

AEROSPACE MATERIAL SPECIFICATION

AMS 3656D
Superseding AMS 3656C

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POLYTETRAFLUOROETHYLENE EXTRUSIONS Normal Strength, As Sintered, Radiographically Inspected

1. SCOPE:

- 1.1 Form: This specification covers polytetrafluoroethylene resin in the form of extruded rods, tubes, and shapes.
- 1.2 Application: Primarily for mechanical parts, such as seals, back-up rings, and bearings, requiring chemical inertness up to 260°C (500°F). When dimensional stability is important, extrusions may be stress-relief annealed but best results will be obtained by machining parts almost to size, stress-relief annealing, and taking a thin, finishing cut.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

- 2.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods

- 2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM D149 - Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies
ASTM D638 - Tensile Properties of Plastics
ASTM D792 - Specific Gravity and Density of Plastics by Displacement

REAFFIRMED
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2.3 U.S. Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Military Standards:

MIL-STD-794 - Parts and Equipment, Procedures for Packaging and Packing of

3. TECHNICAL REQUIREMENTS:

3.1 Material: The product shall be extruded from polytetrafluoroethylene powder without admixture of fillers, pigments, or adulterants and shall be sintered.

3.2 Color: May vary from white to mottled gray or brown. Small gray, brown, or black spots shall not in themselves be unacceptable.

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

3.3.1 Tensile Strength at $23^{\circ}\text{C} \pm 1$ ($73^{\circ}\text{F} \pm 2$), min: 4.5.1

3.3.1.1 Rods and Shapes

Nominal Diameter or Distance Between Parallel Sides		
Inches	Millimetres	
Up to 0.500, excl	Up to 12.50, excl	1600 psi (11 MPa)
0.500 to 1.500, incl	12.50 to 37.50, incl	1700 psi (11.5 MPa)
Over 1.500	Over 37.50	1800 psi (12.5 MPa)

3.3.1.2 Tubes, All Sizes 1600 psi (11 MPa)

3.3.2 Elongation at $23^{\circ}\text{C} \pm 1$ ($73^{\circ}\text{F} \pm 2$), min: 4.5.1

3.3.2.1 Rods and Shapes

Nominal Diameter or Distance Between Parallel Sides		
Inches	Millimeters	
Up to 0.500, excl	Up to 12.50, excl	100%
0.500 to 1.500, incl	12.50 to 37.50, incl	125%
Over 1.500	Over 37.50	150%

3.3.2.2 Tubes, All Sizes 100%

3.3.3 Specific Gravity at 23°/23°C (73°/73°F):

ASTM D792
Add 2 drops
of wetting
agent to the
water

3.3.3.1 Rods and Shapes

Nominal Diameter or Distance Between Parallel Sides		
Inches	Millimetres	
Up to 0.500, excl	Up to 12.50, excl	2.12 - 2.17
0.500 to 1.500, incl	12.50 to 37.50, incl	2.13 - 2.18
Over 1.500	Over 37.50	2.14 - 2.19

3.3.3.2 Tubes, All Sizes

2.12 - 2.17

3.3.4 Dielectric Strength, Short Time Test, min:

4.5.2

3.3.4.1 Rods and Shapes

Nominal Diameter or Distance Between Parallel Sides		
Inches	Millimetres	
Up to 0.500, excl	Up to 12.50, excl	600 V per mil (23,600 V/mm)
0.500 to 1.500, incl	12.50 to 37.50, incl	650 V per mil (25,600 V/mm)
Over 1.500	Over 37.50	700 V per mil (27,550 V/mm)

3.3.4.2 Tubes, All Sizes

600 V per mil (23,600 V/mm)

3.4 Quality: Extrusions, as received by purchaser, shall be uniform in quality
Ø and condition, smooth, and free from foreign materials and from
imperfections detrimental to usage of the extrusions.

3.4.1 The product shall be radiographically inspected. Radiographic procedures
and standards for acceptance shall be as agreed upon by purchaser and
vendor.

3.5 Tolerances: Unless otherwise specified, the following tolerances apply at
23° - 30°C (73° - 86°F):