

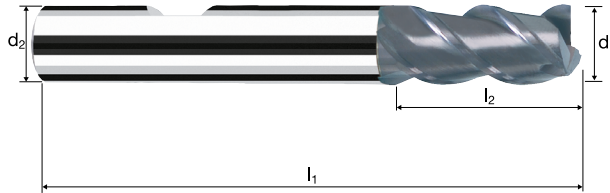
Cylindrical end mills

Smooth-edged, normal version



HM
MG10

λ 45°
 γ 15°

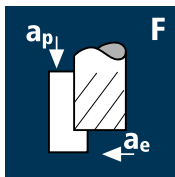


| | | | | | | | | | |
|-------------|----------------|-----------------|--|--|--|--|-------------------|--|-----------------|
| Rm < 850 | Rm 850-1100 | Rm 1100-1300 | | | | | Inox Stainless | | GG(G) Copper |
|-------------|----------------|-----------------|--|--|--|--|-------------------|--|-----------------|

| Ø Code | d ₁ e8 | d ₂ h6 | l ₁ | l ₂ | l ₄ | 45° | α | z | POLYCHROM | |
|-----------|----------------------|----------------------|----------------|----------------|----------------|------|------|---|-----------|-------|
| | | | | | | | | | 5330 | P5330 |
| 138* | 2.00 | 2.00 | 42 | 6.00 | - | 0.10 | 0.0° | 3 | ● | ● |
| 140 | 2.00 | 6.00 | 54 | 6.00 | 15.32 | 0.10 | 8.0° | 3 | ● | ● |
| 158* | 2.50 | 2.50 | 42 | 7.00 | - | 0.10 | 0.0° | 3 | ● | ● |
| 160 | 2.50 | 6.00 | 54 | 6.00 | 14.89 | 0.10 | 7.5° | 3 | ● | ● |
| 178* | 3.00 | 3.00 | 45 | 7.00 | - | 0.10 | 0.0° | 3 | ● | ● |
| 180 | 3.00 | 6.00 | 57 | 7.00 | 14.96 | 0.10 | 6.0° | 3 | ● | ● |
| 198* | 3.50 | 3.50 | 50 | 7.00 | - | 0.10 | 0.0° | 3 | ● | ● |
| 200 | 3.50 | 6.00 | 57 | 7.00 | 14.02 | 0.10 | 5.5° | 3 | ● | ● |
| 218* | 4.00 | 4.00 | 50 | 8.00 | - | 0.10 | 0.0° | 3 | ● | ● |
| 220 | 4.00 | 6.00 | 57 | 8.00 | 14.59 | 0.10 | 4.5° | 3 | ● | ● |
| 238* | 4.50 | 4.50 | 50 | 8.00 | - | 0.15 | 0.0° | 3 | ● | ● |
| 240 | 4.50 | 6.00 | 57 | 8.00 | 13.66 | 0.15 | 3.5° | 3 | ● | ● |
| 258* | 5.00 | 5.00 | 50 | 10.00 | - | 0.15 | 0.0° | 3 | ● | ● |
| 260 | 5.00 | 6.00 | 57 | 10.00 | 14.72 | 0.15 | 2.5° | 3 | ● | ● |
| 278* | 5.50 | 5.50 | 57 | 10.00 | - | 0.15 | 0.0° | 3 | ● | ● |
| 280 | 5.50 | 6.00 | 57 | 10.00 | 13.79 | 0.15 | 1.5° | 3 | ● | ● |
| 300 | 6.00 | 6.00 | 57 | 10.00 | - | 0.15 | 0.0° | 3 | ● | ● |
| 322 | 6.50 | 8.00 | 63 | 13.00 | 18.66 | 0.15 | 2.5° | 3 | ● | ● |
| 331 | 7.00 | 8.00 | 63 | 13.00 | 17.72 | 0.15 | 2.0° | 3 | ● | ● |
| 362 | 7.50 | 8.00 | 63 | 16.00 | 19.79 | 0.15 | 1.0° | 3 | ● | ● |
| 391 | 8.00 | 8.00 | 63 | 16.00 | - | 0.15 | 0.0° | 3 | ● | ● |

* without clamping flat only

Application



Material

Steel
< 850 N/mm²

P

P

Steel
850 - 1100 N/mm²

P

P

Stainless steel
[Cr-Ni/1.4301]

P

Cast iron
(lamellar / spheroidal)

P

P



Steel
< 850 N/mm²

P

P

Steel
850 - 1100 N/mm²

P

P

Stainless steel
[Cr-Ni/1.4301]

P

Cast iron
(lamellar / spheroidal)

P

P

| d1 [mm] | z | v _r [m/min] | f _s [mm] | a _p [mm] | a _e [mm] | n [min ⁻¹] | v _r [mm/min] | Q [cm ³ /min] |
|---------|---|------------------------|---------------------|---------------------|---------------------|------------------------|-------------------------|--------------------------|
| 2.00 | 3 | 115 | 0.005 | 3.000 | 0.200 | 18305 | 275 | 0.2 |
| 2.50 | 3 | 115 | 0.010 | 3.750 | 0.250 | 14640 | 440 | 0.4 |
| 3.00 | 3 | 115 | 0.010 | 4.500 | 0.300 | 12200 | 365 | 0.5 |
| 3.50 | 3 | 115 | 0.010 | 5.250 | 0.350 | 10460 | 315 | 0.6 |
| 4.00 | 3 | 115 | 0.015 | 6.000 | 0.400 | 9150 | 410 | 1.0 |
| 5.00 | 3 | 115 | 0.015 | 7.500 | 0.500 | 7320 | 330 | 1.2 |
| 6.00 | 3 | 115 | 0.020 | 9.000 | 0.600 | 6100 | 365 | 2.0 |
| 7.00 | 3 | 115 | 0.025 | 10.500 | 0.700 | 5230 | 390 | 2.9 |
| 8.00 | 3 | 115 | 0.025 | 12.000 | 0.800 | 4575 | 345 | 3.3 |
| 2.00 | 3 | 75 | 0.005 | 3.000 | 0.200 | 11935 | 180 | 0.1 |
| 2.50 | 3 | 75 | 0.010 | 3.750 | 0.250 | 9550 | 285 | 0.3 |
| 3.00 | 3 | 75 | 0.010 | 4.500 | 0.300 | 7960 | 240 | 0.3 |
| 3.50 | 3 | 75 | 0.010 | 5.250 | 0.350 | 6820 | 205 | 0.4 |
| 4.00 | 3 | 75 | 0.015 | 6.000 | 0.400 | 5970 | 270 | 0.6 |
| 5.00 | 3 | 75 | 0.015 | 7.500 | 0.500 | 4775 | 215 | 0.8 |
| 6.00 | 3 | 75 | 0.020 | 9.000 | 0.600 | 3980 | 240 | 1.3 |
| 7.00 | 3 | 75 | 0.025 | 10.500 | 0.700 | 3410 | 255 | 1.9 |
| 8.00 | 3 | 75 | 0.025 | 12.000 | 0.800 | 2985 | 225 | 2.1 |
| 2.00 | 3 | 60 | 0.005 | 3.000 | 0.200 | 9550 | 145 | 0.1 |
| 2.50 | 3 | 60 | 0.010 | 3.750 | 0.250 | 7640 | 230 | 0.2 |
| 3.00 | 3 | 60 | 0.010 | 4.500 | 0.300 | 6365 | 190 | 0.3 |
| 3.50 | 3 | 60 | 0.010 | 5.250 | 0.350 | 5455 | 165 | 0.3 |
| 4.00 | 3 | 60 | 0.015 | 6.000 | 0.400 | 4775 | 215 | 0.5 |
| 5.00 | 3 | 60 | 0.015 | 7.500 | 0.500 | 3820 | 170 | 0.6 |
| 6.00 | 3 | 60 | 0.020 | 9.000 | 0.600 | 3185 | 190 | 1.0 |
| 7.00 | 3 | 60 | 0.025 | 10.500 | 0.700 | 2730 | 205 | 1.5 |
| 8.00 | 3 | 60 | 0.025 | 12.000 | 0.800 | 2385 | 180 | 1.7 |
| 2.00 | 3 | 150 | 0.005 | 3.000 | 0.200 | 23875 | 360 | 0.2 |
| 2.50 | 3 | 150 | 0.010 | 3.750 | 0.250 | 19100 | 575 | 0.5 |
| 3.00 | 3 | 150 | 0.010 | 4.500 | 0.300 | 15915 | 475 | 0.6 |
| 3.50 | 3 | 150 | 0.010 | 5.250 | 0.350 | 13640 | 410 | 0.8 |
| 4.00 | 3 | 150 | 0.015 | 6.000 | 0.400 | 11935 | 535 | 1.3 |
| 5.00 | 3 | 150 | 0.015 | 7.500 | 0.500 | 9550 | 430 | 1.6 |
| 6.00 | 3 | 150 | 0.020 | 9.000 | 0.600 | 7960 | 475 | 2.6 |
| 7.00 | 3 | 150 | 0.025 | 10.500 | 0.700 | 6820 | 510 | 3.8 |
| 8.00 | 3 | 150 | 0.025 | 12.000 | 0.800 | 5970 | 450 | 4.3 |
| 2.00 | 3 | 85 | 0.005 | 1.000 | 2.000 | 13530 | 205 | 0.4 |
| 2.50 | 3 | 85 | 0.005 | 1.250 | 2.500 | 10825 | 160 | 0.5 |
| 3.00 | 3 | 85 | 0.010 | 1.500 | 3.000 | 9020 | 270 | 1.2 |
| 3.50 | 3 | 85 | 0.010 | 1.750 | 3.500 | 7730 | 230 | 1.4 |
| 4.00 | 3 | 85 | 0.010 | 2.000 | 4.000 | 6765 | 205 | 1.6 |
| 5.00 | 3 | 85 | 0.015 | 2.500 | 5.000 | 5410 | 245 | 3.0 |
| 6.00 | 3 | 85 | 0.015 | 3.000 | 6.000 | 4510 | 205 | 3.7 |
| 7.00 | 3 | 85 | 0.020 | 3.500 | 7.000 | 3865 | 230 | 5.7 |
| 8.00 | 3 | 85 | 0.020 | 4.000 | 8.000 | 3380 | 205 | 6.5 |
| 2.00 | 3 | 60 | 0.005 | 1.000 | 2.000 | 9550 | 145 | 0.3 |
| 2.50 | 3 | 60 | 0.005 | 1.250 | 2.500 | 7640 | 115 | 0.4 |
| 3.00 | 3 | 60 | 0.010 | 1.500 | 3.000 | 6365 | 190 | 0.9 |
| 3.50 | 3 | 60 | 0.010 | 1.750 | 3.500 | 5455 | 165 | 1.0 |
| 4.00 | 3 | 60 | 0.010 | 2.000 | 4.000 | 4775 | 145 | 1.1 |
| 5.00 | 3 | 60 | 0.015 | 2.500 | 5.000 | 3820 | 170 | 2.1 |
| 6.00 | 3 | 60 | 0.015 | 3.000 | 6.000 | 3185 | 145 | 2.6 |
| 7.00 | 3 | 60 | 0.020 | 3.500 | 7.000 | 2730 | 165 | 4.0 |
| 8.00 | 3 | 60 | 0.020 | 4.000 | 8.000 | 2385 | 145 | 4.6 |
| 2.00 | 3 | 40 | 0.005 | 1.000 | 2.000 | 6365 | 95 | 0.2 |
| 2.50 | 3 | 40 | 0.005 | 1.250 | 2.500 | 5095 | 75 | 0.2 |
| 3.00 | 3 | 40 | 0.010 | 1.500 | 3.000 | 4245 | 125 | 0.6 |
| 3.50 | 3 | 40 | 0.010 | 1.750 | 3.500 | 3640 | 110 | 0.7 |
| 4.00 | 3 | 40 | 0.010 | 2.000 | 4.000 | 3185 | 95 | 0.8 |
| 5.00 | 3 | 40 | 0.015 | 2.500 | 5.000 | 2545 | 115 | 1.4 |
| 6.00 | 3 | 40 | 0.015 | 3.000 | 6.000 | 2120 | 95 | 1.7 |
| 7.00 | 3 | 40 | 0.020 | 3.500 | 7.000 | 1820 | 110 | 2.7 |
| 8.00 | 3 | 40 | 0.020 | 4.000 | 8.000 | 1590 | 95 | 3.1 |
| 2.00 | 3 | 105 | 0.005 | 1.000 | 2.000 | 16710 | 250 | 0.5 |
| 2.50 | 3 | 105 | 0.010 | 1.250 | 2.500 | 13370 | 400 | 1.3 |
| 3.00 | 3 | 105 | 0.010 | 1.500 | 3.000 | 11140 | 335 | 1.5 |
| 3.50 | 3 | 105 | 0.010 | 1.750 | 3.500 | 9550 | 285 | 1.8 |
| 4.00 | 3 | 105 | 0.010 | 2.000 | 4.000 | 8355 | 250 | 2.0 |
| 5.00 | 3 | 105 | 0.015 | 2.500 | 5.000 | 6685 | 300 | 3.8 |
| 6.00 | 3 | 105 | 0.020 | 3.000 | 6.000 | 5570 | 335 | 6.0 |
| 7.00 | 3 | 105 | 0.020 | 3.500 | 7.000 | 4775 | 285 | 7.0 |
| 8.00 | 3 | 105 | 0.025 | 4.000 | 8.000 | 4180 | 315 | 10.0 |

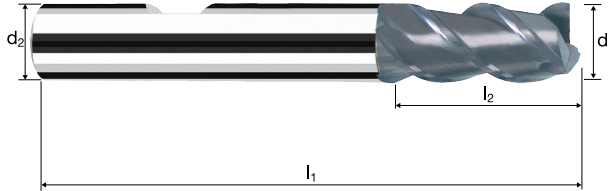
Cylindrical end mills

Smooth-edged, normal version



HM
MG10

λ 45°
 γ 15°



Roughing

Finishing

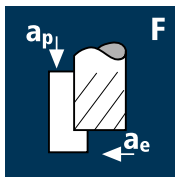


ToolSchool

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

| Ø Code | d ₁ e8 | d ₂ h6 | l ₁ | l ₂ | l ₄ | 45° | α | z | POLYCHROM | |
|-----------|----------------------|----------------------|----------------|----------------|----------------|------|------|---|-----------|-------|
| | | | | | | | | | 5330 | P5330 |
| 410 | 8.50 | 10.00 | 72 | 16.00 | 21.66 | 0.20 | 2.5° | 3 | ● | ● |
| 420 | 9.00 | 10.00 | 72 | 16.00 | 20.72 | 0.20 | 1.5° | 3 | ● | ● |
| 430 | 9.50 | 10.00 | 72 | 19.00 | 22.79 | 0.20 | 1.0° | 3 | ● | ● |
| 450 | 10.00 | 10.00 | 72 | 19.00 | - | 0.20 | 0.0° | 3 | ● | ● |
| 470 | 11.00 | 12.00 | 83 | 22.00 | 27.22 | 0.20 | 1.5° | 3 | ● | ● |
| 501 | 12.00 | 12.00 | 83 | 22.00 | - | 0.20 | 0.0° | 3 | ● | ● |
| 540 | 13.00 | 14.00 | 83 | 22.00 | 27.22 | 0.20 | 1.5° | 3 | ● | ● |
| 570 | 14.00 | 14.00 | 83 | 22.00 | - | 0.20 | 0.0° | 3 | ● | ● |
| 581 | 15.00 | 16.00 | 92 | 26.00 | 31.22 | 0.20 | 1.0° | 3 | ● | ● |
| 610 | 16.00 | 16.00 | 92 | 26.00 | - | 0.20 | 0.0° | 3 | ● | ● |
| 640 | 18.00 | 18.00 | 92 | 26.00 | - | 0.20 | 0.0° | 3 | ● | ● |
| 682 | 20.00 | 20.00 | 104 | 32.00 | - | 0.20 | 0.0° | 3 | ● | ● |
| 710 | 22.00 | 20.00 | 104 | 38.00 | - | 0.25 | 0.0° | 3 | ● | ● |
| 772 | 25.00 | 25.00 | 121 | 45.00 | - | 0.25 | 0.0° | 3 | ● | ● |

Application



Material

Steel
< 850 N/mm²

P

P

Steel
850 - 1100 N/mm²

P

P

Stainless steel
[Cr-Ni/1.4301]

P

Cast iron
(lamellar / spheroidal)

P

P



Steel
< 850 N/mm²

P

P

Steel
850 - 1100 N/mm²

P

P

Stainless steel
[Cr-Ni/1.4301]

P

Cast iron
(lamellar / spheroidal)

P

P

| d1 [mm] | z | v _c [m/min] | f _s [mm] | a _p [mm] | a _e [mm] | n [min ⁻¹] | v _r [mm/min] | Q [cm ³ /min] |
|---------|---|------------------------|---------------------|---------------------|---------------------|------------------------|-------------------------|--------------------------|
| 9.00 | 3 | 115 | 0.030 | 13.500 | 0.900 | 4065 | 365 | 4.4 |
| 10.00 | 3 | 115 | 0.035 | 15.000 | 1.000 | 3660 | 385 | 5.8 |
| 12.00 | 3 | 115 | 0.040 | 18.000 | 1.200 | 3050 | 365 | 7.9 |
| 14.00 | 3 | 115 | 0.045 | 21.000 | 1.400 | 2615 | 355 | 10.4 |
| 16.00 | 3 | 115 | 0.055 | 24.000 | 1.600 | 2290 | 375 | 14.5 |
| 18.00 | 3 | 115 | 0.060 | 27.000 | 1.800 | 2035 | 365 | 17.8 |
| 20.00 | 3 | 115 | 0.065 | 30.000 | 2.000 | 1830 | 355 | 21.4 |
| 22.00 | 3 | 115 | 0.075 | 33.000 | 2.200 | 1665 | 375 | 27.2 |
| 25.00 | 3 | 115 | 0.085 | 37.500 | 2.500 | 1465 | 375 | 35.0 |
| 9.00 | 3 | 75 | 0.030 | 13.500 | 0.900 | 2655 | 240 | 2.9 |
| 10.00 | 3 | 75 | 0.035 | 15.000 | 1.000 | 2385 | 250 | 3.8 |
| 12.00 | 3 | 75 | 0.040 | 18.000 | 1.200 | 1990 | 240 | 5.2 |
| 14.00 | 3 | 75 | 0.045 | 21.000 | 1.400 | 1705 | 230 | 6.8 |
| 16.00 | 3 | 75 | 0.055 | 24.000 | 1.600 | 1490 | 245 | 9.5 |
| 18.00 | 3 | 75 | 0.060 | 27.000 | 1.800 | 1325 | 240 | 11.6 |
| 20.00 | 3 | 75 | 0.065 | 30.000 | 2.000 | 1195 | 235 | 14.0 |
| 22.00 | 3 | 75 | 0.075 | 33.000 | 2.200 | 1085 | 245 | 17.7 |
| 25.00 | 3 | 75 | 0.085 | 37.500 | 2.500 | 955 | 245 | 22.8 |
| 9.00 | 3 | 60 | 0.030 | 13.500 | 0.900 | 2120 | 190 | 2.3 |
| 10.00 | 3 | 60 | 0.035 | 15.000 | 1.000 | 1910 | 200 | 3.0 |
| 12.00 | 3 | 60 | 0.040 | 18.000 | 1.200 | 1590 | 190 | 4.1 |
| 14.00 | 3 | 60 | 0.045 | 21.000 | 1.400 | 1365 | 185 | 5.4 |
| 16.00 | 3 | 60 | 0.055 | 24.000 | 1.600 | 1195 | 195 | 7.6 |
| 18.00 | 3 | 60 | 0.060 | 27.000 | 1.800 | 1060 | 190 | 9.3 |
| 20.00 | 3 | 60 | 0.065 | 30.000 | 2.000 | 955 | 185 | 11.2 |
| 22.00 | 3 | 60 | 0.075 | 33.000 | 2.200 | 870 | 195 | 14.2 |
| 25.00 | 3 | 60 | 0.085 | 37.500 | 2.500 | 765 | 195 | 18.3 |
| 9.00 | 3 | 150 | 0.030 | 13.500 | 0.900 | 5305 | 475 | 5.8 |
| 10.00 | 3 | 150 | 0.035 | 15.000 | 1.000 | 4775 | 500 | 7.5 |
| 12.00 | 3 | 150 | 0.040 | 18.000 | 1.200 | 3980 | 475 | 10.3 |
| 14.00 | 3 | 150 | 0.045 | 21.000 | 1.400 | 3410 | 460 | 13.5 |
| 16.00 | 3 | 150 | 0.055 | 24.000 | 1.600 | 2985 | 490 | 18.9 |
| 18.00 | 3 | 150 | 0.060 | 27.000 | 1.800 | 2655 | 475 | 23.2 |
| 20.00 | 3 | 150 | 0.065 | 30.000 | 2.000 | 2385 | 465 | 27.9 |
| 22.00 | 3 | 150 | 0.075 | 33.000 | 2.200 | 2170 | 490 | 35.5 |
| 25.00 | 3 | 150 | 0.085 | 37.500 | 2.500 | 1910 | 485 | 45.7 |
| 9.00 | 3 | 85 | 0.025 | 4.500 | 9.000 | 3005 | 225 | 9.1 |
| 10.00 | 3 | 85 | 0.030 | 5.000 | 10.000 | 2705 | 245 | 12.2 |
| 12.00 | 3 | 85 | 0.035 | 6.000 | 12.000 | 2255 | 235 | 17.0 |
| 14.00 | 3 | 85 | 0.040 | 7.000 | 14.000 | 1935 | 230 | 22.7 |
| 16.00 | 3 | 85 | 0.045 | 8.000 | 16.000 | 1690 | 230 | 29.2 |
| 18.00 | 3 | 85 | 0.050 | 9.000 | 18.000 | 1505 | 225 | 36.5 |
| 20.00 | 3 | 85 | 0.055 | 10.000 | 20.000 | 1355 | 225 | 44.6 |
| 22.00 | 3 | 85 | 0.060 | 11.000 | 22.000 | 1230 | 220 | 53.6 |
| 25.00 | 3 | 85 | 0.070 | 12.500 | 25.000 | 1080 | 225 | 71.0 |
| 9.00 | 3 | 60 | 0.025 | 4.500 | 9.000 | 2120 | 160 | 6.4 |
| 10.00 | 3 | 60 | 0.025 | 5.000 | 10.000 | 1910 | 145 | 7.2 |
| 12.00 | 3 | 60 | 0.030 | 6.000 | 12.000 | 1590 | 145 | 10.3 |
| 14.00 | 3 | 60 | 0.035 | 7.000 | 14.000 | 1365 | 145 | 14.0 |
| 16.00 | 3 | 60 | 0.040 | 8.000 | 16.000 | 1195 | 145 | 18.3 |
| 18.00 | 3 | 60 | 0.045 | 9.000 | 18.000 | 1060 | 145 | 23.2 |
| 20.00 | 3 | 60 | 0.050 | 10.000 | 20.000 | 955 | 145 | 28.6 |
| 22.00 | 3 | 60 | 0.055 | 11.000 | 22.000 | 870 | 145 | 34.7 |
| 25.00 | 3 | 60 | 0.065 | 12.500 | 25.000 | 765 | 150 | 46.6 |
| 9.00 | 3 | 40 | 0.025 | 4.500 | 9.000 | 1415 | 105 | 4.3 |
| 10.00 | 3 | 40 | 0.025 | 5.000 | 10.000 | 1275 | 95 | 4.8 |
| 12.00 | 3 | 40 | 0.030 | 6.000 | 12.000 | 1060 | 95 | 6.9 |
| 14.00 | 3 | 40 | 0.035 | 7.000 | 14.000 | 910 | 95 | 9.4 |
| 16.00 | 3 | 40 | 0.040 | 8.000 | 16.000 | 795 | 95 | 12.2 |
| 18.00 | 3 | 40 | 0.045 | 9.000 | 18.000 | 705 | 95 | 15.5 |
| 20.00 | 3 | 40 | 0.050 | 10.000 | 20.000 | 635 | 95 | 19.1 |
| 22.00 | 3 | 40 | 0.055 | 11.000 | 22.000 | 580 | 95 | 23.1 |
| 25.00 | 3 | 40 | 0.065 | 12.500 | 25.000 | 510 | 100 | 31.0 |
| 9.00 | 3 | 105 | 0.030 | 4.500 | 9.000 | 3715 | 335 | 13.5 |
| 10.00 | 3 | 105 | 0.030 | 5.000 | 10.000 | 3340 | 300 | 15.0 |
| 12.00 | 3 | 105 | 0.035 | 6.000 | 12.000 | 2785 | 290 | 21.1 |
| 14.00 | 3 | 105 | 0.045 | 7.000 | 14.000 | 2385 | 320 | 31.6 |
| 16.00 | 3 | 105 | 0.050 | 8.000 | 16.000 | 2090 | 315 | 40.1 |
| 18.00 | 3 | 105 | 0.055 | 9.000 | 18.000 | 1855 | 305 | 49.6 |
| 20.00 | 3 | 105 | 0.060 | 10.000 | 20.000 | 1670 | 300 | 60.2 |
| 22.00 | 3 | 105 | 0.065 | 11.000 | 22.000 | 1520 | 295 | 71.7 |
| 25.00 | 3 | 105 | 0.075 | 12.500 | 25.000 | 1335 | 300 | 94.0 |