SAE Aerospace
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS3315 REV. G

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Superseding AMS3315F

Silicone (VMQ) Rubber Sheet, Glass Cloth Reinforced

RATIONALE

This document has been determined to contain basic and stable technology which is not dynamic in nature.

STABILIZED NOTICE

This document has been declared "Stabilized" by SAE AMS P, Polymeric Materials Committee, and will no longer be subjected to periodic reviews for currency. Users are responsible for verifying references and continued suitability of technical requirements. Newer technology may exist.

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1. SCOPE:

1.1 Form:

This specification covers silicone (VMQ) rubber sheet reinforced with glass cloth.

1.2 Application:

This product has been used typically for gaskets or seals requiring a thin, resilient, nonporous sheet material suitable for operating from -55 to +205 °C (-67 to +401 °F), but usage is not limited to such applications. This material is resistant to deterioration by weathering and petroleum-base engine oil and remains flexible over the temperature range noted. This material is not normally suitable for use in contact with gasoline or aromatic fuels and low-aniline-point petroleum-base fluids due to excessive swelling of the elastomer.

1.3 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 which 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.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 2810 Identification and Packaging, Elastomeric Products
AMS 3824 Cloth, Type "E" Glass, Finished for Resin Laminates

2.2 ASTM Publications:

Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM D 471 Rubber Property - Effect of Liquids
ASTM D 518 Rubber Deterioration - Surface Cracking
ASTM D 573 Rubber - Deterioration in an Air Oven
ASTM D 751 Testing Coated Fabrics
ASTM D 1149 Rubber Deterioration - Surface Ozone Cracking in a Chamber (Flat Specimens)
ASTM D 2137 Rubber Property - Brittleness Point of Flexible Polymers and Coated Fabrics

3. TECHNICAL REQUIREMENTS:

3.1 Material:

Shall consist of a single ply of glass cloth coated on both sides with a silicone (VMQ) rubber compound substantially uniform in thickness on both faces of the cloth, with the rubber suitably cured to produce a product meeting the requirements of 3.2.

3.1.1 The glass cloth shall conform to AMS 3824 for the style specified for each nominal thickness shown in Table 1.

TABLE 1 - Glass Cloth Designation

Nominal Thickness Inch	Nominal Thickness Millimeters	Glass Cloth Designation
0.010	0.25	116
0.017	0.43	128
0.032	0.81	162 or 164
0.050	1.27	184

3.2 Properties:

Sheet shall conform to requirements shown in Table 2, 3.2.5, and 3.2.6; tests shall be performed on the sheet supplied and in accordance with specified ASTM methods, insofar as practicable:

TABLE 2 - Properties

Paragraph	Property	Requirement	Test Method
3.2.1 As Received:			
3.2.1.1	Breaking Strength, minimum		ASTM D 751, Cut Strip Method

Nominal Thickness Inch	Nominal Thickness Millimeters	Warp pounds force/inch	Warp kN/m	Fill pounds force/inch	Fill kN/m
0.010	0.25	70	12.3	70	12.3
0.017	0.43	200	35.0	150	26.3
0.032	0.81	400	70.0	300	52.5
0.050	1.27	800	140.0	600	105.1

3.2.1.2	Hydrostatic Pressure Resistance at 20 psi (240 kPa)	No Leaks	ASTM D 751, Method B, Procedure 2 1 hour, minimum
3.2.1.3	Adhesion, minimum[1]	10 pounds force per inch (1.75 kN/m)	ASTM D 751
3.2.1.3.1	If it is impossible to strip adhesion test specimens to make the test properly, the adhesion shall be considered acceptable.		
3.2.2	Petroleum Lubricating Oil Resistance: (Immediate Deteriorated Properties)		ASTM D 471 ASTM Oil No. 1 175 °C ± 3 (347 °F ± 5) 70 hours ± 0.5
3.2.2.1	Volume Change	0 to +10%	
3.2.2.2	Decomposition	None	
3.2.2.3	Surface Tackiness	None	
3.2.3	Dry Heat Resistance:		4.5.1
3.2.3.1	Decomposition or Softening	None	
3.2.3.2	Surface Tackiness	None	

TABLE 2 - Properties (Continued)

Paragraph	Property	Requirement	Test Method
3.2.3.3	Bend (flat)	No cracking or checking	
3.2.4	Low-Temperature Resistance:		ASTM D 2137 Method B -55 °C ± 1 (-67 °F ± 2)
3.2.4.1	Flex	No cracks	
3.2.4.2	Delamination	None	

3.2.5 Weathering: The sheet shall show no evidence of cracking when tested in accordance with ASTM D 1149 for 7 days at 40 °C ± 1 (104 °F ± 2). Test specimens shall be prepared and mounted in accordance with ASTM D 518, Method B.

3.2.6 Corrosion: The sheet shall not have a corrosive effect on other materials, determined by a procedure acceptable to purchaser. Discoloration of metal shall not be considered objectionable.

3.3 Quality:

The sheet, as received by purchaser, shall be uniform in quality and condition, smooth, and free from chalky spots, delamination, and foreign materials and from imperfections detrimental to usage of the sheet.

3.4 Sizes and Tolerances:

Sheet shall be supplied in nominal thicknesses of 0.010, 0.017, 0.032, and 0.050 inch (0.25, 0.43, 0.81, and 1.27 mm), as ordered, and nominal width of 36 inches (914 mm). Tolerances shall be as shown in Table 3 and 3.4.2.

3.4.1 Thickness:

TABLE 3 - Thickness Tolerances

Nominal Thickness Inch	Nominal Thickness Millimeters	Tolerance Inch Plus and Minus	Tolerance Millimeter Plus and Minus
0.010	0.25	0.001	0.03
0.017	0.43	0.002	0.05
0.032	0.81	0.004	0.10
0.050	1.27	0.005	0.13

3.4.2 Width: ±1 inch (±25 mm).

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of the sheet shall supply all samples for vendor's tests and shall be responsible for performing all required tests. 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 Acceptance Tests: Tests for material (3.1), properties as received (3.2.1), and sizes and tolerances (3.4) are acceptance tests and shall be performed on each lot.

4.2.2 Preproduction Tests: Tests for all technical requirements are preproduction tests and shall be performed prior to or on the initial shipment of sheet to a purchaser, when a change in ingredients and/or processing requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.2.2.1 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, contracting officer, or request for procurement.

4.3 Sampling and Testing:

Shall be as follows:

4.3.1 For Acceptance Tests: Sufficient sheet shall be taken at random from each lot to perform all required tests. 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. If test specimens cannot be prepared from the sheet, ASTM test specimens prepared from the same lot and state of cure shall be used for required tests.

4.3.1.1 A lot shall be all sheet from the same batch of compound and same style of fabric processed in one continuous run and presented for vendor's inspection at one time; a lot shall not exceed 500 pounds (227 kg) and may be packaged in smaller quantities and delivered under the basic lot approval provided lot identification is maintained.

4.3.1.2 A batch shall be the quantity of compound run through a mill or mixer at one time.

4.3.1.3 When a statistical sampling plan has been agreed upon by purchaser and vendor, sampling shall be in accordance with such plan in lieu of sampling as in 4.3.1 and the report of 4.6 shall state that such plan was used.

4.3.2 For Preproduction Tests: As agreed upon by purchaser and vendor.

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 ingredients and/or processing and, when requested, sample sheet. Production sheet made by the revised procedure shall not be shipped prior to receipt of reapproval.