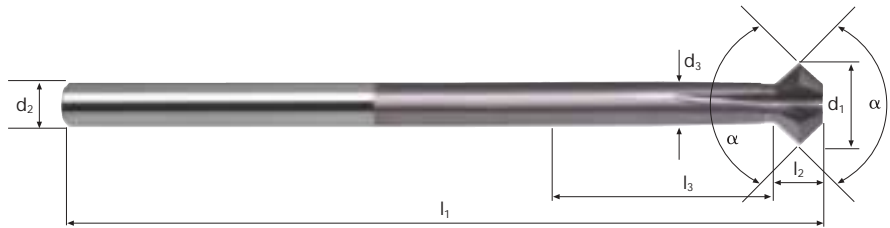


Forward and reverse deburring end mills

45° - Chamfer



| | |
|----|--------------|
| HM | λ 0° |
| | γ 8° |
| | |
| | |
| | |



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|----------|-------------|--------------|--|--|--|--|----------------|-------------|------------------------|
| Rm < 850 | Rm 850-1100 | Rm 1100-1300 | | | | | Inox Stainless | Ti Titanium | GG(G) Aluminium Copper |
|----------|-------------|--------------|--|--|--|--|----------------|-------------|------------------------|

| Example: Order-N°. | | | | | | | | | UNICUT-4X | |
|-------------------------------------|-----------|-------|-----|-----|------|----|-----|---|-----------|--|
| Coating Article-N° α-Code | | | | | | | | | | |
| U 7930 .180 | | | | | | | | | | |
| ∅ Code | d1 * | d2 h6 | d3 | l1 | l2 | l3 | α | Z | | |
| .180 | 3 | 6 | 2.2 | 100 | 1.30 | 10 | 90° | 4 | ● | |
| .220 | 4 | 6 | 2.9 | 100 | 1.75 | 12 | 90° | 4 | ● | |
| .260 | 5 | 6 | 3.4 | 100 | 2.30 | 15 | 90° | 4 | ● | |
| .300 | 6 | 6 | 3.8 | 100 | 2.90 | 18 | 90° | 4 | ● | |
| .391 | 8 | 6 | 4.9 | 100 | 3.10 | 35 | 90° | 4 | ● | |
| .450 | 10 | 6 | 5.9 | 100 | 4.10 | 35 | 90° | 4 | ● | |
| .501 | 12 | 6 | 5.9 | 100 | 6.10 | 35 | 90° | 4 | ● | |
| * Tolerance of the cutting diameter | | | | | | | | | | |
| d1 | Tolerance | | | | | | | | | |
| < 6 | 0/-0.05 | | | | | | | | | |
| ≥ 6 | 0/-0.15 | | | | | | | | | |





Material

Steel
< 850 N/mm²

| d1 [mm] | z | v _c [m/min] | f _z [mm] | a _p [mm] | a _e [mm] | n [min ⁻¹] | v _f [mm/min] |
|---------|---|------------------------|---------------------|---------------------|---------------------|------------------------|-------------------------|
| 6 | 4 | 150 | 0.020 | 0.20 | 0.20 | 7960 | 635 |
| 8 | 4 | 150 | 0.025 | 0.25 | 0.25 | 5970 | 595 |
| 10 | 4 | 150 | 0.030 | 0.30 | 0.30 | 4775 | 575 |
| 12 | 4 | 150 | 0.035 | 0.40 | 0.40 | 3980 | 555 |
| | | | | | | | |
| | | | | | | | |
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Steel
850 - 1100 N/mm²

| | | | | | | | |
|----|---|-----|-------|------|------|------|-----|
| 6 | 4 | 120 | 0.020 | 0.20 | 0.20 | 6365 | 510 |
| 8 | 4 | 120 | 0.025 | 0.25 | 0.25 | 4775 | 480 |
| 10 | 4 | 120 | 0.030 | 0.30 | 0.30 | 3820 | 460 |
| 12 | 4 | 120 | 0.035 | 0.40 | 0.40 | 3185 | 445 |
| | | | | | | | |
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Steel
1100 - 1300 N/mm²

| | | | | | | | |
|----|---|----|-------|------|------|------|-----|
| 6 | 4 | 70 | 0.020 | 0.20 | 0.20 | 3715 | 295 |
| 8 | 4 | 70 | 0.025 | 0.25 | 0.25 | 2785 | 280 |
| 10 | 4 | 70 | 0.030 | 0.30 | 0.30 | 2230 | 270 |
| 12 | 4 | 70 | 0.035 | 0.40 | 0.40 | 1855 | 260 |
| | | | | | | | |
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Stainless steel
[Cr-Ni/1.4301]

| | | | | | | | |
|----|---|----|-------|------|------|------|-----|
| 6 | 4 | 60 | 0.020 | 0.20 | 0.20 | 3185 | 255 |
| 8 | 4 | 60 | 0.025 | 0.25 | 0.25 | 2385 | 240 |
| 10 | 4 | 60 | 0.030 | 0.30 | 0.30 | 1910 | 230 |
| 12 | 4 | 60 | 0.035 | 0.40 | 0.40 | 1590 | 225 |
| | | | | | | | |
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Material

Cast iron
(lamellar / spheroidal)

| d1 [mm] | z | v _c [m/min] | f _z [mm] | a _p [mm] | a _e [mm] | n [min ⁻¹] | v _f [mm/min] |
|---------|---|------------------------|---------------------|---------------------|---------------------|------------------------|-------------------------|
| 6 | 4 | 160 | 0.020 | 0.20 | 0.20 | 8490 | 680 |
| 8 | 4 | 160 | 0.025 | 0.25 | 0.25 | 6365 | 635 |
| 10 | 4 | 160 | 0.030 | 0.30 | 0.30 | 5095 | 610 |
| 12 | 4 | 160 | 0.035 | 0.40 | 0.40 | 4245 | 595 |
| | | | | | | | |
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Unalloyed copper

| | | | | | | | |
|----|---|-----|-------|------|------|------|-----|
| 6 | 4 | 180 | 0.020 | 0.20 | 0.20 | 9550 | 765 |
| 8 | 4 | 180 | 0.025 | 0.25 | 0.25 | 7160 | 715 |
| 10 | 4 | 180 | 0.030 | 0.30 | 0.30 | 5730 | 690 |
| 12 | 4 | 180 | 0.035 | 0.40 | 0.40 | 4775 | 670 |
| | | | | | | | |
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Titanium alloys
up to 300 HB
[Ti5Al2.5Sn]

| | | | | | | | |
|----|---|----|-------|------|------|------|-----|
| 6 | 4 | 70 | 0.020 | 0.20 | 0.20 | 3715 | 295 |
| 8 | 4 | 70 | 0.025 | 0.25 | 0.25 | 2785 | 280 |
| 10 | 4 | 70 | 0.030 | 0.30 | 0.30 | 2230 | 270 |
| 12 | 4 | 70 | 0.035 | 0.40 | 0.40 | 1855 | 260 |
| | | | | | | | |
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Wrought aluminium
alloys Si < 6%

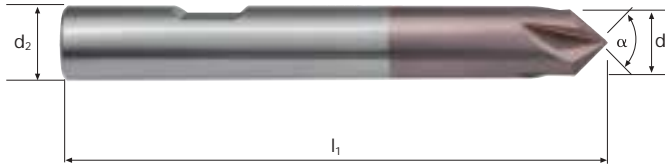
| | | | | | | | |
|----|---|-----|-------|------|------|-------|-----|
| 6 | 4 | 200 | 0.020 | 0.20 | 0.20 | 10610 | 850 |
| 8 | 4 | 200 | 0.025 | 0.25 | 0.25 | 7960 | 795 |
| 10 | 4 | 200 | 0.030 | 0.30 | 0.30 | 6365 | 765 |
| 12 | 4 | 200 | 0.035 | 0.40 | 0.40 | 5305 | 745 |
| | | | | | | | |
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Deburring end mills

45° - Chamfer



| | |
|----|--------------|
| HM | λ 0° |
| | γ 0° |



| | | | | | | | | | |
|----------|-------------|--------------|--|--|--|--|-------------------|----------------|------------------------------|
| Rm < 850 | Rm 850-1100 | Rm 1100-1300 | | | | | Inox Stainless | Ti Titanium | GG(G) Aluminium Copper |
|----------|-------------|--------------|--|--|--|--|-------------------|----------------|------------------------------|

| Example: Order-N°. | | | | | | | UNICUT-4X | |
|--------------------|----------|---------------------|---------------------------|-----------------------|---|---|--------------|--|
| | | Coating U | Article-N° 7940 | α-Code .300 | | | U7940 | |
| ∅ Code | d1 h6 | d2 h6 | l1 | α | Z | | | |
| .300 | 6 | 6 | 57 | 90° | 4 | ● | | |
| .391 | 8 | 8 | 63 | 90° | 4 | ● | | |
| .450 | 10 | 10 | 72 | 90° | 4 | ● | | |
| .501 | 12 | 12 | 83 | 90° | 4 | ● | | |
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Application



Material

Steel
< 850 N/mm²



| d1 [mm] | z | v _c [m/min] | f _z [mm] | a _p [mm] | a _e [mm] | n [min ⁻¹] | v _f [mm/min] |
|---------|---|------------------------|---------------------|---------------------|---------------------|------------------------|-------------------------|
| 3 | 2 | 120 | 0.008 | 0.10 | 0.10 | 12735 | 205 |
| 4 | 2 | 120 | 0.012 | 0.15 | 0.15 | 9550 | 230 |
| 5 | 2 | 120 | 0.014 | 0.20 | 0.20 | 7640 | 215 |
| 6 | 2 | 120 | 0.018 | 0.20 | 0.20 | 6365 | 230 |
| 8 | 2 | 120 | 0.022 | 0.25 | 0.25 | 4775 | 210 |
| 10 | 2 | 120 | 0.028 | 0.35 | 0.35 | 3820 | 215 |
| 12 | 2 | 120 | 0.034 | 0.45 | 0.45 | 3185 | 215 |

Steel
850 - 1100 N/mm²



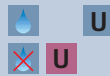
| | | | | | | | |
|----|---|-----|-------|------|------|-------|-----|
| 3 | 2 | 100 | 0.008 | 0.10 | 0.10 | 10610 | 170 |
| 4 | 2 | 100 | 0.012 | 0.15 | 0.15 | 7960 | 190 |
| 5 | 2 | 100 | 0.014 | 0.20 | 0.20 | 6365 | 180 |
| 6 | 2 | 100 | 0.018 | 0.20 | 0.20 | 5305 | 190 |
| 8 | 2 | 100 | 0.022 | 0.25 | 0.25 | 3980 | 175 |
| 10 | 2 | 100 | 0.028 | 0.35 | 0.35 | 3185 | 180 |
| 12 | 2 | 100 | 0.034 | 0.45 | 0.45 | 2655 | 180 |

Stainless steel
[Cr-Ni/1.4301]



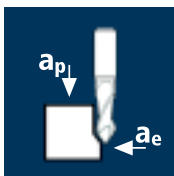
| | | | | | | | |
|----|---|----|-------|------|------|------|----|
| 3 | 2 | 50 | 0.008 | 0.10 | 0.10 | 5305 | 85 |
| 4 | 2 | 50 | 0.012 | 0.15 | 0.15 | 3980 | 95 |
| 5 | 2 | 50 | 0.014 | 0.20 | 0.20 | 3185 | 90 |
| 6 | 2 | 50 | 0.018 | 0.20 | 0.20 | 2655 | 95 |
| 8 | 2 | 50 | 0.022 | 0.25 | 0.25 | 1990 | 90 |
| 10 | 2 | 50 | 0.028 | 0.35 | 0.35 | 1590 | 90 |
| 12 | 2 | 50 | 0.034 | 0.45 | 0.45 | 1325 | 90 |

Cast iron
(lamellar / spheroidal)



| | | | | | | | |
|----|---|-----|-------|------|------|-------|-----|
| 3 | 2 | 140 | 0.008 | 0.10 | 0.10 | 14855 | 240 |
| 4 | 2 | 140 | 0.012 | 0.15 | 0.15 | 11140 | 265 |
| 5 | 2 | 140 | 0.014 | 0.20 | 0.20 | 8915 | 250 |
| 6 | 2 | 140 | 0.018 | 0.20 | 0.20 | 7425 | 265 |
| 8 | 2 | 140 | 0.022 | 0.25 | 0.25 | 5570 | 245 |
| 10 | 2 | 140 | 0.028 | 0.35 | 0.35 | 4455 | 250 |
| 12 | 2 | 140 | 0.034 | 0.45 | 0.45 | 3715 | 255 |

Application



Material

Steel
< 850 N/mm²



| d1 [mm] | z | v _c [m/min] | f _z [mm] | a _p [mm] | a _e [mm] | n [min ⁻¹] | v _f [mm/min] |
|---------|---|------------------------|---------------------|---------------------|---------------------|------------------------|-------------------------|
| 3 | 2 | 100 | 0.008 | 3 | 0.15 | 10610 | 170 |
| 4 | 2 | 100 | 0.012 | 4 | 0.15 | 7960 | 190 |
| 5 | 2 | 100 | 0.014 | 5 | 0.20 | 6365 | 180 |
| 6 | 2 | 100 | 0.018 | 6 | 0.20 | 5305 | 190 |
| 8 | 2 | 100 | 0.022 | 8 | 0.25 | 3980 | 175 |
| 10 | 2 | 100 | 0.028 | 10 | 0.25 | 3185 | 180 |
| 12 | 2 | 100 | 0.034 | 12 | 0.30 | 2655 | 180 |

Steel
850 - 1100 N/mm²



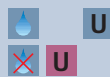
| | | | | | | | |
|----|---|----|-------|----|------|------|-----|
| 3 | 2 | 80 | 0.008 | 3 | 0.15 | 8490 | 135 |
| 4 | 2 | 80 | 0.012 | 4 | 0.15 | 6365 | 155 |
| 5 | 2 | 80 | 0.014 | 5 | 0.20 | 5095 | 145 |
| 6 | 2 | 80 | 0.018 | 6 | 0.20 | 4245 | 155 |
| 8 | 2 | 80 | 0.022 | 8 | 0.25 | 3185 | 140 |
| 10 | 2 | 80 | 0.028 | 10 | 0.25 | 2545 | 145 |
| 12 | 2 | 80 | 0.034 | 12 | 0.30 | 2120 | 145 |

Stainless steel
[Cr-Ni/1.4301]



| | | | | | | | |
|----|---|----|-------|----|------|------|----|
| 3 | 2 | 45 | 0.008 | 3 | 0.15 | 4775 | 75 |
| 4 | 2 | 45 | 0.012 | 4 | 0.15 | 3580 | 85 |
| 5 | 2 | 45 | 0.014 | 5 | 0.20 | 2865 | 80 |
| 6 | 2 | 45 | 0.018 | 6 | 0.20 | 2385 | 85 |
| 8 | 2 | 45 | 0.022 | 8 | 0.25 | 1790 | 80 |
| 10 | 2 | 45 | 0.028 | 10 | 0.25 | 1430 | 80 |
| 12 | 2 | 45 | 0.034 | 12 | 0.30 | 1195 | 80 |

Cast iron
(lamellar / spheroidal)



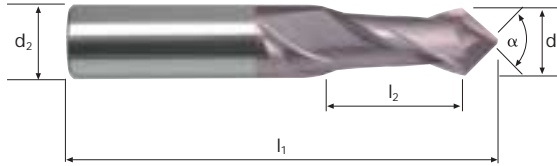
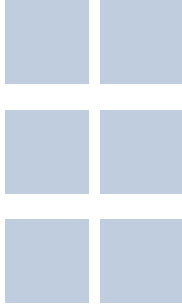
| | | | | | | | |
|----|---|-----|-------|----|------|-------|-----|
| 3 | 2 | 120 | 0.008 | 3 | 0.15 | 12735 | 205 |
| 4 | 2 | 120 | 0.012 | 4 | 0.15 | 9550 | 230 |
| 5 | 2 | 120 | 0.014 | 5 | 0.20 | 7640 | 215 |
| 6 | 2 | 120 | 0.018 | 6 | 0.20 | 6365 | 230 |
| 8 | 2 | 120 | 0.022 | 8 | 0.25 | 4775 | 210 |
| 10 | 2 | 120 | 0.028 | 10 | 0.25 | 3820 | 215 |
| 12 | 2 | 120 | 0.034 | 12 | 0.30 | 3185 | 215 |

Universal end mills

Milling, chamfering, centering, drilling



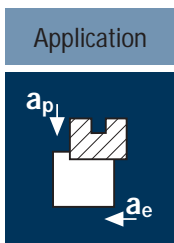
HM λ 30°
 γ 12°



Rm < 850 **Rm** 850-1100 **Rm** 1100-1300 **Inox** Stainless **Ti** Titanium **GG(G)** Aluminium Copper

| | | | | | | | UNICUT-4X | |
|--|---------|----------|----|----|----------|---|--------------|--|
| Example: Order-N°. $\underbrace{\text{U}}_{\text{Coating}}$ $\underbrace{7960}_{\text{Article-N°}}$ $\underbrace{.180}_{\alpha\text{-Code}}$ | | | | | | | | |
| \emptyset Code | d1 * | d2 h6 | l1 | l2 | α | Z | U7960 | |
| .180 | 3 | 4 | 50 | 6 | 90° | 2 | ● | |
| .220 | 4 | 5 | 50 | 8 | 90° | 2 | ● | |
| .260 | 5 | 6 | 50 | 10 | 90° | 2 | ● | |
| .300 | 6 | 8 | 60 | 12 | 90° | 2 | ● | |
| .391 | 8 | 10 | 70 | 16 | 90° | 2 | ● | |
| .450 | 10 | 12 | 70 | 18 | 90° | 2 | ● | |
| .501 | 12 | 12 | 70 | 20 | 90° | 2 | ● | |
| * Tolerance of the cutting diameter | | | | | | | | |
| d1 Tolerance | | | | | | | | |
| < 12 h9 | | | | | | | | |
| ≥ 12 h11 | | | | | | | | |

V



Material

Steel
< 850 N/mm²

| d1 [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] |
|---------|----|------------------------|---------------------|---------------------|---------------------|------------------------|-------------------------|--------------------------|
| 32 | 6 | 65 | 0.060 | 6.4 | 24.0 | 645 | 230 | 35.5 |
| 40 | 8 | 65 | 0.080 | 8.0 | 30.0 | 515 | 330 | 79.0 |
| 50 | 8 | 65 | 0.100 | 10.0 | 37.5 | 415 | 330 | 124.0 |
| 63 | 10 | 65 | 0.120 | 12.6 | 47.3 | 330 | 395 | 235.0 |
| 80 | 10 | 65 | 0.120 | 16.0 | 60.0 | 260 | 310 | 297.5 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

Steel
850 - 1100 N/mm²

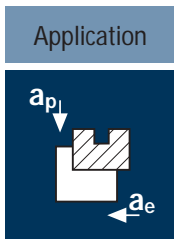
| | | | | | | | | |
|----|----|----|-------|------|------|-----|-----|-------|
| 32 | 6 | 48 | 0.060 | 6.4 | 24.0 | 475 | 170 | 26.0 |
| 40 | 8 | 48 | 0.080 | 8.0 | 30.0 | 380 | 245 | 59.0 |
| 50 | 8 | 48 | 0.100 | 10.0 | 37.5 | 305 | 245 | 92.0 |
| 63 | 10 | 48 | 0.120 | 12.6 | 47.3 | 245 | 295 | 175.5 |
| 80 | 10 | 48 | 0.120 | 16.0 | 60.0 | 190 | 230 | 221.0 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

Steel
1100 - 1300 N/mm²

| | | | | | | | | |
|----|----|----|-------|------|------|-----|-----|-------|
| 32 | 6 | 35 | 0.060 | 6.4 | 24.0 | 350 | 125 | 19.0 |
| 40 | 8 | 35 | 0.080 | 8.0 | 30.0 | 280 | 180 | 43.0 |
| 50 | 8 | 35 | 0.100 | 10.0 | 37.5 | 225 | 180 | 67.5 |
| 63 | 10 | 35 | 0.120 | 12.6 | 47.3 | 175 | 210 | 125.0 |
| 80 | 10 | 35 | 0.120 | 16.0 | 60.0 | 140 | 170 | 163.0 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

Stainless steel
[Cr-Ni/1.4301]

| | | | | | | | | |
|----|----|----|-------|------|------|-----|-----|-------|
| 32 | 6 | 26 | 0.060 | 6.4 | 24.0 | 260 | 95 | 14.5 |
| 40 | 8 | 26 | 0.080 | 8.0 | 30.0 | 205 | 130 | 31.0 |
| 50 | 8 | 26 | 0.100 | 10.0 | 37.5 | 165 | 130 | 49.0 |
| 63 | 10 | 26 | 0.120 | 12.6 | 47.3 | 130 | 155 | 92.5 |
| 80 | 10 | 26 | 0.120 | 16.0 | 60.0 | 105 | 125 | 120.0 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |



Material

Steel
< 850 N/mm²

| d1 [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] |
|---------|----|------------------------|---------------------|---------------------|---------------------|------------------------|-------------------------|--------------------------|
| 32 | 6 | 68 | 0.070 | 6.4 | 9.6 | 675 | 285 | 17.5 |
| 40 | 8 | 68 | 0.090 | 8.0 | 12.0 | 540 | 390 | 37.5 |
| 50 | 8 | 68 | 0.110 | 10.0 | 15.0 | 435 | 385 | 58.0 |
| 63 | 10 | 68 | 0.125 | 12.6 | 18.9 | 345 | 430 | 102.5 |
| 80 | 10 | 68 | 0.145 | 16.0 | 24.0 | 270 | 390 | 150.0 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

Steel
850 - 1100 N/mm²

| | | | | | | | | |
|----|----|----|-------|------|------|-----|-----|-------|
| 32 | 6 | 55 | 0.070 | 6.4 | 9.6 | 545 | 230 | 14.0 |
| 40 | 8 | 55 | 0.090 | 8.0 | 12.0 | 440 | 315 | 30.0 |
| 50 | 8 | 55 | 0.110 | 10.0 | 15.0 | 350 | 310 | 46.5 |
| 63 | 10 | 55 | 0.125 | 12.6 | 18.9 | 280 | 350 | 83.5 |
| 80 | 10 | 55 | 0.145 | 16.0 | 24.0 | 220 | 320 | 123.0 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

Steel
1100 - 1300 N/mm²

| | | | | | | | | |
|----|----|----|-------|------|------|-----|-----|------|
| 32 | 6 | 40 | 0.070 | 6.4 | 9.6 | 400 | 170 | 10.5 |
| 40 | 8 | 40 | 0.090 | 8.0 | 12.0 | 320 | 230 | 22.0 |
| 50 | 8 | 40 | 0.110 | 10.0 | 15.0 | 255 | 225 | 34.0 |
| 63 | 10 | 40 | 0.125 | 12.6 | 18.9 | 200 | 250 | 59.5 |
| 80 | 10 | 40 | 0.145 | 16.0 | 24.0 | 160 | 230 | 88.5 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

Stainless steel
[Cr-Ni/1.4301]

| | | | | | | | | |
|----|----|----|-------|------|------|-----|-----|------|
| 32 | 6 | 29 | 0.070 | 6.4 | 9.6 | 290 | 120 | 7.5 |
| 40 | 8 | 29 | 0.090 | 8.0 | 12.0 | 230 | 165 | 16.0 |
| 50 | 8 | 29 | 0.110 | 10.0 | 15.0 | 185 | 165 | 25.0 |
| 63 | 10 | 29 | 0.125 | 12.6 | 18.9 | 145 | 180 | 43.0 |
| 80 | 10 | 29 | 0.145 | 16.0 | 24.0 | 115 | 165 | 63.5 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |