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AEROSPACE MATERIAL SPECIFICATION

AMS 3199J
Superseding AMS 3199H

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SPONGE, CHLOROPRENE (CR) RUBBER
Firm

1. SCOPE:

1.1 Form: This specification covers firm chloroprene (CR) rubber sponge in the form of sheet, strip, molded shapes, or other forms, as ordered.

1.2 Application: Primarily for general applications requiring the use of open-cell, firm sponge rubber pads and seals operating from -40° to +80°C (-40° to +175°F).

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 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

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

ASTM D1056 - Flexible Cellular Materials - Sponge or Expanded Rubber

3. TECHNICAL REQUIREMENTS:

3.1 Material: Shall be a compound based on chloroprene (CR) elastomer with agents to form an open-cell sponge, suitably cured to produce a product meeting the technical requirements of this specification.

3.1.1 Color: Shall be black.

3.1.2 Finish: The top and bottom surfaces of sheet and strip and the exterior surfaces of molded parts shall have a natural skin finish. Unless otherwise specified, fabric or wire mesh type of surface impressions are not objectionable.

3.1.3 Vulcanized Joints: Vulcanized joints are permissible in molded products where the finished product is larger than is usual industry practice to mold in one section. If a vulcanized joint is necessary, the joint shall have the same strength, size, and color as the parent material.

3.2 Properties: Sponge shall conform to the following requirements; tests shall be performed on the sponge supplied and in accordance with ASTM D1056 except as otherwise specified, insofar as practicable:

3.2.1 As Received:

3.2.1.1 Compression Deflection: Shall be 15 - 22 psi (103 - 152 kPa) at 20° - 30°C (68° - 86°F).

3.2.1.2 Specific Volume: Shall be as follows for each nominal thickness; a tolerance of ± 10% will be allowed:

Nominal Thickness		Specific Volume	
Inches	Millimetres	Cu In. per Lb	cm^3/g
1/16	1.6	31	1.12
3/32	2.4	33	1.19
1/8	3.2	35	1.26
3/16	4.8	37	1.33
1/4	6.4	38	1.37
5/16	7.9	40	1.44
3/8	9.5	41	1.48
1/2	12.7	43	1.55
5/8	15.9	45	1.62
3/4	19.0	47	1.69
7/8	22.2	49	1.76
1	25.4	51	1.84
1-1/2	38.1	54	1.94

3.2.1.3 Hydrogen Ion Concentration (pH): 7.0 ± 1.0 4.5.1

3.2.2 Dry Heat Resistance: 4.5.2

3.2.2.1 Compression Deflection Change: -5% to +30%

3.2.2.2 Specific Volume Change: -10% to +10%

3.2.2.3 Bend (Flat): No cracking or checking

3.2.3 Compression Set: Temperature: 70°C ± 1 (158°F ± 2)

3.2.3.1 Percent of Original Deflection 60 max Time: 22 hr ± 0.2

3.2.3.2 Percent of Original Thickness 30 max

3.2.4 Low-Temperature Flexibility: When specified, the product shall have low-temperature flexibility acceptable to the purchaser, determined by a procedure agreed upon by purchaser and vendor.

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

3.2.6 Corrosion: The product shall not have a corrosive effect on other Ø materials when exposed to conditions normally encountered in service, determined by a procedure agreed upon by purchaser and vendor. Surface 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, smooth, as free from foreign materials as commercially practicable, and free from imperfections detrimental to usage of the product.

3.4 Tolerances: Unless otherwise specified, the following tolerances shall apply:

3.4.1 Sheet and Strip:

3.4.1.1 Thickness: Shall be as specified in Table I:

TABLE I

Nominal Thickness Inches	Tolerance, Inch plus and minus
Up to 1/8, incl	1/64
Over 1/8 to 1/2, incl	1/32
Over 1/2	3/64

TABLE I (SI)

Nominal Thickness Millimetres	Tolerance, Millimetres plus and minus
Up to 3.2, incl	0.4
Over 3.2 to 12.7, incl	0.8
Over 12.7	1.2

3.4.1.2 Width: Shall be as specified in Table II:

TABLE II

Nominal Width Inches	Tolerance, Inch plus and minus
Up to 6, incl	1/16
Over 6 to 18, incl	1/8
Over 18	1/4

TABLE II (SI)

Nominal Width Millimetres	Tolerance, Millimetres plus and minus
Up to 152, incl	1.6
Over 152 to 457, incl	3.2
Over 457	6.4

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of sponge shall supply all samples for vendor's tests and shall be responsible for performing all Ø required tests. Results of such tests shall be reported to the purchaser as required by 4.6. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the sponge conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to all technical requirements of this specification are classified as acceptance tests and shall be performed on each lot.

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 sponge to a purchaser, when a change in material or 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.

4.3 Sampling: Shall be as follows:

4.3.1 For Acceptance Tests: Sufficient sponge 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 batch shall be all material run through a mixer at one time.

4.3.1.2 An inspection lot shall be not more than 2500 lb (1135 kg) of sponge from one batch.

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

4.4 Approval:

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

4.4.2 Vendor shall use ingredients, manufacturing procedures, processes, and methods of inspection on production sponge which are essentially the same as those used on the approved sample. 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 or processing, or both, and, when requested, sample sponge. Production sponge made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5 Test Methods:

4.5.1 Hydrogen Ion Concentration (pH): Dice approximately 1 cu in. (16 cm^3) of sponge to approximately 1/8 in. (3 mm) or smaller cubes and extract with continuous agitation for 1 hr with 100 mL of freshly distilled water. Determine pH of the extract by chemical means or pH meter.

4.5.2 Dry Heat Aging: A sample of sponge 4 in. (100 mm) square shall be suspended for 22 hr ± 0.2 by a wire attached to one corner of the sample in a circulating air convection oven operating at 100°C ± 1 (212°F ± 2). The sample shall be removed from the oven and trimmed to 2 in. (50 mm) square by removing 1 in. (25 mm) from each side prior to testing. Standard specimens shall be cut from the sample and tested by the procedure used for the sponge as received. Bend test specimens shall be the 1 in. (25 mm) strips produced in trimming the 4 in. (100 mm) square sample to 2 in. (50 mm) square.

4.6 Reports:

4.6.1 The vendor of sponge shall furnish with each shipment three copies of a report showing the results of tests to determine conformance to the technical requirements of this specification. This report shall include the purchase order number, lot number, AMS 3199J, vendor's compound number, form or part number, and quantity.

4.6.2 The vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, AMS 3199J, contractor or other direct supplier of sponge, supplier's compound number, part number, and quantity. When sponge for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of sponge to determine conformance to the requirements of this specification and shall include in the report either a statement that the sponge conforms or copies of laboratory reports showing the results of tests to determine conformance.

4.7 Resampling and Retesting: If any specimen used in the above tests fails to meet the specified requirements, disposition of the sponge 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 sponge represented and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Identification and Packaging: Shall be in accordance with AMS 2810.

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