AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 5580 B

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ALLOY TUBING, SEAMLESS, CORROSION AND HEAT RESISTANT
Nickel Base - 15.5Cr - 8Fe
Annealed

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

2. APPLICATION: Parts requiring resistance to high temperatures during fabrication or in service where oxidation resistance superior to that of the 18-8 type of steel is desired.

3. COMPOSITION:

Carbon	0.15 max
Manganese	1.00 max
Silicon	0.50 max
Chromium	14.00 - 17.00
Nickel + Cobalt	72.00 min
Cobalt, if determined	1.00 max
Iron	6.00 - 10.00
Copper	0.50 max

4. CONDITION: Cold drawn and annealed, unless otherwise specified.

5. TECHNICAL REQUIREMENTS:

5.1 Physical Properties: Tubing shall conform to the following requirements:

Tensile Strength, psi	80,000 - 105,000
Yield Strength at 0.2% offset or at 0.0059 inch in 2 in. extension under load, psi	30,000 min
Elongation, % in 2 in.	35 min

5.2 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 degree included angle, to produce a permanent expanded OD not less than 30% greater than the original nominal OD.

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

7. TOLERANCES: Unless otherwise specified, tolerances shall be as follows:

7.1 Diameter and Wall Thickness:

Nominal OD, Inches	Nominal Wall Thickness, Inch	OD Tolerance, Inch plus	OD Tolerance, Inch minus	Wall Thickness Tolerance, % T plus and minus
Under 0.094	All	0.002 (1)	0	10
0.094 to 0.188, excl	All	0.003 (1)	0	10
0.188 to 0.500, excl	All	0.004 (1)	0	10
0.500 to 0.625, incl	0.083 and less	0.005 (1)	0	10
0.500 to 0.625, incl	Over 0.083	0.005 (2)	0.005 (2)	15
Over 0.625 to 1.50, incl	All	0.0075 (2)	0.0075 (2)	10
Over 1.50 to 3.50, incl	All	0.010 (2)	0.010 (2)	10
Over 3.50 to 4.50, incl	All	0.015 (2)	0.015 (2)	10

(1) Tolerances are based on individual measurements of OD.

(2) Tolerances are based on mean measurements of OD.

7.2 Ovality:

7.2.1 Tubes Less than 0.500 In. OD, and Tubes 0.500 - 0.625 In. OD with Wall Thickness 0.083 In. and Less: If nominal wall thickness is 3% or more of the nominal OD, no additional tolerance for ovality will be permitted on the OD. If nominal wall thickness is less than 3% of the nominal OD, an additional ovality tolerance equal to ± 0.5% of the nominal OD will be permitted, but the average OD shall be within the OD tolerances specified in 7.1.

7.2.2 Tubes 0.500 - 0.625 In. OD with Wall Thickness Over 0.083 In. and Tubes Over 0.625 In. OD: If wall thickness is 3% or more of the nominal OD, individual OD measurements shall not deviate from the nominal OD by more than twice the mean OD tolerance, plus or minus, specified in 7.1. If nominal wall thickness is less than 3% of the nominal OD, an ovality tolerance equal to ± 0.5% of the nominal OD will be permitted in addition to the mean OD tolerances specified in 7.1.

8. REPORTS:

8.1 Unless otherwise specified, the vendor of tubing shall furnish with each shipment three copies of a notarized report of the results of tests for chemical composition of each heat in the shipment and the results of tests on each size from each heat to determine conformance to the physical property requirements of this specification. This report shall include the purchase order number, heat number, material specification number, size, and quantity from each heat.

8.2 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 material conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.