

# AEROSPACE MATERIAL SPECIFICATION



AMS 3305H

Issued NOV 1948  
Revised APR 1990  
Reaffirmed APR 2001

Superseding AMS 3305G

Silicone, Rubber  
General Purpose  
80 Durometer

## FOREWORD

This Reaffirm contains format/editorial changes only.

### 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:

Primarily for parts required to operate or seal from -65 to +205 °C (-85 to +401 °F). 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 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.

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## 2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

### 2.1.1 Aerospace Material Specifications:

AMS 2279 Tolerances, Rubber Products  
MAM 2279 Tolerances, Metric, Rubber Products  
AMS 2810 Identification and Packaging, Elastomeric Products

## 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 Rubber Properties in Tension  
ASTM D 471 Rubber Property - Effect of Liquids  
ASTM D 573 Rubber - Deterioration in an Air Oven  
ASTM D 624 Rubber Property - Tear Resistance  
ASTM D 797 Rubber Property - Young's Modulus at Normal and Subnormal Temperatures  
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

|         |                                                                              |                                            |                                                                                                         |
|---------|------------------------------------------------------------------------------|--------------------------------------------|---------------------------------------------------------------------------------------------------------|
| 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<br>(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<br>per inch<br>(4.38 kN/m) | ASTM D 624, Die B                                                                                       |
| 3.2.1.5 | Specific Gravity                                                             | Preproduction<br>Value ± 0.03              | ASTM D 297                                                                                              |
| 3.2.2   | Petroleum Lubricating Oil Resistance:<br>(Immediate Deteriorated Properties) |                                            | ASTM D 471<br>Medium: ASTM Oil No. 1<br>Temperature: 150 °C ± 3<br>(302 °F ± 5)<br>Time: 70 hours ± 0.5 |
| 3.2.2.1 | Hardness Change,<br>Durometer "A" or equivalent                              | -15 to +5                                  |                                                                                                         |
| 3.2.2.2 | Tensile Strength,<br>Change, maximum                                         | -20%                                       |                                                                                                         |
| 3.2.2.3 | Elongation Change,<br>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<br>Temperature: 225 °C ± 3<br>(437 °F ± 5)<br>Time: 70 hours ± 0.5                           |
| 3.2.3.1 | Hardness Change,<br>Durometer "A" or<br>equivalent                           | ±10                                        |                                                                                                         |
| 3.2.3.2 | Tensile Strength<br>Change, maximum                                          | -25%                                       |                                                                                                         |
| 3.2.3.3 | Elongation Change,<br>maximum                                                | -40%                                       |                                                                                                         |
| 3.2.3.4 | Bend (flat)                                                                  | No cracking<br>or checking                 |                                                                                                         |

TABLE 1 (Continued)

|         |                                         |                       |                         |
|---------|-----------------------------------------|-----------------------|-------------------------|
| 3.2.4   | Compression Set:                        |                       | ASTM D 395, Method B    |
|         |                                         |                       | Temperature: 150 °C ± 3 |
| 3.2.4.1 | Percent of Original Deflection, maximum | 30                    | (302 °F ± 5)            |
|         |                                         |                       | Time: 70 hours ± 0.5    |
| 3.2.5   | Low Temperature Resistance:             |                       |                         |
| 3.2.5.1 | Brittleness                             | Pass                  | ASTM D 2137, Method A   |
|         |                                         |                       | Temperature: -65 °C ± 3 |
|         |                                         |                       | (-85 °F ± 5)            |
|         |                                         |                       | Time: 3 minutes ± 0.3   |
| 3.2.5.2 | Young's Modulus, maximum (See 8.2)      | 10,000 psi (68.9 MPa) | ASTM D 797              |
|         |                                         |                       | Temperature: -50 °C ± 3 |
|         |                                         |                       | (-58 °F ± 5)            |
|         |                                         |                       | Time: 5 hours ± 0.2     |

3.2.6 Weathering: When specified, the product shall have weather resistance acceptable to purchaser, determined by a procedure agreed upon by purchaser and supplier.

3.2.7 Corrosion: The product shall not have a corrosive effects on other materials when exposed to conditions normally encountered in service, determined by a procedure agreed upon by purchaser and vendor. Discoloration of metal shall not be considered objectionable.

### 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 AMS 2279 or MAM 2279.

## 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 performing all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to the requirements of this specification.

### 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

| 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 Preproduction Tests: Tests for 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.

4.2.2.1 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.

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  $\pm$  0.063 (25.40 mm  $\pm$  1.60) in OD by 0.075 inch  $\pm$  0.008 (1.90 mm  $\pm$  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  $\pm$  0.008 (1.90 mm  $\pm$  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.

4.3.1.4 When a statistical sampling plan has been agreed upon by purchaser and vendor, sampling shall be in accordance with such plan in lieu of sampling as in 4.3.1 and the report of 4.5 shall state that such plan was used.