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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS-3201 REV J

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Superseding AMS-3201H

Submitted for recognition as an American National Standard

NITRILE (NBR) RUBBER
Dry Heat Resistant
35 - 45

1. SCOPE:

1.1 Form: This specification covers a nitrile (NBR) rubber in the form of sheet, strip, tubing, extrusions, and molded shapes.

1.2 Application: Primarily for parts, such as packings, bushings, grommets, and seals, requiring resistance to dry heat.

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 following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

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

2.1.1 Aerospace Material Specifications:

AMS-2279 - Tolerances, Rubber Products
MAM-2279 - Tolerances, Metric, Rubber Products
AMS-2810 - Identification and Packaging, Elastomeric Products

2.2 ASTM Publications: Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM D 297 - Rubber Products - Chemical Analysis
ASTM D 395 - Rubber Property - Compression Set
ASTM D 412 - Rubber Properties in Tension
ASTM D 471 - Rubber Property - Effect of Liquids
ASTM D 518 - Rubber Deterioration - Surface Cracking
ASTM D 865 - Rubber - Deterioration by Heating in Air (Test Tube Enclosure)
ASTM D 1149 - Rubber Deterioration - Surface Ozone Cracking in a Chamber (Flat Specimens)
ASTM D 2137 - Rubber Property - Brittleness Point of Flexible Polymers and Coated Fabrics
ASTM D 2240 - Rubber Property - Durometer Hardness

3. TECHNICAL REQUIREMENTS:

3.1 Material: Shall be a compound, based on an acrylonitrile-butadiene (NBR) elastomer, suitably cured to produce a product meeting the requirements of 3.2.

3.2 Properties: The product shall conform to the following requirements; tests shall be performed on the product supplied and in accordance with specified ASTM methods, insofar as practicable:

3.2.1 As Received:

3.2.1.1 Hardness, Durometer "A" or equivalent	40 ± 5	ASTM D 2240
3.2.1.2 Tensile Strength, minimum		ASTM D 412, Die B or C
3.2.1.2.1 For parts other than extrusions	1000 psi (6.90 MPa)	
3.2.1.2.2 For extruded parts	800 psi (5.52 MPa)	
3.2.1.3 Elongation, minimum	300%	
3.2.1.4 Specific Gravity	Preproduction Value ±0.02	ASTM D 297
3.2.2 Oil Resistance: (Immediate Deteriorated Properties)		ASTM D 471 Medium: ASTM Oil No. 3 Temperature: 100°C ± 1 (212°F ± 2) Time: 70 hours ± 0.5
3.2.2.1 Hardness Change, Durometer "A" or equivalent	-15 to +10	

3.2.2.2 Tensile Strength Change, maximum	-50%		
3.2.2.3 Elongation Change, maximum	-40%		
3.2.2.4 Volume Change	-10 to +50%		
3.2.2.5 Decomposition	None		
3.2.2.6 Surface Tackiness	None		
3.2.3 Dry Heat Resistance:		ASTM D 865	
		Temperature:	150°C ± 3 (302°F ± 5)
3.2.3.1 Hardness Change, Durometer "A" or equivalent	0 to +20	Time:	70 hours ± 0.5
3.2.3.2 Tensile Strength Change, maximum			
3.2.3.2.1 For parts other than extrusions	-60%		
3.2.3.2.2 For extruded parts	-70%		
3.2.3.3 Elongation Change, maximum			
3.2.3.3.1 For parts other than extrusions	70%		
3.2.3.3.2 For extruded parts	-85%		
3.2.3.4 Bend (flat)	No cracking or checking		
3.2.4 Compression Set:		ASTM D 395, Method B	
		Temperature:	100°C ± 1 (212°F ± 2)
Percent of Original Deflection, maximum	75	Time:	70 hours ± 0.5
3.2.5 Low-Temperature Resistance:			
3.2.5.1 Brittleness	Pass	ASTM D 2137, Method A	
		Temperature:	-40°C ± 1 (-40°F ± 2)

3.2.6 Weathering: The product shall show no evidence of cracking when tested in accordance with ASTM D 1149 for 7 days at 40°C ± 1 (104°F ± 2). Test specimens shall be prepared and mounted in accordance with ASTM D 518, Method B.

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 material as commercially practicable, and free from imperfections detrimental to usage of the product.

3.4 Tolerances: Shall conform to all applicable requirements of AMS-2279 or Ø MAM-2279.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the product shall supply all Ø samples for vendor's tests and shall be responsible for performing 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 requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests for the following requirements are acceptance tests and shall be performed on each lot:

Requirement	Paragraph
Hardness, as received	3.2.1.1
Tensile Strength, as received	3.2.1.2
Elongation, as received	3.2.1.3
Specific Gravity	3.2.1.4
Volume Change in oil	3.2.2.4
Compression Set	3.2.4

4.2.2 Preproduction Tests: Tests for all technical requirements are preproduction tests and shall be performed prior to or on the first-article shipment of a product to a purchaser, when a change in ingredients and/or processing requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.2.2.1 For direct U.S. Military procurement, substantiating test data and, when requested, preproduction test material shall be submitted to the cognizant agency as directed by the procuring activity, contracting officer, or request for procurement.