

Submitted for recognition as an American National Standard

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

THIS REVISION CONTAINS ONLY EDITORIAL CHANGES.

1. SCOPE:

- 1.1 Form: This specification covers a low-compression-set, non-oil-resistant silicone rubber in the form of molded rings.
- 1.2 Application: Sealing rings for use in contact with air from  $-55^{\circ}$  to  $+200^{\circ}\text{C}$  ( $-67^{\circ}$  to  $+392^{\circ}\text{F}$ ). These rings are not intended for service involving exposure to petroleum products and are not required to be tested for compatibility with such products. These rings have excellent resistance to compression set at the expense of tensile strength, elongation, and tear resistance and are resistant to deterioration by ozone, smog, and weathering. Standard sizes are as shown in AS568.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications, Aerospace Standards, and Aerospace Information Reports shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

- 2.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods  
AMS 2817 - Packaging and Identification, Preformed Packings

2.1.2 Aerospace Standards:

AS568 - Aerospace Size Standard for O-Rings  
AS871 - Manufacturing and Inspection Standards for Preformed Packings  
(O-Rings)

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### 2.1.3 Aerospace Information Reports:

AIR 851 - O-Ring Tension Testing Calculations

### 2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM D624 - Rubber Property - Tear Resistance  
 ASTM D1414 - Testing Rubber O-Rings  
 ASTM D3182 - Rubber - Materials, Equipment, and Procedures for Mixing Standard Compounds and Preparing Standard Vulcanized Sheets

### 2.3 U.S. Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

#### 2.3.1 Military Standards:

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes  
 MIL-STD-413 - Visual Inspection Guide for Rubber O-Rings

### 3. TECHNICAL REQUIREMENTS:

#### 3.1 Material: Shall be a compound based on a silicone elastomer, suitably cured to produce sealing rings meeting the requirements of 3.2.

3.2 Properties: Rings shall conform to the following requirements; except as otherwise specified herein, tests shall be performed on the rings supplied and in accordance with ASTM D1414, insofar as practicable except that tear resistance shall be determined in accordance with ASTM D624 on specimens cut with Die B from ASTM D3182 standard sheets. When permitted by purchaser, hardness also may be determined on ASTM D3182 standard sheets. For tension testing rings smaller than can be tested using 1/2 inch (12.7 mm) diameter rotating spools, spools of reduced diameter, in 1/8 inch (3.2 mm) increments, shall be used. Spool mounts shall be rotated 180 degrees relative to each other when necessary to allow closing to the unelongated length of the ring (See AIR 851).

#### 3.2.1 As Received:

3.2.1.1	Hardness, Durometer "A" or equiv.	70 ± 5
3.2.1.2	Tensile Strength, minimum	800 psi (5.52 MPa)
3.2.1.3	Elongation, minimum	125%
3.2.1.4	Tear Resistance, minimum	50 pounds force/inch (8756 N/m)
3.2.1.5	Specific Gravity	Preproduction Value ±0.03

- 3.2.2 Dry Heat Resistance:
- |   |              |                          |
|---|--------------|--------------------------|
|   | Temperature: | 225°C ± 3<br>(437°F ± 5) |
| 3.2.2.1 Hardness Change, Durometer "A"<br>or equivalent | Time:        | 70 hours<br>± 0.5        |
|   |              |                          |
| 3.2.2.2 Tensile Strength Change, maximum                |              | -20%                     |
| 3.2.2.3 Elongation Change, maximum                      |              | -35%                     |
- 3.2.3 Compression Set:
- |   |              |                          |
|---|--------------|--------------------------|
|   | Temperature: | 175°C ± 3<br>(347°F ± 5) |
| Percent of Original Deflection, maximum     | Time:        | 22 hours<br>± 0.25       |
| Ring Cross Section Diameter                 |              |                          |
| 0.066 to 0.110 inch (1.68 to 2.79 mm), incl |              | 25                       |
| Over 0.110 inch (2.79 mm)                   |              | 20                       |
- 3.2.4 Low-Temperature Resistance:
- |  |               |
|--|---------------|
| Temperature Retraction,<br>TR <sub>10</sub> point, maximum | -42°C (-44°F) |
|--|---------------|
- 3.3 Quality: Rings, as received by purchaser, shall be uniform in quality and condition, smooth, and free from chalky spots, as free from foreign materials as commercially practicable, and free from imperfections detrimental to usage of the rings. Surface imperfections shall be no greater than permitted by MIL-STD-413. The acceptance quality level (AQL) for surface imperfections shall be 2.5, using general inspection level II of MIL-STD-105.
- 3.4 Sizes and Tolerances: Shall be as specified on the drawing. Inspection for conformance to dimensional requirements shall be made in accordance with AS871.
4. QUALITY ASSURANCE PROVISIONS:
- 4.1 Responsibility for Inspection: The vendor of rings shall supply all samples for vendor's tests 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 sample and to perform any confirmatory testing deemed necessary to ensure that the rings conform 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:

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, as received	3.2.1.5
Compression Set	3.2.3

4.2.2 Preproduction Tests: Tests to determine conformance to all technical requirements of this specification are classified as preproduction tests and shall be performed prior to or on the first-article shipment of rings to a purchaser, when a change in material 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: Shall be as follows:

4.3.1 For Acceptance Tests: Sufficient rings and, when required, ASTM D3182 standard sheets of cure equivalent to that of the rings 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. For rings smaller than AS568-10 dimensions, AS568-218 rings from the same batch and equivalent cure shall be used.

4.3.1.1 A lot shall be all rings of the same size and, when required, ASTM D3182 standard sheets of equivalent cure from the same batch of compound and presented for vendor's inspection at one time but shall not exceed 1000 rings or 100 pounds (45 kg), whichever is the lesser mass. A lot may be packaged in smaller quantities and delivered under the basic lot approval provided lot identification is maintained.

4.3.1.2 A batch shall be the quantity of compound run through a mill or mixer at one time.

4.3.1.3 When a statistical sampling plan and acceptance quality level (AQL) have 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.

4.3.2 For Preproduction Tests: As agreed upon by purchaser and vendor.

4.4 Approval: