



AEROSPACE MATERIAL

Society of Automotive Engineers, Inc. SPECIFICATION

400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AMS 3635B

Superseding AMS 3635A

Issued 3-1-55

Revised 4-15-78

PLASTIC SHEET AND STRIP, MODIFIED VINYL, FOAMED Closed Cell

1. SCOPE:

- 1.1 Form: This specification covers a closed-cell, modified vinyl plastic foam in the form of sheet and strip up to 1-1/2 in. (38 mm) in nominal thickness.
- 1.2 Application: Primarily for parts, such as head rest pads and arm rests, wherever an impact-resistant, slow-recovery, energy-absorbing product is of prime importance.

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 Society of Automotive Engineers, Inc., 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

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

ASTM D297 - Rubber Products - Chemical Analysis

ASTM D573 - Rubber Deterioration in an Air Oven

ASTM D1056 - Flexible Cellular Materials - Sponge or Expanded Rubber

- 2.3 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-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 - Airworthiness Standards: Transport Category Airplanes

3. TECHNICAL REQUIREMENTS:

SAE Technical Board rules provide that: "All technical reports, including standards approved in industry or trade is entirely voluntary. There is no agreement to adhere to any SAE standard any technical report. In formulating and approving technical reports, the Board and its committees will not investigate or consider patents which may apply to the subject matter. Prospective users of the report are responsible for protecting themselves against infringement of patents."

practices recommended, are advisory only. Their use by anyone engaged by recommended practice, and no commitment to conform to or be guided by committees will not investigate or consider patents which may apply to the subject

3.1 **Material:** Shall be a closed-cell, modified vinyl plastic foam; it may have a skin on one face at the option of the vendor, unless otherwise agreed upon by purchaser and vendor. Edges of sheets and strips may show exposed cell structure.

3.1.1 **Color:** Shall be natural (light beige).

3.1.2 **Odor:** The product shall have no unpleasant odor after being exposed to still air for 48 hours.

3.2 **Properties:** The product shall conform to the following requirements; tests shall be performed on the product supplied and in accordance with specified test methods, insofar as practicable:

3.2.1 **As Received:**

| | | |
|--|--|---|
| 3.2.1.1 Density, max | 8.5 lb per cu ft (136 kg/m ³) | ASTM D297 |
| 3.2.1.2 Compression-Deflection (Force to compress to 75% Original Thickness) | 5 ± 1 psi (0.345 MPa ± 0.0069) | ASTM D1056 Temperature: 20° - 30°C (68° - 86°F) |
| 3.2.1.3 Return Rate, time to return to 95% of Original Thickness, max | 170 sec | 4.5.1 |
| 3.2.1.4 Flammability, Time to Cease Burning, max | 5 sec | FAR 25.853(b) and Appendix F |
| 3.2.1.5 Rebound, max | 5 in. (127 mm) | 4.5.2 |

3.2.2 **Dry Heat Resistance:**

| | | |
|---|-----------------------|---|
| 3.2.2.1 Compression-Deflection (Force to compress to 75% Original Thickness), max | 10 psi (0.069 MPa) | ASTM D573 Temperature: 70°C ± 2 (158°F ± 4) Time: 168 hr ± 1 |
| 3.2.2.2 Return Rate, Time to return to 95% of Original Thickness, max | 190 sec | 4.5.1 |
| 3.2.2.3 Rebound, max | 5 in. (127 mm) | 4.5.2 |
| 3.2.2.4 Volume change, max | | 4.5.3 |
| After 24 hr ± 0.25 | 3.0% | |
| After 168 hr ± 1.0 | 6.0% | |

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

3.2.4 **Corrosion:** The product shall not have a corrosive effect on other materials when exposed to conditions normally encountered in service. Discoloration of metal shall not be considered objectionable.

3.3 Quality: The product shall be uniform in quality and condition, clean, smooth, as free from foreign materials as commercially practicable, and free from internal and external imperfections detrimental to fabrication, appearance, or performance of parts.

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 | 1/16 | 1/32 |
| Over 1/8 to 5/16, incl | 1/16 | 1/16 |
| Over 5/16 to 1 , incl | 3/32 | 3/32 |
| Over 1 to 1-1/2 , incl | 1/8 | 1/8 |

TABLE I (SI)

| Nominal Thickness Millimetres | Tolerance, Millimetres plus and minus | |
|----------------------------------|--|-----|
| Up to 3.2, incl | 1.6 | 0.8 |
| Over 3.2 to 7.9, incl | 1.6 | 1.6 |
| Over 7.9 to 25.4, incl | 2.4 | 2.4 |
| Over 25.4 to 38.1, incl | 3.2 | 3.2 |

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 the product shall supply all samples 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 perform such confirmatory testing as he deems necessary to ensure that the product 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 of product:

| Ø | Requirement | Paragraph |
|---|--|-----------|
| | Density | 3.2.1.1 |
| | Compression-Deflection, as received | 3.2.1.2 |
| | Flammability | 3.2.1.4 |
| | Compression-Deflection, after heat aging | 3.2.2.1 |

4.2.2 Qualification Tests: Tests to determine conformance to all technical requirements of this specification are classified as qualification tests and may be the basis for approval of the compound (See 4.4.1).

4.2.2.1 For direct U.S. Military procurement, substantiating test data and, when requested, qualification test material shall be submitted to the cognizant qualification agency as directed by the procuring activity, the contracting officer, or the request for procurements.

4.3 Sampling: Sufficient product shall be taken at random from each lot to perform all required tests. The number of specimens for each test shall be as specified in the applicable test procedure or, if not specified therein, not less than three.

4.3.1 A lot shall be all product from the same batch of compound processed in one continuous run and submitted for vendor's inspection at one time.

4.3.2 A batch shall be the quantity of compound run through a mill or mixer at one time.

4.4 Approval:

4.4.1 Sample material shall be approved by purchaser before material for production use is supplied, unless such approval be waived. Results of tests on production material 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 material which are essentially the same as those used on the approved sample material. If any change is necessary in ingredients, in type or equipment for processing, or in manufacturing procedures, vendor shall submit for reapproval a statement of the proposed changes in material and processing and, when requested, sample material. Production material made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5 Test Methods:

4.5.1 Return Rate: Immediately after determining the force for compression-deflection, remove the force and commence measuring thickness recovery.

4.5.2 Rebound: Drop a steel ball, nominally 5/8 in. (16 mm) in diameter, from a height of 50 in. (1270 mm) onto a 1-in. (25-mm) thick specimen of any convenient size at 25°C ± 1 (77°F ± 2) and measure the height to which the ball rebounds. For convenience in measurement, a glass tube 7/8 - 1 in. (22 - 25 mm) in diameter may be used to confine the ball during the test.