AEROSPACE MATERIAL SPECIFICATION

AMS7276™	REV. J
Issued 1974-06 Revised 2020-05 Superseding AMS7276H	

(R) Rubber: Fluorocarbon (FKM)
High Temperature - Fluid Resistant
Low Compression Set/70 to 80 Type A Hardness
For Seals in Fuel Systems and Specific Engine Oil Systems

RATIONALE

Five-Year Review and update to latest AMS7xxx template.

1. SCOPE

1.1 Form

This specification covers a fluorocarbon 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 AMS3216 specification which is intended for that use.

1.2 Application

This material has resistance to a wide variety of fuels, lubricants, and specific hydraulic fluids, but usage is not limited to such applications. Each application should be considered individually. This class of fluoroelastomers may not be suitable for use in some high temperature stabilized, “HTS,” engine oils. Each “HTS” oil should be evaluated separately. Examples of "HTS" oils are those oils conforming to MIL-PRF-23699 Class HTS, MIL-PRF-7808 Grade 4, and AS5780 Class HPC. This material has a typical service temperature range of -20 to 400 °F (-29 to 204 °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. 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.

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. All statutory and regulatory requirements (excluding this document).

2. Procurement Document or Contractual Agreement.

2. Applicable purchaser's drawing or AS3208 or AS3209 or MA3352 Parts Standard, as applicable.

3. Specification 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 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
AMS3023	Fluid, Reference for Testing Polyol Ester (and Diester) Resistant Material
AS568	Aerospace Size Standard for O-rings
AIR851	O-Ring Tension Testing Calculations
AS871	Manufacturing and Inspection Standards for Preformed Packings (O-rings)
MA3352	Packing, Preformed - O-ring Seal, AMS7276, Metric
AS3208	Packing, Preformed - AMS7276 - Seal
AS3209	Packing, Preformed - AMS7276, 'O' Ring
AS5752	Aerospace - Visual Inspection Standard for Elastomeric Sealing Elements Other than O-Rings

AS6414 Manufacturing Processing Requirements for Molded Elastomer Components Used in Aerospace Applications

AS83248/1 O-ring Molded from AMS7276 Material

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 D471 Standard Test Method for Rubber Property - Effect of Liquids

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

ASTM D1329 Standard Test Method for Evaluating Rubber Property - Retraction at Lower Temperatures (TR Test)

ASTM D1414 Standard Test Methods for Rubber O-Rings

ASTM D2240 Standard Test Method for Rubber Property - Durometer Hardness

2.3 ISO Publications

Available from International Organization for Standardization, ISO Central Secretariat, 1, ch. de la Voie-Creuse, CP 56, CH-1211 Geneva 20, Switzerland, Tel: +41 22 749 01 11, www.iso.org.

ISO 3601-1 Fluid Power Systems - O-Rings - Part 1: Inside Diameters, Cross-sections, Tolerances and Designation Codes

ISO 3601-3 Fluid Power Systems - O-Rings - Part 3: Quality Acceptance Criteria

2.4 PRI Publications

Available from Performance Review Institute, 161 Thorn Hill Road, Warrendale, PA 15086-7527, Tel: 724-772-1616, www.pri-network.org.

PD2000 Procedures for an Industry Qualified Product Management Process

PD2102 Aerospace Quality Assurance, Product Standards, Qualification Procedure, Elastomeric Seal

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 product meeting the requirements of 3.2. A dihydroxy/bisphenol cure system shall be used. Material shall be 100% virgin fluorocarbon (FKM) elastomer. Reprocessed vulcanized material is not acceptable.

3.1.1 Color

Shall be black or brown. No other color shall be acceptable.

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. For brown seals only, Table 1A also applies.

Material shall be tested on the part standard AS3209-214 O-rings to determine the qualification properties. AS83248/1 and AS3209 are alternate part standards using AMS7276. Wherever AS3209-214 is called out in this specification, the use of AS83248/1-214 instead shall be permitted.

Table 1 - Qualification properties

Paragraph	Property	Test Sample	Requirements	Test Method
3.2.1	As Received			
3.2.1.1	Hardness, Durometer Type “A”	AS3209-214 O-rings	75 ± 5	ASTM D1414 (D2240)
3.2.1.1.a	Hardness, Durometer Type “A”	Hardness solid disk/button or plied specimens	75 ± 5	ASTM D2240
3.2.1.2	Tensile Strength, minimum	AS3209-214 O-rings	1400 psi (9.65 MPa)	ASTM D1414
3.2.1.3	Elongation %, minimum	AS3209-214 O-rings	125	ASTM D1414
3.2.1.4	Specific Gravity/Relative Density	AS3209-214 O-rings	Preproduction Value ± 0.02	ASTM D1414 (D297) Hydrostatic Method
3.2.2	Short Term Compression set Percent of original deflection, maximum	AS3209-214 O-rings	15	ASTM D1414 (D395, Method B) Temperature: 392 °F ± 5 °F (200 °C ± 3 °C) Time: 22.0 hours ± 0.5 hours
3.2.3	Long-term Compression Set Percent of original deflection, maximum	AS3209-214 O-rings	40	ASTM D1414 (D395, Method B) Temperature: 392 °F ± 5 °F (200 °C ± 3 °C) Time: 336.0 hours ± 0.5 hours
3.2.4	Temperature Retraction Test (TR-10), maximum	AS3209-214 O-rings	5 °F (-15 °C)	ASTM D1414 (D1329)
3.2.5	Dry Heat Resistance ASTM D573			
3.2.5.1	Hardness, Durometer Type “A” Change	AS3209-214 O-rings	-5 to +10	ASTM D1414 (D573) Temperature: 518 °F ± 5 °F (270 °C ± 3 °C) Time: 70.0 hours ± 0.5 hours Weight loss per 4.4.1
3.2.5.2	Tensile strength % change, maximum	AS3209-214 O-rings	-35	
3.2.5.3	Tensile elongation % change, maximum	AS3209-214 O-rings	-15	
3.2.5.4	Percent weight Loss, maximum	AS3209-214 O-rings	10	
3.2.6	Aromatic Fuel Resistance ASTM D471			
3.2.6.1	Hardness, Durometer Type “A” Change	AS3209-214 O-rings	-5 to +5	ASTM D1414 (D471) Temperature: 73 °F ± 5 °F (23 °C ± 2 °C) Time: 70.0 hours ± 0.5 hours ASTM Ref. Fuel B
3.2.6.2	Tensile strength % change, maximum	AS3209-214 O-rings	-20	
3.2.6.3	Tensile elongation % change, maximum	AS3209-214 O-rings	-20	
3.2.6.4	Volume % change	AS3209-214 O-rings	0 to +5	
3.2.7	Polyol Ester (and Diester) Fluid Resistance ASTM D471 (Note 1)			
3.2.7.1	Hardness, Durometer Type “A” Change	AS3209-214 O-rings	-15 to 0	ASTM D1414 (D471) Temperature: 392 °F ± 5 °F (200 °C ± 3 °C) Time: 70.0 hours ± 0.5 hours AMS3023 Polyol Ester (and Diester) fluid ASTM D1414 (D395, Method B)
3.2.7.2	Tensile strength % change, maximum	AS3209-214 O-rings	-35	
3.2.7.3	Tensile elongation % change, maximum	AS3209-214 O-rings	-20	
3.2.7.4	Volume % change	AS3209-214 O-rings	+1 to +25	
3.2.7.5	Compression Set Percent of original deflection, maximum	AS3209-214 O-rings	10	

NOTE 1: Do not dip specimen in acetone; blot dry residual oil from specimen.