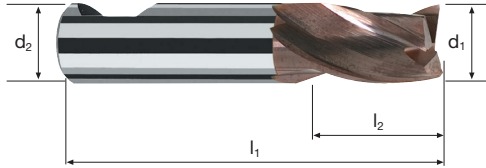


# Zylindrische Fräser

Glattschneidig, kurze Schaftausführung



|           |                               |
|-----------|-------------------------------|
| <b>HM</b> | $\lambda$ 30°<br>$\gamma$ 12° |
| 90°       |                               |
|           |                               |
|           |                               |



Schuppen



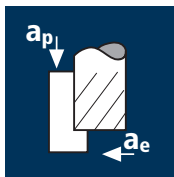
Schichten



|                    |                       |                        |  |  |  |                          |  |   |
|--------------------|-----------------------|------------------------|--|--|--|--------------------------|--|---|
| <b>Rm</b><br>< 850 | <b>Rm</b><br>850-1100 | <b>Rm</b><br>1100-1300 |  |  |  | <b>Inox</b><br>Stainless |  | <b>Aluminium</b><br><b>Copper</b><br><b>Gold / Platinum</b> |
|--------------------|-----------------------|------------------------|--|--|--|--------------------------|--|---|

| Beispiel:<br>Bestell-Nr. |          | Beschichtung<br><b>U</b> | Artikel-Nr.<br><b>45336</b> | ø-Code<br><b>120</b> |          |   |             |               |                  |
|--------------------------|----------|--------------------------|-----------------------------|----------------------|----------|---|-------------|---------------|------------------|
| ø<br>Code                | d1<br>e8 | d2<br>h6                 | l1                          | l2                   | $\alpha$ | z |             |               | <b>UNICUT-4X</b> |
|                          |          |                          |                             |                      |          |   | <b>5336</b> | <b>U45336</b> |                  |
|                          |          |                          |                             |                      |          |   | <b>5236</b> |               |                  |
| <b>120</b>               | 1.5      | 6                        | 38                          | 3                    | 11.5°    | 3 | ●           | ●             |                  |
| <b>140</b>               | 2.0      | 6                        | 38                          | 3                    | 11.0°    | 3 | ●           | ●             |                  |
| <b>160</b>               | 2.5      | 6                        | 38                          | 3                    | 10.0°    | 3 | ●           | ●             |                  |
| <b>180</b>               | 3.0      | 6                        | 38                          | 4                    | 8.0°     | 3 | ●           | ●             |                  |
| <b>200</b>               | 3.5      | 6                        | 38                          | 4                    | 7.0°     | 3 | ●           | ●             |                  |
| <b>220</b>               | 4.0      | 6                        | 38                          | 5                    | 5.5°     | 3 | ●           | ●             |                  |
| <b>240</b>               | 4.5      | 6                        | 38                          | 5                    | 4.5°     | 3 | ●           | ●             |                  |
| <b>260</b>               | 5.0      | 6                        | 38                          | 6                    | 3.0°     | 3 | ●           | ●             |                  |
| <b>300</b>               | 6.0      | 6                        | 38                          | 7                    | 0.0°     | 3 | ●           | ●             |                  |
| <b>331</b>               | 7.0      | 8                        | 41                          | 8                    | 2.5°     | 3 | ●           | ●             |                  |
| <b>391</b>               | 8.0      | 8                        | 41                          | 9                    | 0.0°     | 3 | ●           | ●             |                  |
| <b>420</b>               | 9.0      | 10                       | 48                          | 10                   | 2.5°     | 3 | ●           | ●             |                  |
| <b>450</b>               | 10.0     | 10                       | 48                          | 11                   | 0.0°     | 3 | ●           | ●             |                  |
|                          |          |                          |                             |                      |          |   |             |               |                  |
|                          |          |                          |                             |                      |          |   |             |               |                  |
|                          |          |                          |                             |                      |          |   |             |               |                  |
|                          |          |                          |                             |                      |          |   |             |               |                  |
|                          |          |                          |                             |                      |          |   |             |               |                  |
|                          |          |                          |                             |                      |          |   |             |               |                  |
|                          |          |                          |                             |                      |          |   |             |               |                  |
|                          |          |                          |                             |                      |          |   |             |               |                  |

## Anwendung

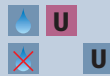


## Werkstoff

Stahl  
< 850 N/mm<sup>2</sup>



Stahl  
850 - 1100 N/mm<sup>2</sup>



Gold



Nichtrostender Stahl  
[Cr-Ni/1.4301]



| d1 [mm] | z | v <sub>c</sub> [m/min] | f <sub>z</sub> [mm] | a <sub>p</sub> [mm] | a <sub>e</sub> [mm] | n [min <sup>-1</sup> ] | v <sub>f</sub> [mm/min] |
|---------|---|------------------------|---------------------|---------------------|---------------------|------------------------|-------------------------|
| 2       | 3 | 105                    | 0.005               | 2                   | 0.1                 | 16710                  | 250                     |
| 3       | 3 | 105                    | 0.010               | 3                   | 0.2                 | 11140                  | 335                     |
| 4       | 3 | 105                    | 0.015               | 4                   | 0.2                 | 8355                   | 375                     |
| 5       | 3 | 105                    | 0.015               | 5                   | 0.3                 | 6685                   | 300                     |
| 6       | 3 | 105                    | 0.020               | 6                   | 0.3                 | 5570                   | 335                     |
| 7       | 3 | 105                    | 0.025               | 7                   | 0.4                 | 4775                   | 360                     |
| 8       | 3 | 105                    | 0.025               | 8                   | 0.4                 | 4180                   | 315                     |
| 9       | 3 | 105                    | 0.030               | 9                   | 0.5                 | 3715                   | 335                     |
| 10      | 3 | 105                    | 0.035               | 10                  | 0.5                 | 3340                   | 350                     |
| 2       | 3 | 65                     | 0.005               | 2                   | 0.1                 | 10345                  | 155                     |
| 3       | 3 | 65                     | 0.010               | 3                   | 0.2                 | 6895                   | 205                     |
| 4       | 3 | 65                     | 0.015               | 4                   | 0.2                 | 5175                   | 235                     |
| 5       | 3 | 65                     | 0.015               | 5                   | 0.3                 | 4140                   | 185                     |
| 6       | 3 | 65                     | 0.020               | 6                   | 0.3                 | 3450                   | 205                     |
| 7       | 3 | 65                     | 0.025               | 7                   | 0.4                 | 2955                   | 220                     |
| 8       | 3 | 65                     | 0.025               | 8                   | 0.4                 | 2585                   | 195                     |
| 9       | 3 | 65                     | 0.030               | 9                   | 0.5                 | 2300                   | 205                     |
| 10      | 3 | 65                     | 0.035               | 10                  | 0.5                 | 2070                   | 215                     |
| 2       | 3 | 160                    | 0.005               | 2                   | 0.1                 | 25465                  | 380                     |
| 3       | 3 | 160                    | 0.010               | 3                   | 0.2                 | 16975                  | 510                     |
| 4       | 3 | 160                    | 0.015               | 4                   | 0.2                 | 12735                  | 575                     |
| 5       | 3 | 160                    | 0.015               | 5                   | 0.3                 | 10185                  | 460                     |
| 6       | 3 | 160                    | 0.020               | 6                   | 0.3                 | 8490                   | 510                     |
| 7       | 3 | 160                    | 0.025               | 7                   | 0.4                 | 7275                   | 545                     |
| 8       | 3 | 160                    | 0.025               | 8                   | 0.4                 | 6365                   | 475                     |
| 9       | 3 | 160                    | 0.030               | 9                   | 0.5                 | 5660                   | 510                     |
| 10      | 3 | 160                    | 0.035               | 10                  | 0.5                 | 5095                   | 535                     |
| 2       | 3 | 65                     | 0.005               | 2                   | 0.1                 | 10345                  | 155                     |
| 3       | 3 | 65                     | 0.010               | 3                   | 0.2                 | 6895                   | 205                     |
| 4       | 3 | 65                     | 0.015               | 4                   | 0.2                 | 5175                   | 235                     |
| 5       | 3 | 65                     | 0.015               | 5                   | 0.3                 | 4140                   | 185                     |
| 6       | 3 | 65                     | 0.020               | 6                   | 0.3                 | 3450                   | 205                     |
| 7       | 3 | 65                     | 0.025               | 7                   | 0.4                 | 2955                   | 220                     |
| 8       | 3 | 65                     | 0.025               | 8                   | 0.4                 | 2585                   | 195                     |
| 9       | 3 | 65                     | 0.030               | 9                   | 0.5                 | 2300                   | 205                     |
| 10      | 3 | 65                     | 0.035               | 10                  | 0.5                 | 2070                   | 215                     |

## Anwendung

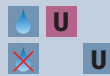


## Werkstoff

Stahl  
< 850 N/mm<sup>2</sup>



Stahl  
850 - 1100 N/mm<sup>2</sup>



Gold



Nichtrostender Stahl  
[Cr-Ni/1.4301]



| d1 [mm] | z | v <sub>c</sub> [m/min] | f <sub>z</sub> [mm] | a <sub>p</sub> [mm] | a <sub>e</sub> [mm] | n [min <sup>-1</sup> ] | v <sub>f</sub> [mm/min] | Q [cm <sup>3</sup> /min] |
|---------|---|------------------------|---------------------|---------------------|---------------------|------------------------|-------------------------|--------------------------|
| 2       | 3 | 75                     | 0.005               | 0.8                 | 2                   | 11935                  | 180                     | 0.3                      |
| 3       | 3 | 75                     | 0.010               | 1.2                 | 3                   | 7960                   | 240                     | 0.9                      |
| 4       | 3 | 75                     | 0.010               | 1.6                 | 4                   | 5970                   | 180                     | 1.2                      |
| 5       | 3 | 75                     | 0.015               | 2.0                 | 5                   | 4775                   | 215                     | 2.2                      |
| 6       | 3 | 75                     | 0.015               | 2.4                 | 6                   | 3980                   | 180                     | 2.6                      |
| 7       | 3 | 75                     | 0.020               | 2.8                 | 7                   | 3410                   | 205                     | 4.0                      |
| 8       | 3 | 75                     | 0.020               | 3.2                 | 8                   | 2985                   | 180                     | 4.6                      |
| 9       | 3 | 75                     | 0.025               | 3.6                 | 9                   | 2655                   | 200                     | 6.5                      |
| 10      | 3 | 75                     | 0.030               | 4.0                 | 10                  | 2385                   | 215                     | 8.6                      |
| 2       | 3 | 50                     | 0.005               | 0.8                 | 2                   | 7960                   | 120                     | 0.2                      |
| 3       | 3 | 50                     | 0.010               | 1.2                 | 3                   | 5305                   | 160                     | 0.6                      |
| 4       | 3 | 50                     | 0.010               | 1.6                 | 4                   | 3980                   | 120                     | 0.8                      |
| 5       | 3 | 50                     | 0.015               | 2.0                 | 5                   | 3185                   | 145                     | 1.5                      |
| 6       | 3 | 50                     | 0.015               | 2.4                 | 6                   | 2655                   | 120                     | 1.7                      |
| 7       | 3 | 50                     | 0.020               | 2.8                 | 7                   | 2275                   | 135                     | 2.6                      |
| 8       | 3 | 50                     | 0.020               | 3.2                 | 8                   | 1990                   | 120                     | 3.1                      |
| 9       | 3 | 50                     | 0.025               | 3.6                 | 9                   | 1770                   | 135                     | 4.4                      |
| 10      | 3 | 50                     | 0.025               | 4.0                 | 10                  | 1590                   | 120                     | 4.8                      |
| 2       | 3 | 140                    | 0.005               | 0.8                 | 2                   | 22280                  | 335                     | 0.5                      |
| 3       | 3 | 140                    | 0.010               | 1.2                 | 3                   | 14855                  | 445                     | 1.6                      |
| 4       | 3 | 140                    | 0.010               | 1.6                 | 4                   | 11140                  | 335                     | 2.1                      |
| 5       | 3 | 140                    | 0.015               | 2.0                 | 5                   | 8915                   | 400                     | 4.0                      |
| 6       | 3 | 140                    | 0.020               | 2.4                 | 6                   | 7425                   | 445                     | 6.4                      |
| 7       | 3 | 140                    | 0.020               | 2.8                 | 7                   | 6365                   | 380                     | 7.4                      |
| 8       | 3 | 140                    | 0.025               | 3.2                 | 8                   | 5570                   | 420                     | 10.8                     |
| 9       | 3 | 140                    | 0.030               | 3.6                 | 9                   | 4950                   | 445                     | 14.4                     |
| 10      | 3 | 140                    | 0.030               | 4.0                 | 10                  | 4455                   | 400                     | 16.0                     |
| 2       | 3 | 50                     | 0.005               | 0.8                 | 2                   | 7960                   | 120                     | 0.2                      |
| 3       | 3 | 50                     | 0.010               | 1.2                 | 3                   | 5305                   | 160                     | 0.6                      |
| 4       | 3 | 50                     | 0.010               | 1.6                 | 4                   | 3980                   | 120                     | 0.8                      |
| 5       | 3 | 50                     | 0.015               | 2.0                 | 5                   | 3185                   | 145                     | 1.5                      |
| 6       | 3 | 50                     | 0.015               | 2.4                 | 6                   | 2655                   | 120                     | 1.7                      |
| 7       | 3 | 50                     | 0.020               | 2.8                 | 7                   | 2275                   | 135                     | 2.6                      |
| 8       | 3 | 50                     | 0.020               | 3.2                 | 8                   | 1990                   | 120                     | 3.1                      |
| 9       | 3 | 50                     | 0.025               | 3.6                 | 9                   | 1770                   | 135                     | 4.4                      |
| 10      | 3 | 50                     | 0.025               | 4.0                 | 10                  | 1590                   | 120                     | 4.8                      |