AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 5570 E

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STEEL TUBING, SEAMLESS, CORROSION AND HEAT RESISTANT 18Cr - 11Ni

1. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

2. APPLICATION: Parts and assemblies subjected to high temperatures during fabrication or in service, requiring corrosion and heat resistance.

3. COMPOSITION:

		Check Analysis	
		Under Min or	Over Max
Carbon	0.08 max	---	0.01
Manganese	2.00 max	---	0.04
Silicon	0.75 max	---	0.05
Phosphorus	0.030 max	---	0.005
Sulfur	0.030 max	---	0.005
Chromium	17.00 - 20.00	0.20	0.20
Nickel	9.00 - 13.00	0.15	0.15
Columbium or Titanium	10xC - 1.00	0.05	0.05
	0.40 min	0.05	---
Copper	0.50 max	---	0.03
Molybdenum	0.50 max	---	0.03

4. CONDITION: Solution heat treated and pickled, or as ordered.

5. TECHNICAL REQUIREMENTS: (a) Physical Properties. -

Tensile Strength, psi	
Under 0.312 in. OD	105,000 max
0.312 in. and Over	100,000 max
Elongation, % in 2 in.	
Strip	35 min
Full Section	40 min

(b) Flarability. - The tubing shall be capable of being flared without formation of cracks or other visible defects. Specimens for flaring may be cut from any portion of the tube, or an entire tube may be used as a specimen. The end of the specimen to be flared shall be cut square, with the cut end smooth and free from burrs but not rounded. The specimen shall, at room temperature, be forced axially with steady pressure over a hardened and polished tapered steel pin having a 74 degree included angle, to produce a flare having the permanent expanded OD dimensions specified in the following table. The specimen and pin shall be clean and dry during test.

Nominal OD Inch	Expanded OD Inch.min	Nominal OD Inch	Expanded OD Inch.min
0.188	0.290	0.750	0.937
0.250	0.359	1.000	1.187
0.312	0.421	1.250	1.500
0.375	0.484	1.500	1.721
0.500	0.656	1.750	2.106
0.625	0.781	2.000	2.356

For sizes with nominal OD greater than 2.00 inches, flarability shall be as agreed upon by purchaser and vendor.

(c) Embrittlement. - The tubing shall be capable of meeting the following test:

Embrittlement test specimens, after being heated to 1200 F for two hours and air cooled, shall withstand immersion for 48 hours in a boiling aqueous solution containing 100 g of $CuSO_4 \cdot 5H_2O$ and 100 ml of H_2SO_4 (sp gr 1.84) per liter of solution under a reflux condenser, without evidence of intercrystalline surface attack. After such immersion, full cross-section specimens of tubing 0.625 inch or less in diameter shall then be flattened to a total thickness under load of three times the wall thickness of the tubing, and one inch long specimens of tubing over 0.625 inch in diameter shall be split and bent 180 degrees with outside surface of tube on inside of bend, around a diameter equal to the wall thickness, without showing evidence of cracks or defects. In either flattening or bending, the fold shall be made parallel to the axis of the tube.

6. QUALITY: Tubing shall have a good workmanlike finish conforming to the best practice for high quality aircraft material. Tubing shall be uniform in quality and condition, clean, sound, and free from grease or other foreign matter, and from internal and external defects detrimental to fabrication or to performance of parts.

7. TOLERANCES: Unless otherwise specified, tolerances shall conform to the latest issue of AMS 2243 as applicable. Diameter tolerances shall conform to Table I, column headed "Annealed".

8. REPORTS: (a) Unless otherwise specified, the vendor of tubing shall furnish three copies of a notarized report of the chemical composition of each heat in each shipment and the physical properties of each size from each heat. This report shall include the purchase order number, heat number, material specification number, size, and quantity from each heat.

(b) Unless otherwise specified, the vendor of finished or semi-finished parts shall furnish with each shipment three copies of a notarized report showing the purchase order number, material specification number, contractor or other direct supplier of tubing, part number, and quantity. When tubing for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of tubing to determine conformance to the requirements of this specification, and shall include in the report a certification that the tubing conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.