



Standard Specification for Seamless Austenitic and Martensitic Stainless Steel Tubing for Liquid Metal-Cooled Reactor Core Components¹

This standard is issued under the fixed designation A 771/A 771M; 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 seamless annealed or cold-worked, austenitic or martensitic stainless steel tubing of 0.100 to 1.0 in. [2.5 to 25 mm] outside diameter with wall thickness of 0.050 in. [1.3 mm] or less for use at high temperature in liquid metal-cooled reactor plants.

1.2 The values stated in either inch-pound units or SI units are to be regarded separately as standard. Within the text, the SI units are shown in brackets. 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.

1.3 This specification and the applicable material specifications are expressed in both inch-pound and SI units. However, 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 Products^{2,3}
- A 380 Practice for Cleaning, Descaling and Passivation of Stainless Steel Parts, Equipment, and Systems²
- A 450/A 450M Specification for General Requirements for Carbon, Ferritic Alloy, and Austenitic Alloy Steel Tubes³
- D 129 Test Method for Sulfur in Petroleum Products (General Bomb Method)⁴
- D 808 Test Method for Chlorine in New and Used Petroleum Products (Bomb Method)⁴
- E 3 Methods of Preparation of Metallographic Specimens⁵
- E 21 Test Methods for Elevated Temperature Tension Tests of Metallic Materials⁵

E 45 Test Methods for Determining the Inclusion Content of Steel⁵

E 165 Test Method for Liquid Penetrant Examination⁶

E 213 Practice for Ultrasonic Examination of Metal Pipe and Tubing⁶

E 384 Test Method for Microhardness of Materials⁵

E 407 Practice for Microetching Metals and Alloys⁵

2.2 ANSI Standard:

B46.1 Surface Texture⁷

2.3 ASNT Standard:

SNT-TC-1A Recommended Practice for Nondestructive Testing Personnel Qualification and Certification⁸

2.4 ASME Standard:

NQA-1 Quality Assurance Program Requirements for Nuclear Facilities⁹

3. Ordering Information

3.1 It is the responsibility of the purchaser to specify all requirements that are necessary for the safe and satisfactory performance of material ordered under this specification. Examples of such requirements include but are not limited to the following:

- 3.1.1 Quantity (feet, metres, or number of lengths),
- 3.1.2 Name of material (seamless tubes),
- 3.1.3 Grade (Table 1),
- 3.1.4 Annealing and tempering requirements for martensitic grades,
- 3.1.5 Condition (cold-worked, annealed, or thermomechanical condition),
- 3.1.6 Dimensions:
 - 3.1.6.1 Diameter and length (tubing dimensions or applicable drawings),
 - 3.1.6.2 Ovality (tolerances on roundness),
 - 3.1.6.3 Wall thickness and eccentricity,
 - 3.1.6.4 Straightness,
 - 3.1.7 Tubing end configuration,

¹ This specification is under the jurisdiction of ASTM Committee A01 on Steel, Stainless Steel, and Related Alloys and is the direct responsibility of Subcommittee A01.10 on Stainless and Alloy Steel Tubular Products.

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

³ *Annual Book of ASTM Standards*, Vol 01.01.

⁴ *Annual Book of ASTM Standards*, Vol 05.01.

⁵ *Annual Book of ASTM Standards*, Vol 03.01.

⁶ *Annual Book of ASTM Standards*, Vol 03.03.

⁷ Available from American National Standards Institute, 11 West 42nd St., 13th Floor, New York, NY 10036.

⁸ Available from American Society for Nondestructive Testing, 914 Chicago Ave., Evanston, IL 60202.

⁹ Available from ASME International, Three Park Avenue, New York, NY 10016–5990.