



AEROSPACE MATERIAL SPECIFICATION

AMS5564™**REV. D**

Issued 1985-07
Reaffirmed 2013-04
Revised 2023-05

Superseding AMS5564C

Steel, Corrosion Resistant, Tubing
19Cr - 10Ni
High-Pressure Hydraulic, Welded Plus Ultrasonically Tested or Seamless
Cold Drawn, One Eighth - Hard Temper
(Composition similar to UNS S30400)

RATIONALE

AMS5564D is the result of a Five-Year Review and update of the specification. The revision prohibits unauthorized exceptions (3.7, 4.4.1, 5.2.1, and 8.4), revises composition testing (3.1, 3.1.1), updates condition and fabrication requirements (3.2, 3.3), controls tensile testing (3.4.1.1), updates hydrostatic testing consistent with other committees (3.4.3), updates inspection (3.5), clarifies tolerances and identification (3.6, 5.2), requires country of origin (4.4), and allows prior revisions (8.3).

1. SCOPE

1.1 Form

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

1.2 Application

This tubing has been used typically for high-pressure hydraulic lines requiring corrosion resistance, but usage is not limited to such applications. Maximum service temperature should not exceed 700 °F (371 °C).

1.3 Classification

Tubing covered by this specification is classified as follows:

Class 1 - Seamless and drawn

Class 2 - Welded and drawn

1.3.1 Unless a specific class is ordered, either Class 1 or Class 2 may be supplied.

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.

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Documents
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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
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
AS7766	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 A262	Practices for 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, Austenitic Alloy Steel and Stainless Steel Tubes
ASTM E112	Determining the Average Grain Size
ASTM E426	Electromagnetic (Eddy-Current) Testing of Seamless and Welded Tubular Products, Austenitic Stainless Steel and Similar Alloys

2.3 ASME Publications

Available from ASME, P.O. Box 2900, 22 Law Drive, Fairfield, NJ 07007-2900, Tel: 800-843-2763 (U.S./Canada), 001-800-843-2763 (Mexico), 973-882-1170 (outside North America), www.asme.org.

ANSI B46.1	Surface Texture
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2.4 Definitions

Terms used in AMS are defined in AS7766 and the following:

2.4.1 Solution Heat Treatment

Solution treatment is the heating of an alloy to a suitable temperature, holding it at that temperature long enough to cause one or more constituents to enter into a solid solution and then cooling it rapidly enough to keep these constituents in solution. AMS2761 provides guidance, but refers to this process as annealing with a quenching treatment.

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 the purchaser.

Table 1 - Composition

Element	Min	Max
Carbon	--	0.08
Manganese	--	2.00
Silicon	--	1.00
Phosphorus	--	0.045
Sulfur	--	0.030
Chromium	18.00	20.00
Nickel	8.00	12.00
Molybdenum	--	0.75
Copper	--	0.75

3.1.1 The producer may test for any element not listed in Table 1 and include this analysis in the report of 4.4. Reporting of any element not listed in the composition table is not a basis for rejection unless limits of acceptability are specified by the purchaser.

3.1.2 Check Analysis

Composition variations shall meet the requirements of AMS2248.

3.2 Condition

Solution heat treated (see 2.4), cold drawn pickled as required, and passivated in accordance with AMS2700 or pickled. Passivation shall be performed after final finishing.

3.3 Fabrication

Tubing shall be produced by a seamless and cold drawn, or a welded and cold drawn process. The specified tensile properties shall be obtained by cold working and not by heat treatment. Surface finishes shall not be rougher than 32 μin (0.8 μm) for OD and 63 μin (1.6 μm) for ID, determined in accordance with ASME B46.1, and may be produced by any method which will provide the required surface condition and which will not affect limits of wall thickness or corrosion resistance, with the exception that centerless ground finish is not acceptable. A light polish to improve external surface appearance or meet surface finish requirements may be employed after solution treatment.

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

3.3.2 Welded (Class 2) tubing shall be processed to eliminate any dimensional indication of the weld and shall be ultrasonically tested to detect and discard any tubing containing defects exceeding calibration notches (see 3.5.3).