

# ASTM A-249 WELDED TUBING

## WALL THICKNESS

Wall thickness tolerances shall be +/- 10% of nominal wall for all tubing.

### Permissible Variations in Outside Diameter<sup>A, B</sup>

Outside Diameter, in. (mm)	Permissible Variations, in. (mm)	
	Over	Under
Welded Tubes and Cold-Finished Seamless Tubes		
Under 1 (25.4)	0.004 (0.1)	0.004 (0.1)
1 to 1 1/2 (25.4 to 38.1), incl	0.006 (0.15)	0.006 (0.15)
Over 1 1/2 to 2 (38.1 to 50.8), excl	0.008 (0.2)	0.008 (0.2)
2 to 2 1/2 (50.8 to 63.5), excl	0.010 (0.25)	0.010 (0.25)
2 1/2 to 3 (63.5 to 76.2), excl	0.012 (0.3)	0.012 (0.3)
3 to 4 (76.2 to 101.6), incl	0.015 (0.38)	0.015 (0.38)
Over 4 to 7 1/2 (101.6 to 190.5), incl	0.015 (0.38)	0.025 (0.64)
Over 7 1/2 to 9 (190.5 to 228.6), incl	0.015 (0.38)	0.045 (1.14)

<sup>A</sup> Except as provided in <sup>B</sup> below, these permissible variations include out-of-roundness. These permissible variations in outside diameter apply to hot-finished seamless, welded and cold-finished seamless tubes before other fabricating operations such as upsetting, swaging, expanding, bending, or polishing.

<sup>B</sup> The diameter tolerances are not sufficient to provide for additional ovality expected in thin-wall tubes, and, for such tubes, are applicable only to the mean of the extreme (maximum and minimum) outside diameter readings in any one cross section. However, for thin wall tubes the *difference* in extreme outside diameter readings (ovality) in any one cross section shall not exceed the following ovality allowances:

Outside Diameter	Ovality Allowance
1 in. (25.4 mm) and under	0.020 in. (0.5 mm)
Over 1 in. (25.4 mm)	2.0 % of specified outside diameter

# ASTM A-269 SEAMLESS AND WELDED TUBING

## Permissible Variations in Dimensions<sup>A</sup>

Group	Size, Outside Diameter, in.	Permissible Variations in Outside Diameter, in. (mm)	Permissible Variations in Wall Thickness, <sup>B</sup> %	Permissible Variations in Cut Length, in. (mm) <sup>C</sup>		Thin Walled Tubes <sup>D</sup>
				Over	Under	
1	Up to 1/2	±0.005 (0.13)	±15	1/8 (3.2)	0	...
2	1/2 to 1 1/2, excl	±0.005 (0.13)	±10	1/8 (3.2)	0	< 0.065 in. (1.65 mm) nominal
3	1 1/2 to 3 1/2, excl	±0.010 (0.25)	±10	3/16 (4.8)	0	< 0.095 in. (2.41 mm) nominal
4	3 1/2 to 5 1/2, excl	±0.015 (0.38)	±10	3/16 (4.8)	0	< 0.150 in. (3.81 mm) nominal
5	5 1/2 to 8, excl	±0.030 (0.76)	±10	3/16 (4.8)	0	< 0.150 in. (3.81 mm) nominal

**A** Variations in outside diameter, wall thickness, and length, from those specified, shall not exceed the amounts prescribed in above table.

**B** When tubes as ordered require wall thicknesses 3/4 in. (19.0 mm) or over, or an inside diameter 60 % or less of the outside diameter, a wider variation in wall thickness is required. On such sizes a variation in wall thickness of 12.5 % over or under will be permitted. For tubes less than 1/2 in. (12.7 mm) in inside diameter which cannot be successfully drawn over a mandrel, the wall thickness may vary ±15 % from that specified.

**C** These tolerances apply to cut lengths up to and including 24 ft (7.3 m). For lengths greater than 24 ft (7.3 m), the above over tolerances shall be increased by 1/8 in.

**D** The permissible variations in outside diameter are not sufficient to provide for ovality in thin-walled tubes, as defined in the table. In such tubes, the maximum and minimum diameters at any cross section shall deviate from the nominal diameter by no more than twice the permissible variation in outside diameter given in above table; however, the mean diameter at that cross section must still be within the given permissible variation.