SAE Aerospace
An SAE International Group

AEROSPACE MATERIAL SPECIFICATION

SAE AMS3305 REV. J

Issued 1948-11
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Superseding AMS3305H

Silicone, Rubber General Purpose 80 Durometer

RATIONALE

AMS3305J results from a Five Year Review and update of this specification. The requirements for low temperature modulus per ASTM D 797 were eliminated per committee agreement since this test specification is obsolete. In addition, the general requirements for corrosion and weathering resistance were eliminated.

1. SCOPE

1.1 Form

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

1.2 Application

This products has been used typically for parts required to operate or seal from -85 to +401 °F (-65 to +205 °C), but usage is not limited to such applications. This material and specification are not intended for O-ring applications. Silicone elastomer is resistant to deterioration by weathering and petroleum-base lubricating oil and remains flexible over the temperature range noted. These products are 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 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.

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
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SAE WEB ADDRESS: **http://www.sae.org**

SAE values your input. To provide feedback on this Technical Report, please visit
http://www.sae.org/technical/standards/AMS3305J

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 Vulcanized Rubber 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 Elastomers

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 elastomer, suitably cured to produce a product meeting the requirements of 3.2.

3.2 Properties

This 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

Paragraph	Property	Requirement	Test Method
3.2.1	As Received		
3.2.1.1	Hardness, Durometer “A” or equivalent	80 ± 5	ASTM D 2240
3.2.1.2	Tensile Strength, minimum	650 psi (4.48 MPa)	ASTM D 412, Die B or C
3.2.1.3	Elongation, minimum	100%	ASTM D 412, Die B or C
3.2.1.4	Tear Resistance, minimum	25 pounds force per inch (4.38 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: IRM 901 Oil Temperature: 302 °F ± 5 (150 °C ± 3) Time: 70 hours ± 0.5
3.2.2.1	Hardness Change, Durometer “A”	-15 to +5	
3.2.2.2	Tensile Strength, Change, maximum	-20%	
3.2.2.3	Elongation Change, maximum	-15%	
3.2.2.4	Volume Change	0 to +15%	
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: 70 hours ± 0.5
3.2.3.1	Hardness Change, Durometer “A” or equivalent	±10	
3.2.3.2	Tensile Strength Change, maximum	-25%	
3.2.3.3	Elongation Change, maximum	-40%	
3.2.3.4	Bend (flat)	No cracking or checking	
3.2.4	Compression Set		ASTM D 395, Method B Temperature: 302 °F ± 5 (150 °C ± 3) Time: 70 hours ± 0.5
3.2.4.1	Percent of Original Deflection, maximum	30	
3.2.5	Low Temperature Resistance		
3.2.5.1	Brittleness	Pass	ASTM D 2137, Method A Temperature: -85 °F ± 5 (-65 °C ± 3) Time: 3 minutes ± 0.3

3.3 Quality

The product, as received by purchaser, shall be uniform in quality and condition, smooth, as free from foreign materials 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

The following requirements are acceptance tests and shall be performed on each lot:

TABLE 2

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.

4.3.1.1 If specimens cannot be prepared from the product, ASTM test specimens prepared from the same batch and state of cure shall be used. When the product supplied is an extrusion of such shape that suitable test specimens cannot be cut from the product, a separate flat strip test sample from the same production lot shall be supplied upon request. This strip shall be prepared from tubing 1.000 inch ± 0.063 (25.40 mm ± 1.60) in OD by 0.075 inch ± 0.008 (1.90 mm ± 0.20) in wall thickness, mechanically slit and flattened into a strip while being extruded, and cured in the same manner as production material. 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) molded from the same batch of compound shall be supplied upon request.

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

4.3.1.3 A batch shall be the quantity of compound run through a mill or mixer at one time. Excluded from the definition is the mixing and combining of batches of previously compounded material (such as remaining tuber or extruder heads).