



AEROSPACE MATERIAL

Society of Automotive Engineers, Inc.

400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

SPECIFICATION

AMS 3843 A

Superseding AMS 3843

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POLYTETRAFLUOROETHYLENE SHEET

Asbestos Fiber Reinforced
High Compressibility, Low Density

1. SCOPE:

- 1.1 Form: This specification covers polytetrafluoroethylene resin in the form of asbestos-fiber-reinforced sheet.
- 1.2 Application: Primarily for gaskets requiring a minimum of thickness variation and compatibility with liquid oxygen.

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 D792 - Specific Gravity and Density of Plastics by Displacement

ASTM F36 - Compressibility and Recovery of Gasket Materials

ASTM F39 - Testing of Compressed Asbestos Sheet Packing

ASTM F104 - Classification System for Nonmetallic Gasket Materials

- 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 and Fabrication: Sheet shall be made from selected short-fiber chrysotile asbestos fibers impregnated with approximately twice its own weight of polytetrafluoroethylene, felted, and thermally sintered.

- 3.1.1 Color: Shall be light grey to dark brown.

- 3.2 Properties: Sheet shall conform to the following requirements; tests shall be performed on the sheet supplied and in accordance with the specified methods:

SAE Technical Board rules provide that: "All technical reports, including standards, approved and practices recommended, are advisory only. Their use by anyone engaged in industry or trade is entirely voluntary. There is no agreement to adhere to any SAE standard or recommended practice, and no commitment to conform to or be guided by any technical report. In formulating and approving technical reports, the Board and its Committees will not investigate or consider patents which may apply to the subject matter. Prospective users of the report are responsible for protecting themselves against infringement of patents."

- 3.2.1 Weight Loss at 600° F or 315° C based on original dry weight, max 5% 4.5.1
- 3.2.2 Weight Loss at 900° F or 480° C based on original dry weight 65 - 70% 4.5.1
- 3.2.3 Density 75 - 85 lb per cu ft ASTM D792, Method B
 \emptyset 1.20 - 1.36 Mg/m³
- \emptyset 3.2.4 Tensile Strength, min 1500 psi ASTM F39
 (10.3 MPa)
- \emptyset 3.2.5 Compressibility using 5000 psi (34.5 MPa) load 20 - 40% ASTM F36
- \emptyset 3.2.5.1 Recovery, min 15% ASTM F36
- 3.2.6 Liquid Oxygen Compatibility No Reaction 4.5.2
- 3.2.7 Weathering: When specified, sheet shall have weather resistance acceptable to the purchaser, determined by a procedure agreed upon by purchaser and vendor.
- 3.2.8 Corrosion: Sheet shall not have a corrosive effect on other materials when exposed to conditions normally encountered in service. Discoloration of metal shall not be considered objectionable.
- 3.3 Quality: Sheet shall be uniform in quality and condition, clean, sound, and free from foreign materials and from internal and external imperfections detrimental to fabrication, appearance, or performance of parts.
- 3.4 Tolerances: Shall be as follows, based on the average of five determinations in accordance with \emptyset ASTM F104:
- 3.4.1 Thickness:

TABLE I

Nominal Thickness Inches	Tolerance, Inch plus and minus	Variation from Reading to Reading in Any One Sheet Inch
0.016 to 0.030, incl	0.004	0.002
Over 0.030 to 0.060, incl	0.004	0.003
Over 0.060 to 0.090, incl	0.005	0.003
Over 0.090 to 0.120, incl	0.010	0.004
Over 0.120	0.015	0.004

TABLE I (SI)

Nominal Thickness Millimetres	Tolerance, Millimetre plus and minus	Variation from Reading to Reading In Any One Sheet Millimetre
0.41 to 0.76, incl	0.10	0.05
Over 0.76 to 1.52, incl	0.10	0.08
Over 1.52 to 2.29, incl	0.13	0.08
Over 2.29 to 3.05, incl	0.25	0.10
Over 3.05	0.38	0.10

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of sheet shall supply all samples and shall be responsible 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:

4.2.1 Acceptance Tests: Tests to determine conformance to weight loss (3.2.1 and 3.2.2), density (3.2.3), tensile strength (3.2.4), compressibility (3.2.5), recovery (3.2.5.1), liquid oxygen compatibility (3.2.6), and tolerance (3.4) requirements are classified as acceptance or routine control tests.

4.2.2 Qualification Tests: Tests to determine conformance to all technical requirements of this specification are classified as qualification or periodic control tests and may be the basis for approval of the sheet (See 4.4.1).

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

4.3 Sampling: Sufficient product shall be selected from each lot of sheet to perform all required tests as follows; a lot shall be all sheet produced in a single production run from the same batch of raw materials under the same fixed conditions and submitted for vendor's inspection at one time:

Property	Paragraph Reference	Number of Tests
Weight Loss at 600° F or 315° C	3.2.1	1
Weight Loss at 900° F or 480° C	3.2.2	1
Density	3.2.3	1
Tensile Strength	3.2.4	1
Compressibility	3.2.5	1
Recovery	3.2.5.1	1
Liquid Oxygen Compatibility	3.2.6	1

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 materials and processing and, when requested, sample revised sheet. No production sheet made by the revised procedure shall be shipped prior to receipt of reapproval.

4.5 Test Methods:

- 4.5.1 Weight Loss: Place a $2\text{-g} \pm 0.1$ sample in a tared crucible and heat at $220^{\circ}\text{F} \pm 2$ or $105^{\circ}\text{C} \pm 1$ to constant weight (original dry weight) at room temperature. Heat the crucible and contents to $600^{\circ}\text{F} \pm 10$ or $315^{\circ}\text{C} \pm 5$, hold at heat for $24\text{ hr} \pm 0.3$, cool in a desiccator, and reweigh. Reheat the crucible and contents to $900^{\circ}\text{F} \pm 25$ or $480^{\circ}\text{C} \pm 15$, hold at heat for $3\text{ hr} \pm 0.3$, cool, weigh, and calculate the weight losses occurring during the 600°F or 315°C and the 900°F or 480°C heatings.

- 4.5.2 Liquid Oxygen Compatibility: A sample of sheet shall be immersed in liquid oxygen and tested under hammer impact using an impact energy of $300\text{ ft-lb per sq in. (63 N}\cdot\text{m/cm}^2\text{)}$, obtained by dropping a 20-lb (9.1-kg) weight onto a hammer having a diameter of $0.50\text{ in. (12.7 mm)}$, using a testing procedure acceptable to the purchaser. Other suitable procedures may be used when permitted by purchaser.

4.6 Reports:

- 4.6.1 The vendor of sheet shall furnish with each shipment three copies of a report showing the results of tests made on the sheet 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 material designation, 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 material designation, 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: 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 be protected from exposure to weather or any normal hazard.
- 5.1.2 Identification: Each package shall be permanently and legibly marked to show the following information: