

AEROSPACE MATERIAL SPECIFICATION

SAE AMS3667D

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Superseding AMS3667C

(R) Polytetrafluoroethylene (PTFE) Sheet, Molded
General Purpose Grade, AS Sintered

RATIONALE

AMS3667D results from a Five Year Review and update of this specification.

1. SCOPE

1.1 Form

This specification covers virgin, unfilled polytetrafluoroethylene (PTFE) in the form of sheet, manufactured by compression molding and sintering.

1.2 Application

This sheet has been used typically for mechanical parts such as insulation, seals, and bearings requiring chemical inertness up to 500 °F (260 °C), but usage is not limited to such applications.

1.3 Classification

Sheet covered by this specification is classified as follows:

Type 1 For parts, such as insulators and mounting posts, requiring chemical inertness and good mechanical and electrical properties up to 500 °F (260 °C). Testing of all specified properties is required.

Type 2 For parts, such as seals, backup rings, and bearings, requiring chemical inertness and good mechanical properties up to 500 °F (260 °C). Dielectric strength test (3.3.4) is not required.

1.3.1 Unless a specific type is ordered, Type 1 shall be supplied.

1.4 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.

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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 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

Sheet shall be molded from virgin polytetrafluoroethylene (PTFE) powder in accordance with ASTM D 4894 without the addition of fillers, pigments, or adulterants and shall be sintered. "Virgin" shall mean having no previous heat or pressure history.

3.2 Color

Shall be predominantly white. Surface discoloration from sintering and/or annealing may vary from white to mottled gray or brown. Small gray, brown, or black spots are acceptable provided they have no detrimental effect on performance of the finished product.

3.3 Properties

The product shall conform to the requirements shown in Table 1; tests shall be performed on production sheet and in accordance with specified test methods.

TABLE 1 - PROPERTIES

Paragraph	Property	Requirement	Test Method
3.3.1	Tensile Strength at 73 °F ± 2 (23 °C ± 1), minimum	3000 psi (20.7 MPa)	4.3.1
3.3.2	Elongation at 73 °F ± 2 (23 °C ± 1), minimum	200%	4.3.1
3.3.3	Specific Gravity at 73 °F (23 °C)	2.14 to 2.19	ASTM D 792 Add two drops of wetting agent to the water
3.3.4	Dielectric Strength, applicable only to Type 1 sheet Short Time Test, minimum	500 Volts per mil (19.7 kV/mm)	4.3.2

3.4 Quality

Sheet, as received by purchaser, shall be uniform in quality and condition, smooth, and free from foreign materials and from imperfections detrimental to usage of the sheet.

3.5 Tolerances

Unless otherwise agreed between vendor and purchaser, dimensional tolerances of moldings shall be in accordance with Table 2, determined at 73 to 86 °F (23 to 30 °C):

3.5.1 Thickness

Shall be as shown in Table 2.

TABLE 2 - THICKNESS TOLERANCES

Nominal Thickness (T) Inch (Millimeter)		Tolerance	
		Inch (Millimeter) Plus	Inch (Millimeter) Minus
0.0312 (0.792) to 0.0938 (2.382)	incl	0.015 (0.38)	0.005 (0.13)
Over 0.0938 (2.382) to 0.125 (3.180)	incl	0.016 (0.41)	0.008 (0.20)
Over 0.125 (3.180) to 0.1563 (3.970)	incl	0.018 (0.46)	0.009 (0.23)
Over 0.1563 (3.970) to 0.1875 (4.762)	incl	0.022 (0.56)	0.011 (0.28)
Over 0.1875 (4.762) to 0.250 (6.350)	incl	0.030 (0.76)	0.015 (0.38)
Over 0.250 (6.350) to 0.375 (9.520)	incl	0.038 (0.96)	0.019 (0.48)
Over 0.375 (9.520) to 0.500 (12.70)	incl	0.046 (1.17)	0.022 (0.56)
Over 0.500 (12.70) to 0.625 (15.88)	incl	0.054 (1.37)	0.027 (0.68)
Over 0.625 (15.88) to 0.750 (19.05)	incl	0.070 (1.78)	0.035 (0.89)
Over 0.750 (19.05) to 1.000 (25.40)	incl	0.087 (2.21)	0.043 (1.09)
Over 1.000 (25.40) to 1.250 (31.75)	incl	0.102 (2.59)	0.051 (1.30)
Over 1.250 (31.75) to 1.500 (38.10)	incl	0.118 (3.00)	0.059 (1.50)
Over 1.500 (38.10) to 1.750 (44.45)	incl	0.134 (3.40)	0.067 (1.70)
Over 1.750 (44.45) to 2.000 (50.80)	incl	0.150 (3.81)	0.075 (1.90)
Over 2.000 (50.80)		0.10T	0.05T

3.5.2 Width and Length

Shall not vary more than +0.25 inch (+6.35 mm), -0.00 inch.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The manufacturer of sheet shall be responsible for the performance of all required tests. Purchaser reserves the right to sample and to perform any testing deemed necessary to ensure that the sheet conforms to AMS requirements.

4.2 Classification of Tests

4.2.1 Acceptance Tests

Each lot of product shall conform to all technical requirements and shall be performed prior to shipment of sheet to a purchaser.

4.2.1.1 Sampling and Testing

Sufficient sheet(s) shall be taken at random from each lot to perform all required tests. The number of determinations for each requirement shall be as specified in the applicable test procedure or, if not specified therein, not less than three.

4.2.1.2 A lot shall be all sheet of the same size made from the same batch of compound in one production run and presented for vendor's inspection at one time.

4.2.1.3 When a statistical sampling plan has been agreed upon by purchaser and vendor, sampling shall be in accordance with such plan and the report of 4.4 shall state that such plan was used.

4.3 Test Methods

4.3.1 Tensile Strength and Elongation

Shall be determined in accordance with ASTM D 4894. Specimens shall be prepared from production sheet(s) of sufficient size, or if production sheet(s) will not yield suitable samples, from a test or other suitable production sheet from the same resin lot. All results shall be reported.

4.3.2 Dielectric Strength

Shall be determined in accordance with ASTM D 149, on specimens 0.060 inch \pm 0.010 (1.52 mm \pm 0.25) thick. Tests shall be conducted under oil using electrodes of corrosion-resistant steel, nominally 0.25 inch (6.35 mm) in diameter with 0.031 inch (0.79 mm) radius at the edges.

4.4 Reports

The vendor of sheet shall furnish with each shipment a report showing the results of tests to determine conformance to the technical requirements. This report shall include the purchase order number, lot number, AMS3667D, type, vendor's compound number, size, and quantity.

4.5 Resampling and Retesting

If any specimen used in the above tests fails to meet the specified requirements, disposition of the sheet may be based on the results of testing three additional specimens for each original nonconforming specimen. Failure of any retest specimen to meet the specified requirements shall be cause for rejection of the sheet represented. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY

5.1 Packaging and Identification

5.1.1 Packaging of sheet shall be accomplished to ensure that, the sheet, during shipment and storage, will not be permanently distorted and will be protected against damage from exposure to weather or any other normal hazard.

5.1.1.1 A lot of sheet may be packaged in small quantities and delivered under the basic lot approval provided lot identification is maintained.

5.1.2 Each package of sheet shall be permanently and legibly marked with not less than the following information:

POLYTETRAFLUOROETHYLENE SHEET, MOLDED

General Purpose Grade, As Sintered

AMS3667D

TYPE _____

SIZE _____

LOT NUMBER _____

PURCHASE ORDER NUMBER _____

QUANTITY _____

MANUFACTURER'S IDENTIFICATION _____