



AEROSPACE MATERIAL

Society of Automotive Engineers, Inc.
TWO PENNSYLVANIA PLAZA, NEW YORK, N.Y. 10001

SPECIFICATION

AMS 5580E

Superseding AMS 5580D

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ALLOY TUBING, SEAMLESS, CORROSION AND HEAT RESISTANT Nickel Base - 15.5Cr - 8.0Fe

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 requiring both corrosion and oxidation resistance, and where such parts may require welding during fabrication. Parts and assemblies requiring oxidation resistance up to approximately 2000 F (1093 C), but useful at the higher temperatures only when stresses are low. Strength at elevated temperatures is similar to that of the 18-8 type of steel.
3. COMPOSITION:

	min	max
Carbon	--	0.15
Manganese	--	1.00
Silicon	--	0.50
Sulfur	--	0.015
Chromium	14.00 - 17.00	
Nickel + Cobalt	72.00	--
Cobalt (1)	--	1.00
Iron	6.00 - 10.00	
Columbium + Tantalum (1)	--	1.00
Titanium (1)	--	0.50
Aluminum (1)	--	0.35
Copper	--	0.50

(1) Determination not required for routine acceptance.

- 3.1 Check Analysis: Composition variations shall meet the requirements of the latest issue of AMS 2269.
4. CONDITION: Unless otherwise ordered, the product shall be supplied in the following condition:
 - 4.1 Tubing 6.625 in. and under in nominal OD with nominal wall thickness 0.382 in. and under shall be cold drawn and annealed, and pickled if necessary.
 - 4.2 Tubing over 6.625 in. in nominal OD or over 0.382 in. nominal wall thickness shall be hot finished and annealed.
5. TECHNICAL REQUIREMENTS:
 - 5.1 Tensile Properties:

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5.1.1 Cold Drawn:

Ø	Nominal OD Inches	Tensile Strength psi, min	Yield Strength at 0.2% Offset or at Extension Indicated (E = 31,000,000)		Elongation % in 2 in. or 4D, min
			psi, min	Extension Under Load in. in 2 in.	
	Up to 5.000, incl	80,000	35,000	0.0063	30
	Over 5.000 to 6.625, incl	80,000	30,000	0.0059	35

5.1.2 Hot Finished:

Ø	Nominal OD Inches	Tensile Strength psi, min	Yield Strength at 0.2% Offset or at Extension Indicated (E = 31,000,000)		Elongation % in 2 in. or 4D, min
			psi, min	Extension Under Load in. in 2 in.	
	2.500 to 5.000, incl	80,000	30,000	0.0059	35
	Over 5.000 to 9.250, incl	75,000	25,000	0.0056	35

5.1.3 In case of dispute over the yield strength values, yield strength determined by the offset method shall apply.

5.2 Flarability: Cold drawn tubing with nominal OD of 0.188 - 2.000 in., incl, having nominal wall thickness of 0.125 in. and under 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 pin having a 74 deg included angle, to produce a permanent expanded OD not less than 1.3 times the original nominal OD.

5.2.1 Flarability of cold drawn tubing having nominal wall thickness 0.125 in. and under with nominal OD greater than 2.00 in. or less than 0.188 in. shall be as agreed upon by purchaser and vendor.

6. QUALITY:

6.1 Cold drawn tubing shall have a 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 burrs, seams, tears, grooves, laminations, slivers, pits, and other injurious imperfections. External and internal surface imperfections such as handling marks, light mandrel and die marks, shallow pits, seams, scores, and scale pattern will not be considered injurious, provided the imperfections are removable within the tolerances specified herein for wall thickness.

6.2 Hot finished 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:

7.1 Cold Drawn: Unless otherwise specified, tolerances shall conform to all applicable requirements of the latest issue of AMS 2263.

7.2 Hot Finished: Unless otherwise specified, tolerances for diameter and wall thickness shall be as shown below; length and straightness tolerances shall conform to the requirements of the latest issue of AMS 2263: