



AEROSPACE MATERIAL SPECIFICATION

AMS3303™**REV. L**

Issued 1948-11
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Superseding AMS3303K

(R) Elastomer: Silicone, Rubber (MQ/VMQ)
General Purpose
55 - 65 Durometer Type "A" Hardness

RATIONALE

Five-Year Review and update of this specification and to incorporate new AMS3XXX series template format.

1. SCOPE

1.1 Form

This specification covers a silicone (MQ/VMQ) elastomer that can be used to manufacture product in the form of sheet, strip, tubing, extrusions, and molded shapes. This specification should not be used for molded rings, compression seals, O-ring cord, and molded in place gaskets for aeronautical and aerospace applications without complete consideration of the end use prior to the selection of this material.

1.2 Application

This material type has resistance to deterioration by weathering and petroleum based lubrication oil, but usage is not limited to such applications. This Material Type has a typical service temperature range of -85 to +400 °F (-65 to +205 °C) and remains flexible over the temperature range noted. The service temperature range of the material is a general temperature range, but the presence of particular fluids and specific design requirements may modify this range. Each application should be considered separately. It is the responsibility of the user to determine that this specification is appropriate for the environments (temperature range, fluids exposure, etc.) in which it is sought to be used. These products are not normally suitable for use in contact with gasoline or aromatic fuels and low-aniline-point petroleum-based fluids due to excessive swelling of the elastomer.

1.3 Order of Precedence

This specification is in addition to and in no way limiting, superseding, or abrogating any contractual obligation as required by the applicable procurement document. In the event of conflict in requirements, the order of precedence shall be:

1. Procurement Document or Contractual Agreement and all statutory and regulatory requirements (excluding this document)
2. Applicable purchaser's drawing and/or design data

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Documents
Document Sharing Hub

3. Specifications referenced on the drawing
4. This document
5. All specifications referenced in this document

1.4 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.

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or + 1 724-776-4970 (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 D297 Standard Test Methods for Rubber Products - Chemical Analysis

ASTM D395 Standard Test Methods for Rubber Property - Compression Set

ASTM D412 Standard Test Methods for Rubber Properties in Tension

ASTM D471 Standard Test Methods for Rubber Property - Effect of Liquids

ASTM D573 Standard Test Methods for Rubber - Deterioration in an Air Oven

ASTM D624 Standard Test Methods for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers

ASTM D2137 Standard Test Methods for Rubber Property - Brittleness Point of Flexible Polymers and Coated Fabrics

ASTM D2240 Standard Test Methods for Rubber Property - Durometer Hardness

2.3 Other

Available online from the National Conference of Standards Laboratories, www.ncsli.org.

ANSI/ASQ Z1.4 Sampling Procedures and Tables for Inspection by Attributes

3. TECHNICAL REQUIREMENTS

3.1 Material

Shall be prepared from ingredients as shall be necessary to achieve the requirements detailed in this standard and shall be a compound, based on the polymer specified in 1.1, suitably cured to produce a product meeting the requirements of 3.2. Material shall be based on 100% virgin silicone (MQ/VMQ) elastomer. Reprocessed vulcanized material is not acceptable.

3.2 Properties

This product shall conform to the requirements shown in Table 1.

Table 1 - Physical property requirements

The following testing shall be performed every 5 years and test reports shall be made available upon request.

Paragraph	Property	Test Sample	Requirement	Test Method
3.2.1	As Received			
3.2.1.1	Hardness, Durometer, Type “A”	BUTTON or plied platens	60 ± 5	ASTM D2240
3.2.1.2	Tensile Strength, minimum	ASTM Platen	650 psi (4.48 MPa)	ASTM D412, Die C
3.2.1.3	Elongation, minimum	ASTM Platen	150%	ASTM D412, Die C
3.2.1.4	Tear Resistance, minimum	ASTM Platen	35 ppi (6.13 kN/m)	ASTM D624, Die B
3.2.1.5	Specific Gravity/Relative Density	ASTM Platen	Preproduction Value ± 0.03	ASTM D297, Hydrostatic Method
3.2.1.6	Compression Set Percent of Original Deflection, maximum	ASTM Platen, Plied Discs	25%	ASTM D395, Method B Temperature: 302 °F ± 4 °F (150 °C ± 2.2 °C) Time: 70 hours ± 0.5 hour
3.2.1.7	Low Temperature Brittleness	ASTM Platen	Pass	ASTM D2137, Method C Temperature: -85 °F ± 4 °F max (-65 °C ± 3 °C) Time: 3 minutes ± 0.3 minute
3.2.2	Dry Heat Resistance - ASTM D573			
3.2.2.1	Hardness Change, Durometer Type “A,” pts	BUTTON or plied platens	±10	ASTM D573
3.2.2.2	Tensile Strength Change, maximum	ASTM Platen	-20%	Temperature: 437 °F ± 5 °F (225 °C ± 3 °C) Time: 70 hours ± 0.5 hour
3.2.2.3	Elongation Change, maximum	ASTM Platen	-40%	
3.2.2.4	Bend	ASTM Platen	No cracking or checking	
3.2.3	Fluid Resistance - IRM901 - ASTM D471			
3.2.3.1	Hardness Change, Durometer Type “A,” pts	BUTTON or plied platens	-15 to +5	ASTM D471 Medium: IRM 901 Oil
3.2.3.2	Tensile Strength, Change, maximum	ASTM Platen	-20%	Temperature: 302 °F ± 4 °F (150 °C ± 2.2 °C) Time: 70 hours ± 0.5 hour
3.2.3.3	Elongation Change, maximum	ASTM Platen	-15%	
3.2.3.4	Volume Change	ASTM Platen	0 to +15%	
3.2.3.5	Decomposition	ASTM Platen	None	
3.2.3.6	Surface Tackiness	ASTM Platen	None	