

**AEROSPACE  
MATERIAL  
SPECIFICATION**

**SAE** AMS3253

REV. A

Issued 2001-02  
Revised 2010-12

Superseding AMS3253

Ethylene Propylene Rubber  
Phosphate Ester Resistant  
65 - 75

RATIONALE

AMS3253A is a Five Year Review and update of this specification.

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

This product has been used typically 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 cancelled 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 International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), [www.sae.org](http://www.sae.org).

AMS4943 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 International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, [www.astm.org](http://www.astm.org).

ASTM D 297 Standard Test Methods for Rubber Products - Chemical Analysis

ASTM D 395 Standard Test Methods for Rubber Property - Compression Set

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

ASTM D 471 Standard Test Methods for Rubber Property - Effect of Liquids

ASTM D 573 Standard Test Methods for 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 Standard Test Methods for Rubber Property - Durometer Hardness

## 2.3 U.S. Government Publications

Available from the Document Automation and Production Service (DAPS), Building 4/D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Tel: 215-697-6257, <http://assist.daps.dla.mil/quicksearch/>.

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

## 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

Paragraph	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: 275 °F ± 5 (135 °C ± 3) 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: 275 °F ± 5.4 (35 °C ± 3) 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%	
3.2.4	Compression Set		ASTM D 395, Method B Temperature: 212 °F ± 5.4 (100 °C ± 3) 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: -65 °F ± 5.4 (-54 °C ± 3) High Temperatures: 275 °F ± 5.4 (135 °C ± 3)
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, paragraph 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 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.

#### 4.2.2 Preproduction Tests

All technical requirements are preproduction tests and shall be performed prior to or on the initial shipment of product by the manufacturer, when any change in ingredients and/or processing requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

### 4.3 Sampling and Testing

Shall be as follows:

#### 4.3.1 For Acceptance Tests

Sufficient product shall be taken at random from each lot to perform all required tests. The number of determinations for each requirement shall be as specified in the applicable test procedure or, if not specified therein, not less than three.

4.3.1.1 If specimens cannot be prepared from the product, ASTM test specimens prepared from the same batch and state of cure shall be used. When the product supplied is an extrusion of such shape that suitable test specimens cannot be cut from the product, a separate flat strip test sample from the same production lot shall be supplied upon request. This strip shall be prepared from tubing 1.000 inch  $\pm$  0.063 (25.40 mm  $\pm$  1.60) in OD by 0.075 inch  $\pm$  0.008 (1.90 mm  $\pm$  0.20) in wall thickness, mechanically slit and flattened into a strip while being extruded, and cured in the same manner as production product. When the product is a molded shape form which test specimens cannot be cut, a slab 6 inches (152 mm) square by 0.075 inch  $\pm$  0.008 (1.90 mm  $\pm$  0.20) thick molded from the same batch of compound shall be supplied upon request.

4.3.1.2 A lot shall be all product from the same batch of compound processed in one continuous run and presented for manufacturer's inspection at one time.

4.3.1.3 A batch shall be the quantity of compound run through a mill or mixer at one time.

#### 4.3.1.4 Final inspection Sampling Plan

A statistical sampling plan acceptable to the purchaser may be used in lieu of sampling as in 4.3.1. Sample size for visual and dimensional requirements shall be as shown in Table 2; sample unit shall be one molded part and acceptance based on zero defects.