

AEROSPACE

MATERIAL SPECIFICATIONS

SOCIETY OF AUTOMOTIVE ENGINEERS, Inc.

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AMS 2243D

Issued 5-1-45

Revised 1-15-62

TOLERANCES

Corrosion and Heat Resistant Steel Tubing

1. PURPOSE: To publish established manufacturing tolerances.
2. APPLICATION: Tolerances shown herein apply, unless otherwise agreed upon by purchaser and vendor. These tolerances apply to all conditions and are based on individual measurements, unless otherwise noted. The term "excl" is used to apply only to the higher figure of the specified range. Ovality is the difference between the maximum and minimum diameters of any one section of a tube.
3. DIAMETER:
 - 3.1 Seamless, Cold Finished:

TABLE I

Nominal OD (See Note 1) Inches	Nominal Wall Thickness Inch	Tolerance, Inch,	
		Cold Drawn, Annealed or Solution Heat Treated	
		Mean OD (See Notes 2, 3 & 4)	Ovality
		Plus and Minus	
0.500 and under	Under 0.015	0.005	0.010
0.500 and under	0.015 and over	0.005	--
0.500 to 1.500, excl	Under 0.065	0.005	0.010
0.500 to 1.500, excl	0.065 and over	0.005	--
1.500 to 3.500, excl	Under 0.095	0.010	0.020
1.500 to 3.500, excl	0.095 and over	0.010	--
3.500 to 5.500, excl	Under 0.150	0.015	0.030
3.500 to 5.500, excl	0.150 and over	0.015	--
5.500 to 8.000, excl	Under 0.240	0.030	0.060
5.500 to 8.000, excl	0.240 and over	0.030	--
8.000 to 8.625, incl	Under 0.300	0.045	0.090
8.000 to 8.625, incl	0.300 and over	0.045	--

Note 1. When specified on the purchase order, OD tolerances in Tables I shall apply to the ID instead, but not to both ID and OD of the same lot of tubing.

Note 2. Special Tolerance Tubing: Up to 1.500 in. OD, when special tolerance tubing is required by specification, drawing or purchase order, tolerances for ovality do not apply.

Note 3. Mean diameter is the average of two measurements taken at right angles to each other.

Note 4. For annealed tubing larger than 0.500 in. OD having wall thickness less than 2% of the OD, ovality tolerances shall be as agreed upon by purchaser and vendor.

3.2 Welded:

TABLE III

Nominal OD Inches	Nominal Wall Thickness Inch	Tolerance, Inch (See Notes 5 & 6) Plus and Minus		
		OD	ID	Ovality
Under 0.094	3% or less of nominal OD	0.001	0.001	0.001
Under 0.094	Over 3% of nominal OD	0.001	0.001	--
0.094 to 0.1875, excl	3% or less of nominal OD	0.0015	0.0015	0.0015
0.094 to 0.1875, excl	Over 3% of nominal OD	0.0015	0.0015	--
0.1875 to 0.500, excl	3% or less of nominal OD	0.003	0.005	0.003
0.1875 to 0.500, excl	Over 3% of nominal OD	0.003	0.005	--
0.500 to 1.000, excl	3% or less of nominal OD	0.004	0.006	0.004
0.500 to 1.000, excl	Over 3% of nominal OD	0.004	0.006	--
1.000 to 1.500, excl	3% or less of nominal OD	0.005	0.007	0.005
1.000 to 1.500, excl	Over 3% of nominal OD	0.005	0.007	--
1.500 to 2.000, excl	3% or less of nominal OD	0.006	0.008	0.006
1.500 to 2.000, excl	Over 3% of nominal OD	0.006	0.008	--
2.000 to 2.500, excl	3% or less of nominal OD	0.007	0.010	0.007
2.000 to 2.500, excl	Over 3% of nominal OD	0.007	0.010	--
2.500 to 3.500, excl	3% or less of nominal OD	0.010	0.014	0.010
2.500 to 3.500, excl	Over 3% of nominal OD	0.010	0.014	--
3.500 to 5.000, excl	3% or less of nominal OD	0.015	0.020	0.015
3.500 to 5.000, excl	Over 3% of nominal OD	0.015	0.020	--

Note 5. OD and ID tolerances shall not both apply to the same lot of tubing.

Note 6. For tubing with wall thickness 3% or less of nominal OD, OD tolerances apply to mean OD.

4. WALL THICKNESS:

4.1 Seamless, Cold Finished:

TABLE IV

Nominal OD Inches	Tolerance, % (See Notes 7 & 8) Plus and Minus	
Under 0.500		15
0.500 to 1.500, excl		10
1.500 to 3.500, excl		10
3.500 to 5.500, excl		10
5.500 to 8.000, excl		10
8.000 to 8.625, incl		10

Note 7. For tubes with ID 0.500 and over, or over 0.625 in. when wall thickness is over 20% of OD, where wall thickness is greater than 1.250 in. or 25% of OD and for tubing weighing more than 90 lb per ft, wall thickness tolerance shall be $\pm 12.5\%$.