

# AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard



**AMS 3243F**

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Superseding AMS 3243E

## Chloroprene (CR) Rubber Flame Resistant 55 - 65

### 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:

These products have been used typically for parts, such as grommets, seals, and line supports, on the firewall of aircraft or wherever flame resistance is of prime importance, but usage is not limited to such applications. Each application should be considered individually.

#### 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.

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

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## 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

## 2.2 ASTM Publications:

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

ASTM D 395 Rubber Property - Compression Set

ASTM D 412 Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension

ASTM D 471 Rubber Property - Effect of Liquids

ASTM D 573 Rubber Property - Deterioration in an Air Oven

ASTM D 624 Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers

ASTM D 635 Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position

ASTM D 792 Density and Specific Gravity (Relative Density) of Plastics by Displacement

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 requirements shown in Table 1, 3.2.12 and 3.2.13; tests shall be performed on the product supplied and in accordance with specified ASTM methods, insofar as practicable.

TABLE 1 - Properties

	Property	Requirement	Test Method
3.2.1	Hardness, Durometer "A" or equivalent	60 $\pm$ 5	ASTM D 2240
3.2.2	Tensile Strength, min	900 psi (6.2 MPa)	ASTM D 412, Die B or C
3.2.3	Elongation, min	200%	ASTM D 412, Die B or C
3.2.4	Tear Resistance, min	70 pounds force per inch (12.5 kN/m)	ASTM D 624, Die B
3.2.5	Specific Gravity	Preproduction Value $\pm$ 0.02	ASTM D 792
3.2.6	Petroleum Hydraulic Oil Resistance:		ASTM D 471 IRM 903 Oil (See 8.2) 100 °C $\pm$ 1 (212 °F $\pm$ 2) 22 hours $\pm$ 0.5
3.2.6.1	Tensile Strength Change, max	-60%	
3.2.6.2	Elongation Change, max	-60%	
3.2.6.3	Volume Change	+40 to +100%	
3.2.6.4	Decomposition	None	
3.2.6.5	Surface Tackiness	None	
3.2.7	Aromatic Fuel Resistance (Immediate Deteriorated Properties)		ASTM D 471 ASTM Ref. Fuel B 20 to 30 °C (68 to 86 °F) 22 hours $\pm$ 0.5
3.2.7.1	Tensile Strength Change, max	-75%	
3.2.7.2	Elongation Change, max	-50%	
3.2.7.3	Volume Change	0 to +80%	
3.2.7.4	Decomposition	None	
3.2.7.5	Surface Tackiness	None	
3.2.8	Dry Heat Resistance:		ASTM D 573 125 °C $\pm$ 2 (257 °F $\pm$ 4) 70 hours $\pm$ 0.5

TABLE 1 - Properties (Continued)

	Property	Requirement	Test Method
3.2.8.1	Hardness Change, Durometer "A" or equivalent	0 to +20	
3.2.8.2	Tensile Strength Change, max	-30%	
3.2.8.3	Elongation Change, max	-50%	
3.2.9	Compression Set:		ASTM D 395 Method B 100 °C ± 1 (212 °F ± 2) 70 hours ± 0.5
3.2.9.1	Percent of Original Deflection, max	50	
3.2.10	Low-Temperature Resistance		ASTM D 2137 Method A -35°C ± 1 (-31 °F ± 2)
3.2.10.1	Brittleness	Pass	
3.2.11	Flame Resistance (See 8.3): Flameout time, max	10 seconds	4.5.1

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

3.2.13 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 supplier. 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 material as commercially practicable, and free from imperfections detrimental to usage of the product.

### 3.4 Sizes and Tolerances:

Shall conform to all applicable requirements of AMS 2279 or MAM 2279.

#### 4. QUALITY ASSURANCE PROVISIONS:

##### 4.1 Responsibility for Inspection:

The manufacturer shall supply all samples and shall be responsible for the performance of 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 specified requirements.

##### 4.2 Classification of Tests:

##### 4.2.1 Acceptance Tests: Requirements shown in Table 2 are acceptance tests and shall be performed on each lot.

TABLE 2 - Acceptance Test Requirements

Requirement	Paragraph
Hardness, as received	3.2.1
Tensile Strength, as received	3.2.2
Elongation, as received	3.2.3
Specific Gravity	3.2.5
Volume Change in Oil	3.2.6.3
Flame Resistance	3.2.11

##### 4.2.2 Preproduction Tests: All technical requirements are preproduction tests and shall be performed prior to or on the initial shipment of a product by the manufacturer, when a change in ingredients and/or processing requires reapproval as in 4.4.1, and when purchaser deems confirmatory testing to be required.

##### 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  $\pm$  0.063 (25.40 mm  $\pm$  1.60) in OD by 0.075 inch  $\pm$  0.008 (1.90 mm  $\pm$  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  $\pm$  0.008 (1.90 mm  $\pm$  0.20) thick molded from the same batch of compound and cured in the same manner as production product shall be supplied upon request.
- 4.3.1.2 A lot shall be all product produced from the same batch of compound, processed in one continuous run and presented for manufacturer's inspection at one time.
- 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 A statistical sampling plan acceptable to purchaser may be used in lieu of sampling as in 4.3.1. Sample size for visual and dimensional requirements shall be as shown in Table 3; sample unit shall be one molded part and acceptance based on zero defects.

TABLE 3 - Visual and Dimensional Inspection

Lot Size		Sample Size
2 to	8	Entire Lot
9 to	90	8
91 to	150	12
151 to	280	19
281 to	500	21
501 to	1200	27
1201 to	3200	35
3201 to	10,000	38
10,001 to	35,000	46
35,001 to	150,000	56
150,001 and Over		65

- 4.3.2 For Preproduction Tests: Acceptable to purchaser or as stated in the contract.