

AEROSPACE MATERIAL SPECIFICATION

Ethylene Propylene Rubber Phosphate Ester Resistant 65 - 75

1. SCOPE:

1.1 Form:

This specification covers an ethylene propylene elastomer in the form of molded sheet and shapes, color coded purple per ARP1527.

1.2 Application:

Primarily for parts such as tube supports, grommets, clamp cushions, and gaskets requiring resistance to phosphate ester hydraulic fluids, but usage is not limited to such applications. This material is not suitable for use in contact with hydrocarbon fuels and oil or diester lubricating oils. Each application, however, should be considered individually.

1.3 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 canceled and no superseding document has been specified, the last published issue of that document shall apply.

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2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 4943 Titanium Alloy, Hydraulic, Seamless Tubing 3.0Al-2.5V, Annealed

ARP1527 Color Coding - Elastomers for Tube Clamp Cushions

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM D 297 Rubber Products - Chemical Analysis

ASTM D 395 Rubber Property - Compression Set

ASTM D 412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension

ASTM D 471 Rubber Property - Effect of Liquids

ASTM D 573 Rubber- Deterioration in an Air Oven

ASTM D 624 Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers

ASTM D 2240 Rubber Property - Durometer Hardness

2.3 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-C-85052 Clamp, Loop, Cushion, General Specification for

MIL-STD-810 Environmental Test Methods and Engineering Guidelines

Federal Aviation Regulations, Part 25 Fire Protection, Section 25.853 Compartment Interiors

3. TECHNICAL REQUIREMENTS:

3.1 Material:

Shall be a compound based on an ethylene propylene elastomer, suitably cured to produce a product meeting the requirements of Table 1, and color coded purple in accordance with ARP1527.

3.2 Properties:

The product shall conform to the requirements in Table 1; tests shall be performed on product supplied and in accordance with specified ASTM methods, insofar as practicable.

TABLE 1 - Properties

Property	Requirement	Test Method
3.2.1 As Received:		
3.2.1.1 Hardness, Durometer "A" or equivalent	70 ± 5	ASTM D 2240
3.2.1.2 Tensile Strength, min	13.7 MPa (2000 psi)	ASTM D 412, Die B or C
3.2.1.3 Elongation, min	400%	ASTM D 412, Die B or C
3.2.1.4 Tear Resistance, min	34.7 kN/m (200 pounds force/inch)	ASTM D 624, Die B
3.2.1.5 Specific Gravity	Preproduction Value ±0.02	ASTM D 297
3.2.2 Phosphate Ester Hydraulic Fluid Resistance:		ASTM D 471 AS1241, Type IV, Class I, Grade A Temperature: 135 °C ± 3 (275 °F ± 5) Time: 22 hours ± 0.5
3.2.2.1 Hardness Change, Durometer "A" or equivalent	-20 to 0	
3.2.2.2 Tensile Strength Change, max	-50%	
3.2.2.3 Elongation Change, max	-25%	
3.2.2.4 Tear Resistance, max	-40%	
3.2.2.5 Volume Change	0 to +30%	
3.2.3 Dry Heat Resistance:		ASTM D 573 Temperature: 135 °C ± 3 (275 °F ± 5.4) Time: 70 hours ± 0.5
3.2.3.1 Hardness Change, Durometer "A" or equivalent	0 to +10	
3.2.3.2 Tensile Strength Change, max	-20%	
3.2.3.3 Elongation Change, max	-40%	
3.2.3.4 Tear Resistance, max	-40%	
3.2.3.5 Volume Change	-10 to 0%	

TABLE 1 - Properties (Continued)

Property	Requirement	Test Method
3.2.4 Compression Set:		ASTM D 395, Method B Temperature: 100 °C ± 3 (212 °F ± 5.4) Time: 70 hours ± 0.5
3.2.4.1 Percent of Original Deflection, max	30	
3.2.5 Thermal Shock:	No cracking, surface tackiness, or degradation	MIL-STD-810 Method 503.2 Low Temperatures: -54 °C ± 3 (-65 °F ± 5.4) High Temperatures: 135 °C ± 3 (275 °F ± 5.4)
3.2.6 Flame Resistance - Horizontal Burn Test	Use specimen 0.08 inch nominal thickness	MIL-C-85052, paragraph 4.5.3.3.3 or FAA FAR 25.853, Appendix F
3.2.6.1 Burning rate; maximum 2.5 inches/max		
3.2.7 Titanium Compatibility	No cracking or pitting permitted	MIL-C-85052, para 3.5.1.4 and 4.5.3.4

3.3 Quality:

The product, as received by purchaser, shall be uniform in quality and condition, smooth, as free from foreign material as commercially practical, and free from imperfections detrimental to usage of the product.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

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

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Hardness (3.2.1.1), tensile strength (3.2.1.2), elongation (3.2.1.3), tear strength (3.2.1.4), and dry heat resistance (3.2.3) are acceptance tests and shall be performed on each lot.