



AEROSPACE MATERIAL SPECIFICATION

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

AMS3327A
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FLUROSILICONE RUBBER High Temperature Fuel and Oil Resistant 70 - 80

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1. SCOPE:

1.1 Form: This specification covers a fluorosilicone rubber in the form of sheet, strip, and molded shapes.

1.2 Application: Primarily for parts requiring continuous operation in aromatic fuels at temperatures from -55° to +175°C (-65° to +345°F) and in lubricating oils at temperatures from -55° to +150°C (-65° to +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, Philadelphia, PA 19103.

ASTM D297 - Rubber Products - Chemical Analysis
ASTM D395 - Rubber Property - Compression Set
ASTM D412 - Rubber Properties in Tension
ASTM D471 - Rubber Property - Effect of Liquids
ASTM D573 - Rubber Deterioration in An Air Method
ASTM D624 - Rubber Property - Tear Resistance
ASTM D2137 - Rubber Property - Brittleness Point of Flexible Polymers and Coated Fabrics
ASTM D2240 - Rubber Property - Durometer Hardness

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: Shall be a compound based on a fluorosilicone rubber, suitably cured to produce a product meeting the requirements of 3.2.

3.2 Properties: The product shall conform to the following requirements; tests shall be performed on the product supplied and in accordance with specified ASTM methods, insofar as practicable:

3.2.1 As Received:

3.2.1.1	Hardness, Durometer "A" or equiv.	75 \pm 5	ASTM D2240
3.2.1.2	Tensile Strength, min	800 psi (5.52 MPa)	ASTM D412, Die B or C
3.2.1.3	Elongation, min	100%	ASTM D412, Die B or C
3.2.1.4	Tensile Stress at 100% Elongation	700 - 1000 psi (4.83 - 6.90 MPa)	ASTM D412, Die B or C
3.2.1.5	Specific Gravity	Qualification Value \pm 0.03	ASTM D297
3.2.2	<u>Aromatic Fuel Resistance:</u> (Immediate Deteriorated Properties)		ASTM D471 Medium: ASTM Ref. Fuel B Temperature: 20 ^o - 30 ^o C (68 ^o - 86 ^o F) Time: 70 hr \pm 0.5
3.2.2.1	Hardness Change, Durometer "A" or equiv.	-15 to 0	
3.2.2.2	Tensile Strength Change, max	-30%	
3.2.2.3	Elongation Change, max	-25%	
3.2.2.4	Volume Change	0 to +20%	
3.2.2.5	Decomposition	None	
3.2.2.6	Surface Tackiness	None	
3.2.3	<u>Di-Ester Oil Resistance:</u> (Immediate Deteriorated Properties)		ASTM D471 Medium: SAE Ester Test Fluid No. 2 (See 8.2) Temperature: 150 ^o C \pm 3 (302 ^o F \pm 5) Time: 70 hr \pm 0.5
3.2.3.1	Hardness Change, Durometer "A" or equiv., max	-10	
3.2.3.2	Tensile Strength Change, max	-20%	
3.2.3.3	Elongation Change, max	-25%	
3.2.3.4	Volume Change	0 to +12%	
3.2.4	<u>Dry Heat Resistance:</u>		ASTM D573 Temperature: 200 ^o C \pm 3 (392 ^o F \pm 5) Time: 70 hr \pm 0.5
3.2.4.1	Hardness Change, Durometer "A" or equiv.	0 to +10	
3.2.4.2	Tensile Strength Change, max	-15%	
3.2.4.3	Elongation Change, max	-30%	

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- 3.2.4.4 Bend (flat) No cracking or checking
- 3.2.5 Compression Set: ASTM D395, Method B
Temperature: 175°C ± 3
(347°F ± 5)
- 3.2.5.1 Percent of Original Deflection, max 40 Time: 22 hr ± 0.5
- ∅ 3.2.6 Low-Temperature Resistance: ASTM D2137, Method A
Temperature: -55°C ± 3
(-67°F ± 5)
- 3.2.6.1 Brittleness Pass
- 3.2.7 Weathering: When specified, the product shall have weather resistance acceptable to the purchaser, ∅ determined by a procedure agreed upon by purchaser and vendor.
- 3.2.8 Corrosion: The product 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: 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 shall apply:
- 3.4.1 Sheet and Strip:

TABLE I

Nominal Thickness Inches	Tolerance, Inch plus and minus
Up to 0.125, incl	0.016
Over 0.125 to 0.500, incl	0.031
Over 0.500	0.047

TABLE I (SI)

Nominal Thickness Millimetres	Tolerance, Millimetres plus and minus
Up to 3.18, incl	0.41
Over 3.18 to 12.70, incl	0.79
Over 12.70	1.19

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 4.5. 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 the following requirements are classified as acceptance tests and shall be performed on each lot of product:

Requirement	Paragraph Reference
Hardness, as received	3.2.1.1
Tensile Strength, as received	3.2.1.2
Elongation, as received	3.2.1.3
Tensile Stress, as received	3.2.1.4
Specific Gravity	3.2.1.5
Volume Change in Fuel	3.2.2.4

- 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 product shall be taken from each lot to perform all required tests in triplicate. If test specimens cannot be prepared from the product, ASTM test specimens prepared from the same batch and state of cure shall be used for required tests.

- 4.3.1 A lot shall be all product from the same batch of compound processed in one continuous run and submitted for vendor's inspection at one time.

- 4.3.2 A batch shall be the quantity of compound run through a mill or mixer 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 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 Reports:

- 4.5.1 The vendor of the product shall furnish with each shipment three copies of a report showing the results of tests 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 compound number, form and size or part number, and quantity.
- 4.5.2 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 compound number, 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.