Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 3607D
Superseding AMS 3607C
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PLASTIC SHEET
Cotton Fabric Reinforced Phenol-Formaldehyde

1. SCOPE:

1.1 Form: This specification covers phenol/formaldehyde-resin-impregnated, cotton fabric laminates in the form of sheet.

1.2 Application: Primarily for parts requiring good mechanical properties but where electrical properties are of secondary importance and no post-forming is required. Often used for fair-leads and tubing supports.

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

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

ASTM D256 - Impact Resistance of Plastics and Electrical Insulating Materials
ASTM D570 - Water Absorption of Plastics
ASTM D635 - Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position
ASTM D638 - Tensile Properties of Plastics
ASTM D695 - Compressive Properties of Rigid Plastics
ASTM D709 - Laminated Thermosetting Materials
ASTM D790 - Flexural Properties of Plastics and Electrical Insulating Materials

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

2.3.1 Military Standards:

MIL-STD-794 - Parts and Equipment, Procedures for Packaging and Packing of

Printed in U.S.A.

3. TECHNICAL REQUIREMENTS:

3.1 Material and Fabrication: Sheet shall be constructed of laminations of cotton fabric which have been impregnated with a phenolic-type synthetic resin and properly cured.

3.1.1 Color: Shall be natural (tan), unless otherwise specified. Supplementary coloring, when specified, shall be substantially uniform throughout the sheet. Faces of sheet shall be substantially free from streaks and stains.

3.1.2 Finish: Shall be semi-gloss, unless otherwise specified.

3.2 Properties: Sheet shall conform to the following requirements in both the warp and filling directions of the base fabric; tests shall be performed on the sheet supplied and in accordance with specified test methods, insofar as practicable. Where requirements vary with standard thickness, use the value for the next lower thickness for thicknesses not specified.

3.2.1	Tensile Strength, min	7,500 psi (51.7 MPa)	ASTM D638
3.2.2	Compressive Strength, flatwise, min	35,000 psi (241 MPa)	ASTM D695
3.2.3	Flexural Strength, flatwise, min	16,000 psi (110 MPa)	ASTM D790
3.2.4	Impact Strength, edgewise, min per unit of notch	2.0 ft-lb per in. (107 J/m)	ASTM D256

3.2.5 Afterglow, max 4.5.1

Nominal Thickness		Afterglow, sec	
Inches	(Millimetres)	Without Heating	After Heating
Up to 1/4, incl	(Up to 6.4, incl)	4	15
Over 1/4 to 1/2, incl	(Over 6.4 to 12.7, incl)	15	25
Over 1/2 to 1, incl	(Over 12.7 to 25.4, incl)	35	45
Over 1	(Over 25.4)	45	70

3.2.6 Water Absorption, 24 hr immersion, max ASTM D570

Nominal Thickness		
Inches	(Millimetres)	Weight Gain, %
1/32	(0.8)	8.0
3/64	(1.2)	5.2
1/16	(1.6)	4.4
3/32	(2.4)	3.2
1/8	(3.2)	2.5
5/32	(4.0)	2.2
3/16	(4.8)	1.9
7/32	(5.6)	1.8
1/4	(6.4)	1.6
1/2	(12.7)	1.2
3/4	(19.0)	1.1
1 and over	(25.4 and over)	1.0

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

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

3.2.9 Machinability: Sheet, at room temperature, shall not split, crack, chip, or delaminate when punched in nominal thicknesses 1/8 in. (3 mm) and under or when drilled, sawed, or machined in any thickness.

3.3 Quality: Sheet shall be uniform in quality and condition and free from blisters, wrinkles, cracks, crazing, delamination, and surface roughness, and reasonably free from other imperfections such as scratches and dents.

3.4 Sizes and Tolerances: Unless otherwise specified, the following shall apply:

3.4.1 Thickness: Standard thicknesses and tolerances shall be in accordance with Table I.

TABLE I

Nominal Thickness Inch	Tolerance Inch plus and minus	Nominal Thickness Inch	Tolerance Inch Plus only	Nominal Thickness Inches	Tolerance Inch Plus only
1/32	0.0065	5/16	0.035	1	0.065
3/64	0.0075	3/8	0.040	1-1/8	0.069
1/16	0.0075	7/16	0.044	1-1/4	0.073
3/32	0.009	1/2	0.048	1-3/8	0.077
1/8	0.010	5/8	0.053	1-1/2	0.081
5/32	0.011	3/4	0.058	1-5/8	0.085
3/16	0.0125	7/8	0.062	1-3/4	0.089
7/32	0.014			2	0.097
1/4	0.030				

TABLE I (SI)

Nominal Thickness Millimetres	Tolerance Millimetres plus and minus	Nominal Thickness Millimetres	Tolerance Millimetres Plus only	Nominal Thickness Millimetres	Tolerance Millimetres Plus only
0.8	0.165	7.9	0.89	25.4	1.65
1.2	0.190	9.5	1.02	28.6	1.75
1.6	0.190	11.1	1.12	31.8	1.85
2.4	0.23	12.7	1.22	34.9	1.96
3.2	0.25	15.9	1.35	38.1	2.06
4.0	0.28	19.0	1.47	41.3	2.16
4.8	0.318	22.2	1.57	44.4	2.26
5.6	0.36			50.8	2.46
6.4	0.76				

3.4.2 Length and Width: Shall not vary more than ±1 in. (±25 mm) from the nominal dimensions ordered.

3.4.3 Warp and Twist: Shall not exceed 1% based on a 36 in. (914 mm) length, determined in accordance with ASTM D709.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of sheet 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 such confirmatory testing as he deems necessary to ensure that the sheet conforms to the requirements of this specification.

4.2 Classifications of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to requirements for compressive strength (3.2.2), flexural strength (3.2.3), and water absorption (3.2.6) 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 on the initial shipment of sheet to a purchaser, when a change in material 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, the contracting officer, or the request for procurement.

4.3 Sampling: Shall be as follows:

4.3.1 Acceptance Tests: Sufficient sheet shall be taken at random from each lot to perform all required tests. The number of tests 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 sheet of the same nominal thickness produced from the same batches of raw materials in a single production run under the same fixed conditions and presented for vendor's inspection at one time but shall not exceed 1,500 sq ft (140 m^2).

4.3.1.2 When a statistical sampling plan and acceptance quality level (AQL) 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 Preproduction Tests: As agreed upon by purchaser and vendor.

4.4 Approval:

4.4.1 Sample sheet shall be approved by purchaser before sheet for production use is supplied, unless such approval be waived. Results of tests on production sheet 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 sheet which are essentially the same as those used on the approved sample sheet. If any change is necessary 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 and processing and, when requested, sample sheet. Production sheet made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.5 Test Methods: