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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 5868A

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Superseding AMS 5868

Steel, Corrosion Resistant, Seamless and Welded Aircraft Tubing
19Cr - 9.5Ni (SAE 30304)
Cold Drawn, 1/2 Hard Temper

UNS S30400

1. SCOPE:

1.1 Form:

This specification covers a corrosion-resistant steel in the form of two types of aircraft tubing.

1.2 Application:

This tubing has been used typically in the fabrication of aircraft structural parts requiring good corrosion resistance, but usage is not limited to such applications. This tubing is not suitable for use in applications requiring flaring or sharp bends. Welding or other exposure over 800 °F (427 °C) during fabrication may impair corrosion resistance.

1.3 Classification:

Tubing covered by this specification is classified as follows:

Type 1 - Seamless and drawn
Type 2 - Welded and drawn

1.3.1 Unless a specific type is ordered, either type 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 canceled and no superseding document has been specified, the last published issue of that document shall apply.

QUESTIONS REGARDING THIS DOCUMENT: (724) 772-7161 FAX: (724) 776-0243
TO PLACE A DOCUMENT ORDER: (724) 776-4970 FAX: (724) 776-0790
SAE WEB ADDRESS: http://www.sae.org

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 2243	Tolerances, Corrosion and Heat Resistant Steel Tubing
MAM 2243	Tolerances, Metric, Corrosion and Heat Resistant Steel Tubing
AMS 2248	Chemical Check Analysis Limits, Corrosion and Heat Resistant Steels and Alloys, Maraging and Other Highly-Alloyed Steels, and Iron Alloys
AMS 2371	Quality Assurance Sampling and Testing, Corrosion and Heat Resistant Steels and Alloys, Wrought Products and Forging Stock
AMS 2807	Identification, Carbon and Low-Alloy Steels, Corrosion and Heat Resistant Steels and Alloys, Sheet, Strip, Plate, and Aircraft Tubing

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM A 370	Mechanical Testing of Steel Products
ASTM E 353	Chemical Analysis of Stainless, Heat-Resisting, Maraging, and Other Similar Chromium-Nickel-Iron Alloys

2.3 U.S. Government Publications::

Available from Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-STD-753	Corrosion-Resistant Steel Parts, Sampling, Inspection, and Testing for Surface Passivation

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

Shall conform to the percentages by weight shown in Table 1, determined by wet chemical methods in accordance with ASTM E 353, by spectrochemical methods, or by other analytical methods acceptable to 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	11.00
Molybdenum	--	0.75
Copper	--	0.75

3.1.1 Check Analysis: Composition variations shall meet the applicable requirements of AMS 2248.

3.2 Condition:

Solution heat treated and, unless solution heat treatment is performed in an atmosphere yielding a bright finish, descaled, and cold worked to obtain the tensile properties of 3.4.1.

3.3 Fabrication:

Tubing shall be produced by either a seamless or a welded and drawn process. The external and internal surface finishes may be produced by pickling, bright annealing, or any method which will provide the required surface condition and which will not affect the limits for wall thickness or corrosion resistance, with the exception that a centerless ground finish is not acceptable. Surfaces shall be passive, determined in accordance with MIL-STD-753, Methods 102 and 103. A light polish to improve external surface appearance may be employed, and if performed, the product shall be subsequently passivated.

3.3.1 Welded tubing (Type 2) shall be processed to remove the bead and any dimensional indication of the presence of welds.

3.4 Properties:

Tubing shall conform to the following requirements:

3.4.1 Tensile Properties: Shall be as shown in Table 2, determined in accordance with ASTM A 370.

TABLE 2 - Minimum Tensile Properties

Property	Value
Tensile Strength	150 ksi (1034 MPa)
Yield Strength at 0.2% Offset	110 ksi (758 MPa)
Elongation in 2 Inches (50.8 mm)	
Full Tube	7%
Strip	5%

3.4.2 Susceptibility to Intergranular Attack: Specimens from annealed tubing, prior to cold drawing, shall pass the copper/copper sulfate/sulfuric acid test of ASTM A 262, Practice E.

3.5 Quality:

Tubing, as received by purchaser, shall be uniform in quality and condition and shall have a finish conforming to the best practice for high quality aircraft tubing. It shall be smooth and free from heavy scale or oxide, burrs, seams, tears, grooves, laminations, slivers, pits, and other imperfections detrimental to usage of the tubing. Surface imperfections, such as handling marks, straightening marks, light mandrel and die marks, and scale pattern will not be considered injurious if the imperfections are removable within the tolerances specified for wall thickness, but removal of such imperfections is not required.

3.6 Tolerances:

Shall conform to all applicable requirements of AMS 2243 or MAM 2243.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of tubing shall supply all samples for vendor's tests and shall be responsible for the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the tubing conforms to specified requirements.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Composition (3.1), condition (3.2), fabrication (3.3), tensile properties (3.4.1), quality (3.5), and tolerances (3.6) are acceptance tests and shall be performed on each heat or lot as applicable.

4.2.2 Periodic Tests: Susceptability to intergranular attack (3.4.2) is a periodic test and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.