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Superseding AMS3215L	

Acrylonitrile Butadiene (NBR) Rubber  
Aromatic Fuel Resistant  
65 - 75

#### RATIONALE

Specification was updated for the five year review.

#### 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 gaskets, diaphragms, bushings, grommets, and sleeves, requiring resistance to aromatic and aliphatic fuels when continuously or alternately exposed to both.

##### 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).

AMS2279 Tolerances, Rubber Products

MAM2279 Tolerances, Metric, 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](http://www.astm.org)

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 573 Rubber - Deterioration in an Air Oven

ASTM D 624 Rubber Property - Tear Resistance

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	70 ± 5	ASTM D 2240
3.2.1.2	Tensile Strength, minimum	1500 psi (10.3 MPa)	ASTM D 412, Die B or C
3.2.1.3	Elongation, minimum	250%	ASTM D 412, Die B or C
3.2.1.4	Tensile Stress at 100% Elongation, maximum	1000 psi (6.89 MPa)	ASTM D 412, Die B or C Stretch specimen twice to 125% elongation within 5 minutes before testing.
3.2.1.5	Tear Resistance, minimum	80% of Preproduction Value	ASTM D 624, Die B
3.2.1.6	Specific Gravity	Preproduction Value ± 0.02	ASTM D 297

3.2.2 Aliphatic Fuel Resistance:  
(After 24 hours drying at 158 °F ± 2 (70 °C ± 1))

ASTM D 471  
 Medium: ASTM Ref. Fuel A  
 Temperature: 68 to 86 °F  
 (20 to 30 °C)  
 Time: 24 hours ± 0.5

3.2.2.1 Volume Change, maximum -5%

3.2.3 Aromatic Fuel Resistance:  
(Immediate Deteriorated Properties)

ASTM D 471  
 Medium: ASTM Ref. Fuel B  
 Temperature: 68 to 86 °F  
 (20 to 30 °C)

3.2.3.1 Hardness Change, Durometer "A" or equivalent  
 -20 to 0

3.2.3.2 Tensile Strength Change, maximum

Time: 168 hours ± 0.5

3.2.3.2.1 For parts other than extrusions -50%

3.2.3.2.2 For extruded parts -60%

3.2.3.3 Elongation Change, maximum -45%

3.2.3.4 Volume Change in 24 hours 0 to +35%

3.2.3.5 Volume Change in 168 hours 0 to +35%

3.2.3.6 Volume Change on Drying  
(after 168 hours  
immersion) at 158 °F ± 2  
(70 °C ± 1) for  
24 hours, maximum

-10%

3.2.4 Dry Heat Resistance:

ASTM D 573

Temperature: 212 °F ± 2  
(100 °C ± 1)

3.2.4.1 Hardness Change,  
Durometer "A" or  
equivalent

0 to +10

Time: 70 hours ± 0.5

3.2.4.2 Tensile Strength  
Change, maximum

-20%

3.2.4.3 Elongation Change,  
maximum

-40%

3.2.5 Compression Set:

ASTM D 395, Method B

Temperature: 212 °F ± 2  
(100 °C ± 1)

3.2.5.1 Percent of Original  
Deflection, maximum

Time: 70 hours ± 0.5

3.2.5.1.1 For parts other than  
extrusions

75

3.2.5.1.2 For extruded parts

80

3.2.6 Low-Temperature Resistance:

ASTM D 2137, Method A

Temperature: 0 °F ± 2  
(-18 °C ± 1)

3.2.6.1 Brittleness

Pass

Time: 10 minutes ± 1

3.2.7 Weathering

The product shall show no evidence of cracking when tested in accordance with ASTM D 1149 for 7 days at 104 °F ± 2 (40 °C ± 1).

3.2.8 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 with all applicable requirements of AMS2279 or MAM2279.

## 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 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:

TABLE 1

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	3.2.1.6
Compression Set	3.2.5

#### 4.2.2 Periodic Tests

Tests for the following requirements are periodic tests and shall be performed at a frequency selected by the vendor unless frequency of testing is specified by purchaser.

TABLE 2

Requirement	Paragraph
Tensile Stress at 100% Elongation, as received	3.2.1.4
Tear Resistance	3.2.1.5
Volume Change in Aliphatic Fuel	3.2.2.1
Volume Change in Aromatic Fuel	3.2.3.4

#### 4.2.3 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 4.4.2, and when purchaser deems confirmatory testing to be required.