SAE Aerospace
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS3657 REV. F

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Superseding AMS3657E

Polytetrafluoroethylene (PTFE) Extrusions Premium Strength, As Sintered

RATIONALE

This document has been determined to contain basic and stable technology which is not dynamic in nature.

STABILIZED NOTICE

This document has been declared "Stabilized" by SAE AMS P, Polymeric Materials Committee, and will no longer be subjected to periodic reviews for currency. Users are responsible for verifying references and continued suitability of technical requirements. Newer technology may exist.

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1. SCOPE

1.1 Form

This specification covers a virgin, unfilled polytetrafluoroethylene (PTFE) in the form of extruded and sintered rods, tubes, and profiles.

1.2 Application

These products have been used typically for parts, such as bushings, and insulators, requiring chemical inertness up to 500 °F (260 °C) and better mechanical and/or electrical properties than AMS3656, but usage is not limited to such applications. When improved dimensional stability is required, it is recommended that stress relieved product in accordance with AMS3659 be specified. For parts such as seals, back-up rings and bearings that do not require dielectric properties and radiographic inspection it is recommended to use AMS3678/1 Grade B.

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.

1.4 Types 1 and 2, which were defined in previous revisions of this specification, have been combined. For documentation which specifies Type 1 or Type 2 of this specification, all of the requirements of this specification now apply.

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.

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

AMS3656 Polytetrafluoroethylene Extrusions, Normal Strength, As Sintered
AMS3659 Polytetrafluoroethylene Extrusions, Premium Strength, Sintered and Stress-Relieved
AMS3678 Polytetrafluoroethylene (PTFE) Moldings and Extrusions, Unfilled, Pigmented and Filled Compounds

2.2 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 D 149 Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies
ASTM D 792 Specific Gravity (Relative Density) and Density of Plastics by Displacement
ASTM D 4894 Polytetrafluoroethylene (PTFE) Granular Molding and Ram Extrusion Materials

3. TECHNICAL REQUIREMENTS

3.1 Material

The product shall be extruded from virgin PTFE powder conforming to ASTM D 4894 Type IV or Type V without admixture of fillers, pigments, or adulterants and shall be sintered. “Virgin” shall mean no previous heat or pressure history.

3.1.1 Color

Shall be opaque white. Minor discolorations or contamination are acceptable provided they do not have a detrimental effect on the performance of the finished product.

3.2 Properties

Extrusions shall conform to requirements shown in Table 1, Table 2, Table 3, and Table 4; tests shall be performed on production extrusions and in accordance with specified test methods, insofar as practicable.

3.2.1 Tensile Strength at 73 °F ± 2 (23 °C ± 1)

Shall be as shown in Table 1, determined in accordance with 4.3.1.

TABLE 1 - MINIMUM TENSILE STRENGTH

Form	Nominal Diameter or Distance Between Parallel Sides Inches	Nominal Diameter or Distance Between Parallel Sides Millimeters	Tensile Strength psi (MPa)
Rods, Profiles	Up to 0.500, excl	Up to 12.70, excl	1800 (12.4)
Rods, Profiles	0.500 to 1.500, incl	12.70 to 38.10, incl	1900 (13.1)
Rods, Profiles	Over 1.500	Over 38.10	2000 (13.8)
Tubes	All sizes	All sizes	1800 (12.4)