



Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing (Small-Diameter) for General Service¹

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1. Scope

1.1 This specification covers grades of stainless steel tubing in sizes under ½ down to 0.050 in. (12.7 to 1.27 mm) in outside diameter and wall thicknesses less than 0.065 in. down to 0.005 in. (1.65 to 0.13 mm) for general corrosion-resisting and low- or high-temperature service, as designated in Table 1.

NOTE 1—The grades of austenitic stainless steel tubing furnished in accordance with this specification have been found suitable for low-temperature service down to –325°F (–200°C) in which Charpy notched-bar impact values of 15 ft-lbf (20 J), minimum, are required and these grades need not be impact tested.

1.2 Optional supplementary requirements are provided and, when desired, shall be so stated in the order.

1.3 The values stated in inch-pound units are to be regarded as the standard.

2. Referenced Documents

2.1 ASTM Standards:

A 262 Practices for Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels²

A 370 Test Methods and Definitions for Mechanical Testing of Steel Products³

A 751 Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products³

A 941 Terminology Relating to Steel, Stainless Steel, Related Alloys, and Ferroalloys⁴

E 165 Test Method for Liquid Penetrant Examination⁵

E 527 Practice for Numbering Metals and Alloys (UNS)⁴

2.2 SAE Standard:

SAE J 1086 Practice for Numbering Metals and Alloys (UNS)⁶

3. Terminology

3.1 *Definitions*—For definitions of terms used in this specification, refer to Terminology A 941.

4. Ordering Information

4.1 Orders for material under this specification should include the following, as required, to describe the desired material adequately:

4.1.1 Quantity (feet or number of lengths),

4.1.2 Name of material (seamless or welded tubes),

4.1.3 Grade (see Table 1),

4.1.4 Size (only two of the following: outside diameter, inside diameter, and average wall),

4.1.5 Length (specific or random),

4.1.6 Optional requirements (check analysis, see Section 15; hydrostatic or nondestructive electric test, see Section 16),

4.1.7 Test report required,

4.1.8 Specification designation, and

4.1.9 Special requirements or any supplementary requirements selected, or both.

5. Manufacture

5.1 *Manufacture*—The tubes shall be cold finished and shall be made by the seamless or welded process.

5.2 *Heat Treatment*—All material shall be furnished in the heat-treated condition. The heat-treatment procedure shall consist of heating the material to a minimum temperature of 1800°F (980°C) and quenching in water or rapidly cooling by other means.

6. Chemical Composition

6.1 The steel shall conform to the requirements as to chemical composition as specified in Table 1.

7. Product Analysis

7.1 When specified on the purchase order, an analysis of either one billet or one length of flat-rolled stock or one tube shall be made from each heat. Samples for chemical analysis, except spectrochemical analysis, shall be taken in accordance with Test Methods A 751. The chemical composition thus determined shall conform to the requirements specified.

7.2 If the analysis made in accordance with 7.1 does not conform to the requirements specified, an analysis of each

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² *Annual Book of ASTM Standards*, Vol 01.03.

³ *Annual Book of ASTM Standards*, Vols 01.01, 01.02, 01.03, 01.04, and 01.05.

⁴ *Annual Book of ASTM Standards*, Vol 01.01.

⁵ *Annual Book of ASTM Standards*, Vol 03.03.

⁶ Available from Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096.