



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

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1. Scope

1.1 This specification covers seamless, annealed or cold worked, austenitic or martensitic stainless steel duct tubes of 2 to 7-in. [51 to 178 mm] outside dimensions with wall thickness of 0.250 in. [6.35 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

2. Referenced Documents

2.1 ASTM Standards:

- A 370 Test Methods and Definitions for Mechanical Testing of Steel Products³
- A 380 Practice for Cleaning and Descaling Stainless Steel Parts, Equipment and Systems⁴
- A 450/A 450M Specification for General Requirements for Carbon, Ferritic Alloy, and Austenitic Alloy Steel Tubes⁵
- A 751 Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products³
- D 129 Test Method for Sulfur in Petroleum Products (General Bomb Method)⁶
- D 808 Test Method for Chlorine in New and Used Petroleum Products (Bomb Method)⁶

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 Available from the American Society for Nondestructive Testing, 3200 Riverside Drive, Columbus, OH 43221.

³ Annual Book of ASTM Standards, Vol 01.03.

⁴ Annual Book of ASTM Standards, Vol 01.03.

⁵ Annual Book of ASTM Standards, Vol 01.01.

⁶ Annual Book of ASTM Standards, Vol 05.01.

E 3 Methods of Preparation of Metallographic Specimens⁷

E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications⁸

E 45 Practice for Determining the Inclusion Content of Steel⁷

E 112 Test Methods for Determining the Average Grain Size⁷

E 165 Test Method for Liquid Penetrant Examination⁹

E 384 Test Method for Microhardness of Materials⁷

E 407 Test Methods for Microetching Metals and Alloys⁷

2.2 ANSI Standard:

B46.1 Surface Texture¹⁰

2.3 ASME Standard:

NQA-1 Quality Assurance Program Requirements for Nuclear Facilities¹⁰

2.4 ASNT Standard:

SNT-TC-1A Recommended Practice for Nondestructive Testing Personnel Qualification and Certification¹⁰

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 duct tubes),
- 3.1.3 Grade (Table 1),
- 3.1.4 Melting process (5.1),
- 3.1.5 Approval of procedures for conversion of ingot to bar (5.2),
- 3.1.6 Thermomechanical treatment requirements (5.4),
- 3.1.7 Annealing and tempering requirements for martensitic grades (5.4),
- 3.1.8 Condition (annealed, cold-worked, or thermomechanical treatment) (5.6),
- 3.1.9 Percent of cold-work (5.7),
- 3.1.10 Sublotting requirements (5.8),
- 3.1.11 Duct identification requirements (5.9),

⁷ Annual Book of ASTM Standards, Vol 03.01.

⁸ Annual Book of ASTM Standards, Vol 14.02.

⁹ Annual Book of ASTM Standards, Vol 03.03.

¹⁰ Available from American National Standards Institute, 11 West 42nd St., 13th Floor, New York, NY 10036.