 80  | Ø 100 | Ø 160 |
| 810070   |                |                |                |                       |       |       |       |
| P.1      | ≤ 600 N/mm²    | 1xR            | 30             | 0,080                 | 0,120 | 0,140 | 0,140 |
| P.4      | ≤ 900 N/mm²    | 1xR            | 20             | 0,080                 | 0,120 | 0,140 | 0,140 |
| K.1      | < 240 HB       | 1xR            | 25             | 0,080                 | 0,120 | 0,140 | 0,140 |
| K.2      | > 240 HB       | 1xR            | 17             | 0,080                 | 0,120 | 0,140 | 0,140 |

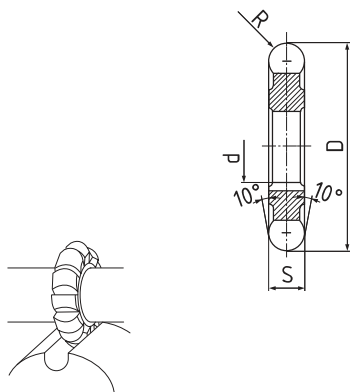


EN Half circle milling cutters | convex  
 DE Halbrund-Profilfräser | konvex  
 RU Фрезы полукруглые | выпуклые



8100

8100V



HSS

HSS  
Co5

| D<br>js 16 | S<br>s 10 | d<br>H 7 | R<br>k 11 | Z<br>8100 | Z<br>8100V | 810070 | 810075V |
|------------|-----------|----------|-----------|-----------|------------|--------|---------|
| 100        | 22        | 32       | 11        | 12        |            | .110   |         |
| 100        | 24        | 32       | 12        | 12        | 12         | .120   | .120    |
| 100        | 25        | 32       | 12,5      | 12        |            | .125   |         |
| 125        | 28        | 40       | 14        | 12        |            | .140   |         |
| 125        | 30        | 32       | 15        | 12        |            | .150   |         |
| 125        | 32        | 32       | 16        | 12        |            | .160   |         |
| 125        | 35        | 40       | 17,5      | 12        |            | .175   |         |
| 125        | 36        | 40       | 18        | 12        |            | .180   |         |
| 125        | 40        | 32       | 20        | 12        |            | .200   |         |
| 160        | 50        | 40       | 25        | 12        |            | .250   |         |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material | A <sub>p</sub>  | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |
|----------|-----------------|----------------|----------------|-----------------------|-------|-------|-------|
|          |                 |                |                | Ø 50                  | Ø 80  | Ø 100 | Ø 160 |
| 810075V  |                 |                |                |                       |       |       |       |
| P.1      | ≤ 600 N/mm²     | 1xR            | 37,5           | 0,080                 | 0,120 | 0,140 | 0,140 |
| P.3      | ≤ 1100 N/mm²    | 1xR            | 18             | 0,080                 | 0,120 | 0,140 | 0,140 |
| P.4      | ≤ 900 N/mm²     | 1xR            | 25             | 0,080                 | 0,120 | 0,140 | 0,140 |
| P.6      | > 1100 N/mm²    | 1xR            | 16             | 0,056                 | 0,084 | 0,098 | 0,098 |
| M.2      | 750 - 850 N/mm² | 1xR            | 10             | 0,080                 | 0,120 | 0,140 | 0,140 |
| K.1      | < 240 HB        | 1xR            | 30             | 0,080                 | 0,120 | 0,140 | 0,140 |
| K.2      | > 240 HB        | 1xR            | 22             | 0,080                 | 0,120 | 0,140 | 0,140 |



EN Half circle milling cutters | concave  
 DE Halbrund-Profilfräser | konkav  
 RU Фрезы полукруглые | вогнутые

DIN 138

DIN ~855A

typ N

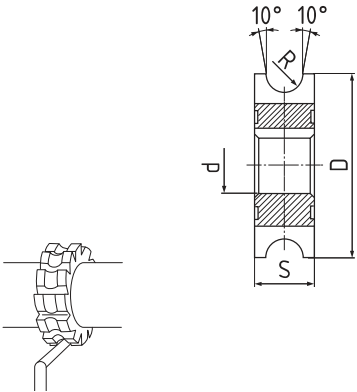
$\lambda=0^\circ$   
 $\gamma=10^\circ$

HSS

HSS Co5

8200

8200V



HSS



HSS Co5

| D<br>js 16 | S<br>js 16 | d<br>H 7 | R<br>H 11 | Z<br>8200 | Z<br>8200V | 820070 | 820075V |
|------------|------------|----------|-----------|-----------|------------|--------|---------|
| 50         | 6          | 16       | 1         | 14        | 14         | .010   | .010    |
| 50         | 6          | 16       | 1,25      | 14        | 14         | .0125  | .0125   |
| 50         | 8          | 16       | 1,5       |           | 14         |        | .015    |
| 50         | 8          | 16       | 1,6       | 14        |            | .016   |         |
| 50         | 9          | 16       | 2         | 14        | 14         | .020   | .020    |
| 63         | 10         | 22       | 2,5       | 12        | 14         | .025   | .025    |
| 63         | 12         | 22       | 3         | 12        | 12         | .030   | .030    |
| 63         | 12         | 22       | 3,15      | 12        |            | .0315  |         |
| 63         | 16         | 22       | 3,5       | 12        |            | .035   |         |
| 63         | 16         | 22       | 4         | 12        | 12         | .040   | .040    |
| 63         | 18         | 22       | 4,5       | 12        |            | .045   |         |
| 63         | 20         | 22       | 5         | 12        | 10         | .050   | .050    |
| 80         | 24         | 27       | 6         | 12        | 10         | .060   | .060    |
| 80         | 24         | 27       | 6,3       | 12        |            | .063   |         |
| 80         | 24         | 27       | 7         | 12        |            | .070   |         |
| 80         | 32         | 27       | 8         | 12        | 10         | .080   | .080    |
| 100        | 32         | 32       | 9         | 12        | 10         | .090   | .090    |
| 100        | 36         | 32       | 10        | 12        | 10         | .100   | .100    |
| 100        | 40         | 32       | 12        | 12        | 10         | .120   | .120    |
| 100        | 40         | 32       | 12,5      | 12        |            | .125   |         |
| 125        | 50         | 32       | 16        | 10        |            | .160   |         |
| 125        | 60         | 32       | 20        | 10        | 10         | .200   | .200    |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

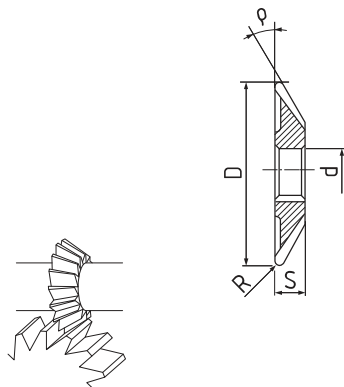
| Material | A <sub>p</sub>  | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |
|----------|-----------------|----------------|----------------|-----------------------|-------|-------|-------|
|          |                 |                |                | Ø 50                  | Ø 63  | Ø 80  | Ø 100 |
| 820070   |                 |                |                |                       |       |       |       |
| P.1      | ≤ 600 N/mm²     | 1xR            | 30             | 0,080                 | 0,100 | 0,120 | 0,140 |
| P.4      | ≤ 900 N/mm²     | 1xR            | 20             | 0,080                 | 0,100 | 0,120 | 0,140 |
| K.1      | < 240 HB        | 1xR            | 25             | 0,080                 | 0,100 | 0,120 | 0,140 |
| K.2      | > 240 HB        | 1xR            | 17             | 0,080                 | 0,100 | 0,120 | 0,140 |
| 810075V  |                 |                |                |                       |       |       |       |
| P.1      | ≤ 600 N/mm²     | 1xR            | 37,5           | 0,080                 | 0,100 | 0,120 | 0,140 |
| P.3      | ≤ 1100 N/mm²    | 1xR            | 18             | 0,080                 | 0,100 | 0,120 | 0,140 |
| P.4      | ≤ 900 N/mm²     | 1xR            | 25             | 0,080                 | 0,100 | 0,120 | 0,140 |
| P.6      | > 1100 N/mm²    | 1xR            | 16             | 0,056                 | 0,070 | 0,084 | 0,098 |
| M.2      | 750 - 850 N/mm² | 1xR            | 10             | 0,080                 | 0,100 | 0,120 | 0,140 |
| K.1      | < 240 HB        | 1xR            | 30             | 0,080                 | 0,100 | 0,120 | 0,140 |
| K.2      | > 240 HB        | 1xR            | 22             | 0,080                 | 0,100 | 0,120 | 0,140 |

- EN Single angle milling cutters  
 DE Aufsteck-Winkelfräser | einseitig  
 RU Фрезы угловые | односторонние



HSS

8525

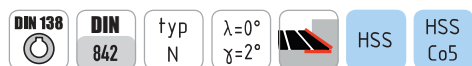


| $\rho$<br>±30 | D<br>js 16 | S<br>js 16 | d<br>H7 | R   | Z  | 852570  |
|---------------|------------|------------|---------|-----|----|---------|
| 20°           | 63         | 6          | 16      | 1   | 14 | .020063 |
| 20°           | 100        | 10         | 27      | 1,5 | 18 | .020100 |
| 25°           | 63         | 6          | 22      | 1   | 14 | .025063 |
| 25°           | 80         | 10         | 22      | 1   | 16 | .025080 |
| 25°           | 100        | 14         | 27      | 1,5 | 18 | .025100 |
| 25°           | 125        | 18         | 27      | 2   | 20 | .025125 |
| 25°           | 160        | 22         | 32      | 2,5 | 22 | .025160 |
| 30°           | 63         | 8          | 22      | 1   | 14 | .030063 |
| 30°           | 100        | 14         | 27      | 1,5 | 18 | .030100 |

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

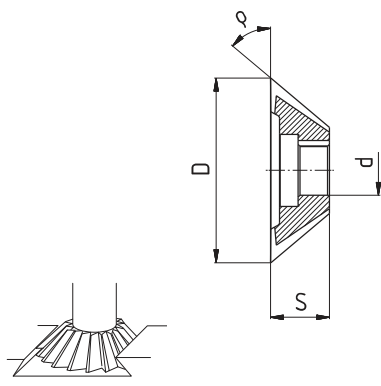
| Material | $A_p$                   | $A_e$ | $V_c$ | $f_z$ (mm/z) |       |       |       |
|----------|-------------------------|-------|-------|--------------|-------|-------|-------|
|          |                         |       |       | Ø 63         | Ø 80  | Ø 100 | Ø 125 |
| P.1      | ≤ 600 N/mm <sup>2</sup> | 1xb   | 30    | 0,035        | 0,040 | 0,045 | 0,045 |
| P.4      | ≤ 900 N/mm <sup>2</sup> | 1xb   | 20    | 0,035        | 0,040 | 0,045 | 0,045 |
| K.1      | < 240 HB                | 1xb   | 25    | 0,035        | 0,040 | 0,045 | 0,045 |
| K.2      | > 240 HB                | 1xb   | 17    | 0,035        | 0,040 | 0,045 | 0,045 |
| N.4      | ≤ 800 N/mm <sup>2</sup> | 1xb   | 50-90 | 0,035        | 0,040 | 0,045 | 0,045 |

EN Single angle milling cutters  
DE Aufsteck-Winkelfräser | einseitig  
RU Фрезы одноугловые



## 8532

## 8532V



HSS



HSS  
Co5

| p<br>±20 | D<br>js 16 | S      | d<br>H 7 | Z<br>8532 | Z<br>8532V |
|----------|------------|--------|----------|-----------|------------|
| 45°      | 40         | 10/12* | 10       | 14        | 14         |
| 45°      | 50         | 13/15* | 13       | 16        | 16         |
| 45°      | 63         | 18     | 16       | 18        | 16         |
| 45°      | 80         | 22/23* | 22       | 20        | 18         |
| 45°      | 100        | 28/30* | 27       | 22        | 20         |
| 45°      | 125        | 36     | 32       | 24        |            |
| 45°      | 160        | 45     | 40       | 28        |            |
| 50°      | 40         | 13     | 10       | 14        | 14         |
| 50°      | 50         | 16     | 13       | 16        | 16         |
| 50°      | 63         | 20     | 16       | 18        | 16         |
| 50°      | 80         | 25     | 22       | 20        | 18         |
| 50°      | 100        | 32     | 27       | 22        | 20         |
| 50°      | 125        | 40     | 32       | 24        |            |
| 50°      | 160        | 50     | 40       | 28        |            |
| 55°      | 40         | 13     | 10       | 14        |            |
| 55°      | 50         | 16     | 13       | 16        |            |
| 55°      | 63         | 20     | 16       | 18        |            |
| 55°      | 80         | 25     | 22       | 20        |            |
| 55°      | 100        | 32     | 27       | 22        |            |
| 55°      | 125        | 40     | 32       | 24        |            |

853270

853275V

|         |         |
|---------|---------|
| .045040 | .045040 |
| .045050 | .045050 |
| .045063 | .045063 |
| .045080 | .045080 |
| .045100 | .045100 |
| .045125 |         |
| .045160 |         |
| .050040 | .050040 |
| .050050 | .050050 |
| .050063 | .050063 |
| .050080 | .050080 |
| .050100 | .050100 |
| .050125 |         |
| .050160 |         |
| .055040 |         |
| .055050 |         |
| .055063 |         |
| .055080 |         |
| .055100 |         |
| .055125 |         |

### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

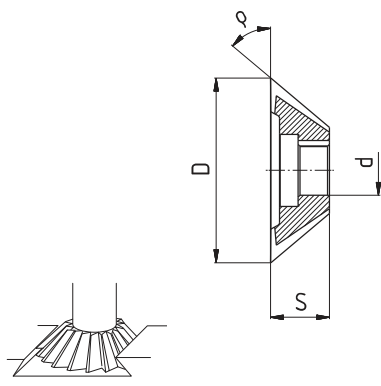
| Material |             | A <sub>p</sub> | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |
|----------|-------------|----------------|----------------|----------------|-----------------------|-------|-------|-------|
|          |             |                |                |                | Ø 50                  | Ø 80  | Ø 100 | Ø 160 |
| 853270   |             |                |                |                |                       |       |       |       |
| P.1      | ≤ 600 N/mm² |                | 1xb            | 30             | 0,030                 | 0,040 | 0,045 | 0,055 |
| P.4      | ≤ 900 N/mm² |                | 1xb            | 20             | 0,030                 | 0,040 | 0,045 | 0,055 |
| K.1      | < 240 HB    |                | 1xb            | 25             | 0,030                 | 0,040 | 0,045 | 0,055 |
| K.2      | > 240 HB    |                | 1xb            | 17             | 0,030                 | 0,040 | 0,045 | 0,055 |
| N.4      | ≤ 800 N/mm² |                | 1xb            | 50-90          | 0,030                 | 0,040 | 0,045 | 0,055 |

- EN Single angle milling cutters  
 DE Aufsteck-Winkelfräser | einseitig  
 RU Фрезы одноугловые



8532

8532V



HSS

HSS  
Co5

| p<br>±20 | D<br>js 16 | S  | d<br>H 7 | Z<br>8532 | Z<br>8532V |
|----------|------------|----|----------|-----------|------------|
| 60°      | 40         | 13 | 10       | 14        | 14         |
| 60°      | 50         | 16 | 13       | 16        | 16         |
| 60°      | 63         | 20 | 16       | 18        | 16         |
| 60°      | 80         | 25 | 22       | 20        | 18         |
| 60°      | 100        | 32 | 27       | 22        | 20         |
| 60°      | 125        | 40 | 32       | 26        |            |
| 60°      | 160        | 50 | 40       | 28        |            |

\*) = S 853275V

853270

853275V

.060040

.060040

.060050

.060050

.060063

.060063

.060080

.060080

.060100

.060100

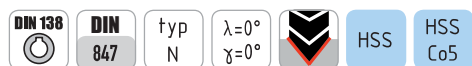
.060125

.060160

## Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

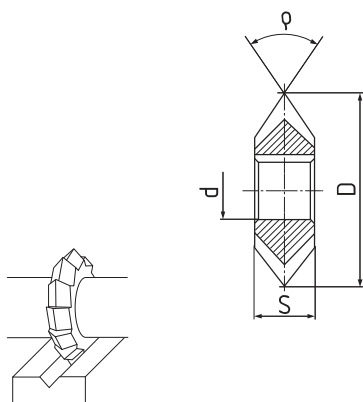
| Material |                 |     |        | fz (mm/z) |       |       |       |       |       |
|----------|-----------------|-----|--------|-----------|-------|-------|-------|-------|-------|
| Ap       |                 |     |        | Ae        | Vc    | Ø 50  | Ø 80  | Ø 100 | Ø 160 |
| 853275V  |                 |     |        |           |       |       |       |       |       |
| P.1      | ≤ 600 N/mm²     | 1xb | 37,5   | 0,030     | 0,040 | 0,045 | 0,055 |       |       |
| P.3      | ≤ 1100 N/mm²    | 1xb | 18     | 0,030     | 0,040 | 0,045 | 0,055 |       |       |
| P.4      | ≤ 900 N/mm²     | 1xb | 25     | 0,030     | 0,040 | 0,045 | 0,055 |       |       |
| P.6      | > 1100 N/mm²    | 1xb | 16     | 0,021     | 0,028 | 0,032 | 0,039 |       |       |
| M.2      | 750 - 850 N/mm² | 1xb | 10     | 0,030     | 0,040 | 0,045 | 0,055 |       |       |
| K.1      | < 240 HB        | 1xb | 30     | 0,030     | 0,040 | 0,045 | 0,055 |       |       |
| K.2      | > 240 HB        | 1xb | 22     | 0,030     | 0,040 | 0,045 | 0,055 |       |       |
| S.2      | ≤ 1250 N/mm²    | 1xb | 9      | 0,021     | 0,028 | 0,032 | 0,039 |       |       |
| N.4      | ≤ 800 N/mm²     | 1xb | 60-100 | 0,030     | 0,040 | 0,045 | 0,055 |       |       |

EN Double angle milling cutters | symmetrical  
DE Aufsteck-Winkelfräser | doppelseitig, symmetrisch  
RU Фрезы двухугольные | симметричные



## 8570

## 8570V



HSS



HSS  
Co5

| ρ<br>±30' | D<br>js 16 | S  | d<br>H 7 | Z<br>8570 | Z<br>8570V |
|-----------|------------|----|----------|-----------|------------|
| 45°       | 50         | 8  | 16       | 22        | 16         |
| 45°       | 63         | 10 | 22       | 24        | 16         |
| 45°       | 80         | 12 | 27       | 26        | 20         |
| 45°       | 100        | 18 | 32       | 28        | 20         |
| 60°       | 50         | 10 | 16       | 18        | 16         |
| 60°       | 63         | 14 | 22       | 20        | 16         |
| 60°       | 80         | 18 | 27       | 22        | 18         |
| 60°       | 100        | 25 | 32       | 24        | 20         |
| 80°       | 63         | 16 | 22       |           | 16         |
| 90°       | 50         | 14 | 16       | 16        | 16         |
| 90°       | 63         | 20 | 22       | 18        | 16         |
| 90°       | 80         | 22 | 27       | 20        | 18         |
| 90°       | 100        | 32 | 32       | 24        | 20         |
| 120°      | 50         | 14 | 16       | 16        | 16         |
| 120°      | 63         | 20 | 22       | 16        | 16         |
| 120°      | 80         | 25 | 27       | 20        | 20         |
| 120°      | 100        | 36 | 32       | 24        | 24         |

857070

857075V

|         |         |
|---------|---------|
| .045050 | .045050 |
| .045063 | .045063 |
| .045080 | .045080 |
| .045100 | .045100 |
| .060050 | .060050 |
| .060063 | .060063 |
| .060080 | .060080 |
| .060100 | .060100 |
|         | .080063 |
| .090050 | .090050 |
| .090063 | .090063 |
| .090080 | .090080 |
| .090100 | .090100 |
| .120050 |         |
| .120063 |         |
| .120080 |         |
| .120100 |         |

### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material | A <sub>p</sub>  | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |
|----------|-----------------|----------------|----------------|-----------------------|-------|-------|
|          |                 |                |                | Ø 50                  | Ø 80  | Ø 100 |
| 857070   |                 |                |                |                       |       |       |
| P.1      | ≤ 600 N/mm²     | 1xb            | 30             | 0,030                 | 0,040 | 0,045 |
| P.4      | ≤ 900 N/mm²     | 1xb            | 20             | 0,030                 | 0,040 | 0,045 |
| K.1      | < 240 HB        | 1xb            | 25             | 0,030                 | 0,040 | 0,045 |
| K.2      | > 240 HB        | 1xb            | 17             | 0,030                 | 0,040 | 0,045 |
| N.4      | ≤ 800 N/mm²     | 1xb            | 50-90          | 0,030                 | 0,040 | 0,045 |
| 857075V  |                 |                |                |                       |       |       |
| P.1      | ≤ 600 N/mm²     | 1xb            | 37,5           | 0,030                 | 0,040 | 0,045 |
| P.3      | ≤ 1100 N/mm²    | 1xb            | 18             | 0,030                 | 0,040 | 0,045 |
| P.4      | ≤ 900 N/mm²     | 1xb            | 25             | 0,030                 | 0,040 | 0,045 |
| P.6      | > 1100 N/mm²    | 1xb            | 16             | 0,021                 | 0,028 | 0,032 |
| M.2      | 750 - 850 N/mm² | 1xb            | 10             | 0,030                 | 0,040 | 0,045 |
| K.1      | < 240 HB        | 1xb            | 30             | 0,030                 | 0,040 | 0,045 |
| K.2      | > 240 HB        | 1xb            | 22             | 0,030                 | 0,040 | 0,045 |
| S.2      | ≤ 1250 N/mm²    | 1xb            | 9              | 0,021                 | 0,028 | 0,032 |
| N.4      | ≤ 800 N/mm²     | 1xb            | 60-100         | 0,030                 | 0,040 | 0,045 |

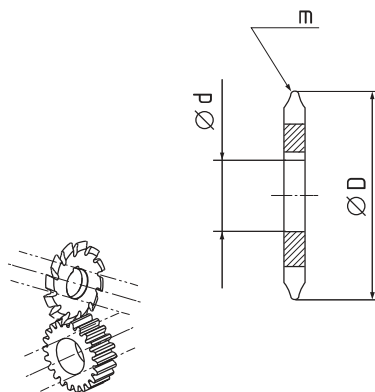
EN Involute gear cutters for spur wheels | pressure angle 20°

DE Zahnformfräser für Stirnräder | eingriffs winkel 20°

RU Модульные фрезы | угол зацепления 20°



8900



| m    | D<br>js 16 | d<br>H 7 | 890075    |
|------|------------|----------|-----------|
| 0,5  | 40         | 16       | .050(1-8) |
| 0,75 | 40         | 16       | .075(1-8) |
| 1    | 50         | 16       | .100(1-8) |
| 1,25 | 50         | 16       | .125(1-8) |
| 1,5  | 63         | 22       | .150(1-8) |
| 1,75 | 63         | 22       | .175(1-8) |
| 2    | 63         | 22       | .200(1-8) |
| 2,25 | 63         | 22       | .250(1-8) |
| 2,5  | 63         | 22       | .225(1-8) |
| 2,75 | 70         | 27       | .275(1-8) |
| 3    | 70         | 27       | .300(1-8) |
| 3,25 | 70         | 27       | .325(1-8) |
| 3,5  | 80         | 27       | .350(1-8) |
| 3,75 | 80         | 27       | .375(1-8) |
| 4    | 80         | 27       | .400(1-8) |
| 4,25 | 80         | 27       | .425(1-8) |
| 4,5  | 90         | 27       | .450(1-8) |
| 4,75 | 90         | 27       | .475(1-8) |
| 5    | 90         | 32       | .500(1-8) |
| 5,5  | 90         | 32       | .550(1-8) |
| 6    | 100        | 32       | .600(1-8) |

#### Počet zubů (ozubeného kola)

Number of teeth (on the spur wheel) | Zähnezahl (au dem Stirnrad) | Количество зубьев (шестерны)

|                 | 1     | 2     | 3     | 4     | 5     | 6     | 7      | 8      |
|-----------------|-------|-------|-------|-------|-------|-------|--------|--------|
| Z <sub>oz</sub> | 12-13 | 14-16 | 17-20 | 21-25 | 26-34 | 35-54 | 55-134 | 135-00 |

#### Řezné podmínky / Cutting conditions / Schnittbedingungen / Условия резания

| Material | A <sub>p</sub>          | A <sub>e</sub> | V <sub>c</sub> | f <sub>z</sub> (mm/z) |       |       |       |       |       |
|----------|-------------------------|----------------|----------------|-----------------------|-------|-------|-------|-------|-------|
|          |                         |                |                | Ø 40                  | Ø 50  | Ø 63  | Ø 80  | Ø 90  | Ø 100 |
| P.1      | ≤ 600 N/mm <sup>2</sup> |                | 20             | 0,012                 | 0,016 | 0,02  | 0,025 | 0,028 | 0,031 |
| P.2      | ≤ 850 N/mm <sup>2</sup> |                | 17             | 0,011                 | 0,014 | 0,018 | 0,023 | 0,026 | 0,029 |
| K.1      | < 240 HB                |                | 13             | 0,011                 | 0,014 | 0,018 | 0,023 | 0,026 | 0,029 |
| K.2      | > 240 HB                |                | 10             | 0,011                 | 0,014 | 0,018 | 0,023 | 0,026 | 0,029 |