

AEROSPACE MATERIAL SPECIFICATION

SAE AMS3337

REV. E

Issued 1960-01
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Superseding AMS3337D

Silicone (PVMQ) Rubber
Extreme-Low-Temperature Resistant
65 - 75

RATIONALE

AMS3337E is a Five Year Review and update of this specification and deleted corrosion test.

1. SCOPE

1.1 Form

This specification covers a silicone (PVMQ) rubber in the form of sheet, strip, tubing, extrusions, and molded shapes.

1.2 Application

Primarily for parts required to operate or seal from -121 to +446 °F (-85 to +230 °C), compounded especially for operation at extreme low temperatures. Silicone rubber is resistant to deterioration by weathering and by high-aniline-point petroleum-base oils and remains flexible over the temperature range noted. These products are not normally suitable for use in contact with low-aniline-point petroleum-base fluids, including fuels, due to excessive swelling.

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 issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

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2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

AMS2279 Tolerances, Rubber Products

AMS2810 Identification and Packaging, Elastomeric Products

2.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM D 297 Rubber Products Chemical Analysis

ASTM D 395 Rubber Property Compression Set

ASTM D 412 Rubber Properties in Tension

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 624 Rubber Property Tear Resistance

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

ASTM D 2240 Rubber Property Durometer Hardness

3. TECHNICAL REQUIREMENTS

3.1 Material

Shall be a compound, based on a silicone (PVMQ) 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:

TABLE 1 - PROPERTIES

Paragraph	Property	Requirement	Test Method
3.2.1	As Received		
3.2.1.1	Hardness, Durometer "A" or equivalent	70 ± 5	ASTM D 2240
3.2.1.2	Tensile Strength, minimum	600 psi (4.14 MPa)	ASTM D 412, Die B or C
3.2.1.3	Elongation, minimum	150%	ASTM D 412, Die B or C
3.2.1.4	Tear Resistance, minimum	60 pounds force/inch (10.5 kN/m)	ASTM D 624, Die B
3.2.1.5	Specific Gravity	Preproduction Value ± 0.03	ASTM D 297
3.2.2	Petroleum Lubricating Oil Resistance (Immediate Deteriorated Properties)		ASTM D 471 Medium: IRM901 Temperature: 347 °F ± 5 (175 °C ± 3) Time: 70 hours ± 0.5
3.2.2.1	Hardness Change, Durometer "A" or equivalent	-15 to +5	
3.2.2.2	Tensile Strength Change, maximum	-30%	
3.2.2.3	Elongation Change, maximum	-20%	
3.2.2.4	Volume Change	0 to +25%	
3.2.2.5	Decomposition	None	
3.2.2.6	Surface Tackiness	None	
3.2.3	Dry Heat Resistance		ASTM D 573 Temperature: 437 °F ± 5 (225 °C ± 3) Time: 22 hours ± 0.5
3.2.3.1	Hardness Change, Durometer "A" or equivalent	-5 to +10	
3.2.3.2	Tensile Strength Change, maximum	-15%	
3.2.3.3	Elongation Change, maximum	-20%	
3.2.4	Compression Set		ASTM D 395, Method B Temperature: 347 °F ± 5 (175 °C ± 3) Time: 22 hours ± 0.5
3.2.4.1	Percent of Original Deflection, maximum	35	
3.2.5	Low-Temperature Resistance		
3.2.5.1	Brittleness	Pass	ASTM D 2137, Method A Temperature: -120 °F ± 5 (-85 °C ± 3)

3.2.6 Weathering

The product shall show no evidence of cracking when tested in accordance with ASTM D 1149 for seven days at 104 °F ± 2 (40 °C ± 1). The ozone pressure shall be 50 mPa ± 5.

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 AMS2279.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The vendor of the product shall supply all samples for vendor's tests and shall be responsible for the performance of 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

Tests for the following requirements are acceptance tests and shall be performed on each lot:

TABLE 2 - ACCEPTANCE TESTS

Requirement	Paragraph
Hardness, as received	3.2.1.1
Tensile Strength, as received	3.2.1.2
Elongation, as received	3.2.1.3
Specific Gravity	3.2.1.5

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 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.

4.3 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.