

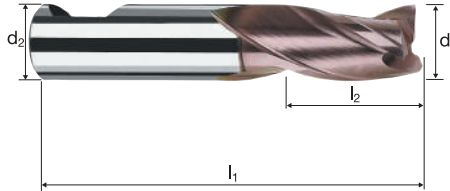
Cylindrical end mills

Smooth-edged, short-shank version

HSS

HSS-E λ 30°
Co8 γ 15°

90°



Roughing

Finishing



Rm
< 850

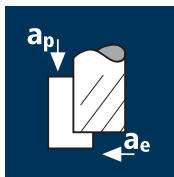
Rm
850-1100

Inox
Stainless

Copper

| Example: Order-N°. | | | | | | | | UNICUT-4X | |
|-----------------------|-------------|-------------|-------|-------|-------|----------|---|-----------|--|
| | | | | | | | | U0400 | |
| | | | | | | | | | |
| \emptyset Code | d_1 f8 | d_2 h6 | l_1 | l_2 | l_4 | α | z | | |
| 100 | 1.00 | 6.00 | 34 | 3.00 | 10.48 | 14.0° | 3 | ● | |
| 120 | 1.50 | 6.00 | 34 | 3.00 | 9.99 | 13.0° | 3 | ● | |
| 130 | 1.80 | 6.00 | 35 | 4.00 | 10.78 | 11.5° | 3 | ● | |
| 140 | 2.00 | 6.00 | 35 | 4.00 | 10.61 | 11.0° | 3 | ● | |
| 150 | 2.30 | 6.00 | 36 | 5.00 | 12.00 | 9.0° | 3 | ● | |
| 160 | 2.50 | 6.00 | 36 | 5.00 | 12.00 | 8.5° | 3 | ● | |
| 170 | 2.80 | 6.00 | 36 | 5.00 | 12.00 | 8.0° | 3 | ● | |
| 180 | 3.00 | 6.00 | 36 | 5.00 | 12.00 | 7.5° | 3 | ● | |
| 190 | 3.30 | 6.00 | 37 | 6.00 | 13.00 | 6.0° | 3 | ● | |
| 200 | 3.50 | 6.00 | 37 | 6.00 | 13.00 | 5.5° | 3 | ● | |
| 210 | 3.80 | 6.00 | 38 | 7.00 | 14.00 | 4.5° | 3 | ● | |
| 220 | 4.00 | 6.00 | 38 | 7.00 | 14.00 | 4.5° | 3 | ● | |
| 230 | 4.30 | 6.00 | 38 | 7.00 | 14.00 | 3.5° | 3 | ● | |
| 240 | 4.50 | 6.00 | 38 | 7.00 | 14.00 | 3.5° | 3 | ● | |
| 250 | 4.80 | 6.00 | 39 | 8.00 | 15.00 | 2.5° | 3 | ● | |
| 260 | 5.00 | 6.00 | 39 | 8.00 | 15.00 | 2.0° | 3 | ● | |
| 270 | 5.30 | 6.00 | 39 | 8.00 | 15.00 | 1.5° | 3 | ● | |
| 280 | 5.50 | 6.00 | 39 | 8.00 | 15.00 | 1.0° | 3 | ● | |
| 290 | 5.75 | 6.00 | 39 | 8.00 | 15.00 | 0.0° | 3 | ● | |
| 300 | 6.00 | 6.00 | 39 | 8.00 | - | 0.0° | 3 | ● | |

Application



Material

Steel
< 850 N/mm²

Steel
850 - 1100 N/mm²

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

Inox medium
[Cr-Ni-Mo+/1.4539]
Duplex steel
[17-4 PH]

| d1 [mm] | z | v _c [m/min] | f _t [mm] | a _p [mm] | a _e [mm] | n [min ⁻¹] | v _r [mm/min] |
|---------|---|------------------------|---------------------|---------------------|---------------------|------------------------|-------------------------|
| 1.00 | 3 | 60 | 0.005 | 1.000 | 0.100 | 19100 | 285 |
| 2.00 | 3 | 60 | 0.010 | 2.000 | 0.200 | 9550 | 285 |
| 2.50 | 3 | 60 | 0.010 | 2.500 | 0.250 | 7640 | 230 |
| 3.00 | 3 | 60 | 0.010 | 3.000 | 0.300 | 6365 | 190 |
| 3.50 | 3 | 60 | 0.015 | 3.500 | 0.350 | 5455 | 245 |
| 4.00 | 3 | 60 | 0.015 | 4.000 | 0.400 | 4775 | 215 |
| 5.00 | 3 | 60 | 0.020 | 5.000 | 0.500 | 3820 | 230 |
| 5.50 | 3 | 60 | 0.020 | 5.500 | 0.550 | 3470 | 210 |
| 6.00 | 3 | 60 | 0.025 | 6.000 | 0.600 | 3185 | 240 |

| | | | | | | | |
|------|---|----|-------|-------|-------|-------|-----|
| 1.00 | 3 | 48 | 0.005 | 1.000 | 0.100 | 15280 | 230 |
| 2.00 | 3 | 48 | 0.010 | 2.000 | 0.200 | 7640 | 230 |
| 2.50 | 3 | 48 | 0.010 | 2.500 | 0.250 | 6110 | 185 |
| 3.00 | 3 | 48 | 0.010 | 3.000 | 0.300 | 5095 | 155 |
| 3.50 | 3 | 48 | 0.015 | 3.500 | 0.350 | 4365 | 195 |
| 4.00 | 3 | 48 | 0.015 | 4.000 | 0.400 | 3820 | 170 |
| 5.00 | 3 | 48 | 0.020 | 5.000 | 0.500 | 3055 | 185 |
| 5.50 | 3 | 48 | 0.020 | 5.500 | 0.550 | 2780 | 165 |
| 6.00 | 3 | 48 | 0.025 | 6.000 | 0.600 | 2545 | 190 |

| | | | | | | | |
|------|---|----|-------|-------|-------|------|-----|
| 1.00 | 3 | 25 | 0.005 | 1.000 | 0.100 | 7960 | 120 |
| 2.00 | 3 | 25 | 0.010 | 2.000 | 0.200 | 3980 | 120 |
| 2.50 | 3 | 25 | 0.010 | 2.500 | 0.250 | 3185 | 95 |
| 3.00 | 3 | 25 | 0.010 | 3.000 | 0.300 | 2655 | 80 |
| 3.50 | 3 | 25 | 0.015 | 3.500 | 0.350 | 2275 | 100 |
| 4.00 | 3 | 25 | 0.015 | 4.000 | 0.400 | 1990 | 90 |
| 5.00 | 3 | 25 | 0.020 | 5.000 | 0.500 | 1590 | 95 |
| 5.50 | 3 | 25 | 0.020 | 5.500 | 0.550 | 1445 | 85 |
| 6.00 | 3 | 25 | 0.025 | 6.000 | 0.600 | 1325 | 100 |

| | | | | | | | |
|------|---|----|-------|-------|-------|------|-----|
| 1.00 | 3 | 22 | 0.005 | 1.000 | 0.100 | 7005 | 105 |
| 2.00 | 3 | 22 | 0.010 | 2.000 | 0.200 | 3500 | 105 |
| 2.50 | 3 | 22 | 0.010 | 2.500 | 0.250 | 2800 | 85 |
| 3.00 | 3 | 22 | 0.010 | 3.000 | 0.300 | 2335 | 70 |
| 3.50 | 3 | 22 | 0.015 | 3.500 | 0.350 | 2000 | 90 |
| 4.00 | 3 | 22 | 0.015 | 4.000 | 0.400 | 1750 | 80 |
| 5.00 | 3 | 22 | 0.020 | 5.000 | 0.500 | 1400 | 85 |
| 5.50 | 3 | 22 | 0.020 | 5.500 | 0.550 | 1275 | 75 |
| 6.00 | 3 | 22 | 0.025 | 6.000 | 0.600 | 1165 | 90 |

Application



Material

Steel
< 850 N/mm²

Steel
850 - 1100 N/mm²

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

Inox medium
[Cr-Ni-Mo+/1.4539]
Duplex steel
[17-4 PH]

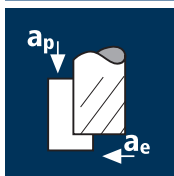
| d1 [mm] | z | v _c [m/min] | f _t [mm] | a _p [mm] | a _e [mm] | n [min ⁻¹] | v _r [mm/min] | Q [mm ³ /min] |
|---------|---|------------------------|---------------------|---------------------|---------------------|------------------------|-------------------------|--------------------------|
| 1.00 | 3 | 55 | 0.005 | 0.500 | 1.000 | 17505 | 265 | 131.3 |
| 2.00 | 3 | 55 | 0.010 | 1.000 | 2.000 | 8755 | 265 | 525.2 |
| 2.50 | 3 | 55 | 0.010 | 1.250 | 2.500 | 7005 | 210 | 656.5 |
| 3.00 | 3 | 55 | 0.010 | 1.500 | 3.000 | 5835 | 175 | 787.8 |
| 3.50 | 3 | 55 | 0.015 | 1.750 | 3.500 | 5000 | 225 | 1378.7 |
| 4.00 | 3 | 55 | 0.015 | 2.000 | 4.000 | 4375 | 195 | 1575.6 |
| 5.00 | 3 | 55 | 0.020 | 2.500 | 5.000 | 3500 | 210 | 2626.1 |
| 5.50 | 3 | 55 | 0.020 | 2.750 | 5.500 | 3185 | 190 | 2888.7 |
| 6.00 | 3 | 55 | 0.025 | 3.000 | 6.000 | 2920 | 220 | 3939.1 |

| | | | | | | | | |
|------|---|----|-------|-------|-------|-------|-----|--------|
| 1.00 | 3 | 45 | 0.005 | 0.500 | 1.000 | 14325 | 215 | 107.4 |
| 2.00 | 3 | 45 | 0.010 | 1.000 | 2.000 | 7160 | 215 | 429.7 |
| 2.50 | 3 | 45 | 0.010 | 1.250 | 2.500 | 5730 | 170 | 537.1 |
| 3.00 | 3 | 45 | 0.010 | 1.500 | 3.000 | 4775 | 145 | 644.6 |
| 3.50 | 3 | 45 | 0.015 | 1.750 | 3.500 | 4095 | 185 | 1128.0 |
| 4.00 | 3 | 45 | 0.015 | 2.000 | 4.000 | 3580 | 160 | 1289.2 |
| 5.00 | 3 | 45 | 0.020 | 2.500 | 5.000 | 2865 | 170 | 2148.6 |
| 5.50 | 3 | 45 | 0.020 | 2.750 | 5.500 | 2605 | 155 | 2363.5 |
| 6.00 | 3 | 45 | 0.025 | 3.000 | 6.000 | 2385 | 180 | 3222.9 |

| | | | | | | | | |
|------|---|----|-------|-------|-------|------|-----|--------|
| 1.00 | 3 | 22 | 0.005 | 0.500 | 1.000 | 7005 | 105 | 52.5 |
| 2.00 | 3 | 22 | 0.010 | 1.000 | 2.000 | 3500 | 105 | 210.1 |
| 2.50 | 3 | 22 | 0.010 | 1.250 | 2.500 | 2800 | 85 | 262.6 |
| 3.00 | 3 | 22 | 0.010 | 1.500 | 3.000 | 2335 | 70 | 315.1 |
| 3.50 | 3 | 22 | 0.015 | 1.750 | 3.500 | 2000 | 90 | 551.5 |
| 4.00 | 3 | 22 | 0.015 | 2.000 | 4.000 | 1750 | 80 | 630.3 |
| 5.00 | 3 | 22 | 0.020 | 2.500 | 5.000 | 1400 | 85 | 1050.4 |
| 5.50 | 3 | 22 | 0.020 | 2.750 | 5.500 | 1275 | 75 | 1155.5 |
| 6.00 | 3 | 22 | 0.025 | 3.000 | 6.000 | 1165 | 90 | 1575.6 |

| | | | | | | | | |
|------|---|----|-------|-------|-------|------|----|--------|
| 1.00 | 3 | 20 | 0.005 | 0.500 | 1.000 | 6365 | 95 | 47.7 |
| 2.00 | 3 | 20 | 0.010 | 1.000 | 2.000 | 3185 | 95 | 191.0 |
| 2.50 | 3 | 20 | 0.010 | 1.250 | 2.500 | 2545 | 75 | 238.7 |
| 3.00 | 3 | 20 | 0.010 | 1.500 | 3.000 | 2120 | 65 | 286.5 |
| 3.50 | 3 | 20 | 0.015 | 1.750 | 3.500 | 1820 | 80 | 501.3 |
| 4.00 | 3 | 20 | 0.015 | 2.000 | 4.000 | 1590 | 70 | 573.0 |
| 5.00 | 3 | 20 | 0.020 | 2.500 | 5.000 | 1275 | 75 | 954.9 |
| 5.50 | 3 | 20 | 0.020 | 2.750 | 5.500 | 1155 | 70 | 1050.4 |
| 6.00 | 3 | 20 | 0.025 | 3.000 | 6.000 | 1060 | 80 | 1432.4 |

Application



Material

Steel
< 850 N/mm²

| d1 [mm] | z | v _c [m/min] | f _t [mm] | a _p [mm] | a _e [mm] | n [min ⁻¹] | v _r [mm/min] |
|---------|---|------------------------|---------------------|---------------------|---------------------|------------------------|-------------------------|
| 6.50 | 3 | 60 | 0.025 | 6.500 | 0.650 | 2940 | 220 |
| 7.00 | 3 | 60 | 0.030 | 7.000 | 0.700 | 2730 | 245 |
| 7.50 | 3 | 60 | 0.030 | 7.500 | 0.750 | 2545 | 230 |
| 8.00 | 3 | 60 | 0.030 | 8.000 | 0.800 | 2385 | 215 |
| 8.50 | 3 | 60 | 0.035 | 8.500 | 0.850 | 2245 | 235 |
| 9.00 | 3 | 60 | 0.035 | 9.000 | 0.900 | 2120 | 225 |
| 9.50 | 3 | 60 | 0.040 | 9.500 | 0.950 | 2010 | 240 |
| 10.00 | 3 | 60 | 0.040 | 10.000 | 1.000 | 1910 | 230 |

Steel
850 - 1100 N/mm²

| | | | | | | | |
|-------|---|----|-------|--------|-------|------|-----|
| 6.50 | 3 | 48 | 0.025 | 6.500 | 0.650 | 2350 | 175 |
| 7.00 | 3 | 48 | 0.030 | 7.000 | 0.700 | 2185 | 195 |
| 7.50 | 3 | 48 | 0.030 | 7.500 | 0.750 | 2035 | 185 |
| 8.00 | 3 | 48 | 0.030 | 8.000 | 0.800 | 1910 | 170 |
| 8.50 | 3 | 48 | 0.035 | 8.500 | 0.850 | 1800 | 190 |
| 9.00 | 3 | 48 | 0.035 | 9.000 | 0.900 | 1700 | 180 |
| 9.50 | 3 | 48 | 0.040 | 9.500 | 0.950 | 1610 | 195 |
| 10.00 | 3 | 48 | 0.040 | 10.000 | 1.000 | 1530 | 185 |

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

| | | | | | | | |
|-------|---|----|-------|--------|-------|------|-----|
| 6.50 | 3 | 25 | 0.025 | 6.500 | 0.650 | 1225 | 90 |
| 7.00 | 3 | 25 | 0.030 | 7.000 | 0.700 | 1135 | 100 |
| 7.50 | 3 | 25 | 0.030 | 7.500 | 0.750 | 1060 | 95 |
| 8.00 | 3 | 25 | 0.030 | 8.000 | 0.800 | 995 | 90 |
| 8.50 | 3 | 25 | 0.035 | 8.500 | 0.850 | 935 | 100 |
| 9.00 | 3 | 25 | 0.035 | 9.000 | 0.900 | 885 | 95 |
| 9.50 | 3 | 25 | 0.040 | 9.500 | 0.950 | 840 | 100 |
| 10.00 | 3 | 25 | 0.040 | 10.000 | 1.000 | 795 | 95 |

Inox medium
[Cr-Ni-Mo+/1.4539]
Duplex steel
[17-4 PH]

| | | | | | | | |
|-------|---|----|-------|--------|-------|------|----|
| 6.50 | 3 | 22 | 0.025 | 6.500 | 0.650 | 1075 | 80 |
| 7.00 | 3 | 22 | 0.030 | 7.000 | 0.700 | 1000 | 90 |
| 7.50 | 3 | 22 | 0.030 | 7.500 | 0.750 | 935 | 85 |
| 8.00 | 3 | 22 | 0.030 | 8.000 | 0.800 | 875 | 80 |
| 8.50 | 3 | 22 | 0.035 | 8.500 | 0.850 | 825 | 85 |
| 9.00 | 3 | 22 | 0.035 | 9.000 | 0.900 | 780 | 80 |
| 9.50 | 3 | 22 | 0.040 | 9.500 | 0.950 | 735 | 90 |
| 10.00 | 3 | 22 | 0.040 | 10.000 | 1.000 | 700 | 85 |

Application



Material

Steel
< 850 N/mm²

| d1 [mm] | z | v _c [m/min] | f _t [mm] | a _p [mm] | a _e [mm] | n [min ⁻¹] | v _r [mm/min] | Q [cm ³ /min] |
|---------|---|------------------------|---------------------|---------------------|---------------------|------------------------|-------------------------|--------------------------|
| 6.50 | 3 | 55 | 0.025 | 3.250 | 6.500 | 2695 | 200 | 4.3 |
| 7.00 | 3 | 55 | 0.030 | 3.500 | 7.000 | 2500 | 225 | 5.5 |
| 7.50 | 3 | 55 | 0.030 | 3.750 | 7.500 | 2335 | 210 | 5.9 |
| 8.00 | 3 | 55 | 0.030 | 4.000 | 8.000 | 2190 | 195 | 6.3 |
| 8.50 | 3 | 55 | 0.035 | 4.250 | 8.500 | 2060 | 215 | 7.8 |
| 9.00 | 3 | 55 | 0.035 | 4.500 | 9.000 | 1945 | 205 | 8.3 |
| 9.50 | 3 | 55 | 0.040 | 4.750 | 9.500 | 1845 | 220 | 10.0 |
| 10.00 | 3 | 55 | 0.040 | 5.000 | 10.000 | 1750 | 210 | 10.5 |

Steel
850 - 1100 N/mm²

| | | | | | | | | |
|-------|---|----|-------|-------|--------|------|-----|-----|
| 6.50 | 3 | 45 | 0.025 | 3.250 | 6.500 | 2205 | 165 | 3.5 |
| 7.00 | 3 | 45 | 0.030 | 3.500 | 7.000 | 2045 | 185 | 4.5 |
| 7.50 | 3 | 45 | 0.030 | 3.750 | 7.500 | 1910 | 170 | 4.8 |
| 8.00 | 3 | 45 | 0.030 | 4.000 | 8.000 | 1790 | 160 | 5.2 |
| 8.50 | 3 | 45 | 0.035 | 4.250 | 8.500 | 1685 | 175 | 6.4 |
| 9.00 | 3 | 45 | 0.035 | 4.500 | 9.000 | 1590 | 165 | 6.8 |
| 9.50 | 3 | 45 | 0.040 | 4.750 | 9.500 | 1510 | 180 | 8.2 |
| 10.00 | 3 | 45 | 0.040 | 5.000 | 10.000 | 1430 | 170 | 8.6 |

Inox normal
[Cr-Ni/1.4301]
[Cr-Ni-Mo/1.4571]

| | | | | | | | | |
|-------|---|----|-------|-------|--------|------|----|-----|
| 6.50 | 3 | 22 | 0.025 | 3.250 | 6.500 | 1075 | 80 | 1.7 |
| 7.00 | 3 | 22 | 0.030 | 3.500 | 7.000 | 1000 | 90 | 2.2 |
| 7.50 | 3 | 22 | 0.030 | 3.750 | 7.500 | 935 | 85 | 2.4 |
| 8.00 | 3 | 22 | 0.030 | 4.000 | 8.000 | 875 | 80 | 2.5 |
| 8.50 | 3 | 22 | 0.035 | 4.250 | 8.500 | 825 | 85 | 3.1 |
| 9.00 | 3 | 22 | 0.035 | 4.500 | 9.000 | 780 | 80 | 3.3 |
| 9.50 | 3 | 22 | 0.040 | 4.750 | 9.500 | 735 | 90 | 4.0 |
| 10.00 | 3 | 22 | 0.040 | 5.000 | 10.000 | 700 | 85 | 4.2 |

Inox medium
[Cr-Ni-Mo+/1.4539]
Duplex steel
[17-4 PH]

| | | | | | | | | |
|-------|---|----|-------|-------|--------|-----|----|-----|
| 6.50 | 3 | 20 | 0.025 | 3.250 | 6.500 | 980 | 75 | 1.6 |
| 7.00 | 3 | 20 | 0.030 | 3.500 | 7.000 | 910 | 80 | 2.0 |
| 7.50 | 3 | 20 | 0.030 | 3.750 | 7.500 | 850 | 75 | 2.1 |
| 8.00 | 3 | 20 | 0.030 | 4.000 | 8.000 | 795 | 70 | 2.3 |
| 8.50 | 3 | 20 | 0.035 | 4.250 | 8.500 | 750 | 80 | 2.8 |
| 9.00 | 3 | 20 | 0.035 | 4.500 | 9.000 | 705 | 75 | 3.0 |
| 9.50 | 3 | 20 | 0.040 | 4.750 | 9.500 | 670 | 80 | 3.6 |
| 10.00 | 3 | 20 | 0.040 | 5.000 | 10.000 | 635 | 75 | 3.8 |