



AEROSPACE MATERIAL SPECIFICATION

AMS7410™

Issued

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Rubber: Fluorocarbon Elastomer (FKM)
Aircraft Engine Oil, Fuel and Hydraulic Fluid Resistant
70 to 80 Shore Type A Hardness
Low Temperature Sealing Tg -47 °F (-43.9 °C)
for Elastomeric Seals in Aircraft Engine, Fuel and Hydraulic Systems

RATIONALE

Specification covers a grade of fluorocarbon elastomer capable of meeting glass transition Tg -47 °F (-43.9 °C).

1. SCOPE

1.1 Form

This specification covers high temperature, compression set, and fluid resistant fluorocarbon (FKM) elastomer in the form of molded rings, compression seals, O-ring cord, and molded-in-place gaskets for aeronautical and aerospace applications.

1.2 Application

This material has resistance to a variety of gas turbine engine oils, including high thermal stability (HTS) oils, fuels, and hydraulic fluids, but usage is not limited to such applications. This material has a typical service temperature range of -65 to +400 °F (-54 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. 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.

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

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Documents

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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 that 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 document 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 of Molded Elastomeric Seals and Sealing Components
AMS3085	Fluid, Reference for Testing AS5780C HPC Class (Polyol) Resistance Material (Also Known as Eastman Reference Oil 300)
AMS7379	Rubber: Fluorocarbon Elastomer (FKM), Low Temperature Sealing Tg -40° F (-40 °C), 70 to 80 Type "A" Hardness, for Elastomeric Seals in Aircraft Engine Oil, Fuel and Hydraulics Systems
AIR851	O-Ring Tension Testing Calculations
AS568	Aerospace Size Standard for O-Rings
AS5316	Storage of Elastomer Seals and Seal Assemblies Which Include an Elastomer Element Prior to Hardware Assembly
AS5440	Hydraulic Systems, Military Aircraft, Design and Installation, Requirements for
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
AS6837	Required O-Ring Sizes for Quality Conformance Testing
AS9100	Quality Management Systems - Requirements for Aviation, Space, and Defense Organizations

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
ASTM D471	Standard Test Method for Rubber Property - Effects of Liquids
ASTM D573	Standard Test Method for Rubber - Deterioration in an Air Oven
ASTM D1414	Standard Test Methods for Rubber O-Rings

ASTM D1329	Standard Test Method for Evaluating Rubber Property - Retraction at Lower Temperatures (TR)
ASTM D2240	Standard Test Method for Rubber Property - Durometer Hardness
ASTM D7426	Standard Test Method for Assignment of the DSC Procedure for Determining Tg of a Polymer or an Elastomeric Compound

2.3 ISO Publications

Copies of these documents are available online at <http://webstore.ansi.org/>.

ISO 3601-1	Fluid Power Systems - O-Rings - Part 1: Inside Diameter, Cross Sections, Tolerances and Size Identification Code
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

2.5 U.S. Government Publications

Copies of these documents are available online at <https://quicksearch.dla.mil>.

MIL-PRF-5606	Hydraulic Fluid, Petroleum Base; Aircraft, Missile, and Ordnance
MIL-PRF-83282	Hydraulic Fluid, Fire Resistant; Synthetic Hydrocarbon Base, Metric, NATO Code Number H-537
MIL-PRF-87257	Hydraulic Fluid, Fire Resistant; Low Temperature, Synthetic Hydrocarbon Base, Aircraft and Missile

2.6 ASQ Publications

Available from American Society for Quality, 600 North Plankinton Avenue, Milwaukee, WI 53203, Tel: 800-248-1946 (United States or Canada), 001-800-514-1564 (Mexico), or +1-414-272-8575 (all other locations), www.asq.org.

ANSI/ASQ Z1.4	Sampling Procedures and Tables for Inspection by Attributes
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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. The basic ingredients shall be based on 100% virgin fluorocarbon (FKM) elastomer. Reprocessed vulcanized material is not 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.

Material shall be tested on size standard AS568-214 O-rings to determine the qualification properties.