SAE Aerospace
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS3383 REV. A

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Superseding AMS3383

Polytetrafluoroethylene (PTFE) - Fluorosilicone (FVMQ) Rubber High Temperature Fuel and Oil Resistant 75 - 85

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 CE, Elastomers 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 a polytetrafluoroethylene (PTFE) modified fluorosilicone (FVMQ) rubber in the form of molded shapes, molded rings (ASTM D 1414), and compression seals.

1.2 Application:

These products have been used typically for parts requiring resistance to jet fuel and lubricating oils, but usage is not limited to such applications. Generally, products are usable over a temperature range of -60 to +150 °C (-76 to +302 °F); the high tear resistance improves installation characteristics and the high tensile stress (modulus) enhances extrusion resistance. Each application, however, has to be considered individually.

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 2279	Tolerances, Rubber Products
MAM 2279	Tolerances, Metric, Rubber Products
AMS 2810	Identification and Packaging, Elastomeric Products
AMS 3021	Fluid, Reference, for Testing Di-Ester (Polyol) Resistant Materials

2.2 ASTM Publications:

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

ASTM D 297	Rubber Products - Chemical Analysis
ASTM D 395	Rubber Property - Compression Set
ASTM D 412	Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension
ASTM D 471	Rubber Property - Effect of Liquids
ASTM D 573	Rubber - Deterioration in an Air Oven
ASTM D 624	Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomer
ASTM D 1329	Evaluating Rubber Property - Retraction at Low Temperature (TR Test)
ASTM D 1414	Rubber O-Rings
ASTM D 1415	Rubber Property - International Hardness
ASTM D 2240	Rubber Property - Durometer Hardness

3. TECHNICAL REQUIREMENTS:

3.1 Material:

Shall be a compound, based on a polytetrafluoroethylene (PTFE) - modified fluorosilicone (FVMQ) rubber, suitably cured to produce a product meeting the requirements of 3.2.

3.2 Properties:

The product shall conform to requirements shown in Table 1; tests shall be performed on the product supplied and in accordance with specified ASTM methods, insofar as practicable.

TABLE 1 - Properties

	Property	Requirement	Test Method
3.2.1	Hardness, Durometer “A” or equivalent	80 ± 5	ASTM D 2240 or ASTM D 1415
3.2.2	Tensile Strength, min	825 psi (5.69 MPa)	ASTM D 412, Die B or C
3.2.3	Elongation, min	100%	ASTM D 412, Die B or C
3.2.4	Tensile Stress at 100% Elongation, min	600 psi (4.14 MPa)	ASTM D 412, Die B or C
3.2.5	Specific Gravity	Preproduction Value ±0.03	ASTM D 297
3.2.6	Tear Resistance, min	125 pounds force/inch (21.9 kN/m)	ASTM D 624, Die B
3.2.7	Aromatic Fuel Resistance: (Immediate Deteriorated Properties)		ASTM D 471 ASTM Ref. Fuel B 20 to 30 °C (68 to 86 °F) 70 hours ± 0.5
3.2.7.1	Hardness Change Durometer “A” or equivalent	-15 to 0	
3.2.7.2	Tensile Strength Change, max	-35%	
3.2.7.3	Elongation Change, max	-25%	
3.2.7.4	Volume Change	0 to +22%	
3.2.8	Di-Ester Oil Resistance: (Immediate Deteriorated Properties)		ASTM D 471 AMS 3021 150 °C ± 3 (302 °F ± 5) 70 hours ± 0.5
3.2.8.1	Hardness Change, Durometer “A” or equivalent	0 to -10	
3.2.8.2	Tensile Strength Change, max	-25	

TABLE 1 - (Continued)

	Property	Requirement	Test Method
3.2.8.3	Elongation Change, max	-20%	
3.2.8.4	Volume Change	0 to +12%	
3.2.9	Dry Heat Resistance:		ASTM D 573 200 °C ± 3
3.2.9.1	Hardness Change, Durometer "A" or equivalent	-5 to +5	(392 °F ± 5) 70 hours ± 0.5
3.2.9.2	Tensile Strength Change, max	-5%	
3.2.9.3	Elongation Change, max	-20%	
3.2.10	Compression Set:		ASTM D 395, Method B 175 °C ± 3
3.2.10.1	Percent of Original Deflection, max	35	(347 °F ± 5) 22 hours ± 0.5
3.2.10.2	Percent of Original Deflection, max	20	ASTM D 395, Method B 150 °C ± 3 (302 °F ± 5) 22 hours ± 0.5
3.2.11	Low-Temperature Resistance: TR-10, max	-55 °C (-67 °F)	ASTM D 1329

3.3 Quality:

The product, 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 product.

3.4 Tolerances:

Shall conform to all applicable requirements of AMS 2279 or MAM 2279.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The manufacturer of the product shall supply all samples and shall be responsible for all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to specified requirements.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Requirements shown in Table 2 are acceptance tests and shall be performed on each lot.

TABLE 2 - Acceptance Tests

Requirement	Paragraph
Hardness	3.2.1
Tensile Strength	3.2.2
Elongation	3.2.3
Tensile Stress	3.2.4
Specific Gravity	3.2.5
Volume Change in Fuel	3.2.7.4
Compression Set	3.2.10.1
Tolerances	3.4

4.2.2 Preproduction Tests: All technical requirements are preproduction tests and shall be performed prior to or on the initial shipment of a product by the manufacturer, 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 product 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. When the product is a molded shape from which test specimens cannot be cut, a slab 6 inches (152 mm) square by 0.075 inch ± 0.008 (1.90 mm ± 0.20) thick, molded from the same batch of compound, shall be supplied upon request.

4.3.1.1 A lot shall be all product, from the same batch of compound, processed in one continuous production run, and presented for manufacturer's inspection at one time.

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 A statistical sampling plan, acceptable to purchaser, may be used in lieu of sampling as in 4.3.1.

4.3.2 For Preproduction Tests: Shall be acceptable to purchaser.