SAE Aerospace
An SAE International Group

AEROSPACE MATERIAL SPECIFICATION

SAE AMS5577 | REV. H

Issued 1952-02
Revised 2001-06
Reaffirmed 2013-04

Superseding AMS5577G

Steel, Corrosion and Heat Resistant, Welded Tubing
25Cr - 20Ni (SAE 30310)
Solution Heat Treated

(Composition similar to UNS S31008)

RATIONALE

AMS5577H has been reaffirmed to comply with the SAE five-year review policy.

1. SCOPE:

1.1 Form:

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

1.2 Application:

This tubing has been used typically for parts requiring both corrosion and heat resistance, especially when such parts are welded during fabrication, and for parts requiring oxidation resistance up to 2000 °F (1093 °C) though useful at that temperature only when stresses are low, but usage is not limited to such applications.

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.

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 2632	Ultrasonic Inspection of Thin Materials, 0.5 Inch (13 mm) and Thinner
AMS 2807	Identification, Carbon and Low-Alloy Steels, Corrosion and Heat Resistant Steels and Alloys, Sheet, Strip, Plate, and Aircraft Tubing

TO PLACE A DOCUMENT ORDER: Tel: 877-606-7323 (inside USA and Canada)
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: http://www.sae.org

SAE values your input. To provide feedback on this Technical Report, please visit
http://www.sae.org/technical/standards/AMS5577H

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
ASTM E 426	Electromagnetic (Eddy-Current) Examination of Seamless and Welded Tubular Products, Austenitic Stainless Steel and Similar Alloys
ASTM E 1417	Liquid Penetrant Inspection

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	--	0.75
Phosphorus	--	0.040
Sulfur	--	0.030
Chromium	24.00	26.00
Nickel	19.00	22.00
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 free from continuous carbide network and descaled.

3.3 Fabrication:

Tubing shall be produced by a welded and drawn process. Any surface finishing operation applied to remove objectionable pits and surface blemishes shall be performed prior to final solution heat treatment. A light polish to improve external surface appearance may be employed after solution heat treatment and, if performed, the product shall be subsequently passivated.

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 2A - Tensile Properties, Inch/Pound Units

Nominal OD Inch	Tensile Strength ksi, max	Elongation in 2 Inches %, min Strip	Elongation in 2 Inches %, min Full Tube
Up to 0.312, excl	105	35	40
0.312 and over	105	35	40

TABLE 2B - Tensile Properties, SI Units

Nominal OD Millimeters	Tensile Strength MPa, max	Elongation in 50.8 mm %, min Strip	Elongation in 50.8 mm %, min Full Tube
Up to 7.92, excl	724	35	40
7.92 and over	689	35	40

3.4.2 Flarability: Specimens as in 4.3.1 shall withstand flaring at room temperature, without formation of cracks or other visible defects, by being forced axially with steady pressure over a hardened and polished tapered steel pin having a 74-degree included angle to produce a flare having a permanent expanded OD not less than shown in Table 3.

TABLE 3A - Minimum Flarability, Inch/Pound Units

Nominal OD Inch	Expanded OD Inch	Nominal OD Inches	Expanded OD Inches
0.125	0.200	0.750	0.987
0.188	0.302	1.000	1.187
0.250	0.359	1.250	1.500
0.312	0.421	1.500	1.721
0.375	0.484	1.750	2.106
0.500	0.656	2.000	2.356
0.625	0.781		

TABLE 3B - Minimum Flarability, SI Units

Nominal OD Millimeters	Expanded OD Millimeters	Nominal OD Millimeters	Expanded OD Millimeters
3.18	5.08	19.05	23.80
4.78	7.67	25.40	30.15
6.35	9.12	31.75	38.10
7.92	10.69	38.10	43.71
9.52	12.29	44.45	53.49
12.70	16.66	50.80	59.84
15.88	19.84		

3.4.2.1 Tubing with nominal OD between any two standard sizes shown in Table 3 shall take the same percentage flare as shown for the larger of the two sizes.

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 grease, oil and other foreign matter, 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, shallow pits, 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.

3.5.1 If weld reinforcement is present at the welds on the inner surface of the tubing, such weld reinforcement shall not be thicker than 0.010 inch (0.25 mm). The outer surfaces of the tubing shall be free from weld reinforcement.

3.5.2 When specified by purchaser, tubing shall be subjected to fluorescent penetrant inspection in accordance with ASTM E 1417, to ultrasonic inspection in accordance with AMS 2632, to electromagnetic (eddy-current) testing in accordance with ASTM E 426, or to any combination thereof. Standards for such inspections shall be as agreed upon between purchaser and vendor (See 8.2.1).

3.6 Tolerances:

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