

RHINO

High Performance Roughing Cutters

Forever Strong


- Tough and Rigid with increased core diameter
- Suitable for Roughing / Finishing Operations with width of cut up to 60% of Diameter
- Increased Feed Rates optimal with low wear and longer tool life
- Improved workpiece surface Finish
- Reduced Power Requirement in comparison to tools without chip breaking geometry.





DUTCH TECH TOOLS

✉ E: sales@dutchtechtools.com

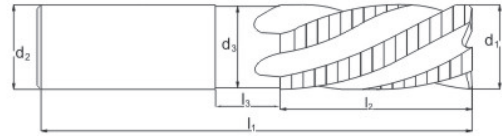


UGC 12  45°

DIN 6527 L **DIN** 6535 HB

Run Out < 0.010 mm



All dimensions are in millimeters.

| d ₁ | d ₂ | d ₃ | l ₁ | l ₂ | l ₃ | z | 1351948 | | 1351944 | |
|----------------|----------------|----------------|----------------|----------------|----------------|---|------------------------------|------------------------------|--------------|--------------|
| | | | | | | | ALCRONA HA | ALCRONA HB | ALCRONA HA | ALCRONA HB |
| 4.0 | 6 | 3.5 | 57 | 11 | 10 | 3 | < 6 = -0.015 > 6 = -0.020 | < 6 = -0.015 > 6 = -0.020 | Item # | Item # |
| 5.0 | 6 | 4.5 | 57 | 13 | 9 | 4 | < 6 = -0.015 > 6 = -0.020 | < 6 = -0.015 > 6 = -0.020 | 135194840400 | 135194440400 |
| 6.0 | 6 | 5.5 | 57 | 13 | 8 | 4 | < 6 = -0.015 > 6 = -0.020 | < 6 = -0.015 > 6 = -0.020 | 135194840500 | 135194440500 |
| 8.0 | 8 | 7.4 | 63 | 19 | 8 | 4 | < 6 = -0.015 > 6 = -0.020 | < 6 = -0.015 > 6 = -0.020 | 135194840600 | 135194440600 |
| 10.0 | 10 | 9.2 | 72 | 22 | 10 | 4 | < 6 = -0.015 > 6 = -0.020 | < 6 = -0.015 > 6 = -0.020 | 135194840800 | 135194440800 |
| 12.0 | 12 | 11.2 | 83 | 26 | 12 | 4 | < 6 = -0.015 > 6 = -0.020 | < 6 = -0.015 > 6 = -0.020 | 135194841000 | 135194441000 |
| 16.0 | 16 | 15.2 | 92 | 32 | 12 | 5 | < 6 = -0.015 > 6 = -0.020 | < 6 = -0.015 > 6 = -0.020 | 135194841200 | 135194441200 |
| 20.0 | 20 | 19.2 | 104 | 38 | 16 | 6 | < 6 = -0.015 > 6 = -0.020 | < 6 = -0.015 > 6 = -0.020 | 135194841600 | 135194441600 |
| | | | | | | | | | 135194842000 | 135194442000 |

Suggested Speeds and Feeds






















| Application | d ₁ [mm] | z | v _c [m/min] | f _z [mm] | a _p [mm] | a _e [mm] | n [min ⁻¹] | v _f [mm/min] | Q [cm ³ /min] |
|-----------------------------|---------------------|-----|------------------------|---------------------|---------------------|---------------------|------------------------|-------------------------|--------------------------|
| Steel <800N/mm ² | 4 | 3 | 180 | 0.018 | 6.0 | 1.6 | 14331 | 774 | 7.43 |
| | 5 | 4 | 180 | 0.020 | 7.5 | 2.0 | 11465 | 917 | 13.76 |
| | 6 | 4 | 180 | 0.025 | 9.0 | 3.6 | 9554 | 955 | 30.96 |
| | 8 | 4 | 180 | 0.030 | 12.0 | 4.8 | 7166 | 860 | 49.53 |
| | 10 | 4 | 180 | 0.050 | 15.0 | 6.0 | 5732 | 1146 | 103.18 |
| | 12 | 4 | 180 | 0.055 | 18.0 | 7.2 | 4777 | 1051 | 136.20 |
| | 16 | 5 | 180 | 0.060 | 24.0 | 9.6 | 3583 | 1075 | 247.64 |
| 20 | 6 | 180 | 0.065 | 30.0 | 12.0 | 2866 | 1118 | 402.42 | |
| Steel 1100N/mm ² | 4 | 3 | 150 | 0.018 | 6.0 | 1.6 | 11943 | 645 | 6.19 |
| | 5 | 4 | 150 | 0.020 | 7.5 | 2.0 | 9554 | 764 | 11.46 |
| | 6 | 4 | 150 | 0.025 | 9.0 | 3.6 | 7962 | 796 | 25.80 |
| | 8 | 4 | 150 | 0.030 | 12.0 | 4.8 | 5971 | 717 | 41.27 |
| | 10 | 4 | 150 | 0.050 | 15.0 | 6.0 | 4777 | 955 | 85.99 |
| | 12 | 4 | 150 | 0.055 | 18.0 | 7.2 | 3981 | 876 | 113.50 |
| | 16 | 5 | 150 | 0.060 | 24.0 | 9.6 | 2986 | 896 | 206.37 |
| 20 | 6 | 150 | 0.065 | 30.0 | 12.0 | 2389 | 932 | 335.35 | |

| Application | d ₁ [mm] | z | v _c [m/min] | f _z [mm] | a _p [mm] | a _e [mm] | n [min ⁻¹] | v _f [mm/min] | Q [cm ³ /min] |
|---|---------------------|-----|------------------------|---------------------|---------------------|---------------------|------------------------|-------------------------|--------------------------|
| Steel 1300N/mm ² | 4 | 3 | 120 | 0.018 | 6.0 | 1.6 | 9554 | 516 | 4.95 |
| | 5 | 4 | 120 | 0.020 | 7.5 | 2.0 | 7643 | 611 | 9.17 |
| | 6 | 4 | 120 | 0.025 | 9.0 | 3.6 | 6369 | 637 | 20.64 |
| | 8 | 4 | 120 | 0.030 | 12.0 | 4.8 | 4777 | 573 | 33.02 |
| | 10 | 4 | 120 | 0.050 | 15.0 | 6.0 | 3822 | 764 | 68.79 |
| | 12 | 4 | 120 | 0.055 | 18.0 | 7.2 | 3185 | 701 | 90.80 |
| | 16 | 5 | 120 | 0.060 | 24.0 | 9.6 | 2389 | 717 | 165.10 |
| 20 | 6 | 120 | 0.065 | 30.0 | 12.0 | 1911 | 745 | 268.28 | |
| Cold Work Tool Steel (12%Cr) & Stainless Steel-1.2379 | 4 | 3 | 80 | 0.018 | 6.0 | 1.6 | 6369 | 344 | 3.30 |
| | 5 | 4 | 80 | 0.020 | 7.5 | 2.0 | 5096 | 408 | 6.11 |
| | 6 | 4 | 80 | 0.025 | 9.0 | 3.6 | 4246 | 425 | 13.76 |
| | 8 | 4 | 80 | 0.030 | 12.0 | 4.8 | 3185 | 382 | 22.01 |
| | 10 | 4 | 80 | 0.050 | 15.0 | 6.0 | 2548 | 510 | 45.86 |
| | 12 | 4 | 80 | 0.055 | 18.0 | 7.2 | 2123 | 467 | 60.54 |
| | 16 | 5 | 80 | 0.060 | 24.0 | 9.6 | 1592 | 478 | 110.06 |
| 20 | 6 | 80 | 0.065 | 30.0 | 12.0 | 1274 | 497 | 178.85 | |

| Application | d ₁ [mm] | z | v _c [m/min] | f _z [mm] | a _p [mm] | a _e [mm] | n [min ⁻¹] | v _f [mm/min] | Q [cm ³ /min] |
|-----------------------------|---------------------|-----|------------------------|---------------------|---------------------|---------------------|------------------------|-------------------------|--------------------------|
| Steel <800N/mm ² | 4 | 3 | 150 | 0.018 | 6.0 | 4.0 | 11943 | 645 | 15.48 |
| | 5 | 4 | 150 | 0.020 | 7.5 | 5.0 | 9554 | 764 | 28.66 |
| | 6 | 4 | 150 | 0.025 | 9.0 | 6.0 | 7962 | 796 | 42.99 |
| | 8 | 4 | 150 | 0.030 | 12.0 | 8.0 | 5971 | 717 | 68.79 |
| | 10 | 4 | 150 | 0.050 | 15.0 | 10.0 | 4777 | 955 | 143.31 |
| | 12 | 4 | 150 | 0.055 | 18.0 | 12.0 | 3981 | 876 | 189.17 |
| | 16 | 5 | 150 | 0.060 | 24.0 | 16.0 | 2986 | 896 | 343.95 |
| 20 | 6 | 150 | 0.065 | 30.0 | 20.0 | 2389 | 932 | 558.92 | |
| Steel 1100N/mm ² | 4 | 3 | 100 | 0.015 | 6.0 | 4.0 | 7962 | 358 | 8.60 |
| | 5 | 4 | 100 | 0.018 | 7.5 | 5.0 | 6369 | 459 | 17.20 |
| | 6 | 4 | 100 | 0.020 | 9.0 | 6.0 | 5308 | 425 | 22.93 |
| | 8 | 4 | 100 | 0.025 | 12.0 | 8.0 | 3981 | 398 | 38.22 |
| | 10 | 4 | 100 | 0.030 | 15.0 | 10.0 | 3185 | 382 | 57.32 |
| | 12 | 4 | 100 | 0.040 | 18.0 | 12.0 | 2654 | 425 | 91.72 |
| | 16 | 5 | 100 | 0.042 | 24.0 | 16.0 | 1990 | 418 | 160.51 |
| 20 | 6 | 100 | 0.045 | 30.0 | 20.0 | 1592 | 430 | 257.96 | |

| Application | d ₁ [mm] | z | v _c [m/min] | f _z [mm] | a _p [mm] | a _e [mm] | n [min ⁻¹] | v _f [mm/min] | Q [cm ³ /min] |
|---|---------------------|----|------------------------|---------------------|---------------------|---------------------|------------------------|-------------------------|--------------------------|
| Steel 1300N/mm ² | 4 | 3 | 80 | 0.015 | 6.0 | 4.0 | 6369 | 287 | 6.88 |
| | 5 | 4 | 80 | 0.018 | 7.5 | 5.0 | 5096 | 367 | 13.76 |
| | 6 | 4 | 80 | 0.020 | 9.0 | 6.0 | 4246 | 340 | 18.34 |
| | 8 | 4 | 80 | 0.025 | 12.0 | 8.0 | 3185 | 318 | 30.57 |
| | 10 | 4 | 80 | 0.030 | 15.0 | 10.0 | 2548 | 306 | 45.86 |
| | 12 | 4 | 80 | 0.040 | 18.0 | 12.0 | 2123 | 340 | 73.38 |
| | 16 | 5 | 80 | 0.042 | 24.0 | 16.0 | 1592 | 334 | 128.41 |
| 20 | 6 | 80 | 0.045 | 30.0 | 20.0 | 1274 | 344 | 206.37 | |
| Cold Work Tool Steel (12%Cr) & Stainless Steel-1.2379 | 4 | 3 | 60 | 0.015 | 6.0 | 4.0 | 4777 | 215 | 5.16 |
| | 5 | 4 | 60 | 0.018 | 7.5 | 5.0 | 3822 | 275 | 10.32 |
| | 6 | 4 | 60 | 0.020 | 9.0 | 6.0 | 3185 | 255 | 13.76 |
| | 8 | 4 | 60 | 0.025 | 12.0 | 8.0 | 2389 | 239 | 22.93 |
| | 10 | 4 | 60 | 0.030 | 15.0 | 10.0 | 1911 | 229 | 34.39 |
| | 12 | 4 | 60 | 0.040 | 18.0 | 12.0 | 1592 | 255 | 55.03 |
| | 16 | 5 | 60 | 0.045 | 24.0 | 16.0 | 1194 | 269 | 103.18 |
| 20 | 6 | 60 | 0.050 | 30.0 | 20.0 | 955 | 287 | 171.97 | |



-  Denotes the helix angle of the Tool. Large Helix angles are used for soft materials, small helix angles are for hard and brittle materials.
-  Denotes the point angle of the Tool.
-  The Tool is suitable for Radial and Axial Machining.
-  The Tool is suitable for Radial, Diagonal & Axial Machining.
-  Flute design with Fine Roughing Pitch
-  Flute design with Chipbreaker
-  The corner between front cutting edge and circumferential cutting edge is provided with protection chamfer of 45°. The size of the protecting chamfer is adjusted to the diameter of the tool and is within the mentioned range (in this case 0.08 to 0.40 mm)
-  The Tool is furnished with a corner radius.
-  Denotes the maximum drilling depth
-  Dimensions of the Drill corresponds to DIN 6537 (Short)
-  Dimension of the Drill corresponds to DIN 6537 (Long)
-  Dimension of the Milling Cutter corresponds to DIN 6527 (Short)
-  Dimension of the Milling Cutter corresponds to DIN 6527 (Long)
-  Shank Execution according to DIN 6535 HA (cylindrical shank for solid carbide tools)
-  Shank Execution according to DIN 6535 HB (cylindrical shank with clamping flat for solid carbide tools)
-  Cylindrical Shank
-  Cylindrical Shank with clamping flat.
-  Cylindrical Shank with Whistle Notch.
-  Tools with internal coolant Holes.
-  Micrograin Carbide with 10% Cobalt used.
-  Ultrafine Micrograin Carbide with 12% Cobalt used.



Formulas and abbreviations

| | |
|-------|--|
| d_1 | Tool diameter |
| d_2 | Diameter of the shank |
| d_3 | Diameter of Recess / Neck |
| l_1 | Total length of the tool |
| l_2 | Length up to the end of the flute |
| l_3 | Length of Recess / Neck |
| l_4 | Length of the countersink phase (Step drills) |
| z | Number of cutting edges |
| r | Radius |
| f | Feed per revolution |
| n | Spindle speed |
| v_c | Cutting speed |
| v_f | Feed rate |
| Q | Material removal rate (removal of a certain material volume in a given time) |



Formulas

| | |
|--|--|
| Spindle speed n [min ⁻¹] | $n = v_c \cdot 1000 / d / \pi$ |
| Cutting speed v_c [m/min] | $v_c = d \cdot \pi \cdot n / 1000$ |
| Feed per rotation f [mm] | $f = f_z \cdot z$ |
| Feed speed v_f [mm/min] | $v_f = f_z \cdot z \cdot n$ |
| Material removal rate Q [cm ³ /min] | $Q = (a_e \cdot a_p \cdot v_f) / 1000$ |





| R _m [N/mm ²] | HV 10 | HB | HRC | R _m [N/mm ²] | HV 10 | HB | HRC |
|-------------------------------------|-------|-----|-----|-------------------------------------|-------|-----|-----|
| 240 | 75 | 71 | | 920 | 287 | 273 | 28 |
| 255 | 80 | 76 | | 940 | 293 | 278 | 29 |
| 270 | 85 | 81 | | 970 | 302 | 287 | 30 |
| 285 | 90 | 86 | | 995 | 310 | 295 | 31 |
| 305 | 95 | 90 | | 1020 | 317 | 301 | 32 |
| 320 | 100 | 95 | | 1050 | 327 | 311 | 33 |
| 335 | 105 | 100 | | 1080 | 336 | 319 | 34 |
| 350 | 110 | 105 | | 1110 | 345 | 328 | 35 |
| 370 | 115 | 109 | | 1140 | 355 | 337 | 36 |
| 385 | 120 | 114 | | 1170 | 364 | 346 | 37 |
| 400 | 125 | 119 | | 1200 | 373 | 354 | 38 |
| 415 | 130 | 124 | | 1230 | 382 | 363 | 39 |
| 430 | 135 | 128 | | 1260 | 392 | 372 | 40 |
| 450 | 140 | 133 | | 1300 | 403 | 383 | 41 |
| 465 | 145 | 138 | | 1330 | 413 | 393 | 42 |
| 480 | 150 | 143 | | 1360 | 423 | 402 | 43 |
| 495 | 155 | 147 | | 1400 | 434 | 413 | 44 |
| 510 | 160 | 152 | | 1440 | 446 | 424 | 45 |
| 530 | 165 | 157 | | 1480 | 458 | 435 | 46 |
| 545 | 170 | 162 | | 1530 | 473 | 449 | 47 |
| 560 | 175 | 166 | | 1570 | 484 | 460 | 48 |
| 575 | 180 | 171 | | 1620 | 497 | 472 | 49 |
| 595 | 185 | 176 | | 1680 | 514 | 488 | 50 |
| 610 | 190 | 181 | | 1730 | 527 | 501 | 51 |
| 625 | 195 | 185 | | 1790 | 544 | 517 | 52 |
| 640 | 200 | 190 | | 1845 | 560 | 532 | 53 |
| 660 | 205 | 195 | | 1910 | 578 | 549 | 54 |
| 675 | 210 | 199 | | 1980 | 596 | 567 | 55 |
| 690 | 215 | 204 | | 2050 | 615 | 584 | 56 |
| 705 | 220 | 209 | | 2140 | 639 | 607 | 57 |
| 720 | 225 | 214 | | | 655 | 622 | 58 |
| 740 | 230 | 219 | | | 675 | | 59 |
| 755 | 235 | 223 | | | 698 | | 60 |
| 770 | 240 | 228 | | | 720 | | 61 |
| 785 | 245 | 233 | | | 745 | | 62 |
| 800 | 250 | 238 | 22 | | 773 | | 63 |
| 820 | 255 | 242 | 23 | | 800 | | 64 |
| 835 | 260 | 247 | 24 | | 829 | | 65 |
| 860 | 268 | 255 | 25 | | 864 | | 66 |
| 870 | 272 | 258 | 26 | | 900 | | 67 |
| 900 | 280 | 266 | 27 | | 940 | | 68 |

