



AEROSPACE MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AMS 3274E

Superseding AMS 3274D

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NITRILE RUBBER SHEET, NYLON FABRIC REINFORCED Fuel Resistant

1. SCOPE:

1.1 Form: This specification covers nylon-fabric-reinforced nitrile rubber in the form of sheet and of shapes molded and cured from partly cured sheet.

1.2 Application: Primarily for diaphragms in power plant fuel supply and control systems.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods

AMS 2810 - Identification and Packaging, Elastomeric Products

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM D471 - Change in Properties of Elastomeric Vulcanizates Resulting from Immersion in Liquids

ASTM D573 - Accelerated Aging of Vulcanized Rubber by the Oven Method

ASTM D751 - Testing Coated Fabrics

ASTM D2137 - Low-Temperature Impact Test for Brittleness Determination of Flexible Polymeric Materials or Fabrics Coated Therewith, or Both

2.3 Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Military Standards:

MIL-STD-794 - Parts and Equipment, Procedures for Packaging and Packing of

3. TECHNICAL REQUIREMENTS:

3.1 Material and Fabrication: The product shall consist of a single ply of a nylon fabric, having either a plain weave or a 2-up and 1-down twill weave, coated on both faces, unless otherwise specified, with a nitrile rubber compound, the rubber being cured to produce a product meeting the requirements of 3.2. Thickness of coating shall be substantially uniform and shall be equal in thickness on both faces of sheet coated on both faces.

3.1.1 Color: Shall be black.

SAE Technical Board rules provide that: "All technical reports, including standards, approved practices recommended, are advisory only. Their use by anyone engaged in industry or trade is entirely voluntary. There is no agreement to adhere to any SAE standard, recommended practice, and no commitment to conform to or be guided by any technical report. In formulating and approving technical reports, the Board and its committees will not investigate or consider patents which may apply to the subject matter. Prospective users of the report are responsible for protecting themselves against liability for infringement of patents."

3.1.2 Surface Cleanliness: Product having evenly dusted surfaces will be acceptable. Surfaces shall be cleanable without damage to the sheet and shall be cementable.

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

3.2.1 As Received: Shall be as specified in Table I, determined in accordance with ASTM D751.

3.2.2 Aliphatic Fuel Resistance:

(After 24 hr $\pm$ 0.5 drying at 70°C $\pm$ 1 (158°F $\pm$ 1.8))

ASTM D471

Medium: ASTM Ref. Fuel A

Temperature: 20° - 30° C

(68° - 86° F)

Time: 24 hr $\pm$ 0.25

3.2.2.1 Volume Change

<u>Nominal Thickness</u>		
Inch	(Millimetres)	
0.008	0.20	-20 to +10%
0.010	0.26	-25 to 0%
0.013	0.33	-25 to 0%
0.017	0.43	-25 to 0%
0.020	0.51	-25 to 0%
0.025	0.64	-25 to 0%
0.030	0.76	-25 to 0%
0.050	1.27	-25 to 0%

3.2.3 Aromatic Fuel Resistance:

(Immediate Deteriorated Properties)

ASTM D471

Medium: ASTM Ref. Fuel B

Temperature: 20° - 30° C

(68° - 86° F)

Time: 24 hr $\pm$ 0.25

3.2.3.1 Volume Change

<u>Nominal Thickness</u>		
Inch	(Millimetres)	
0.008	0.20	0 to +35%
0.010	0.26	0 to +35%
0.013	0.33	0 to +35%
0.017	0.43	0 to +35%
0.020	0.51	0 to +40%
0.025	0.64	0 to +40%
0.030	0.76	0 to +40%
0.050	1.27	0 to +40%

3.2.3.2 Volume Change on Drying

At 70°C $\pm$ 1 (158°F $\pm$ 1.8) for 24 hr $\pm$ 0.5

Ø (After immersion as in 3.2.3.1)

(Based on unimmersed

volume)

-25 to 0%

3.2.4 Dry Heat Resistance: Shall be as specified in Table II, determined on specimens aged in accordance with ASTM D573 at 100°C $\pm$ 1 (212°F $\pm$ 1.8) for 70 hr $\pm$ 0.5.

3.2.5 Low Temperature Brittleness:

ASTM D2137, Method B

Temperature: -55°C $\pm$ 1

(-67°F $\pm$ 1.8)

Time: 10 min. $\pm$ 0.1

3.2.5.1 As Received Pass

3.2.5.2 After Aromatic Fuel Aging
Without Drying Pass

3.2.6 Weathering: When specified, the product shall have weather resistance acceptable to the purchaser, determined by a procedure agreed upon by purchaser and vendor.

3.2.7 Corrosion: The product shall not have a corrosive effect on other materials when exposed to conditions normally encountered in service. Discoloration of metal shall not be considered objectionable.

3.3 Quality: The product shall be uniform in quality and condition, clean, smooth, as free from foreign material as commercially practicable, and free from imperfections detrimental to fabrication, appearance, or performance of parts.

3.4 Sizes and Tolerances: Sheet shall be supplied in nominal thicknesses of 0.008, 0.010, 0.013, 0.017, 0.020, 0.025, 0.030, or 0.050 in. (0.20, 0.26, 0.33, 0.43, 0.51, 0.64, 0.76, or 1.27 mm) and in widths as ordered. Tolerances shall be as follows:

3.4.1 Thickness: Shall be as specified in Table III.

TABLE III

Ø	Nominal Thickness Inch	Tolerance, Inch	
		plus	minus
	0.008	0.002	0.001
	0.010, 0.013, 0.017	0.002	0.002
	0.020, 0.025, 0.030	0.003	0.003
	0.050	0.005	0.005

TABLE III (SI)

Nominal Thickness Millimetres	Tolerance, Millimetres	
	plus	minus
0.020	0.05	0.03
0.26, 0.33, 0.43	0.05	0.05
0.51, 0.64, 0.76	0.08	0.08
1.27	0.13	0.13

3.4.2 Width: ± 1.0 in. (± 25 mm).

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the product shall supply all samples and shall be responsible for performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.5. Purchaser reserves the right to perform such confirmatory testing as he deems necessary to ensure that the product conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to properties as-received (3.2.1), aromatic fuel resistance (3.2.3), and dry heat resistance (3.2.4) requirements are classified as acceptance tests.

4.2.2 Qualification Tests: Tests to determine conformance to all technical requirements of this specification are classified as qualification tests.

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

Ø 4.3 Sampling: Sufficient material shall be taken from each lot to perform all required tests in triplicate.

4.3.1 A lot shall be all product produced in one continuous coating operation from the same roll of fabric and the same batch of compound and presented for vendor's inspection at one time.

4.4 Approval:

4.4.1 Sample material shall be approved by purchaser before material for production use is supplied, unless such approval be waived. Results of tests on production material shall be essentially equivalent to those on the approved sample.

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

4.5 Reports:

4.5.1 The vendor of the product shall furnish with each shipment three copies of a report showing the results of tests to determine conformance to the acceptance test requirements and stating that the product conforms to the other technical requirements of this specification. This report shall include the purchase order number, material specification number and its revision letter, vendor's material designation, form and thickness or part number, and quantity.

4.5.2 The vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, material specification number and its revision letter, contractor or other direct supplier of material, supplier's material designation, part number, and quantity. When material for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of material to determine conformance to the requirements of this specification, and shall include in the report a statement that the material conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.

4.6 Resampling and Retesting: If any specimen used in the above tests fails to meet the specified requirements, disposition of the product may be based on the results of testing three additional specimens for each original nonconforming specimen. Failure of any retest specimen to meet the specified requirements shall be cause for rejection of the product represented and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Identification and Packaging: The product shall be identified and packaged in accordance with AMS 2810.

5.2 For direct U.S. Military procurement, packaging shall be in accordance with MIL-STD-794, Level A or Level C, as specified in the request for procurement. Commercial packaging as specified in AMS 2810 will be acceptable if it meets the requirements of Level C.

6. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.