



AEROSPACE MATERIAL SPECIFICATION

AMS3593™

REV. B

Issued 1984-07
Revised 1991-01
Reaffirmed 2012-01
Stabilized 2017-03

Superseding AMS3593A

Tubing, Plastic, Electrical Insulation
Irradiated Polyvinylidene Fluoride, Semi-Rigid, Heat-Shrinkable
Marker Sleeving Grade
Low Outgassing

RATIONALE

AMS3593B is Stabilized. AMS3593B is not authorized by AS50881 for aircraft applications. See AS23053 for heat shrink sleeves and AS85049 Category 5 for heat shrink boots.

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1. SCOPE:

1.1 Form:

This specification covers an irradiated, thermally-stabilized, flame-resistant, modified-polyvinylidene-fluoride plastic in the form of extra-thin-wall tubing.

1.2 Application:

Primarily for use as a semi-rigid, electrical insulation tubing and marker sleeves in short lengths whose diameter can be reduced to a predetermined size by heating to temperatures of 175 °C (347 °F) or higher.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The applicable issue of referenced publications shall be the issue in effect on the date of the purchase order.

2.1 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 or www.astm.org.

ASTM D 471	Rubber Property - Effect of Liquids
ASTM D 910	Aviation Gasolines
ASTM D 2671	Testing Heat-Shrinkable Tubing for Electrical Use
ASTM E 595	Total Mass Loss and Collected Volatile Condensable Materials from Outgassing in a Vacuum Environment
ASTM G 21	Determining Resistance of Synthetic Polymeric Materials to Fungi

2.2 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

2.2.1 Military Specifications:

MIL-H-5606	Hydraulic Fluid, Petroleum Base, Aircraft, Missile, and Ordnance
MIL-T-5624	Turbine Fuel, Aviation, Grades JP-4 and JP-5
MIL-L-7808	Lubricating Oil, Aircraft Turbine Engine, Synthetic Base
MIL-A-8243	Anti-icing and Deicing-Defrosting Fluid

2.2.2 Military Standards:

MIL-STD-794	Parts and Equipment, Procedures for Packaging and Packing of
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3. TECHNICAL REQUIREMENTS:

3.1 Material:

Shall be an irradiated, thermally-stabilized, flame-resistant, modified-polyvinylidene fluoride plastic.

3.2 Color:

Shall be opaque white.

3.3 Properties:

Tubing shall conform to the following requirements; reported values shall be the average of all specimens tested for each requirement. Except as otherwise specified herein, tests shall be performed in accordance with ASTM D 2671, insofar as practicable.

3.3.1 Recovered Tubing: The following requirements apply to tubing after being shrunk by heating to $200\text{ }^{\circ}\text{C} \pm 5$ ($392\text{ }^{\circ}\text{F} \pm 9$) in a convection-current air oven with an air velocity of 100 to 200 feet per minute (0.5 to 1.0 m/second) past the tubing, holding at heat for not less than 3 minutes, removing from the oven, and conditioning for not less than 4 hours at $23\text{ }^{\circ}\text{C} \pm 2$ ($73\text{ }^{\circ}\text{F} \pm 4$) and 45 to 55% relative humidity:

3.3.1.1	Tensile Strength, minimum Jaw separation rate 2.0 inches per minute (0.85 mm/second)	4000 psi (27.6 MPa)	
3.3.1.2	Elongation, minimum	200%	
3.3.1.3	Dielectric Strength (short time test), minimum	600 volts/mil (23,622 V/mm)	
3.3.1.4	Volume Resistivity, minimum	10^{12} ohm-cm	
3.3.1.5	Flammability, Burning Time Procedure A, maximum (See 8.2)	15 seconds	
3.3.1.6	Fungus Resistance	Rating of 1 or less	ASTM G 21
3.3.1.7	Heat Aging, 168 hours ± 2 at $225\text{ }^{\circ}\text{C} \pm 3$ ($437\text{ }^{\circ}\text{F} \pm 5$)		
3.3.1.7.1	Tensile Strength, minimum	3000 psi (20.7 MPa)	
3.3.1.7.2	Elongation, minimum	150%	
3.3.1.8	Fluid Resistance		4.5.1
3.3.1.8.1	Tensile Strength, minimum	2000 psi (13.8 MPa)	
3.3.1.8.2	Dielectric Strength, minimum	500 volts/mil (19,685 V/mm)	
3.3.1.9	Dimensional Change on Heating		
3.3.1.9.1	Diametral	In accordance with Table I	
3.3.1.9.2	Longitudinal, maximum	$\pm 10\%$	
3.3.1.10	Vacuum Outgassing		ASTM E 595