



Standard Specification for Austenitic Chromium-Nickel-Silicon Alloy Steel Seamless and Welded Tubing¹

This standard is issued under the fixed designation A 953; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers grades of nominal-wall-thickness, austenitic alloy steel tubing for general corrosion-resisting and low- or high-temperature service, having a specified minimum chromium content of less than 10.50 %.

1.2 The tubing sizes and thicknesses usually furnished to this specification are ¼ in. (6.4 mm) in inside diameter and larger and 0.020 in. (0.51 mm) in nominal wall-thickness and heavier.

1.3 Mechanical property requirements do not apply to tubing smaller than ⅛ in. (3.2 mm) in inside diameter or 0.015 in. (0.38 mm) in thickness.

1.4 Some steels covered by this specification, especially the high silicon containing steels, because of their particular alloy content and specialized properties, may require special care in their fabrication and welding. Specific procedures are of fundamental importance, and it is presupposed that all parameters will be in accordance with approved methods capable of producing the desired properties in the finished fabrication.

1.5 The values stated in either inch-pound units or SI units are to be regarded separately as standard. The values stated in each system are not exact equivalents; therefore, each system must be used independently of the other. Combining values from the two systems may result in nonconformance with the specification. Unless the order specifies the applicable “M” specification designation (SI units), the material shall be furnished in inch-pound units.

2. Referenced Documents

2.1 ASTM Standards:

A 370 Test Methods and Definitions for Mechanical Testing of Steel Products²

A 450/A450M Specification for General Requirements for Carbon, Ferritic Alloy, and Austenitic Alloy Steel Tubes³

A 480/A480M Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip²

A 632 Specification for Seamless and Welded Austenitic

Stainless Steel Tubing (Small-Diameter) for General Service³

2.2 ANSI Standard:

B 31.3 Chemical Plant and Petroleum Refinery Piping⁴

2.3 ASME Pressure Vessel Code:

Section VIII Division 1, Pressure Vessels⁵

3. Ordering Information

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

3.1.1 Quantity (feet, metres, or number of lengths),

3.1.2 Name of material (seamless or welded tubes),

3.1.3 Grade (Table 1),

3.1.4 Size (outside diameter and nominal wall thickness),

3.1.5 Length (specific or random),

3.1.6 Test report required (see Section on Inspection of Specification A 450/A 450M),

3.1.7 Specification designation, and

3.1.8 Special requirements.

4. General Requirements

4.1 Material furnished under this specification shall conform to the applicable requirements of the current edition of Specification A 450/A 450M, unless otherwise provided herein.

5. Manufacture

5.1 The tubes shall be made by the seamless or welded process.

5.2 At the manufacturer’s option, tubing may be furnished either hot finished or cold finished.

6. Heat Treatment

6.1 All material shall be furnished in the heat-treated condition. Except as provided in 6.2, the heat-treatment procedure shall, consist of heating the material to a minimum temperature of 1900°F (1040°C) and quenching in water or rapidly cooling by other means.

¹ This specification is under the jurisdiction of ASTM Committee A-1 on Steel, Stainless Steel, and Related Alloys and is the direct responsibility of Subcommittee A01.10 on Steel Tubing.

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² Annual Book of ASTM Standards, Vol 01.03.

³ Annual Book of ASTM Standards, Vol 01.01.

⁴ Available from American National Standards Institute, W. 42nd St., 11th Floor, New York, NY 10036.

⁵ Available from American Society for Mechanical Engineers, 345 E. 47th St., New York, NY 10017.