The Engineering Society For Advancing Mobility Land Sea Air and Space®
INTERNATIONAL
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS 3569B

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Superseding AMS 3569A

Submitted for recognition as an American National Standard

FOAM, FLEXIBLE POLYURETHANE (PUR)
Open Pore, Polyvinylchloride (PVC) Coated

1. SCOPE:

1.1 Form:

This specification covers a reticulated, flexible polyurethane (PUR) foam in the form of sheet coated with polyvinylchloride (PVC).

1.2 Application:

This product has been used typically for fresh air intake and exhaust filters requiring hydrolytic stability of the foam sheet resultant from the PVC coating, 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 applicable issue of referenced publications shall be the issue in effect on the date of the purchase order.

2.1 ASTM Publications:

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

ASTM D 635 Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position
ASTM D 3574 Testing Flexible Cellular Materials - Slab, Bonded, and Molded Urethane Foams

2.2 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

MIL-STD-810 Environmental Test Methods and Engineering Guidelines
MIL-STD-2073-1 DoD Materiel, Procedures for Development and Application of Packaging Requirements

3. TECHNICAL REQUIREMENTS:

3.1 Material:

Shall be a polyvinylchloride (PVC) coated, flexible polyurethane (PUR) foam with controlled pore sizes of 20 and 45 pores per inch (ppi) (0.79 and 1.8 pores/mm).

3.1.1 Color: Shall be green, unless otherwise ordered (See 8.2).

3.1.2 Fungus Resistance: The PVC coated foam shall be treated with a fungicide additive to prevent growth of fungus.

3.1.3 Non-Toxcity: The product shall be non-toxic and shall not cause any harmful effects when in prolonged contact with human skin.

3.2 Properties:

The product shall conform to the requirements shown in Table 1 and 3.2.9; tests shall be performed on the product supplied and, except as otherwise specified herein, in accordance with ASTM D 3574, insofar as practicable.

TABLE 1 - Properties

Paragraph	Property	Requirement	Test Method
3.2.1	Density	0.8 to 1 pound/cubic foot (12.8 to 16 kg/m^3)	
3.2.2	Resiliency, time for recovery to 95% original thickness, maximum	5 seconds	4.5.1

TABLE 1 - Properties (Continued)

Paragraph	Property	Requirement	Test Method
3.2.3	Tensile Strength, minimum	10 psi (68.9 kPa)	
3.2.4	Tear Strength, minimum	2 pounds force/ inch (350 N/m)	
3.2.5	Hydrolytic Stability:		ASTM D 3574, Procedure J_2
3.2.5.1	Change in Tensile Strength, maximum	10%	
3.2.5.2	Evidence of Surface Deterioriation	No tackiness, exudation, or cracking	
3.2.6	Flammability (See 8.3):		ASTM D 635
3.2.6.1	Average Time of Burning, maximum	5 seconds	
3.2.6.2	Average Extent of Burning, maximum	0.1 inch (2.5 mm)	
3.2.7	Fungus Resistance:	Non-Nutrient	MIL-STD-810, Method 508
3.2.8	Low-Temperature Compression Set:		4.5.2
3.2.8.1	Percent of Original Thickness, maximum	25	

3.2.9 Pore Size and Thickness: The foam shall be available in various pore sizes, determined in accordance with 4.5.3, and thicknesses as shown in Table 2.

TABLE 2A - Pore Size and Thickness, Inch/Pound Units

Pore Size pores/inch	Nominal Thickness Inch
20	1/4 to 1
45	1/4 to 1/2

TABLE 2B - Pore Size and Thickness, SI Units

Pore Size pores/mm	Nominal Thickness Millimeters
0.8	6.4 to 25.4
1.8	6.4 to 12.7

3.3 Quality:

Foam, as received by purchaser, shall be uniform in quality and condition, homogeneous, and free from foreign materials and from imperfections detrimental to usage of the foam.

3.4 Tolerances:

Shall conform to the following:

3.4.1 Thickness: Shall not vary from the nominal by more than ±1/32 inch (±0.8 mm).

3.4.2 Pore Size: Shall not vary from the nominal by more than ±5 pores per inch (±0.2 pores/mm).

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:
(R)

The vendor of foam 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 foam conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests for flammability (3.2.6) and pore size (3.2.9) are acceptance tests and shall be performed on each lot.

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

4.2.2.1 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:
(R)

Shall be as follows:

4.3.1 For Acceptance Tests: Sufficient foam 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 (R) A lot shall be all foam of the same nominal thickness and pore size produced in a single production run from the same batches of raw materials and presented for vendor's inspection at one time. A lot shall not exceed 200 pounds (91 kg) of foam.

4.3.1.2 (R) 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 foam shall be approved by purchaser before foam for production use is supplied, unless such approval be waived by purchaser. Results of tests on production foam 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 foam which are essentially the same as those used on the approved sample foam. 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 foam. Production foam made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5 Test Methods:

4.5.1 Resiliency: Specimens having top and bottom surface dimensions greater than the thickness shall be compressed to 25% of original thickness, held in the compressed state for 60 seconds ± 5, and the load removed. The time to recover to 95% of original thickness shall be measured.

4.5.2 Low-Temperature Compression Set: Dry specimens for not less than 16 hours in a desiccator before testing. Place specimens in a cold chamber which is at -40 °C ± 1 (-40 °F ± 2) for 5 hours ± 0.1. At the end of this period and while still in the cold chamber, compress specimens in accordance with ASTM D 3574, Test D, to 75% of original thickness, maintain this compression for 60 seconds ± 5, release the load, and, after 60 seconds ± 5 recovery time, measure the thickness of specimens. Calculate the compression set as a percentage of the original thickness.

4.5.3 Pore Size: Shall be determined by the air pressure drop technique.

4.5.3.1 Test Specimens: Shall be discs, nominally 10 inches (254 mm) in diameter and 1.00 inch ± 0.02 (25.4 mm ± 0.5) thick, with the 1-inch (25-mm) dimension being in the thickness direction of the foam.

4.5.3.1.1 For acceptance tests, one specimen from each lot, taken within the top 3 inches (76 mm) of the foam slab, shall be tested.

4.5.3.1.2 For preproduction tests, three specimens, taken from the same location on the foam slab but from the upper, middle, and lower portions of the thickness of the foam slab, shall be tested.

4.5.3.2 Procedure: Pressure drop measurements shall be made using a porosity test jig as shown in Figure 1, or equivalent.

4.5.3.2.1 Prior to testing, both manometers shall be adjusted to zero with no airflow.

4.5.3.2.2 The specimen shall then be inserted into the specimen holder until it is properly seated into the cutout.

4.5.3.2.3 The blower shall be started and the airflow set to 4 inches (102 mm) on the 8-inch (203-mm) orifice differential manometer.

4.5.3.2.4 The pressure drop through the specimen shall be read on the 4-inch (102-mm) sample differential manometer to the nearest 0.005 inch (0.13 mm) and compared with the calibration curve shown in Figure 2 to determine the average pore size for the specimen.

4.5.3.2.5 Report, for each specimen, the pressure drop and the average pore size calculated from Figure 2.

4.5.3.2.6 The porosity values shown in Figure 2 have been assigned and do not necessarily relate directly to the actual number of pores per lineal inch (millimeter).

4.6 Reports:

The vendor of foam shall furnish with each shipment a report showing the results of tests to determine conformance to the acceptance test requirements and stating that the foam conforms to the other technical requirements. This report shall include the purchase order number, lot number, AMS 3569B, vendor's compound number, and quantity.

4.7 (R) Resampling and Retesting:

If any specimen used in the above tests fails to meet the specified requirements, disposition of the foam 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 foam represented. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Identification and Packaging:

5.1.1 A lot of foam may be packaged in small quantities and delivered under the basic lot approval provided lot identification is maintained.

5.1.2 Foam shall be packaged to ensure that the product, during shipment and storage, will not be permanently distorted and will be protected against damage from exposure to weather, direct sunlight, or any other normal hazard.

5.1.3 Each package shall be permanently and legibly marked with not less than AMS 3569B, size or part number, manufacturer's identification, compound number, purchase order number, and quantity.

5.1.4 (R) Containers of foam shall be prepared for shipment in accordance with commercial practice and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the foam to ensure carrier acceptance and safe delivery.

5.1.5 (R) For direct U.S. Military procurement, packaging shall be in accordance with MIL-STD-2073-1, Commercial Level, unless Level A is specified in the request for procurement.

6. ACKNOWLEDGMENT:

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

7. REJECTIONS:

Foam not conforming to this specification, or to modifications authorized by purchaser, will be subject to rejection.

8. NOTES:

8.1 Marginal Indicia:

The (R) symbol is used to indicate technical changes from the previous issue of this specification.

8.2 The standard color is green. Other colors available on special order are red, blue, orange, and black.

8.3 The flammability test is intended only for comparative evaluation of compounds and is not to be construed as an indication of characteristics of the foam under actual fire conditions.

8.4 Dimensions and properties in inch/pound units and the Celsius temperatures are primary; dimensions and properties in SI units and the Fahrenheit temperatures are shown as the approximate equivalents of the primary units and are presented only for information.

8.5 For direct U.S. Military procurement, purchase documents should specify not less than the following:

Title, number, and date of this specification
Form and size or part number of foam desired
Quantity of foam desired
Color, if other than green (See 3.1.1 and 8.2)
Level A packaging, if required (See 5.1.5).

8.6 Foam meeting the requirements of this specification has been classified under Federal Supply Classification (FSC) 9330.

PREPARED UNDER THE JURISDICTION OF AMS COMMITTEE "P".