



COLD DRAWN SEAMLESS ROUND TUBING - ASTM A519
Outside and Inside Diameter Tolerances (inches) (a,b,c)

| Outside Diameter Size Range in. (d) | Wall Thickness as Percent of OD | Thermal Treatment after Final Cold Work Producing Size | | | | | | | |
|-------------------------------------|---------------------------------|--|-------|-------------|-------|--|-------|-------------|-------|
| | | None, or not exceeding 1100°F. Nominal Temperature | | | | Heated Above 1100°F. Nominal Temperature Without Accelerated Cooling | | | |
| | | OD, in. (d) | | ID, in. (d) | | OD, in. (d) | | ID, in. (d) | |
| | | Over | Under | Over | Under | Over | Under | Over | Under |
| Up to 0.499 | All | 0.004 | 0.000 | — | — | 0.005 | 0.002 | — | — |
| 0.500-1.699 | All | 0.005 | 0.000 | 0.000 | 0.005 | 0.007 | 0.002 | 0.002 | 0.007 |
| 1.700-2.099 | All | 0.006 | 0.000 | 0.000 | 0.006 | 0.006 | 0.005 | 0.005 | 0.006 |
| 2.100-2.499 | All | 0.007 | 0.000 | 0.000 | 0.007 | 0.008 | 0.005 | 0.005 | 0.008 |
| 2.500-2.899 | All | 0.008 | 0.000 | 0.000 | 0.008 | 0.009 | 0.005 | 0.005 | 0.009 |
| 2.900-3.299 | All | 0.009 | 0.000 | 0.000 | 0.009 | 0.011 | 0.005 | 0.005 | 0.011 |
| 3.300-3.699 | All | 0.010 | 0.000 | 0.000 | 0.010 | 0.013 | 0.005 | 0.005 | 0.013 |
| 3.700-4.099 | All | 0.011 | 0.000 | 0.000 | 0.011 | 0.013 | 0.007 | 0.010 | 0.010 |
| 4.100-4.499 | All | 0.012 | 0.000 | 0.000 | 0.012 | 0.014 | 0.007 | 0.011 | 0.011 |
| 4.500-4.899 | All | 0.013 | 0.000 | 0.000 | 0.013 | 0.016 | 0.007 | 0.012 | 0.012 |
| 4.900-5.299 | All | 0.014 | 0.000 | 0.000 | 0.014 | 0.018 | 0.007 | 0.013 | 0.013 |
| 5.300-5.549 | All | 0.015 | 0.000 | 0.000 | 0.015 | 0.020 | 0.007 | 0.014 | 0.014 |
| 5.500-5.559 | Under 6 | 0.010 | 0.010 | 0.010 | 0.010 | 0.018 | 0.018 | 0.018 | 0.018 |
| | 6 to 7-1/2 | 0.009 | 0.009 | 0.009 | 0.009 | 0.016 | 0.016 | 0.016 | 0.016 |
| | over 7-1/2 | 0.018 | 0.000 | 0.009 | 0.009 | 0.017 | 0.015 | 0.016 | 0.016 |
| 6.000-6.499 | Under 6 | 0.013 | 0.013 | 0.013 | 0.013 | 0.023 | 0.023 | 0.023 | 0.023 |
| | 6 to 7-1/2 | 0.010 | 0.010 | 0.010 | 0.010 | 0.018 | 0.018 | 0.018 | 0.018 |
| | over 7-1/2 | 0.020 | 0.000 | 0.010 | 0.010 | 0.020 | 0.015 | 0.018 | 0.018 |
| 6.500-6.999 | Under 6 | 0.015 | 0.015 | 0.015 | 0.015 | 0.027 | 0.027 | 0.027 | 0.027 |
| | 6 to 7-1/2 | 0.012 | 0.012 | 0.012 | 0.012 | 0.021 | 0.021 | 0.021 | 0.021 |
| | over 7-1/2 | 0.023 | 0.000 | 0.012 | 0.012 | 0.026 | 0.015 | 0.021 | 0.021 |
| 7.000-7.499 | Under 6 | 0.018 | 0.018 | 0.018 | 0.018 | 0.032 | 0.032 | 0.032 | 0.032 |
| | 6 to 7-1/2 | 0.013 | 0.013 | 0.013 | 0.013 | 0.023 | 0.023 | 0.023 | 0.023 |
| | over 7-1/2 | 0.026 | 0.000 | 0.013 | 0.013 | 0.031 | 0.015 | 0.023 | 0.023 |
| 7.500-7.999 | Under 6 | 0.020 | 0.020 | 0.020 | 0.020 | 0.035 | 0.035 | 0.035 | 0.035 |
| | 6 to 7-1/2 | 0.015 | 0.015 | 0.015 | 0.015 | 0.026 | 0.026 | 0.026 | 0.026 |
| | over 7-1/2 | 0.029 | 0.000 | 0.015 | 0.015 | 0.036 | 0.015 | 0.026 | 0.026 |
| 8.000-8.499 | Under 6 | 0.023 | 0.023 | 0.023 | 0.023 | 0.041 | 0.041 | 0.041 | 0.041 |
| | 6 to 7-1/2 | 0.016 | 0.016 | 0.016 | 0.016 | 0.028 | 0.028 | 0.028 | 0.028 |
| | over 7 1/4 | 0.031 | 0.000 | 0.015 | 0.016 | 0.033 | 0.022 | 0.028 | 0.028 |
| 8.500-8.999 | Under 6 | 0.025 | 0.025 | 0.025 | 0.025 | 0.044 | 0.044 | 0.044 | 0.044 |
| | 6 to 7-1/2 | 0.017 | 0.017 | 0.017 | 0.017 | 0.030 | 0.030 | 0.030 | 0.030 |
| | over 7-1/2 | 0.034 | 0.000 | 0.015 | 0.019 | 0.038 | 0.022 | 0.030 | 0.030 |
| 9.000-9.499 | Under 6 | 0.028 | 0.028 | 0.028 | 0.028 | 0.045 | 0.045 | 0.049 | 0.049 |
| | 6 to 7-1/2 | 0.019 | 0.019 | 0.019 | 0.019 | 0.033 | 0.033 | 0.033 | 0.033 |
| | over 7-1/2 | 0.037 | 0.000 | 0.015 | 0.022 | 0.043 | 0.022 | 0.033 | 0.033 |
| 9.500-9.999 | Under 6 | 0.030 | 0.030 | 0.030 | 0.030 | 0.045 | 0.045 | 0.053 | 0.053 |
| | 6 to 7-1/2 | 0.020 | 0.020 | 0.020 | 0.020 | 0.035 | 0.035 | 0.035 | 0.035 |
| | over 7-1/2 | 0.040 | 0.000 | 0.015 | 0.025 | 0.048 | 0.022 | 0.035 | 0.035 |
| 10.000-10.999 | Under 6 | 0.034 | 0.034 | 0.034 | 0.034 | 0.045 | 0.045 | 0.060 | 0.060 |
| | 6 to 7-1/2 | 0.022 | 0.022 | 0.022 | 0.022 | 0.039 | 0.039 | 0.039 | 0.039 |
| | over 7-1/2 | 0.044 | 0.000 | 0.015 | 0.029 | 0.055 | 0.022 | 0.039 | 0.039 |
| 11.000-12.000 | Under 6 | 0.035 | 0.035 | 0.035 | 0.035 | 0.050 | 0.050 | 0.065 | 0.065 |
| | 6 to 7- 1/2 | 0.025 | 0.025 | 0.025 | 0.025 | 0.045 | 0.045 | 0.045 | 0.045 |
| | over 7-1/2 | 0.045 | 0.000 | 0.015 | 0.035 | 0.060 | 0.022 | 0.045 | 0.045 |

- (a) Many tubes with inside diameter less than 50% of outside diameter or with wall thickness more than 25% of outside diameter, or with wall thickness over 1-¼ in., or weighing more than 90 lb./ft., are difficult to draw over a mandrel. Therefore, the inside diameter can vary over or under by an amount equal to 10% of the wall thickness. See also Footnote B.
- (b) For those tubes with inside diameter less than 1/2 in. (or less than 5/8 in. when the wall thickness is more than 20% of the outside diameter), which are not commonly drawn over a mandrel, Footnote A is not applicable. Therefore, for those tubes, the inside diameter is governed by the outside diameter tolerance shown in this table and the wall thickness tolerances shown in Table 9.
- (c) Tubing having a wall thickness less than 3% of the outside diameter cannot be straightened properly without a certain amount of distortion. Consequently such tubes, while having an average outside diameter and inside diameter within the tolerances shown in this table, require an ovality tolerance of 1/2 % over and under nominal outside diameter, this being in addition to the tolerances indicated in this table.
- (d) Larger sizes are available. Consult manufacturer for sizes and tolerances.

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| COLD DRAWN SEAMLESS ROUND TUBING - ASTM A519 | | |
|--|--|---------------------------|
| Wall Thickness Tolerances (inches) | | |
| Wall thickness range as % of Outside Diameter | Wall Thickness Tolerance Over and Under Nominal % | |
| | Up to 1.499 in. ID | 1.500 in. and Over |
| 25 and under | 10.0 | 7.5 |
| over 25 | 12.5 | 10.0 |

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