This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

Designation: A511/A511M – 21a

Standard Specification for Seamless Stainless Steel Mechanical Tubing and Hollow Bar[1]

This standard is issued under the fixed designation A511/A511M; 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 U.S. Department of Defense.

1. Scope*

1.1 This specification covers seamless stainless tubing for use in mechanical applications or as hollow bar for use in the production of hollow components such as, but not limited to nozzles, reducers, and couplings by machining where corrosion-resistant or high-temperature strength is needed. The grades covered are listed in Table 1 , Table 2, and Table 3.

1.2 This specification covers seamless cold-finished mechanical tubing and hollow bar and seamless hot-finished mechanical tubing and hollow bar in sizes up to 12¾ in. [325 mm] in outside nominal diameter (for round tubing) with wall thicknesses or inside diameters as required.

1.3 Tubes for mechanical applications shall be furnished in one of the following shapes, as specified by the purchaser: round, square, rectangular, or special. Tubes to be used as hollow bar shall be furnished in round shape.

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. Within the text, the SI units are shown in square brackets. The values stated in each system are not exact equivalents; therefore, each system shall be used independently of the other.

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

A262 Practices for Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels

A1016/A1016M Specification for General Requirements for Ferritic Alloy Steel, Austenitic Alloy Steel, and Stainless Steel Tubes

A1058 Test Methods for Mechanical Testing of Steel Products—Metric

E112 Test Methods for Determining Average Grain Size

2.2 *Military Standards:*

MIL-STD-129 Marking for Shipment and Storage[3]

MIL-STD-163 Steel Mill Products Preparation for Shipment and Storage[3]

2.3 *Federal Standard:*

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

3. Terminology

3.1 *Definitions:*

3.1.1 *hollow bar*—round tubing that is intended to produce engineering components by machining, generally specified by minimum outside diameter and maximum inside diameter.

3.1.2 *mechanical tubing*—tubing of various shapes used for mechanical and general engineering purposes, specified by nominal outside dimension and nominal wall.

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, mass, or number of pieces),

[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.

Current edition approved Nov. 1, 2021. Published November 2021. Originally approved in 1964. Last previous edition approved in 2021 as A511/A511M – 21. DOI: 10.1520/A0511_A0511M-21A.

[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**

Copyright © ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959. United States