SAE Aerospace
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS3248 | REV. C

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Superseding AMS3248B

(R) Ethylene Propylene (EPM) Rubber Phosphate Ester Resistant 55 - 65

RATIONALE

AMS3248C is a Five Year Review and update of this specification.

This specification was updated to include proper ASTM test method titles. The ozone concentration was added and includes the visual inspection criteria. process control parameters were better defined. A finial inspection sampling plan was added.

1. SCOPE

1.1 Form

This specification covers an ethylene propylene (EPM) rubber in the form of sheet, strip, tubing, molded shapes, and extrusions.

1.2 Application

This product has been used typically for parts, such as gaskets, grommets, and seals requiring resistance to phosphate esters and/or to ozone from -54 °C to +135 °C (-65 °F to +275 °F), but usage is not limited to such applications. Not suitable for use in contact with petroleum-base fluids due to excessive swell.

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.

TO PLACE A DOCUMENT ORDER: Tel: 877-606-7323 (inside USA and Canada)
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SAE values your input. To provide feedback on this Technical Report, please visit
http://www.sae.org/technical/standards/AMS3248C

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.

AMS2279 Tolerances, Rubber Products
AMS2810 Identification and Packaging, Elastomeric Products

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 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 518 Standard Test Methods for Rubber Deterioration - Surface Cracking
ASTM D 573 Standard Test Methods for Rubber - Deterioration in an Air Oven
ASTM D 624 Standard Test Methods for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
ASTM D 1149 Standard Test Methods for Rubber Deterioration – Cracking in an Ozone Controlled Environment
ASTM D 2137 Standard Test Methods for Rubber Property Brittleness Point of Flexible Polymers and Coated Fabrics
ASTM D 2240 Standard Test Methods for Rubber Property - Durometer Hardness

3. TECHNICAL REQUIREMENTS

3.1 Material

Shall be a compound, based on an ethylene propylene (EPM) elastomer, suitably cured to produce a product meeting the requirements of 3.2.

3.2 Properties

The product shall conform to the following requirements shown in Table 1 and 3.2.6; tests shall be performed on the 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	60 ± 5	ASTM D 2240
3.2.1.2	Tensile Strength, minimum		
3.2.1.2.1	For parts other than extrusions	2500 psi (17.2 MPa)	ASTM D 412, Die B or C
3.2.1.2.2	For extruded parts	2000 psi (13.8 MPa)	
3.2.1.3	Elongation, minimum		ASTM D 412, Die B or C
3.2.1.3.1	For parts other than extrusions	400%	
3.2.1.3.2	For extruded parts	320%	
3.2.1.4	Tensile Stress at 200% Elongation, maximum	Preproduction Value ±20%	ASTM D 412, Die B or C Stretch specimens to 225% elongation twice within 5 minutes before testing.

TABLE 1 – PROPERTIES (CONT.)

Paragraph	Property	Requirement	Test Method
3.2.1.5	Tear Resistance, minimum		ASTM D 624, Die B
3.2.1.5.1	For parts other than extrusions	150 pounds force per inch (26.3 kN/m)	
3.2.1.5.2	For extruded parts	120 pounds force per inch (21.0 kN/m)	
3.2.1.6	Specific Gravity	Preproduction Value ±0.02	ASTM D 297
3.2.1.7	Total Ash	Preproduction Value ±10%	ASTM D 297
3.2.2	Phosphate Ester Resistance (Immediate Deteriorated Properties)		ASTM D 471 Medium: Tri-n-butyl phosphate
3.2.2.1	Hardness Change, Durometer “A” or equivalent	0 to -10	Temperature: 212 °F ± 2 (100 °C ± 1) Time: 70 hours ± 0.5
3.2.2.2	Tensile Strength Change, maximum	-20%	
3.2.2.3	Elongation Change, maximum	-20%	
3.2.2.4	Volume Change	0 to +15%	
3.2.3	Dry Heat Resistance		ASTM D 573 Temperature: 257 °F ± 2 (125 °C ± 1) 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, maximum	-15%	
3.2.3.3	Elongation Change, maximum	-20%	
3.2.4	Compression Set		ASTM D 395, Method B Temperature: 212 °F ± 2 (100 °C ± 1) Time: 70 hours ± 0.5
3.2.4.1	Percent of Original Deflection, maximum	20	
3.2.5			
3.2.5.1	Low-Temperature Resistance Brittleness	Pass	ASTM D 2137, Method A Temperature: -67 °F ± 2 (-55 °C ± 1) Time: 10 minutes ± 0.5

3.2.6 Weathering

The product shall show no evidence of cracking when tested in accordance with ASTM D 1149 for seven days at 105 °F ± 2 (40 °C ± 1). Test specimens shall be prepared and mounted in accordance with ASTM D 518, Method B. Use Ozone concentration of 50 pphm +/- 10% and observation magnification of 7X.

3.2.7 Corrosion

The product shall not have a corrosive effect on other materials when exposed to conditions normally encountered in service, determined by a procedure agreed upon by purchaser and vendor. Discoloration of metal shall not be considered objectionable.

3.3 Quality

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

3.4 Tolerances

Shall conform to all applicable requirements of AMS2279.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The vendor of the product shall supply all samples for vendor's tests 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

Tests for the following requirements shown in Table 2 are acceptance tests and shall be performed on each lot:

TABLE 2 - ACCEPTANCE TESTS

Requirement	Paragraph Reference
Hardness, as received	3.2.1.1
Tensile Strength, as received	3.2.1.2
Elongation, as received	3.2.1.3
Volume Change in oil	3.2.2.4
Compression Set	3.2.4
Quality	3.3

4.2.2 Preproduction Tests

Tests for all technical requirements are preproduction tests and shall be performed prior to or on the initial shipment of the product to a purchaser, when a change in ingredients and/or processing requires reapproval as in 4.2.2.1 and when purchaser deems confirmatory testing to be required.

4.2.2.1 Manufacturer shall use ingredients, manufacturing procedures, processes, and methods of inspection on production product which are essentially the same as those used on the approved sample. If necessary to make any change in ingredients, in type of equipment for processing, or in manufacturing procedures, manufacturer shall submit for reapproval a statement of the proposed changes in ingredients and/or processing, and, when requested, sample product. Production product made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.3 Sampling and Testing

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.