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AEROSPACE MATERIAL SPECIFICATION

AMS 3273D
Superseding AMS 3273C

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CHLOROPRENE (CR) RUBBER SHEET, NYLON CLOTH REINFORCED
Weather Resistant

1. SCOPE:

1.1 Form: This specification covers nylon-cloth-reinforced chloroprene (CR) rubber in the form of sheet.

1.2 Application: Primarily for parts, such as gaskets, seals, diaphragms, and chafing strips, requiring resistance to weather, ozone, moderate heat, low temperature, water, and petroleum-base lubricating oil.

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

2.1 SAE Publications: Available from SAE, 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 - Rubber Property-Effect of Liquids
ASTM D573 - Rubber - Deterioration in an Air Oven
ASTM D571 - Testing Coated Fabrics
ASTM D2137 - Rubber Property - Brittleness Point of Flexible Polymers and Coated Fabrics

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

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2.3.1 Federal Standards:

FED-STD-191 - Textile Test Methods

3. TECHNICAL REQUIREMENTS:

3.1 Material and Fabrication: The product shall consist of a single ply of a nylon cloth, having either a plain weave or a 2-up and 1-down twill weave, coated on both faces, unless otherwise specified, with a chloroprene (CR) 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. Maximum thickness of the fabric shall be 0.006 in. (0.15 mm) for finished sheet thicknesses of 0.025 in. (0.64 mm) and under and 0.016 in. (0.41 mm) for sheet thickness over 0.025 in. (0.64 mm).

3.1.1 Color: Shall be black.

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

3.2 Properties: Sheet shall conform to the following requirements; tests shall be performed on the sheet supplied and in accordance with specified ASTM 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: (Immediate Deteriorated Properties)		ASTM D471 Medium: Temperature:	 ASTM Ref. Fuel A 20° - 30°C (68° - 86°F)
3.2.2.1 Volume Change	-5 to +20%	Time:	70 hr ± 0.5
3.2.3 Petroleum Hydraulic Oil Resistance: (Immediate Deteriorated Properties)		ASTM D471 Medium: Temperature: Time:	 ASTM Oil No. 3 100°C ± 1 (212°F ± 2) 70 hr ± 0.5
3.2.3.1 Volume Change	+20 to +65%		
3.2.3.2 Surface Tackiness	None		

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 ± 1 (212°F ± 2) for 70 hr ± 0.5.

3.2.5 Low-Temperature Brittleness:	Pass	ASTM D2137, Temperature:	Method B -55°C ± 1 (-67°F ± 2)

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3.2.6 Weather Resistance: Specimens of sheet in the as-received thickness, 4 x 6 in. (100 x 150 mm), after exposure in accordance with FED-STD-191, Method 5804 for 150 hr ± 0.5, shall withstand, without cracking, bending 180 deg around a 0.125-in. (3.12-mm) diameter with axis of bend parallel to either the warp or fill direction of the cloth determined 24 - 36 hr. after removal from the test chamber.

3.2.7 Fungus Resistance: Sheet shall pass the following test with no evidence of fungus growth:

3.2.1.7 A mixed suspension prepared from viable cultures and containing a suitable wetting agent shall be sprayed over the specimens supported on a non-nutrient agar medium. The test organisms shall be Aspergillis niger, Aspergillis flavus, Penicillium luteum, and Trichoderma T-1. A suitable control, such as cotton twine, shall also be included. At the end of two weeks incubation at 28° - 30°C (82° - 86°F), no visible traces of growth are permissible. The controls shall show abundant growth.

3.2.8 Corrosion: Sheet shall not have a corrosive effect on other materials Ø 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 Ø and condition, as free from foreign material as commercially practicable, and free from imperfections detrimental to usage of the product.

3.4 Sizes and Tolerances: Sheet shall be supplied in nominal thickness 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

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	0.002	0.002
0.050	0.003	0.003

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TABLE III (SI)

Nominal Thickness Millimetres	Tolerance, Millimetre plus	minus
0.20	0.05	0.02
0.26, 0.33, 0.43	0.05	0.05
0.51, 0.64, 0.76	0.05	0.05
1.27	0.08	0.08

3.4.2 Width: ±1.0 in. (±25 mm).

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of sheet shall supply all samples for vendor's tests 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 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 to determine conformance to the following requirements are classified as acceptance tests and shall be performed on each lot:

Requirement	Paragraph Reference
Breaking Strength and Bursting Strength, as received	3.2.1
Adhesion, as received	3.2.1
Fuel Resistance	3.2.2
Oil Resistance	3.2.3
Dry Heat Resistance	3.2.4

4.2.2 Preproduction Tests: Tests to determine conformance to all technical requirements of this specification are classified as preproduction tests and shall be performed prior to or on the initial shipment of a product to a purchaser, when a change in material, processing, or both 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, the contracting officer, or the request for procurement.

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4.3 Sampling: Shall be as follows:

4.3.1 For Acceptance Tests: Sufficient sheet 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 A lot shall be all sheet produced in one continuous coating operation from the same roll of cloth and the same batch of compound and presented for vendor's inspection at one time.

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

4.3.1.3 When a statistical sampling plan and acceptance quality level (AQL) have been agreed upon by purchaser and vendor, sampling shall be in accordance with such plan in lieu of sampling as in 4.3.1 and the report of 4.5.1 shall state that such plan was used.

4.3.2 For Preproduction Tests: As agreed upon by purchaser and vendor.

4.4 Approval:

4.4.1 Sample sheet shall be approved by purchaser before sheet for production use is supplied, unless such approval be waived by purchaser. Results of tests on production sheet 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 sheet which are essentially the same as those used on the approved sample sheet. If necessary to make any change 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, processing, or both and, when requested, sample sheet. Production sheet made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5 Reports:

4.5.1 The vendor of sheet shall furnish with each shipment a report showing the results of tests to determine conformance to the acceptance test requirements and stating that the sheet conforms to the other technical requirements of this specification. This report shall include the purchase order number, lot number, AMS 3273D, vendor's material designation, thickness, and quantity.

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