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AEROSPACE MATERIAL SPECIFICATION

SAE AMS3273 REV. F

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Superseding AMS3273E

Chloroprene (CR) Rubber Sheet, Nylon Cloth Reinforced Weather Resistant

RATIONALE

This document has been determined to contain basic and stable technology which is not dynamic in nature.

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1. SCOPE:

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

1.2 Application: This product has been used typically 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, but usage is not limited to such applications.

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 2810 - Identification and Packaging, Elastomeric Products

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

ASTM D 471 - Rubber Property-Effect of Liquids
ASTM D 573 - Rubber-Deterioration in an Air Oven
ASTM D 751 - Testing Coated Fabrics
ASTM D 2137 - Rubber Property-Brittleness Point of Flexible Polymers and Coated Fabrics

2.3 U.S. Government Publications: Available from Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

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 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 inch (0.15 mm) for finished sheet thicknesses of 0.025 inch (0.64 mm) and under and 0.016 inch (0.41 mm) for sheet thickness over 0.025 inch (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 D 751.

3.2.2 Aliphatic Fuel Resistance: (Immediate Deteriorated Properties)	ASTM D 471	
	Medium:	ASTM Ref. Fuel A
	Temperature:	20° - 30°C (68° - 86°F)
	Time	70 hours ± 0.5
3.2.2.1 Volume Change	-5 to +20%	

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TABLE I

As-Received Properties

Nominal Thickness		Breaking Strength, Grab Method, lbf, min		Breaking Strength, Grab Method, N, min		Bursting Strength, Diaphragm Bursting Tester		Adhesion	
Inch	Millimeters	Warp	Filling	Warp	Filling	psi, min	kPa, min	lbf per inch Width, min	N/m Width,min
0.008	0.20	35	35	156	156	75	517	5	876
0.010	0.25	65	60	289	267	125	862	5	876
0.013	0.33	65	60	289	267	125	862	5	876
0.017	0.43	65	60	289	267	125	862	5	876
0.020	0.51	65	60	289	267	125	862	5	876
0.025	0.64	65	60	289	267	125	862	5	876
0.030	0.76	300	300	1334	1334	500	3447	5	876
0.050	1.27	300	300	1334	1334	500	3447	5	876

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TABLE II

Dry Heat Resistance Properties

Nominal Thickness		Breaking Strength, Grab Method, lbf, min		Breaking Strength, Grab Method, N, min		Bursting Strength, Diaphragm Bursting Tester		Surface Hardening
Inch	Millimeters	Warp	Filling	Warp	Filling	psi, min	kPa, min	
0.008	0.20	35	35	156	156	75	517	None
0.010	0.25	65	60	289	267	125	862	for
0.013	0.33	65	60	289	267	125	862	all
0.017	0.43	65	60	289	267	125	862	thicknesses
0.020	0.51	65	60	289	267	125	862	
0.025	0.64	65	60	289	267	125	862	
0.030	0.76	300	300	1334	1334	500	3447	
0.050	1.27	300	300	1334	1334	500	3447	

3.2.3	Petroleum Hydraulic Oil Resistance: (Immediate Deteriorated Properties)		ASTM D 471 Medium: Temperature: Time:	 ASTM Oil No. 3 100°C ± 1 (212°F ± 2) 70 Hours ± 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 D 573 at 100°C ± 1 (212°F ± 2) for 70 hours ± 0.5.

3.2.5	Low-Temperature Brittleness:	Pass	ASTM D 2137 Temperature	Method B -55°C ± 1 (-67°F ± 2)

3.2.5 Weather Resistance: Specimens of sheet in the as-received thickness, 4 x 6 inches 002 x 152 mm), after exposure in accordance with FED-STD-191, Method 5804 for 150 hours ± 0.5, shall withstand, without cracking, bending 180 degrees around a 0.125-inch (3.18 mm) diameter with axis of bend parallel to either the warp or fill direction of the cloth, determined 24 - 36 hours after removal from the test chamber.

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

3.2.7.1 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 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, 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 thicknesses of 0.008, 0.010, 0.013, 0.017, 0.020, 0.025, 0.030, or 0.050 inch (0.20, 0.25, 0.33, 0.43, 0.51, 0.64, 0.76, or 1.27 mm) and in widths as ordered. Tolerances shall be as follows:

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3.4.1 Thickness: Shall be as specified in Table III.

TABLE III

Nominal Thickness Inch	Tolerance, Inch plus	Tolerance, Inch 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

TABLE III (SI)

Nominal Thickness Tolerance Millimeters	Tolerance, Millimeter plus	Tolerance, Millimeter minus
0.20	0.05	0.03
0.25, 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 inch (±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. 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:

Requirements	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

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