Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 3667A
Superseding AMS 3667

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POLYTETRAFLUOROETHYLENE SHEET, MOLDED
General Purpose Grade, As Sintered

1. SCOPE:

1.1 Form: This specification covers one grade of polytetrafluoroethylene resin in the form of molded sheet.

1.2 Application: Primarily for parts requiring good mechanical and electrical properties and chemical resistance at temperatures up to 260° C (500° F). When dimensional stability is important, the product 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 (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from Society of Automotive Engineers, Inc., 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 Electrical Insulating Materials at Commercial Power Frequencies
ASTM D638 - Tensile Properties of Plastics
ASTM D792 - Specific Gravity and Density of Plastics by Displacement
ASTM D1708 - Tensile Properties of Plastics by Use of Microtensile Specimens

2.3 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: Sheet shall be molded 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: 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:

3.3.1 Tensile Strength at 23° C ± 1 (73.4° F ± 1.8), min	3000 psi (20.7 MPa)	4.5.1
3.3.2 Elongation at 23° C ± 1 (73.4° F ± 1.8), min	200%	4.5.1
3.3.3 Specific Gravity at 23°/23° C (73.4°/73.4° F)	2.14 - 2.19	ASTM D792 Add 2 drops of wetting agent to the water
3.3.4 Dielectric Strength, Short Time Test, min	500 V per mil (19,680 V/mm)	4.5.2

3.4 Quality: Sheet shall be uniform in quality and condition, clean, smooth, and free from foreign materials and from internal and external imperfections detrimental to fabrication, appearance, or performance of parts.

3.5 Tolerances: Unless otherwise specified, the following tolerances apply at 23° - 30° C (73.4° - 86° F):

3.5.1 Thickness:

TABLE I

Nominal Thickness (T) Inches	Tolerance, Inch plus	Tolerance, Inch minus
0.0312 to 0.0625, incl	0.015	0.005
Over 0.0625 to 0.0938, incl	0.020	0.005
Over 0.0938 to 0.125 , incl	0.016	0.008
Over 0.125 to 0.1563, incl	0.018	0.009
Over 0.1563 to 0.1875, incl	0.022	0.011
Over 0.1875 to 0.250 , incl	0.030	0.015
Over 0.0250 to 0.375 , incl	0.038	0.019
Over 0.375 to 0.500 , incl	0.046	0.022
Over 0.500 to 0.625 , incl	0.054	0.027
Over 0.625 to 0.750 , incl	0.070	0.035
Over 0.750 to 1.000 , incl	0.087	0.043
Over 1.000 to 1.250 , incl	0.102	0.051
Over 1.250 to 1.500 , incl	0.118	0.059
Over 1.500 to 1.750 , incl	0.134	0.067
Over 1.750 to 2.000 , incl	0.150	0.075
Over 2.000	0.10T	0.10T

TABLE I (SI)

Nominal Thickness (T) Millimetres	Tolerance Millimetres plus	minus
0.792 to 1.588, incl	0.38	0.13
Over 1.588 to 2.383, incl	0.51	0.13
Over 2.383 to 3.18 , incl	0.41	0.20
Over 3.18 to 3.970, incl	0.46	0.23
Over 3.970 to 4.762, incl	0.56	0.28
Over 4.762 to 6.35 , incl	0.76	0.38
Over 6.35 to 9.52 , incl	0.97	0.48
Over 9.52 to 12.70 , incl	1.17	0.56
Over 12.70 to 15.88 , incl	1.37	0.69
Over 15.88 to 19.05 , incl	1.78	0.89
Over 19.05 to 25.40 , incl	2.21	1.09
Over 25.40 to 31.75 , incl	2.59	1.30
Over 31.75 to 38.10 , incl	3.00	1.50
Over 38.10 to 44.45 , incl	3.40	1.70
Over 44.45 to 50.80 , incl	3.81	1.90
Over 50.80	0.10T	0.10T

3.5.2 Width and Length: Shall not vary more than +0.250 in. (+6.35 mm), -0.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of sheet shall supply all samples and shall be resonsible for performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.6. Purchaser reserves the right to perform such confirmatory testing as he deems necessary to ensure that the sheet conforms to the requirements of this specification.

4.2 Classification of Tests: Tests to determine conformance to all technical requirements of this specification are classified as acceptance tests.

4.2.1 For direct U.S. Military procurement, substaniating test data and, when requested, qualification test material shall be submitted to the cognizant qualification agency as directed by the procuring activity, the contracting officer, or the request for procurement.

4.3 Sampling: Sufficient sheet shall be taken from each lot to perform all required tests in triplicate; a lot shall be all sheet produced in a single production run from the same batch of raw material and presented for vendor's inspection at one time.

4.4 Approval:

4.4.1 Sample sheet shall be approved by purchaser before sheet for production use is supplied, unless such approval be waived. Results of tests on production sheet shall be essentially equivalent to those on the approved sample.

4.4.2 Vendor shall use ingredients, manufacturing procedures, processes, and methods of inspection on production sheet which are essentially the same as those used on the approved sample sheet. If any change is necessary in ingredients, in type of equipment for processing, or in manufacturing procedures, vendor shall submit for reapproval a statement of the proposed changes in material and processing and, when requested, sample sheet. Production sheet made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5 Test Methods:

4.5.1 Tensile Strength and Elongation: Shall be determined in accordance with ASTM D638, using the microtensile specimen of ASTM D1708. The initial jaw separation shall be 0.875 in. ± 0.005 (22.22 mm ± 0.13) and the speed of testing shall be 2 in. (51 mm) per minute. Sheet over 0.062 to 0.625 in. (1.57 to 15.88 mm), excl, in nominal thickness shall be machined to 0.062 in. ± 0.010 (1.57 mm ± 0.25) thick before cutting specimens. From sheet 0.625 in. (15.88 mm) and over in nominal thickness, a slice somewhat thicker than 0.062 in. (1.57 mm) shall be cut in a plane parallel to, and not less than 0.5 in. (13 mm) from, the plane of one end of the sheet; this slice shall be machined on both faces to 0.062 in. ± 0.010 (1.57 mm ± 0.25) thick and the specimens cut from the machined slice. In all cases of specimens reduced to specified thickness by machining, tool marks shall be removed by light sanding in a longitudinal direction.

4.5.2 Dielectric Strength: Shall be determined in accordance with ASTM D149, on specimens 0.060 in. ± 0.010 (1.52 mm ± 0.25) thick. Tests shall be conducted under oil using electrodes of corrosion-resistant steel, nominally 0.25 in. (6.4 mm) in diameter with 0.031 in. (0.79 mm) radius at the edges.

4.6 Reports:

4.6.1 Ø The vendor of sheet shall furnish with each shipment three copies of a report showing the results of tests to determine conformance to the technical requirements of this specification. This report shall include the purchase order number, material specification number and its revision letter, vendor's compound number, size, and quantity.

4.6.2 The vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, material specification number and its revision letter, contractor or other direct supplier of sheet, supplier's compound number, part number, and quantity. When sheet for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of sheet to determine conformance to the requirements of this specification, and shall include in the report a statement that the sheet conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.

4.7 Resampling and Retesting: Ø 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 and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Packaging and Identification:

5.1.1 Packaging shall be accomplished in such a manner as 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 normal hazard.

5.1.2 Each package shall be permanently and legibly marked to show not less than the following information:

Ø

POLYTETRAFLUOROETHYLENE SHEET, MOLDED
General Purpose Grade, As Sintered
AMS 3667A
SIZE _____
LOT NUMBER _____
PURCHASE ORDER NUMBER _____
QUANTITY _____
MANUFACTURER'S IDENTIFICATION _____