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

AEROSPACE MATERIAL SPECIFICATION

AMS 3232K
Superseding AMS 3232J

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ASBESTOS AND SYNTHETIC RUBBER SHEET
Hot Oil Resistant

1. SCOPE:

1.1 Form: This specification covers a compressed asbestos and synthetic rubber material in the form of sheets and rolls.

1.2 Application: Primarily for gaskets, sealing between metal surfaces, in contact with fuels or with lubricating oil at temperatures up to 150°C (300°F).

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
AMS 2810 - Identification and Packaging, Elastomeric Products

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Phildelphia, PA 19103.

ASTM F39 - Compressed Asbestos Sheet Packing

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: Shall be composed of selected long-fiber asbestos and heat-resisting synthetic rubber compounds bonded and felted together under pressure into a pliable, resilient product.

3.1.1 Color: Shall be black or light gray, unless otherwise specified. A deep tan or brown discoloration of light gray products will not be acceptable.

Printed in U.S.A.

3.2 Properties: The product shall conform to the following requirements; tests shall be performed on the product supplied and, except as otherwise specified, in accordance with ASTM F39. Only specimens for tensile tests of the product as received shall be conditioned. Method A shall be used for all immersion tests.

3.2.1 As Received:

3.2.1.1	Tensile Strength, min Parallel to Direction of Rolling Perpendicular to Direction of Rolling	4000 psi (27.6 MPa) 2000 psi (13.8 MPa)	
3.2.1.2	Compressibility	5 to 20%	
3.2.1.3	Chloride Content as Cl, max	0.35%	4.5.1

3.2.2 Aliphatic Petroleum Fuel Resistance:

Medium: ASTM Ref. Fuel A
Temperature: 20° - 30°C (68° - 86°F)
Time: 5 hr ± 0.25

3.2.2.1	Thickness Change, max	0 to + 10%	
3.2.2.2	Thickness Change on Drying at 70°C ± 1 (158°F ± 2 for 48 hr ± 0.25 max	-5%	
3.2.2.3	Compressibility, max	25%	
3.2.2.4	Disintegration	None	

3.2.3 Petroleum Oil Resistance:

Medium: ASTM Oil No. 1
Temperature: 150°C ± 3 (302°F ± 5)
Time: 5 hr ± 0.25

3.2.3.1	Tensile Strength Change, max	-20%	
3.2.3.2	Thickness Change	0 to +10%	
3.2.3.3	Compressibility, max	20%	
3.2.3.4	Bend	No cracks	4.5.2

3.2.4 Dry Heat Resistance:

Temperature: 100°C ± 1 (212°F ± 2)
Time: 16 hr ± 0.25

3.2.4.1	Compressibility	5 to 20 %	
3.2.4.2	Bend	No cracks	4.5.2

3.2.5 Weathering: When specified, the product shall have weather resistance acceptable to the purchaser, determined by a procedure agreed upon by purchaser and vendor.

3.2.6 Delamination: The product shall not delaminate, due to sticking, when removed from an assembly.

3.2.7 Corrosion: The product shall not cause objectionable corrosion of aluminum, magnesium, steel, and copper alloys. The method of test and standards for acceptance shall be as agreed upon by purchaser and vendor.

3.3 Quality: The product shall be uniform in quality and condition, clean, smooth, as free from foreign material as commercially practicable, and free from imperfections detrimental to fabrication, appearance, or performance of parts.

3.4 Tolerances: Unless otherwise specified, the following tolerances apply:

TABLE I

Nominal Thickness Inches	Tolerance, Inch	
	plus	minus
Up to 0.0156, incl	0.005	0.002
Over 0.0156 to 0.0625, excl	0.005	0.005
0.0625 and over	0.008	0.008

TABLE I (SI)

Nominal Thickness Millimetres	Tolerance, Millimetres	
	plus	minus
Up to 0.396, incl	0.13	0.05
Over 0.396 to 1.588, excl	0.13	0.13
1.588 and over	0.20	0.20

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the product 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 product conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to as-received tensile strength (3.2.1.1), compressibility (3.2.1.2), and chloride content (3.2.1.3) and to thickness change after fuel immersion (3.2.2.1) requirements are classified as acceptance tests.

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

4.2.2.1 For direct U.S. Military procurement, substantiating 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 material shall be taken from each lot to perform all required tests in triplicate; a lot shall be all product 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 material shall be approved by purchaser before material for production use is supplied, unless such approval be waived. Results of tests on production material shall be essentially equivalent to those on the approved sample.

4.4.2 Ø Vendor shall use ingredients, manufacturing procedures, processes, and methods of inspection on production material which are essentially the same as those used on the approved sample material. 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 material. Production material made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5 Test Methods:

4.5.1 Chloride Content: Weigh out a 5 g sample, cut in 1/8 in. (3.2 mm) squares. Place in Erlenmeyer flask of suitable size. Add 150 cm^3 of distilled water, boil for 60 min. ± 5, and filter. Wash flask and sample with distilled water. Cool filtrate and washings to room temperature and dilute to 200 cu centimetres. Titrate with 0.1 N silver nitrate solution, either potentiometrically or using potassium chromate as the indicator. Run a blank determination on distilled water. Subtract the value for the blank from that for the sample. Calculate per cent chlorine in the sample.

4.5.2 Bend: Bend sample 180 deg (3.14 rad) around a diameter equal to 12T for nominal thicknesses 0.0625 in. (1.588 mm) and under or 16T for nominal thicknesses over 0.0625 in. (1.588 mm).

4.6 Reports:

4.6.1 Ø The vendor of the product shall furnish with each shipment three copies of a report showing the results of tests made on the product to determine conformance to the acceptance test requirements and stating that the product conforms to the other 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 material, supplier's material designation, part number, and quantity. When material for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of material to determine conformance to the requirements of this specification, and shall include in the report a statement that the material conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.

4.7 Ø Resampling and Retesting: If any specimen used in the above tests fails to meet the specified requirements, disposition of the product 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 product represented and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Ø Identification and Packaging: The product shall be identified and packaged in accordance with AMS 2810.

5.2 Ø For direct U.S. Military procurement, packaging shall be in accordance with MIL-STD-794, Level A or Level C, as specified in the request for procurement. Commercial packaging as specified in AMS 2810 will be acceptable if it meets the requirements of Level C.