



AEROSPACE MATERIAL SPECIFICATION

AMS7268™**REV. D**

Issued 1969-11
Reaffirmed 2001-10
Revised 2021-07

Superseding AMS7268C

(R) Rubber: Silicone [VMQ]
Non-Oil Resistant
Low Compression Set, 65 - 75 Type A Hardness

RATIONALE

AMS7268D is a Five-Year Review and update of this specification to the latest AMS-7xxx template.

1. SCOPE

1.1 Form

This specification covers a silicone rubber in the form of molded rings, compression seals, O-ring cord, and molded-in-place gaskets for aeronautical and aerospace applications. For sheet, strip, tubing, extrusions, and molded shapes, use AMS3307 specification, which is intended for that use.

1.2 Application

This material has a typical service temperature range of -67 to +392 °F (-55 to +200 °C). 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. This silicone has excellent resistance to compression set at the expense of tensile strength, elongation, and tear resistance. This silicone is resistant to deterioration by ozone, smog, and weathering. This silicone is not intended for service involving exposure to petroleum products and is not required to be tested for compatibility with such petroleum products. This material is not required to have resistance to oil.

1.3 Order of Precedence

Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained. 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 or AS5728 Parts Standard
3. Specification referenced on the drawing
4. This document

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<https://www.sae.org/standards/content/AMS7268D/>

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 the 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.

AMS2817	Packaging and Identification, Preformed Packings
AIR851	O-ring Tension Testing Calculations
ARP3050	Suitable Test Sizes for O-Ring Specifications
AS568	Aerospace Size Standard for O-rings
AS871	Preformed Packing - Dimensional Inspection Guide
AS5316	Storage of Elastomer Seals and Seal Assemblies Which Include an Elastomer Element Prior to Hardware Assembly
AS5728	Packing, Preformed, O-ring Molded from AMS7268 Material
AS5752	Visual Inspection Standard for Elastomeric Sealing Elements Other than O-rings
AS6414	Manufacturing Processing Requirements for Molded Elastomer Components Used in Aerospace Applications

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 Method for Rubber Property - Compression Set Method B
ASTM D573	Standard Test Method for Rubber - Deterioration in an Air Oven
ASTM D624	Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
ASTM D1329	Standard Test Method for Evaluating Rubber Property - Retraction at Lower Temperatures (TR)
ASTM D1414	Standard Test Methods for Rubber O-rings
ASTM D2240	Standard Test Method for Rubber Property - Durometer Hardness

ASTM D3182 Rubber - Materials, Equipment, and Procedures for Mixing Standard Compounds and Preparing Standard Vulcanized Sheets

3. TECHNICAL REQUIREMENTS

3.1 Compound

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 product meeting the requirements of 3.2. Reprocessed vulcanized material shall not be used to make parts nor shall it be part of the formulation.

3.2 Qualification Properties

The material as processed by the molder in the form as defined in Table 1 (test sample) shall conform to the requirements shown in Table 1; calculations of tensile strength and elongation may be made in accordance with AIR851.

Material shall be tested on the part standard AS5728-214 pertaining to this material specification.

Table 1 - Qualification properties

Paragraph	Property	Test Sample	Requirements	Test Method
3.2.1	As Received			
3.2.1.1	Hardness, Durometer Type "A"	AS5728-214 O-rings	70 ± 5	ASTM D1414 (D2240)
3.2.1.1.a	Hardness, Durometer Type "A"	Hardness solid BUTTON or plied specimens	70 ± 5	ASTM D2240
3.2.1.2	Tensile Strength, Minimum	AS5728-214 O-rings	800 psi (5.52 MPa)	ASTM D1414
3.2.1.3	Elongation, Minimum	AS5728-214 O-rings	125%	ASTM D1414
3.2.1.4	Tear Resistance, Minimum	Platen/sheet	50 ppi [8.8 kN/m]	ASTM D624 on specimens cut with Die B from ASTM D3182
3.2.1.5	Specific Gravity/Relative Density	AS5728-214 O-rings	Preproduction Value ± 0.02	ASTM D1414 (D297) Hydrostatic Method
3.2.2	Acceptance Test (Short Term) Compression Set Percent of Original Deflection, Maximum	AS5728-214 O-rings	20	ASTM D1414 (D395, Method B) Temperature: 347 °F ± 4 °F (175 °C ± 2 °C) Time: 22 hours ± 0.5 hour
3.2.5	Temperature Retraction Test [TR-10], Maximum	AS5728-214 O-rings	-44 °F (-42 °C)	ASTM D1414 (D1329)
3.2.6	Dry Heat Resistance ASTM D573			
3.2.6.1	Hardness, Durometer Type "A" Change	AS5728-214 O-rings	-10 to +10	ASTM D1414 (D573) Temperature: 437 °F ± 4 °F (225 °C ± 2 °C) Time: 70 hours ± 0.5 hour
3.2.6.2	Tensile Strength Change, Maximum	AS5728-214 O-rings	-20%	
3.2.6.3	Tensile Elongation Change, Maximum	AS5728-214 O-rings	-35%	

3.3 Quality

All Product, as received by purchaser, shall be as specified in the AS5728 parts standard, drawing or purchase document (see 1.3). If not specified, O-ring surface quality shall conform to AS871 requirements. For all other compression seal geometries, the parts other than O-rings shall meet AS5752 Type 1 requirements.

3.4 Dimensions and Tolerances

All dimensions and tolerances shall be as specified in the AS5728 parts standard, drawing or purchase document (see 1.3). If not specified, O-rings standard sizes and tolerances shall be per AS568. The procedures outlined in AS871 shall be followed for dimensional inspection.

3.5 Qualification

Qualification shall be as agreed to between customer and supplier. Qualification shall include testing to prove conformance to Table 1 requirements.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection

The manufacturer of the product shall be responsible for performing all required tests. Purchaser reserves the right to sample and perform any testing deemed necessary to ensure that the product conforms to the AMS7268 requirements.

4.1.1 Manufacturer of product to this specification shall be on the current PRI Qualified Manufacturer's List (QML) www.eAuditNet.com.

4.2 Classification of Tests

4.2.1 Batch Testing

AS6414 defines batch testing. Testing on the same batch and state of cure are acceptable as long as the AS5728-214 O-rings are cured and tested within 90 days of the manufacture of the subject lot.

Batch and the blending of compound as defined in AS6414: All incoming batches and or blended batches shall be tested per Table 2.

Table 2 - Batch test

Paragraph	Property	Test Sample	Requirements	Test Method
3.2.1	As Received			
3.2.1.1	Hardness, Durometer Type "A"	AS5728-214 O-rings	70 ± 5	ASTM D1414 (D2240)
3.2.1.2	Tensile Strength, Minimum	AS5728-214 O-rings	800 psi (5.52 MPa)	ASTM D1414
3.2.1.3	Elongation, Minimum	AS5728-214 O-rings	125 %	ASTM D1414
3.2.1.5	Specific Gravity/Relative Density	AS5728-214 O-rings	Preproduction Value ± 0.02	ASTM D1414 (D297) Hydrostatic Method
3.2.2	Acceptance Test (Short Term) Compression Set Percent of Original Deflection, Maximum	AS5728-214 O-rings	20	ASTM D1414 (D395, Method B) Temperature: 347 °F ± 4 °F (175 °F ± 2 °C) Time: 22 hours ± 0.5 hour

4.2.2 Acceptance Lot Tests for All Compression Seals Except Plate Seals (O-rings, etc.)

4.2.2.1 Acceptance Lot Tests for O-rings

Requirements shown in Table 3 are acceptance lot tests and shall be performed on each lot on the O-rings being supplied.

The term "Part" in Table 3 shall be interpreted to mean the O-ring shipped or a section cut from such an O-ring. It shall be permitted to use multiple such O-rings which shall be made from the same lot and batch to perform the applicable test.

O-ring sizes that are suitable for testing (tensile and elongation) are shown in ARP3050.

Table 3 - Acceptance lot test for O-rings

Paragraph	Property	Test Sample	Requirements	Test Method
3.2.1	As Received			
3.2.1.1	Hardness, Durometer Type "A"	Part*	70 ± 5	ASTM D1414 (ASTM D2240)
3.2.1.2	Tensile Strength, Minimum	Part*	800 psi (5.52 MPa)	ASTM D1414
3.2.1.3	Elongation, Minimum	Part*	125 %	ASTM D1414
3.2.1.4	Specific Gravity/Relative Density	Part	Preproduction Value ± 0.02	ASTM D1414 (D297) Hydrostatic Method
3.2.2	Short Term - Compression Set Percent of Original Deflection, Maximum			ASTM D1414 (D395, Method B)
	O-ring Cross Sectional Thickness			Temperature: 347 °F ± 4 °F (175 °C ± 2 °C)
	If 0.064 to 0.110 Inch	Part*	25	Time:
	If over 0.110 Inch	Part*	20	22 hours ± 0.5 hour

Part*: If the O-ring size is such that a particular test cannot be performed reliably using that O-ring size as test specimen then it shall be permitted to use AS5728-214 O-rings as proxy samples for that specific test only provided that the AS5728-214 O-rings have the same state of cure as the O-ring shipped and are molded within 90 days of the cure of the O-ring part shipped.

NOTE 1: O-rings from the same lot and batch which have not passed visual inspection but are otherwise expected to meet the physical properties of this specification may be used for testing.

4.2.2.2 Acceptance Lot Tests for All Seal Geometries Other Than O-rings

For all seal geometries other than O-rings, a suitable test plan shall be agreed upon between the user and supplier. If no specific test plan is established, requirements in 4.2.1 including Table 2 tests shall be performed.

4.2.3 Plate Seal

A plate seal is defined as an elastomer bonded to any substrate material whose primary function is to perform as a seal.

4.2.3.1 For plate seals, a suitable test plan shall be agreed upon between the user and supplier. If no specific test plan is established, requirements in 4.2.1 including Table 2 tests shall be performed.

4.2.4 Lot

Lot definition shall be as given in AS6414.

4.2.5 Random Sampling

The method shall be as specified in the parts standard, drawing or purchase document. If not specified, product shall be taken at random from each lot to perform all the required testing in Tables 3 and 4 where applicable per the part type. The number of test specimens for each requirement shall be specified in the applicable test procedure.

4.2.6 Qualification Tests

All technical requirements shall be in accordance with applicable material specification and performed prior to the initial shipment of the product to a purchaser. Any change in process or ingredients that would require requalification are listed in the AS6414 document unless otherwise specified by the purchase order, print, or design data. For initial qualification, all specimens shall be from the same production batch and lot using test samples as specified in Table 1.

4.2.6.1 Qualification Test Report

The supplier of the product shall make a qualification test report available upon request. This report shall include at a minimum: AMS number, manufacturer's identification and product designation, batch and lot number, date of manufacture and the results of all qualification tests.

4.3 Inspection

Dimensional and Visual Inspection:

4.3.1 Prior to inspection, mold flash shall be removed from the parts in such a manner that they conform to the requirements specified herein. For end of process inspection, each individual part (100%) shall be visually inspected at 1X magnification for mold flash, backrind, parting line projection, non-fills, flow lines, and other significant defects in accordance with AS871 or AS5752, Type 1 requirements. The entire part surface shall be inspected.

4.3.2 For final inspection, the sample size shall be in accordance with ANSI/ASQ Z1.4 single sampling plan inspection Level II with an AQL 1.0 except that the acceptance number shall be zero.

The sample unit shall be one part. Inspection shall be according to AS871.

If the purchaser requires a different sampling plan or visual inspection criteria, the manufacturer shall be informed prior to the time of order.

4.4 Approval

Unless otherwise specified by purchase order, print, or design data, when a change occurs in ingredients, manufacturing, and/or processing reapproval to this material standard shall be required.

4.4.1 The manufacturer shall establish, for each size of seal, parameters for the process control factors which will produce seals meeting the technical requirements per 4.2.1 of this specification. Control factors for producing seals shall be per AS6414. If any change in ingredients, type of equipment for processing, or manufacturing procedures is necessary, the manufacturer shall submit for reapproval a statement of the proposed changes and, when requested, sample product. Production product made by the revised procedure shall not be shipped prior to receipt of re-approval.

4.5 Certification

Unless otherwise specified, the manufacturer of parts shall furnish with each shipment a certification with the minimum requirements of Table 3 Acceptance Lot Testing if supplying O-rings or Table 4 Acceptance Lot Test for All Other Seal Geometries except Plate Seals and O-rings based on the furnished part or Table 2 Batch Testing for Plate seals and all data shall display the results of the testing and state that the parts conform to all other technical requirements for elastomer compounds of this specification (CofA). This certification shall include the purchase order number, material specification number, vendor's compound number and batch and lot number(s).

Certificate of Analysis (CofA): Definition found in AS6414 and requirement per AS6414, 6.2.2.