

AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 3615A

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PLASTIC TUBING

Cotton Fabric Reinforced Phenol-Formaldehyde

1. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter 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.
 - 3.1.1 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, the product shall have weather resistance acceptable to the purchaser as determined by a procedure agreed upon by purchaser and vendor.
 - 4.1.4 Corrosion: The product shall not have a corrosive effect on other materials when exposed to conditions normally encountered in service. Discoloration of metal shall not be considered objectionable.
 - 4.2 Properties: The product shall conform to the following requirements; tests shall be performed on the product supplied and in accordance with ASTM D348-46 insofar as practicable.

	Property	Value
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 cu cm, min	1.10

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4.2.4 Water Absorption (24 hr immersion), % gain, max Nominal Wall Thickness, inch	ID under 0.500 in.	ID 0.500 in. and over
0.063 and under	8.0	6.5
Over 0.063 to 0.094, incl	5.5	3.5
Over 0.094 to 0.125, incl	3.5	2.2
Over 0.125 to 0.188, incl	2.1	1.8
Over 0.188 to 0.250, incl	1.9	1.7
Over 0.250 to 0.500, incl	1.6	1.6
Over 0.500	1.5	1.5

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

5. QUALITY: The product 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 tolerances apply:

6.1 Diameter:

Nominal Diameter Inches	Diameter Tolerance, Inch Plus and Minus	
	ID	OD
Under 0.75	0.003	0.005
0.75 to 2.0, excl	0.004	0.005
2.0 to 4.0, incl	0.008	0.008
Over 4.0 to 12.0, incl	0.010	0.025
Over 12.0 to 18.0, incl	0.030	0.030
Over 18.0 to 24.0, incl	0.040	0.035
Over 24.0 to 48.0, incl	0.060	0.040

6.1.1 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, Inch	
	0.500 and under	Over 0.500
Under 0.063	0.010	0.008
0.063 to 0.125, excl	0.011	0.009
0.125 to 0.250, excl	0.013	0.011
0.250 to 0.500, incl	0.015	0.013

6.2.1 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
0.250 and under	0.72	0.000555 (length) ²
Over 0.250 to 0.750, incl	0.36	0.000277 (length) ²
Over 0.750	0.18	0.000138 (length) ²

7. REPORTS:

7.1 Unless otherwise specified, the vendor of the product shall furnish with each shipment three copies of a report stating that the product 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 report showing the purchase order number, material specification number, contractor or other direct supplier of material, part number, and quantity. When material for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of material to determine conformance to the requirements of this specification, and shall include in a report a statement that the material 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 3615A. The characters shall be 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 product, during shipment and storage, will not be permanently distorted, and will be protected against damage from exposure to weather or any normal hazard.