



Standard Specification for Seamless Stainless Steel Mechanical Tubing¹

This standard is issued under the fixed designation A 511; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope*

1.1 This specification covers seamless stainless tubing for use in mechanical applications where corrosion-resistant or high-temperature strength is needed. The grades covered are listed in Table 1 and Table 2.

1.2 This specification covers seamless cold-finished mechanical tubing and seamless hot-finished mechanical tubing in sizes up to 12¾ in. (313.8 mm) in outside diameter (for round tubing) with wall thicknesses as required.

1.3 Tubes shall be furnished in one of the following shapes, as specified by the purchaser: round, square, rectangular, or special.

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

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

2. Referenced Documents

2.1 ASTM Standards:²

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

A 1016/A 1016M Specification for General Requirements for Ferritic Alloy Steel, Austenitic Alloy Steel, and Stainless Steel Tubes

E 59 Practice for Sampling Steel and Iron for Determination of Chemical Composition

2.2 Military Standards:

MIL-STD-129 Marking for Shipment and Storage³

MIL-STD-163 Steel Mill Products Preparation for Shipment and Storage³

2.3 Federal Standard:

Fed. Std. No. 123 Marking for Shipments (Civil Agencies)³

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, mass, or number of pieces),

3.1.2 Name of material (seamless stainless steel mechanical tubing),

3.1.3 Form (round, square, rectangular, special, see Section 1),

3.1.4 Dimensions (round, outside diameter and wall thickness, see Section 9; square and rectangular, outside dimensions and wall thickness, see Section 10; other, specify),

3.1.5 Length (specific or random, see 9.3),

3.1.6 Manufacture (cold- or hot-finished, see 4.5),

3.1.7 Grade (Section 6),

3.1.8 Condition (annealed, as cold worked, or with special heat treatment, controlled microstructural characteristics, or other condition as required, see Section 5),

3.1.9 Surface finish (special pickling, shot blasting, or polishing, as required, see Supplementary Requirement S5),

3.1.10 Specification designation,

3.1.11 Report of Chemical Analysis, if required (Sections 7 and 8),

3.1.12 Individual supplementary requirements, if required,

3.1.13 End use,

3.1.14 Packaging,

3.1.15 Special marking (see 15.2),

3.1.16 Special packing (see 16.2), and

3.1.17 Special requirements.

4. Materials and Manufacture

4.1 The steel may be made by any process.

4.2 If a specific type of melting is required by the purchaser, it shall be as stated on the purchase order.

4.3 The primary melting may incorporate separate degassing or refining and may be followed by secondary melting, such as electroslag remelting or vacuum-arc remelting. If secondary melting is employed, the heat shall be defined as all of the ingots remelted from a single primary heat.

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 Tubing.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

*A Summary of Changes section appears at the end of this standard.

