



CARBON COLD FINISH STEEL BARS - ASTM A108

A108, Table A1.1 Size Tolerances for Level One Cold-Finished Carbon Steel Bars, Cold Drawn or Turned and Polished

Size, in. (a)	Maximum of Carbon Range 0.28% or less	Maximum of Carbon Range over 0.28% to 0.55% incl.	Maximum of Carbon Range to 0.55% incl, Stress Relieved or Annealed after Cold Finishing	Maximum of Carbon Range over 0.55% or All Grades Quenched and Tempered or Normalized and Tempered before Cold Finishing
All tolerances are in inches and are minus (b)				
Rounds - Cold Drawn (c) to 6 in. or Turned and Polished				
To 1 1/2 incl, in coils, or cut lengths	0.002	0.003	0.004	0.005
Over 1 1/2 to 2 1/2 incl	0.003	0.004	0.005	0.006
Over 2 1/2 to 4 incl	0.004	0.005	0.006	0.007
Over 4 to 6 incl	0.005	0.006	0.007	0.008
Over 6 to 8 incl	0.006	0.007	0.008	0.009
Over 8 to 9 incl	0.007	0.008	0.009	0.010
Hexagons				
To 3/4 incl.	0.002	0.003	0.004	0.006
Over 3/4 to 1 1/2 incl	0.003	0.004	0.005	0.007
Over 1 1/2 to 2 1/2 incl	0.004	0.005	0.006	0.008
Over 2 1/2 to 3 1/8 incl	0.005	0.006	0.007	0.009
Over 3 1/8 to 4 incl	0.005	0.006		
Squares				
To 3/4 incl.	0.002	0.004	0.005	0.007
Over 3/4 to 1 1/2 incl	0.003	0.005	0.006	0.008
Over 1 1/2 to 2 1/2 incl	0.004	0.006	0.007	0.009
Over 2 1/2 to 4 incl	0.006	0.008	0.009	0.011
Over 4 to 5 incl	0.010			
Over 5 to 6 incl	0.014			

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Flats (d)				
<i>Width:</i>				
To 3/4 incl.	0.003	0.004	0.006	0.008
Over 3/4 to 1 1/2 incl	0.004	0.005	0.008	0.010
Over 1 1/2 to 3 incl	0.005	0.006	0.010	0.012
Over 3 to 4 incl	0.006	0.008	0.011	0.016
Over 4 to 6 incl	0.008	0.010	0.012	0.020
Over 6	0.013	0.015		

- (a) Standard manufacturing practice is shear cut for cold drawn bars (size limits vary by producer) which can cause end distortion resulting in those portions of the bar being outside the applicable size tolerance. When this end condition is undesirable, a saw cut end to remove end distortion should be considered.
- (b) While size tolerances are usually specified as minus, tolerances may be ordered all plus, or distributed plus and minus, with the sum being equivalent to the tolerances listed.
- (c) Maximum allowable deviation in roundness around the circumference of the same cross-section of a round cold drawn bar is 1/2 the size tolerance range.
- (d) Width governs the tolerances for both width and thickness of flats. For example, when the maximum of carbon range is 0.28 % or less, for a flat 2 in. (50.80 mm) wide and 1 in. (25.40 mm) thick, the width tolerance is 0.005 in. (0.127 mm) and the thickness tolerance is the same, namely, 0.005 in. (.127 mm).

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A108, Table A1.4 Straightness Tolerances for Level One Cold Finished Bars (a,b)					
Note: All grades quenched and tempered or normalized and tempered to Brinell 302 max before cold finishing; all grades stress relieved or annealed after cold finishing. Straightness tolerances are not applicable to bars having Brinell hardness exceeding 302.					
		Straightness Tolerances, in. (Maximum Deviation) from Straightness in any 10-ft Portion of the bar			
		Maximum of Carbon Range, 0.28% or less		Maximum of Carbon Range, over 0.28% and All Grades Thermally Treated	
Size, in. (a)	Length, ft.	Rounds	Squares, Hexagons, and Octagons	Rounds	Square, Hexagons, and Octagons
Less than 5/8	Less than 15	1/8	3/16	3/16	1/4
Less than 5/8	15 and over	1/8	5/16	5/16	3/8
5/8 and over	Less than 15	1/16	1/8	1/8	3/16
5/8 and over	15 and over	1/8	3/16	3/16	1/4

- (a) The foregoing tolerances are based on the following method of measuring straightness: Departure from straightness is measured by placing the bar on a level table so that the arc or departure from straightness is horizontal, and the depth of the arc is measured with a feeler gage and a straightedge.
- (b) It should be recognized that straightness is a perishable quality and may be altered by mishandling. The preservation of straightness in cold finished bars requires the utmost care in subsequent handling. Specific straightness tolerances are sometimes required for carbon and alloy steels in which case the purchaser should inform the manufacturer of the straightness tolerances and the methods to be used in checking the straightness.

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