AERONAUTICAL
MATERIAL SPECIFICATIONS

SOCIETY OF AUTOMOTIVE ENGINEERS, Inc. 485 Lexington Ave., New York 17, N.Y.

AMS 5576B

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STEEL TUBING, WELDED, CORROSION AND HEAT RESISTANT
18Cr - 10Ni - Ti (SAE 30321)

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

2. APPLICATION: Primarily for parts and assemblies requiring both corrosion and heat resistance, especially when such parts and assemblies are welded during fabrication. Parts and assemblies requiring oxidation resistance up to approximately 1500 F, but useful at that temperature only when stresses are low.

3. COMPOSITION:

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		Check Analysis Under Min or Over Max	
Carbon	0.08 max	--	0.01
Manganese	2.00 max	--	0.04
Silicon	0.40 - 1.00	0.05	0.05
Phosphorus	0.040 max	--	0.005
Sulfur	0.030 max	--	0.005
Chromium	17.00 - 19.00	0.20	0.20
Nickel	8.00 - 11.00	0.15	0.15
Titanium	6xC - 0.70	0.05	0.05
Molybdenum	0.50 max	--	0.03
Copper	0.50 max	--	0.03

ø 4. CONDITION: Solution heat treated and descaled.

4.1 Tubing 2.00 in. and under in nominal OD shall be cold worked after welding.

5. TECHNICAL REQUIREMENTS:

5.1 Tensile Properties:

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Nominal OD Inches	Wall Thickness Inch	Tensile Strength psi, max	Elongation % in 2 in., min Strip	Elongation % in 2 in., min Full Tube
0.188 and under	0.016 and under	120,000	--	33
	Over 0.016	105,000	--	35
Over 0.188 to 0.500, incl	0.010 and under	115,000	30	35
	Over 0.010	105,000	30	35
Over 0.500	0.010 and under	120,000	25	30
	Over 0.010	105,000	30	35

5.2 Ø Flarability: 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 deg included angle, to produce a flare having the permanent expanded OD specified in the following table.

Nominal OD Inches	Expanded OD Inches, min	Nominal OD Inches	Expanded OD Inches, min
0.125	0.200	0.750	0.937
0.188	0.290	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		

5.2.1 Tubing with intermediate nominal OD shall take the same percentage flare as that for the next larger OD.

5.2.2 Ø Tubing with nominal OD greater than 2.00 in. or less than 0.125 in. shall have flarability as agreed upon by purchaser and vendor.

5.3 Embrittlement: Tubing shall be capable of meeting the following test:

5.3.1 Test specimens, after being heated at 1200 F ± 10 for 2 hr and air cooled, shall withstand immersion for 48 hr in a boiling aqueous solution containing 100 g of $CuSO_4.5H_2O$ 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-sectional specimens of tubing 0.625 in. or less in diameter shall be flattened to a total thickness under load of 3 times the wall thickness of the tubing, and 1 in. long specimens of tubing over 0.625 in. in diameter shall be split and bent 180 deg 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, and shall coincide with the weld.

5.4 Pressure Test: Tubing shall show no bulges, leaks, or other defects when subjected to an internal hydrostatic pressure, based on nominal dimensions, sufficient to cause a tensile stress of 20,000 psi in the tubing wall.

6. QUALITY:

6.1 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 imperfections detrimental to fabrication or to performance of parts.

6.2 If beads are present at the welds on the inner surfaces of tubing over 2.00 in. in nominal OD, such beads shall not be thicker than 0.010 in., unless otherwise specified. The outer surfaces of all tubing and the inner surfaces of tubing 2.00 in. and under in nominal OD shall be free from beads.