

AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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New York City

AMS 6531

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Revised

STEEL TUBING (SEAMLESS) ROUND

.55 Ni .5 Cr .2 Mo (.27-.33C)

Heat Treated (125,000 T.S.)

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

2. 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 - 0.70	0.03
Chromium	0.40 - 0.60	0.03
Molybdenum	0.15 - 0.24	0.03

3. 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.

4. CONDITION: Heat treated (quenched in oil unless otherwise agreed and tempered) to conform to the following minimum physical properties:

Tensile Strength, psi	125,000
Yield Strength (0.2% Offset), psi	100,000
Equivalent Extension Under Load, inch in 2 in.	0.0107
Elongation, % in 2 in. - Full Tube - Wall Thickness up to 0.035 inch, incl.	10
Full Tube - Wall Thickness over 0.035 inch	12
Strip	7

5. QUALITY: (a) The tubing shall be suitable for use in aircraft, shall be uniform in temper and shall not reveal defects during the fabrication processes.

(b) 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.

6. **TOLERANCES** (a) The following variations in nominal outside diameter are permissible:

Nominal Outside Diameter Inches	Tolerance, Individual Diameter Measurement Inches
Less than 0.5	$\pm$ 0.010
Over 0.5 to 1.5, incl.	$\pm$ 0.015
Over 1.5 to 3.5, incl.	$\pm$ 0.030
Over 3.5 to 5.5, incl.	$\pm$ 0.045
Over 5.5	$\pm$ 0.060

Note: If so specified in the purchase order the tolerances for outside diameter shall apply to the inside diameter instead, but not to both inside and outside diameter of the same lot of tubing.

(b) The wall thickness of tubes, 0.5 inch or larger nominal inside diameter shall not vary more than plus or minus 10% from the thickness specified; smaller sizes may vary plus or minus 15%.

(c) In no portion of any piece of tubing shall the departure from straightness exceed one part in 600 parts of length.

7. **REPORTS:** (a) The tubing manufacturer shall furnish three copies of a notarized report of the chemical composition, grain size and physical properties of each heat and size in each shipment. This report shall include the purchase order number, material specification number, heat number, size, and quantity.

(b) Unless otherwise specified, the parts manufacturer shall furnish with each shipment three copies of a notarized report showing the purchase order number, material specification number, part number, and quantity. When tubing for making parts is supplied by the parts manufacturer, the parts manufacturer shall inspect each lot of tubing to determine conformance with this specification and shall include in the report a certification that the tubing conforms to the specification.

8. **IDENTIFICATION:** (a) Unless otherwise specified, each tube in sizes 5/8 inch in diameter or over shall be marked with AMS 6531 and the manufacturer's name or trade mark at intervals not greater than two feet between centers. The heat number shall be marked on one or both ends. The characters shall be not less than 1/4 inch in height. The characters shall be clearly legible and applied to the material by suitable means and suitable marking fluid, and shall not be obliterated by normal handling, nor by grease nor oil, and shall not interfere with welding procedures.

(b) Tubes less than 5/8 inch in diameter may be securely bundled and identified by a metal tag stamped with the above information and attached to each bundle, or boxed and the identification tag enclosed.

(c) Material that cannot be identified at destination is subject to rejection.