SAE The Engineering Society For Advancing Mobility Land Sea Air and Space®
INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 3210G

Issued MAR 1951
Revised NOV 1996
Reaffirmed OCT 2001

Superseding AMS 3210F

Chloroprene (CR) Rubber
Electrical Resistant
65 - 75

1. SCOPE:

1.1 Form:

This specification covers a chloroprene (CR) rubber in the form of sheet, strip, tubing, extrusions, and molded shapes.

1.2 Application:

Primarily for parts requiring resistance to electrical breakdown and the embrittling action of corona and ozone.

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.

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

QUESTIONS REGARDING THIS DOCUMENT: (724) 772-7161 FAX: (724) 776-0243
TO PLACE A DOCUMENT ORDER: (724) 776-4970 FAX: (724) 776-0790
SAE WEB ADDRESS: http://www.sae.org

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor, West Conshohocken, PA 19428-2959.

ASTM D 149	Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies
ASTM D 150	A-C Loss Characteristics and Permittivity (Dielectric Constant) of Solid Electrical Insulating Materials
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 573	Rubber - Deterioration in an Air Oven
ASTM D 624	Rubber Property - Tear Resistance
ASTM D 635	Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position
ASTM D 797	Rubber Property - Young's Modulus at Normal and Subnormal Temperatures
ASTM D 1149	Rubber Deterioration - Surface Ozone Cracking in a Chamber (Flat Specimens)
ASTM D 1193	Reagent Water
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 a chloroprene (CR) 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:

TABLE 1 - Properties

Paragraph	Test	Requirement	Test Method
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	1000 psi (6.89 MPa)	ASTM D 412, Die B or C
3.2.1.3	Elongation, minimum	400%	ASTM D 412, Die B or C
3.2.1.4	Tear Resistance, pounds force/inch (kg/m), minimum	80% of Preproduction Value	ASTM D 624, Die B
3.2.1.5	Power Factor at 60 Hz, maximum	10%	ASTM D150
3.2.1.6	Dielectric Strength, minimum	300 V per mil (11,800 V/mm)	ASTM D 149, Short time test, 0.080 inch (2.03 mm) thick specimen
3.2.1.7	Specific Gravity	Preproduction Value ±0.02	ASTM D 297
3.2.2	Oil Resistance (Immediate Deteriorated Properties)		ASTM D 471 Medium: ASTM Oil No. 1 Temperature: 100 °C ± 1 (212 °F ± 2)
3.2.2.1	Tensile Strength Change, maximum	-20%	Time: 70 hours ± 0.5
3.2.2.2	Elongation Change, maximum	-40%	
3.2.2.3	Volume Change	0 to +15%	
3.2.2.4	Decomposition	None	
3.2.2.5	Surface Tackiness	None	
3.2.3	Water Resistance (Immediate Deteriorated Properties)		ASTM D 471 Medium: ASTM D 1193, Type III, Water

TABLE 1 - (Continued)

Paragraph	Test	Requirement	Test Method
3.2.3.1	Weight Increase, maximum	5%	Temperature: 20 - 30 °C (68 to 86 °F)
3.2.3.2	Dielectric Strength, minimum	200 V per mil (7870 V/mm)	Time: 48 hours ± 0.5
3.2.4	Dry Heat Resistance		ASTM D 573
			Temperature: 100 °C ± 1 (212 °F ± 2)
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	-35%	
3.2.4.3	Elongation Change, maximum		
3.2.4.3.1	For parts other than extrusions	-50%	
3.2.4.3.2	For extruded parts	-60%	
3.2.5	Compression Set		ASTM D 395, Method B
			Temperature: 100 °C ± 1 (212 °F ± 2)
3.2.5.1	Percent of Original Deflection, maximum	85	Time: 70 hours ± 0.5
3.2.6	Low-Temperature Resistance		
3.2.6.1	Brittleness	Pass	ASTM D 2137, Method A
			Temperature: -25 °C ± 1 (-13 °F ± 2)
3.2.6.2	Young's Modulus, maximum (See 8.2)	50.0 ksi (345 MPa)	ASTM D 797
			Temperature: -35 °C ± 1 (-31 °F ± 2)
3.2.7	Oxone Resistance	No cracking	4.5.1
3.2.8	Flame Resistance (See 8.3)		
	Time to cease flaming and glowing	10 seconds	4.5.2

3.2.9 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.

3.2.10 Corrosion: The product shall not have a corrosive effect on other materials when exposed to conditions normally encountered in service, determined by a procedure acceptable to purchaser. 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 to all applicable requirements of AMS 2279 or MAM 2279.

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:

Tests for all technical requirements are acceptance tests and preproduction tests and shall be performed prior to or on the initial shipment of a product to a purchaser, on each lot, when a change in ingredients and/or processing requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.2.1 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.

4.3 Sampling and Testing:

Shall be as follows:

4.3.1 For Acceptance Tests: Sufficient product 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 If specimens cannot be prepared from the product, ASTM test specimens prepared from the same batch and state of cure shall be used. When the product supplied is an extrusion of such shape that suitable test specimens cannot be cut from the product, a separate flat strip test sample from the same production lot shall be supplied upon request. This strip shall be prepared from tubing 1.000 inch ± 0.063 (25.40 mm ± 1.60) in OD by 0.075 inch ± 0.008 (1.90 mm ± 0.20) in wall thickness, mechanically slit and flattened into a strip while being extruded, and cured in the same manner as production product. When the product is a molded shape from which test specimens cannot be cut, a slab 6 inches (152 mm) square by 0.075 inch ± 0.008 (1.90 mm ± 0.20) thick molded from the same batch of compound shall be supplied upon request.

4.3.1.2 A lot shall be all product from the same batch of compound processed in one continuous run and presented for vendor's inspection at one time. An inspection lot shall not exceed 500 pounds (227 kg); the lot may be packaged in smaller quantities and delivered under the basic lot approval provided lot identification is maintained.

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

4.3.1.4 When a statistical sampling plan has 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 4.6 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 product shall be approved by purchaser before product for production use is supplied, unless such approval be waived by purchaser. Results of tests on production product 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 product which are essentially the same as those used on the approved sample product. 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 ingredients and/or processing and, when requested, sample product. Production product made by the revised procedure shall not be shipped prior to receipt of reapproval.