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400 COMMONWEALTH DRIVE WARRENDALE, PA 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 3570C
Superseding AMS 3570B

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FOAM, FLEXIBLE POLYURETHANE
Open Cell, Medium Flexibility

1. SCOPE:

1.1 Form: This specification covers an open-cell, medium-flexibility polyurethane foam in the form of sheet, strip, and shapes.

1.2 Application: Primarily for general interior padding, cushioning, and vibration insulation.

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

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

ASTM D3574 - Flexible Cellular Materials - Slab, Bonded, and Molded Urethane Foam

2.3 U.S. Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120, except as specified in 2.3.2.

2.3.1 Military Standards:

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-794 - Parts and Equipment, Procedures for Packaging and Packing of

2.3.2 Federal Aviation Administration Regulations: Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

FAR Part 25.853 - Airworthiness Standards: Transport Category Airplanes, Compartment Interiors

3. TECHNICAL REQUIREMENTS:

3.1 Material: Shall be a flexible polyurethane foam free from contamination and from foreign and scrap materials.

3.1.1 Finish: All surfaces of sheet and strip shall have a cut finish, unless otherwise specified.

3.1.2 Color: Shall be natural, unless otherwise specified.

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

3.2 Properties: Foam shall conform to the following requirements; tests shall be performed in accordance with specified test methods on foam supplied insofar as practicable:

3.2.1 As Received:

3.2.1.1 Ø	Density	2.1 - 2.9 lb per cu ft (33.5 - 46.5 kg/m^3)	ASTM D3574
3.2.1.2 Ø	Load Deflection for 25% Compression	50 - 80 lb per 50 sq in. (6.90 - 11 kPa/320 cm^2)	ASTM D3574, Test B_1
3.2.1.3	Resiliency, time for recovery to 95% original thickness, max	5 sec	4.5.1
3.2.1.4 Ø	Flammability, burn rate, max (See 8.2)	2.5 in./min. (1.0 mm/sec)	FAR 25.853, (b-2), Appendix F, (e)
3.2.2	Compression Set:		ASTM D3574, Test D; compress specimen to 75% of original thickness
3.2.2.1 Ø	Percent of Original Thickness, max	12	

3.2.3 Hydrolytic Stability: ASTM D3574, Procedure J_2

3.2.3.1	Change in Load Deflection for 25% Compression, max	20%
3.2.3.2	Compression Set, max	14%
3.2.3.3	Evidence of Surface Deterioration	No tackiness, exudation, or cracking

3.2.4 Low-Temperature Compression Set: 4.5.2

3.2.4.1	Percent of Original Thickness, max	20

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

3.2.6 Corrosion: Foam shall not have a corrosive effect on other materials when exposed to conditions normally encountered in service. Discoloration of contacting metal shall not be considered objectionable. Method of test and standards for acceptance shall be as agreed upon by purchaser and vendor.

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.

3.3.1 Voids: The foam shall contain no surface voids larger in diameter than the sheet thickness or 1/2 in. (12.5 mm), whichever is smaller.

3.4 Tolerances: Thickness of sheet and strip shall not vary from the nominal by more than ±1/16 in. (± 1.5 mm).

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of the foam shall supply all samples for vendor's tests and shall be responsible for performing all 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 foam conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to the following requirements are classified as acceptance tests and shall be performed on each lot:

Requirement	Paragraph Reference
Density	3.2.1.1
Load Deflection	3.2.1.2
Resiliency	3.2.1.3
Flammability	3.2.1.4

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 foam 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:

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 A lot shall be all foam of the same thickness and density produced in a single production run from the same batches of raw materials and presented for vendor's inspection at one time. An inspection lot shall be all sheets cut from a single block of foam formed in an individual mold cavity and shall not exceed 200 lb (90 kg) or 2000 board feet (4.7 m^3) of foam and may be packaged in smaller quantities and delivered under the basic lot approval provided the lot identification is maintained.

4.3.1.2 When a statistical sampling plan and acceptance quality level (AQL) in accordance with MIL-STD-105 have 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 4.6.1 shall state that such plan was used.

4.3.2 For Preproduction Tests: Shall be 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 material or processing, or both, 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 1 min. ± 0.1, 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 hr in a desiccator before testing. Place specimens in a cold chamber which is at -40°C ± 1 (-40°F ± 2) for 5 hr ± 0.1. At the end of this period and while still in the cold chamber, compress specimens in accordance with ASTM D3574, Test D, to 75% of original thickness, maintain this compression for 1 min. ± 0.1, release the load, and, after 1 min. ± 0.1 recovery time, measure the thickness of specimens. Calculate the compression set as a percentage of the original thickness.

4.6 Reports:

4.6.1 The vendor of foam shall furnish with each shipment three copies of 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 of this specification. This report shall include the purchase order number, AMS 3570C, vendor's compound number, lot 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 3570C, contractor or other direct supplier of foam, supplier's compound number, part number, and quantity. When foam for making parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of foam to determine conformance to the requirements of this specification and shall include in the report either a statement that the foam conforms or copies of laboratory reports showing the results of tests to determine conformance.