SAE Aerospace
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS3232 | REV. N

Issued 1940-03
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Superseding AMS3232M

Asbestos and Synthetic Rubber Sheet Hot Oil Resistant

RATIONALE

AMS3232 is a compressed asbestos and synthetic rubber material. Asbestos is a hazardous material that should no longer be used. AMS3275 is a nonasbestos replacement material which works in most applications where AMS3232 was used.

CANCELLATION NOTICE

This specification has been "CANCELLED" by the Aerospace Materials Division, SAE, as of September 2009. By this action, this document will remain listed in the Numerical Section of the Index of Aerospace Material Specification. Users may refer to AMS3275 as a replacement specification, however, they are cautioned to evaluate AMS3275 for their particular application.

Cancelled specifications are available from SAE.

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http://www.sae.org/technical/standards/AMS3232N

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 up to 150°C (300°F).

1.3 WARNING: This sheet contains asbestos fiber. Abrasion or other fiber-releasing operations require special control techniques. Review procedures with responsible safety personnel before initiating manufacturing operations.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from SAE, 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, Philadelphia, PA 19103.

ASTM D412 - Rubber Properties in Tension
ASTM D471 - Rubber Property - Effect of Liquids
ASTM D573 - Rubber - Deterioration in an Air Oven
ASTM F36 - Compressibility and Recovery of Gasket Materials

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. A deep tan or brown discoloration of light gray products is not acceptable.

3.2 Properties: Sheet shall conform to the following requirements; tests shall be performed on the product supplied and, except as otherwise specified, in accordance with specified ASTM methods. Only specimens for tensile tests of sheet as received shall be conditioned.

3.2.1 As Received:

3.2.1.1	Tensile Strength, min Parallel to Direction of Rolling Perpendicular to Direction of Rolling	 4000 psi (27.5 MPa) 2000 psi (14.0 MPa)	ASTM D412, Die B or C
3.2.1.2	Compressibility	5 to 20%	ASTM F36
3.2.1.3	Chloride Content as Cl, max	0.35%	4.5.1

3.2.2	Aliphatic Fuel Resistance: (Immediate Deteriorated Properties)		ASTM D471 Medium: Temperature:	 ASTM Ref. Fuel A 20° - 30°C (68° - 86°F)
3.2.2.1	Thickness Change, max	0 to +10%	Time:	5 hr ± 0.25
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: (Immediate Deteriorated Properties)		ASTM D471 Medium: Temperature:	 ASTM Oil No. 1 150°C ± 2 (302°F ± 4)
3.2.3.1	Tensile Strength Change, max	-20%	Time:	5 hr ± 0.25
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:		ASTM D573 Temperature:	100°C ± 2 (212°F ± 4)
3.2.4.1 Compressibility	5 to 20%	Time:	16 hr ± 0.25
3.2.4.2 Bend	No cracks	4.5.2	

3.2.5 Weathering: When specified, the product shall have weather resistance acceptable to purchaser, detemined 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 acceptance standards shall be as agreed upon by purchaser and vendor.

3.3 Quality: Sheet, as received by purchaser, shall be uniform in quality and condition, smooth, as free from foreign material as commercially practicable, and free from imperfections detrimental to usage of the sheet.

3.4 Tolerances: Shall be as follows:

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 0.390, incl	0.12	0.05
Over 0.390 to 1.562, excl	0.12	0.12
1.562 and over	0.20	0.20

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of sheet shall supply all samples for vendor's tests 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 sample and to perform any confirmatory testing deemed necessary to ensure that the sheet conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Ø Acceptance Tests: Tests to determine conformance to requirements for 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) are classified as acceptance tests and shall be performed on each lot.

4.2.2 Ø Preproduction Tests: Tests to determine conformance to all technical requirements of this specification are classified as preproduction tests and shall be performed prior to or on the initial shipment of sheet to a purchaser, when a change in material, processing, or both requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

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

4.3 Ø Sampling: Sufficient sheet shall be taken at random 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 but shall not exceed 5000 lb (2270 kg). A lot may be packaged in smaller quantities under the basic lot approval provided lot identification is maintained.

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 by purchaser. 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 necessary to make any change 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, processing, or both 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 Chloride Content: Weigh a 5 g sample, cut in 1/8 in. (3 mm) squares. Place in Erlenmeyer flask of suitable size. Add 150 mL 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 millilitres. 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 percent chlorine in the sample.