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

AMS 5582

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Revised

ALLOY TUBING, SEAMLESS, CORROSION AND HEAT RESISTANT
Nickel Base - 15.5Cr - 7Fe - 2.5Ti - 1(Cb + Ta) - 0.7Al

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

2. APPLICATION: Primarily for fluid lines requiring high strength up to 1500 F and oxidation resistance up to 1800 F. Parts may be formed and then heat treated to improve strength at elevated temperatures.

3. COMPOSITION:

		Check Analysis Under Min	Check Analysis Over Max
Carbon	0.08 max	--	0.01
Manganese	1.00 max	--	0.03
Silicon	0.50 max	--	0.03
Sulfur	0.010 max	--	0.003
Chromium	14.00 - 17.00	0.25	0.25
Nickel + Cobalt	70.00 min	0.45	0.45
Cobalt, if determined	1.00 max	--	0.03
Columbium + Tantalum	0.70 - 1.20	0.05	0.05
Titanium	2.25 - 2.75	0.07	0.07
Aluminum	0.40 - 1.00	0.10	0.10
Iron	5.00 - 9.00	0.10	0.10
Copper	0.50 max	0.03	0.03

4. CONDITION: Cold drawn, annealed, and descaled if necessary, unless otherwise ordered.

5. TECHNICAL REQUIREMENTS:

5.1 Tensile Properties: Tubing 0.125 in. and over in OD and 0.015 in. and over in wall thickness shall conform to the following requirements:

Tensile Strength, psi	140,000 max
Yield Strength at 0.2% Offset or at 0.0092 in. in 2 in. Extension Under Load (E = 31,000,000), psi	80,000 max
Elongation, % in 2 in.	
Strip Specimen	30 min
Full Tube Specimen	35 min

5.1.1 Tubing under 0.125 in. OD or under 0.015 in. wall thickness shall have properties as agreed upon by purchaser and vendor.

5.2 Flarability: Tubing 0.188 - 2.00 in., incl, in OD 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 permanent expanded OD not less than 1.25 times the original nominal OD.

5.2.1 Tubing with nominal OD greater than 2.00 in. or less than 0.188 in. shall have flarability as agreed upon by purchaser and vendor.

5.3 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.

5.4 Properties After Precipitation Heat Treatment: Tubing shall, after precipitation heat treating at 1300 F ± 25 for 20 hr and air cooling, conform to the following requirements.

5.4.1 Tensile Properties:

Tensile Strength, psi	155,000 min
Yield Strength at 0.2% Offset or at 0.0105 in. in 2 in. Extension Under Load (E = 31,000,000), psi	100,000 min
Elongation, % in 2 in.	
Strip Specimen	15 min
Full Tube Specimen	20 min

5.4.1.1 Tubing under 0.125 in. OD or under 0.015 in. wall thickness shall have properties as agreed upon by purchaser and vendor.

5.4.2 Stress-Rupture Test at 1350 F: A specimen, maintained at 1350 F ± 5 while an axial stress of 45,000 psi is applied continuously, shall not rupture in less than 23 hours. The test shall be continued, after the 23 hr, until the specimen ruptures, either maintaining the same stress or increasing the stress to not over 70,000 psi as necessary to produce rupture. The elongation of the ruptured specimen, measured at room temperature, shall be reported.

5.4.3 Grain Size: Grain size of material 0.010 in. and over in wall thickness shall average not over 0.0060 in. (Grain Size No. 2.5) in diameter when determined in accordance with ASTM E112-55T.

6. QUALITY: Tubing shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external imperfections detrimental to fabrication or to performance of parts.

7. TOLERANCES: Unless otherwise specified, tolerances shall conform to the latest issue of AMS 2263 as applicable. Diameter and wall thickness tolerances shall be as specified below:

7.1 Diameter: Table II.

7.2 Wall Thickness: 4.2.1 and 4.2.3.