



AEROSPACE MATERIAL SPECIFICATION

AMS3646™**REV. E**

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Superseding AMS3646D

Sheet, Polychlorotrifluoroethylene (PCTFE),
Molded, Unplasticized

RATIONALE

This document is being revised to update the types of ASTM D638 tensile test coupons that are permitted to be used to test AMS3646 material.

1. SCOPE

1.1 Form

This specification covers a 100% homopolymer of polychlorotrifluoroethylene (PCTFE) in the form of molded sheet 0.250 inch (6.35 mm) and under in nominal thickness.

1.2 Application

Primarily for parts requiring chemical inertness and toughness up to 200 °C (392 °F) or high-frequency electrical insulating properties up to 165 °C (329 °F). This product may also be used at cryogenic temperatures.

1.3 Safety - Hazardous Materials

While the materials, methods, applications, and processes described or referenced in this specification may involve the use of hazardous materials, this specification does not address the hazards which may be involved in such use. It is the sole responsibility of the user to ensure familiarity with the safe and proper use of any hazardous materials and to take necessary precautionary measures to ensure the health and safety of all personnel involved.

2. APPLICABLE DOCUMENTS

The issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

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2.1 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM D149	Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies
ASTM D618	Conditioning Plastics and Electrical Insulating Materials for Testing
ASTM D638	Tensile Properties of Plastics
ASTM D638M	Tensile Properties of Plastics (Metric)
ASTM D792	Specific Gravity (Relative Density) and Density of Plastics by Displacement
ASTM D1430	Polychlorotrifluoroethylene (PCTFE) Plastics
ASTM D1708	Tensile Properties of Plastics by Use of Microtensile Specimens

2.2 U.S. Government Publications

Copies of these documents are available online at <https://quicksearch.dla.mil>.

MIL-STD-2073-1 DOD Materiel, Procedures for Development and Application of Packaging Requirements

3. TECHNICAL REQUIREMENTS

3.1 Material

Shall be manufactured from virgin, unplasticized, 100% homopolymer of polychlorotrifluoroethylene (PCTFE).

3.2 Condition

Annealed.

3.3 Color

May range from natural translucent white to gray; localized discoloration resulting from processing will be acceptable.

3.4 Properties

Sheet shall conform to the following requirements; tests shall be performed on the sheet supplied and in accordance with specified test methods, insofar as practicable:

- 3.4.1 Tensile strength at $23\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ ($73\text{ }^{\circ}\text{F} \pm 2\text{ }^{\circ}\text{F}$), minimum average = 4800 psi (33.1 MPa); see 4.5.1
- 3.4.2 Elongation at $23\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ ($73\text{ }^{\circ}\text{F} \pm 2\text{ }^{\circ}\text{F}$), minimum = 100% (see 4.5.1)
- 3.4.3 Dielectric strength at $23\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ ($73\text{ }^{\circ}\text{F} \pm 2\text{ }^{\circ}\text{F}$), minimum = 450 V per mil (17717 V/mm); see 4.5.2
- 3.4.4 Specific gravity at $23^{\circ}/23\text{ }^{\circ}\text{C}$ ($73^{\circ}/73\text{ }^{\circ}\text{F}$) = 2.08 to 2.18 (refer to ASTM D792, Method A)
- 3.4.5 Zero strength time at $250\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ ($482\text{ }^{\circ}\text{F} \pm 4\text{ }^{\circ}\text{F}$), minimum = 300 seconds (refer to ASTM D1430)