

AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
29 West 39th Street
New York City

AMS3615

Issued 11-1-49

Revised

PLASTIC TUBING Cotton Fabric Reinforced Phenol-Formaldehyde

1. ACKNOWLEDGMENT: A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.
2. APPLICATION: Primarily for electrical insulation at low voltages and for protection from galvanic corrosion. This material has good machining qualities and good moisture resistance.
3. MATERIAL AND FABRICATION:
 - 3.1 Tubing shall consist of laminations of fabric which have been impregnated with a thermosetting phenolic type of synthetic resin, rolled on mandrel between heated pressure rolls, and cured in oven.
 - 3.2 Fabric shall be fine weave cotton and shall weigh not more than 4 oz per square yard. Thread counts, as determined by inspection of finished tubing, shall be not less than 50 per in. in each the filling and warp direction and not less than 140 per in. total in both warp and filling directions.
4. TECHNICAL REQUIREMENTS:
 - 4.1 General:
 - 4.1.1 Color: Unless otherwise specified, the color shall be natural. When other colors are specified, color shall be substantially uniform throughout the tubing. Surfaces of tubing shall be substantially free from streaks and stains.
 - 4.1.2 Finish: Buffed, unless otherwise specified.
 - 4.1.3 Weathering: When specified, tubing shall have weather resistance acceptable to the purchaser as determined by a procedure agreed upon by purchaser and vendor.
 - 4.1.4 Corrosion: Tubing shall not have a corrosive or other deleterious effect on other materials when exposed to conditions normally encountered in service. Discoloration of metal shall not be considered objectionable.
 - 4.2 Properties: Tubing shall conform to the following requirements; tests shall be performed on the tubing and in accordance with ASTM D348-46 insofar as practicable.

<u>Property</u>	<u>Value</u>
4.2.1 Tensile Strength, psi, min	6,500
4.2.2 Compressive Strength (Axial), psi, min	18,000
4.2.3 Density, g per cc, min	1.10

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4.2.4 Water Absorption (24 hr immersion) % gain, max
Nominal Wall Thickness, in.

ID under
0.500 in.

ID 0.500 in.
and over

Up to 1/16, incl	8.0	6.5
Over 1/16 - 3/32, incl	5.5	3.5
Over 3/32 - 1/8, incl	3.5	2.2
Over 1/8 - 3/16, incl	2.1	1.8
Over 3/16 - 1/4, incl	1.9	1.7
Over 1/4 - 1/2, incl	1.6	1.6
Over 1/2	1.5	1.5

4.3 Machinability: Tubing shall not split, crack, chip or delaminate when drilled, sawed, tapped or machined in any direction.

5. QUALITY: Tubing shall be uniform in quality and condition, free from blisters, wrinkles, cracks, crazing and surface roughness, and reasonably free from other small defects such as scratches and dents.

6. TOLERANCES: Unless otherwise specified, the following shall apply:

6.1 Diameter:

Nominal Diameter inches	Diameter Tolerance, inch plus and minus	
	ID	OD
Under 3/4	0.003	0.005
3/4 to 2, excl	0.004	0.005
2 to 4, incl	0.008	0.008
Over 4 to 12, incl	0.010	0.025
Over 12 to 18, incl	0.030	0.030
Over 18 to 24, incl	0.040	0.035
Over 24 to 48, incl	0.060	0.040

Note 1: Diameter tolerance applies to ID or OD but not to both.

6.2 Wall Thickness:

Nominal Wall Thickness Inch	Wall Thickness Tolerance, inch, plus and minus ID Ranges, inches	
	Under 0.500	0.500 and over
Under 1/16	0.010	0.008
1/16 to 1/8, excl	0.011	0.009
1/8 to 1/4, excl	0.013	0.011
1/4 to 1/2, incl	0.015	0.013

Note 1: The term "excl" is used in 6.1 and 6.2 to apply only to the higher figure of the specified range.

6.3 Length:

Nominal Length Inches	Length Tolerance, inch, plus and minus, OD Ranges, Inches		
	2.00 and under	Over 2.00 to 4.00, incl	Over 4.00
3 and under	0.010	0.010	0.030
Over 3 to 6, incl	0.010	0.015	0.030
Over 6 to 12, incl	0.015	0.020	0.030
Over 12 to 48, incl	0.030	0.030	0.050

6.4 Straightness:

Nominal OD inch	Maximum Curvature (depth of arc) inch	
	36 inch Length	Other Lengths, inch
1/4 and under	0.72	0.000555 (length) ²
Over 1/4 to 3/4, incl	0.36	0.000277 (length) ²
Over 3/4	0.18	0.000138 (length) ²

7. REPORTS:

7.1 Unless otherwise specified, the vendor of tubing shall furnish with each shipment three copies of a notarized report stating that the tubing conforms to the requirements of this specification. This report shall include the purchase order number, material specification number, vendor's material number, size, and quantity.

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

8. IDENTIFICATION: Unless otherwise specified, each tube shall be marked near one end with the manufacturer's identification, and AMS 3615. The characters shall be legible, not less than 3/8 in. in height, shall be applied using a suitable marking fluid, and shall not be obliterated by ordinary handling. Alternatively, the information may appear on a suitable adhesive label.

9. PACKAGING:

9.1 Packaging shall be accomplished in such a manner as to ensure that the tubing or parts, during shipment and storage, will not be permanently distorted, and will be protected against damage from exposure to weathering or any normal hazard.