



AEROSPACE MATERIAL SPECIFICATION

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

AMS 3307A

Superseding AMS 3307

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SILICONE RUBBER Low Compression Set, Non-Oil-Resistant 65 - 75

1. SCOPE:

- 1.1 Form: This specification covers a low-compression-set, non-oil-resistant silicone rubber in the form of sheet, strip, and molded shapes.
- 1.2 Application: Primarily for parts required to operate or seal at temperatures from -55° to +200° C (-65° to 390° F), compounded especially for low compression set. Silicone rubber is resistant to deterioration by ozone, smog, and weathering and remains flexible over the temperature range noted. This material is not intended for use with petroleum-base fluids or lubricants. Certain design applications may cause this material to be susceptible to cutting, tearing, and abrasion.

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 D573 - Rubber Deterioration in An Air Method
 - ASTM D624 - Rubber Property - Tear Resistance
 - ASTM D1329 - Evaluating Rubber Property - Retraction at Low Temperature (TR Test)
 - 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 silicone 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:

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3.2.1 As Received:

3.2.1.1	Hardness, Durometer "A" or equiv.	70 $\pm$ 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	125%	ASTM D412, Die B or C
3.2.1.4	Tear Resistance, min	50 lb per in. (8.76 kN/m)	ASTM D624, Die B
3.2.1.5	Specific Gravity	Qualification Value $\pm$ 0.02	ASTM D297

3.2.2 Dry Heat Resistance:

			ASTM D573
3.2.2.1	Hardness Change, Duro- meter "A" or equiv.	$\pm$ 10	Temperature: 225° C $\pm$ 3 (437° F $\pm$ 5)
			Time: 22 hr $\pm$ 0.5
3.2.2.2	Tensile Strength Change, max	-15%	
3.2.2.3	Elongation Change, max	-30%	
3.2.2.4	Bend (flat)	No cracking or checking	

3.2.3 Compression Set:

			ASTM D395, Method B
3.2.3.1	Percent of Original Deflection, max	20	Temperature: 175° C $\pm$ 3 (347° F $\pm$ 5)
			Time: 22 hr $\pm$ 0.5

3.2.4 Low-Temperature Resistance:

3.2.4.1	Temperature Retraction, TR-10 Point, max	-45° C (-49° F)	ASTM D1329, Elongate specimens 75%
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3.2.5 Weathering: When specified, the product shall have weather resistance acceptable to the purchaser, determined by a procedure agreed upon by purchaser and vendor.

3.2.6 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 materials as commercially practicable, and free from internal and external 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
Specific Gravity	3.2.1.5

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.
- 4.6 Resampling and Retesting: If any specimen used in the above tests fails to meet the specified requirements, disposition of the product may be based on the results of testing three additional specimens for each original nonconforming specimen. Failure of any retest specimen to meet the specified requirements shall be cause for rejection of the product represented and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

- 5.1 Identification and Packaging: The product shall be identified and packaged in accordance with AMS 2810.
- 5.2 For direct U.S. Military procurement, packaging shall be in accordance with MIL-STD-794, Level A or Level C, as specified in the request for procurement. Commercial packaging as specified in AMS 2810 will be acceptable if it meets the requirements of Level C.

6. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

7. REJECTIONS: Material not conforming to this specification or to authorized modifications will be subject to rejection.

8. NOTES:

- 8.1 Marginal Indicia: The phi (Ø) symbol is used to indicate technical changes from the previous issue of this specification.