AEROSPACE MATERIAL SPECIFICATION

AMS3669™	REV. H

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Revised 2024-10

Superseding AMS3669G

Polytetrafluoroethylene (PTFE) Sheet, Molded Premium Grade, As Sintered

RATIONALE

This document is being revised to correct the ASTM D4894 resin types that are permitted to be used to produce AMS3669 material.

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 machined parts requiring chemical inertness up to 500 °F (260 °C), with better mechanical properties and/or electrical properties than AMS3667, but usage is not limited to such applications.

1.3 Classification

Sheet covered by this specification is classified as follows:

Type 1 For parts 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 requiring chemical inertness and good mechanical properties up to 500 °F (260 °C), where electrical insulation is not a consideration. Dielectric strength test (see 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 that 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.

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: +1 724-776-4970 (outside USA)
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SAE WEB ADDRESS: **http://www.sae.org**

For more information on this standard, visit
https://www.sae.org/standards/content/AMS3669H/

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 +1 724-776-4970 (outside USA), www.sae.org.

AMS3667 Polytetrafluoroethylene (PTFE) Sheet, Molded, General Purpose Grade, As Sintered

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 D149 Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies

ASTM D792 Specific Gravity (Relative Density) and Density of Plastics by Displacement

ASTM D4894 Polytetrafluoroethylene (PTFE) Granular Molding and Ram Extrusion Materials

3. TECHNICAL REQUIREMENTS

3.1 Material

Sheet shall be molded from virgin polytetrafluoroethylene (PTFE) powder conforming to ASTM D4894 Type II, 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.

3.2 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 shall not in themselves be unacceptable provided they have no detrimental effect on the end usage of the finished product.

3.3 Properties

Sheet shall conform to the requirements shown in Table 1; tests shall be performed on the sheet supplied and in accordance with specified test methods, insofar as practicable.

Table 1 - Properties

Paragraph	Property	Requirement	Test Method
3.3.1	Tensile Strength at 73 °F ± 2 °F (23 °C ± 1 °C), minimum	4000 psi (27.6 MPa)	4.3.1
3.3.2	Elongation at 73 °F ± 2 °F (23 °C ± 1 °C), minimum	300%	4.3.1
3.3.3	Specific Gravity at 73 °F (23 °C)	2.14 to 2.19	ASTM D792; add two drops of wetting agent to the water
3.3.4	Dielectric Strength, Short Time Test, minimum (applicable only to Type 1 sheet)	600 volts per mil (23.6 kV/mm)	4.3.2

3.4 Tolerances

Unless otherwise agreed between the vendor and the purchaser, dimension tolerances of molded sheets shall be in accordance with Table 2, determined at 73 to 86 °F (23 to 30 °C).

3.4.1 Thickness

Shall be as shown in Table 2.

Table 2 - Thickness tolerances

Nominal Thickness (T) Inches (Millimeters)	Tolerance Inch (Millimeters) Plus	Tolerance Inch (Millimeters) 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

3.4.2 Width and Length

Shall not vary more than +0.250 inch (+6.35 mm), -0.00 inch (-0.00 mm).

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The manufacturer of sheet shall supply all test coupons and shall be responsible for the performance of all required tests for each lot of molded sheet. The purchaser reserves the right to sample and to perform any testing deemed necessary to ensure that the sheet conforms to specified requirements. The manufacturer of machined parts shall furnish substantiating test data acquired by the manufacturer of molded sheet(s). The purchaser of parts machined from molded sheet(s) also reserves the right to perform confirmatory testing provided the parts will yield test coupons that conform to the testing procedure(s) listed in 4.5.

4.2 Classification of Tests

4.2.1 Acceptance Tests

All technical requirements are acceptance tests and shall be performed on each lot of moldings (see 4.3.1).

4.3 Sampling and Testing

Shall be as follows:

4.3.1 Sufficient test coupons shall be taken at random from each production lot of molded sheet(s) to perform all required tests. Otherwise, test samples shall be machined from a test or other suitable molded sheet from the same resin lot. 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.

4.3.2 A lot of moldings shall be all the molded sheets of the same configuration made from the same batch of PTFE resin in one continuous run and presented for the manufacturer's inspection at one time. Where multiple shipments are made from one lot of molded sheets, lot traceability shall be maintained. A lot shall consist of not more than 200 pounds (91 kg) of moldings.

4.3.3 A statistical sampling plan, acceptable to the purchaser, may be used in lieu of sampling as in 4.3.1, and the report of 4.6 shall state that such plan was used.

4.4 Approval

4.4.1 Test results from sample product shall be approved by the purchaser before production molded sheets are supplied, unless such approval is waived by the purchaser. Results of tests on samples from the production lot shall be essentially equivalent to those on the approved sample. Production product made by a revised procedure shall not be shipped prior to receipt of reapproval. If necessary to make any change in parameters or the process control factors, the manufacturer shall submit for reapproval a statement of the proposed changes in ingredients and/or processing and, when requested, sample product or test coupons shall be provided.

4.4.2 The manufacturer of the product shall make no significant change in material, processes, or control factors from those on which the approval was based, unless the change is approved by the purchaser's engineering department. A significant change is one which, in the judgment of the purchaser's engineering department, could affect the properties or performance of the product.

4.5 Test Methods

Shall be as follows:

4.5.1 Tensile strength and elongation shall be determined in accordance with ASTM D4894, and the test 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 suitable production sheet from the same resin lot. Test specimens, where size permits, shall conform to ASTM D4894, Figure 11. Specimens shall be prepared from slices 0.031 inch ± 0.002 inch (0.79 mm ± 0.05 mm) thick cut from the product. The initial jaw separation shall be 0.875 inch ± 0.005 inch (22.2 mm ± 0.13 mm), and the speed of testing shall be 2 inches (50 mm) per minute. All results shall be reported.