



AEROSPACE MATERIAL SPECIFICATION

AMS5573™**REV. M**

Issued 1950-12
Reaffirmed 2012-10
Revised 2021-12

Superseding AMS5573L

Steel, Corrosion and Heat-Resistant, Seamless Tubing
17Cr - 12Ni - 2.5Mo (SAE 30316)
Solution Heat Treated
(Composition similar to S31600)

RATIONALE

AMS5573M is the result of a Five-Year Review and update of the specification. The revision prohibits unauthorized exceptions (3.7, 4.4.3.1, 5.2.1, 8.5), updates composition testing (3.1), updated condition and fabrication requirements (3.2, 3.3), updates tensile testing (3.4.1.1), updates Table 2, updates inspection (3.5), adds NDT acceptance testing (4.2.1, 4.4, 8.6), clarifies tolerances and identification (3.6, 5.2), adds definitions (8.2.1, 8.2.2), and allows prior revisions (8.4).

1. SCOPE

1.1 Form

This specification covers a corrosion and heat-resistant steel in the form of seamless tubing.

1.2 Application

This tubing has been used typically for parts requiring resistance to corrosion and pitting and heat resistance up to 1600 °F (871 °C), but usage is not limited to such applications. At elevated temperatures, strength of this steel is slightly higher than, and oxidation resistance similar to, that of 188 type steels.

2. APPLICABLE DOCUMENTS

The issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AMS2243 Tolerances, Corrosion and Heat-Resistant Steel Tubing

AMS2248 Chemical Check Analysis Limits, Corrosion and Heat-Resistant Steels and Alloys, Maraging and Other Highly Alloyed Steels, and Iron Alloys

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Documents
Document Sharing Hub

AMS2371	Quality Assurance Sampling and Testing, Corrosion and Heat-Resistant Steels and Alloys, Wrought Products and Forging Stock
AMS2634	Ultrasonic Inspection, Thin Wall Metal Tubing
AMS2700	Passivation of Corrosion Resistant Steels
AMS2761	Heat Treatment of Steel Raw Materials
AMS2807	Identification, Carbon and Low-Alloy Steels, Corrosion and Heat-Resistant Steels and Alloys Sheet, Strip, Plate, and Aircraft Tubing
ARP1917	Clarification of Terms Used in Aerospace Metals Specifications

2.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM A26	Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels
ASTM A370	Mechanical Testing of Steel Products
ASTM A751	Chemical Analysis of Steel Products
ASTM A1016/A1016M	General Requirements for Ferritic Alloy Steel, Austenitic Alloy Steel, and Stainless Steel Tubes
ASTM E353	Chemical Analysis of Stainless, HeatResisting, Maraging, and Other Similar ChromiumNickelIron Alloys
ASTM E426	Electromagnetic (EddyCurrent) Testing of Seamless and Welded Tubular Products, Austenitic Stainless Steel and Similar Alloys
ASTM E1417/E1417M	Liquid Penetrant Examination

3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall conform to the percentages by weight shown in Table 1, determined in accordance with ASTM A751 or by other analytical methods acceptable to purchaser.

Table 1 - Composition

Element	Min	Max
Carbon	--	0.08
Manganese	1.25	2.00
Silicon	--	1.00
Phosphorus	--	0.04
Sulfur	--	0.03
Chromium	16.00	18.00
Nickel	10.00	14.00
Molybdenum	2.00	3.00
Copper	--	0.75

3.1.1 Check Analysis

Composition variations shall meet the applicable requirements of AMS2248.

3.2 Condition

Solution heat treated (see 8.2.1). Solution heat treatment shall be performed in an atmosphere yielding a bright finish. Alternately, product shall be passivated in accordance with AMS2700 to produce a uniform finish. It is permissible to pickle prior to passivation. Passivation may take place after any final finishing (see 3.3.3).

3.3 Fabrication

3.3.1 Tubing shall be produced by a seamless process. Finishing operations for removal of surface blemishes shall be performed prior to final solution heat treatment. A light polish to improve surface appearance may be employed after solution heat treatment, and, if performed, the product shall be subsequently passivated.

3.3.2 Bore conditioning is permitted after final heat treatment provided the tubing is not sized by metal removal methods beyond the allowable tolerances (see 8.2.2). If bore conditioning is used, 100% visual inspection of each tube shall be performed. The tube ID shall be uniformly shiny with no evidence of remnant material, neither metallic nor nonmetallic in nature.

3.3.3 Tubing shall be passivated in accordance with AMS2700 after any ID or OD finishing that occurs after solution heat treatment.

3.4 Properties

The product shall conform to the following requirements; tensile testing shall be performed in accordance with ASTM A370:

3.4.1 Tensile Properties

Shall be as specified in Table 2.

Table 2A - Tensile properties, inch/pound units

Nominal OD Inch	Nominal Wall Thickness Inch	Tensile Strength ksi ¹	Yield Strength, min, ksi 0.2% Offset ²	Elongation in 2 Inches %, min Strip	Elongation in 2 Inches %, min Full Tube
Up to 0.188, incl	Up to 0.016, incl Over 0.016	75-115 75-100	30 30	-- --	35 40
Over 0.188 to 0.500, incl	Up to 0.010, incl Over 0.010	75-110 75-100	30 30	32 35	37 40
Over 0.500	Up to 0.010, incl Over 0.010	75-100 75-100	30 30	27 30	32 35

Table 2B - Tensile properties, SI units

Nominal OD Millimeters	Nominal Wall Thickness Millimeters	Tensile Strength MPa ¹	Yield Strength, min, MPa 0.2% Offset ²	Elongation in 50 mm %, min Strip	Elongation in 50 mm %, min Full Tube
Up to 4.78, incl	Up to 0.41, incl Over 0.41	517-793 517-689	207 207	-- --	35 40
Over 4.78 to 12.70, incl	Up to 0.25, incl Over 0.25	517-758 517-689	207 207	32 35	37 40
Over 12.70	Up to 0.25, incl Over 0.25	517-689 517-689	207 207	27 30	32 35

¹ Minimum tensile properties have been taken from ASTM A632. The above properties are not based on AMS Statistical Guidelines.

² Yield strength is not required to be determined for OD sizes less than 0.125 inch (3.2 mm) or for wall thicknesses less than 0.015 inch (0.38 mm).

