SAE Aerospace
An SAE International Group

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 3198K

Issued DEC 1942
Revised APR 1993
Reaffirmed MAR 2007

Superseding AMS 3198J

Sponge, Chloroprene (CR) Rubber Medium Stiffness

RATIONALE

This document has been reaffirmed to comply with the SAE 5-year Review policy.

1. SCOPE:

1.1 Form:

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

1.2 Application:

These products have been used typically for general applications requiring the use of open-cell, medium rubber sponge pads and seals operating from -40 to +80 °C (-40 to +176 °F), 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.

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: **http://www.sae.org**

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

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 1056 Flexible Cellular Materials - Sponge or Expanded Rubber

3. TECHNICAL REQUIREMENTS:

3.1 Material:

Shall be a compound, based on a 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. 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 D 1056 except as otherwise specified herein.

3.2.1 Compression Deflection: Shall be 6 to 13 psi (41.4 to 89.6 kPa) at 20 to 30 °C (68 to 86°F).

3.2.2 Specific Volume: Shall be as shown in Table 1 for each nominal thickness; a tolerance of ±10% will be allowed:

TABLE 1 - Specific Volume

Nominal Thickness Inches	Nominal Thickness Millimeters	Specific Volume Cubic Inches per Pound	Specific Volume cm^3/gram
1/16	1.6	34	1.23
3/32	2.4	40	1.45
1/8	3.2	42	1.52
3/16	4.8	45	1.63
1/4	6.4	47	1.70
5/16	7.9	49	1.77
3/8	9.5	51	1.84
1/2	12.7	55	1.99
5/8	15.9	59	2.13
3/4	19.0	63	2.28
7/8	22.2	66	2.38
1	25.4	70	2.53
1-1/2	38.1	76	2.75

3.2.3 Hydrogen Ion Concentration (pH): Shall be 7.0 ± 1.0, determined in accordance with 4.5.1.

3.2.4 Dry Heat Resistance: Shall be as follows, determined in accordance with 4.5.2.

3.2.4.1 Compression Deflection Change: -5 to +30%

3.2.4.2 Specific Volume Change: -10 to +10%

3.2.4.3 Bend (Flat): No cracking or checking.

3.2.5 Compression Set: Shall be as follows, determined at 70 °C ± 1 (158 °F ± 2) for 22 hours ± 0.2.

3.2.5.1 Percent of Original Deflection: Not higher than 50.

3.2.5.2 Percent of Original Thickness: Not higher than 25.

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

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

3.2.8 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 vendor. Surface discoloration of metal shall not be considered objectionable. Standards for acceptance shall be as agreed upon by purchaser and vendor.

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 the following values; measurements shall be made in accordance with ASTM D 1056.

3.4.1 Sheet and Strip:

3.4.1.1 Thickness: Shall be as specified in Table 2:

TABLE 2A - Thickness Tolerance, Inch/Pound Units

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 2B - Thickness Tolerance, SI Units

Nominal Thickness Millimeters	Tolerance, Millimeters 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 3:

TABLE 3A - Width Tolerance, Inch/Pound Units

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 3B - Width Tolerance, SI Units

Nominal Width Millimeters	Tolerance, Millimeters 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 required tests. 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:

Tests for all technical requirements are acceptance tests and preproduction tests and shall be performed prior to or on the initial shipment of sponge 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 AcceptanceTests: 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 A lot shall be not more than 2500 pounds (1135 kg) of sponge from one batch.

4.3.1.3 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 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.

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 ingredients and/or processing 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 cubic inch (16 cm^3) of sponge to approximately 1/8 inch (3.2 mm) or smaller cubes and extract with continuous agitation for 60 minutes ± 6 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 inches (102 mm) square shall be suspended for 22 hours ± 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 inches (51 mm) square by removing 1 inch (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 inch (25 mm) wide strips produced in trimming the 4-inch (102-mm) square sample to a 2-inch (51-mm) square.