AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 6550

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STEEL TUBING (WELDED)
.5 Ni .5 Cr .2 Mo (.27 - .33 C)
(Normalized)

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

2. TYPE: Electric-resistance-welded or gas-welded tubing.

3. COMPOSITION:

		Individual Tube Check Analysis Over or Under
Carbon	0.27 - 0.33	0.02 (under only)
Manganese	0.70 - 0.90	0.03
Phosphorus	0.040 max	0.005
Sulphur	0.040 max	0.005
Silicon	0.20 - 0.35	0.02
Nickel	0.40 - 0.60	0.03
Chromium	0.40 - 0.60	0.03
Molybdenum	0.15 - 0.25	0.03

4. GRAIN SIZE: 5 or finer as determined on the billet, ASTM E19-39T, method a, unless otherwise ordered. A heat of steel predominately 5 or finer, with grains as large as 3, is permissible.

5. CONDITION: Normalized, then stress relieved if cold worked after the normalizing, to conform to the following minimum physical properties, unless otherwise ordered:

Nominal Wall Thickness, Inch	Tensile Strength, lb per sq in.	Yield Strength at 0.2% Set or at Extension Indicated, lb per sq in.	Extension Under Load, inch in 2"	Elongation in 2" Full Tube, %	Elongation in 2" Strip, %
Up to 0.035, incl.	95,000	75,000	0.0090	10	5
Over 0.035 to 0.188, incl.	95,000	75,000	0.0090	12	7
Over 0.188	90,000	70,000	0.0087	15	10

6. QUALITY: (a) This tubing must be aircraft quality, uniform in temper and must not reveal defects during the fabrication processes.

(b) Finished parts may be subject to magnetic inspection.

(c) The tubing shall have a good workmanlike finish conforming to the best practice for high quality aircraft material. It shall be smooth, clean, and free from heavy scale or oxide, burrs, seams, tears, grooves, laminations, slivers, pits, and other injurious defects. Surface imperfections such as handling marks, straightening marks, light mandrel and die marks, shallow pits, and scale pattern will not be considered as injurious defects, provided the imperfections are removable within the tolerances specified herein for diameter and wall thickness. The removal of surface imperfections is not required.

(d) The maximum height of the inside welding flash shall not exceed 60% of the nominal wall thickness and in no case shall it be greater than 3/64 inch.

7. TOLERANCES: (a) The following variations in nominal outside diameter for the available standard sizes listed are permissible; all dimensions are in inches:

Nominal Outside Diameter	Wall Thickness	Tolerance, plus or minus
Up to 3/8, incl.	0.028 to 0.083, incl.	0.003
1/2	0.028 to 0.095, incl.	0.004
5/8	0.028 to 0.065, incl.	0.005
3/4 to 1, incl.	0.028 to 0.049, incl.	0.005
3/4 to 1, incl.	0.065 to 0.109, incl.	0.004
1-1/8 to 2, incl.	0.065 to 0.109, incl.	0.005
1-1/8 to 2, incl.	0.035 to 0.049, incl.	0.006
2-1/8 to 2-1/2, incl.	0.035 to 0.109, incl.	0.007
2-5/8 to 3, incl.	0.049 to 0.109, incl.	0.010

(b) The following variations in nominal wall thickness for the outside diameter ranges indicated are permissible; all dimensions are in inches:

Nominal Wall Thickness	Outside Diameter	Tolerance, plus or minus
0.028 to 0.049, incl.	3/8 to 7/8, incl.	0.003
0.058 to 0.083, incl.	3/8 to 7/8, incl.	0.004
0.028 to 0.035, incl.	1 to 2, incl.	0.003
0.049 to 0.083, incl.	1 to 2, incl.	0.004
0.095 to 0.109, incl.	1 to 2, incl.	0.005
0.095 to 0.109, incl.	2 to 3, incl.	0.006
0.035 to 0.083, incl.	2 to 3, incl.	0.004

Note: These tolerances are exclusive of the inside welding flash.

(c) In no portion of any piece of tubing shall the departure from straightness exceed one part in 800 parts of length.

8. TESTS: (a) Each length of tubing shall be subjected to a non-destructive test by the tube manufacturer for the detection of injurious imperfections. The method of testing shall be capable of detecting all imperfections. interior and exterior, with a length greater than 1/16 inch and a total depth equivalent to half the wall thickness of the tube.

(b) At least one crushing test sample shall be selected from each 1000 feet or less of each lot of tubing in the shipment. Test specimens shall have a length equal to 1-1/2 times the outside diameter and shall withstand crushing under a gradually applied load until the cross sectional dimension is increased in one zone by 20 per cent, or until one complete fold is formed, or until the specimen is reduced in length to 2/3 of the original length, without failure of the weld occurring.

9. REPORTS: The manufacturer shall furnish three copies of a notarized report of the chemical composition, grain size, physical properties and the results of the non-destructive test required by a paragraph 8(a) of each size and heat in each shipment. This report shall include the purchase order number, material specification number, heat number, size and quantity. If parts are supplied, the part numbers shall also be included.