AEROSPACE MATERIAL SPECIFICATION

AMS3940™	REV. H

Issued 1947-07
Revised 1993-07
Reaffirmed 2022-08

Superseding AMS3940G

Fiberboard, Hard-Pressed, Structural

RATIONALE

AMS3940H has been reaffirmed to comply with the SAE Five-Year Review policy.

1. SCOPE:

1.1 Form:

This specification covers hard-pressed fiberboard in the form of flat panels.

1.2 Application:

This fiberboard has been used typically for parts requiring moderate strength, such as paneling and sheathing of shipping containers, 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 1037 Evaluating the Properties of Wood-Base Fiber and Particle Panel Materials

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: **http://www.sae.org**

For more information on this standard, visit
https://www.sae.org/standards/content/AMS3940H/

2.2 U.S. Government Publications:

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

MIL-W-3448 Wallboard, Packaging of

3. TECHNICAL REQUIREMENTS:

3.1 Material and Fabrication:

The product shall consist of wood fibers physically or chemically separated, felted, and heavily compressed to produce the properties specified in 3.2, using the natural wood lignins or other suitable adhesive as a bonding agent, in accordance with the following:

3.1.1 Wood Species: Shall be one or a combination of the following:

Spruce
Cottonwood
Fir
Willow
Poplar
Pine
Gumwood
Redwood
Aspen
Douglas Fir

3.1.2 Laminating: Panels 5/16 inch (7.9 mm) and under in nominal thickness shall be one solid sheet. Panels over 5/16 inch (7.9 mm) in nominal thickness shall be laminated from thinner sheets. Panels 1/4 inch (6.4 mm) and over in nominal thickness and requiring both faces smooth may be laminated from thinner sheets. Bonding of laminated panels shall be accomplished with a thermosetting synthetic resin glue resistant to formation and growth of molds and fungi.

3.1.3 Chemical Treatment: Panels may be chemically treated to improve strength and abrasion resistance and to reduce moisture absorption.

3.2 Properties:

Fiberboard shall conform to the following requirements, determined in accordance with ASTM D 1037, Part B, and, except for density, shall be reported as the average of all values for each test:

3.2.1 Density: Shall be not lower than 31 pounds per cubic foot (497 kg/m^3).

3.2.2 Tensile Strength:

3.2.2.1 Parallel to Surface: Shall be not lower than 3500 psi (24.1 MPa); strength shall be approximately equal in all surface directions.

3.2.2.2 Perpendicular to Surface: Shall be not lower than 150 psi (1.03 MPa).

3.2.3 Modulus of Rupture: Shall be not lower than 7000 psi (48.3 MPa).

3.2.4 Water Resistance:

3.2.4.1 Water Absorption: Shall be not greater than the percentages by weight shown in Table 1 as applicable to the surface finish specified.

TABLE 1 - Water Absorption

Nominal Thickness Inch	Nominal Thickness Millimeters	Absorption % by Weight Smooth One Side (SIS)	Absorption % by Weight Smooth Both Sides (S2S)
1/12	2.1	30	--
1/10	2.5	20	25
1/8	3.2	15	20
3/16	4.8	12	18
1/4	6.4	10	12
5/16	7.9	8	11
3/8	9.5	8	10

3.2.4.2 Thickness Swelling: Shall be not greater than the percentages shown in Table 2 as applicable to the surface finish specified.

TABLE 2 - Thickness Swelling

Nominal Thickness Inch	Nominal Thickness Millimeters	Thickness Increase, % Smooth One Side (SIS)	Thickness Increase, % Smooth Both Sides (S2S)
1/12	2.1	25	--
1/10	2.5	16	20
1/8	3.2	11	16
3/16	4.8	10	15
1/4	6.4	8	11
5/16	7.9	8	10
3/8	9.5	8	9

3.2.4.3 Water resistance requirements for fiberboard over 3/8 inch (9.5 mm) in nominal thickness shall be as agreed upon by purchaser and vendor.

3.3 Workability:

Fiberboard shall not crack, split, chip, or delaminate when drilled, sawed, or nailed perpendicularly to the surface.

3.4 Quality:

Fiberboard, as received by purchaser, shall be sound and free from foreign materials and from imperfections detrimental to usage of the fiberboard. Panels shall be flat and shall have at least one face smooth; laminated panels shall be smooth on both surfaces.

3.5 Tolerances:

Shall be as follows:

3.5.1 Thickness: Shall be specified in Table 3, measured in accordance with ASTM D 1037.

TABLE 3A - Thickness Tolerances, Inch/Pound Units

Nominal Thickness Inches	Actual Thickness Inches
1/12	0.070 to 0.090
1/10	0.091 to 0.100
1/8	0.115 to 0.155
3/16	0.165 to 0.205
1/4	0.210 to 0.265
5/16	0.290 to 0.335
3/8	0.350 to 0.400
7/16	0.410 to 0.460
1/2	0.475 to 0.525
5/8	0.600 to 0.650
11/16	0.660 to 0.710
3/4	0.725 to 0.775
13/16	0.785 to 0.835
7/8	0.850 to 0.900
1	0.975 to 1.025
1- 1/8	1.115 to 1.155

TABLE 3B - Thickness Tolerances, SI Units

Nominal Thickness Millimeters	Actual Thickness Millimeters
2.1	1.78 to 2.29
2.5	2.31 to 2.54
3.2	2.92 to 3.94
4.8	4.19 to 5.21
6.4	5.33 to 6.73
7.9	7.37 to 8.51
9.5	8.89 to 10.16
11.1	10.41 to 11.68
12.7	12.06 to 13.34
15.9	15.24 to 16.51
17.5	16.76 to 18.03
19.0	18.42 to 19.68
20.6	19.94 to 21.21
22.2	21.59 to 22.86
25.4	24.76 to 26.04
28.6	28.32 to 29.34

3.5.2 Length and Width: Nominal length shall be as ordered and nominal width shall be 4 feet (1.22 m) or 5 feet (1.52 m), as ordered. Tolerance on length and width shall be ±1/64 inch per foot (±1.3 mm/m) of linear dimension.

3.5.3 Squareness: The difference in lengths of the two face diagonals of a panel shall be not greater than 1/64 inch per foot (1.3 mm/m) of length of panel. Opposite edges of panels shall not vary more than 1/8 inch (3.2 mm) in length.

3.5.4 Edge Straightness: Edges of panels shall be straight within 1/16 inch per foot (5.2 mm/m) of length or width, determined by stretching a string or wire from one corner to the adjacent corner and measuring the greatest distance between the string or wire and the panel edge being tested.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

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

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests for material and fabrication (3.1), tensile strength (3.2.2), water resistance (3.2.4), quality (3.4), and tolerances (3.4) 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 first-article shipment of fiberboard 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:

Shall be as follows; a lot shall be all panels of one size manufactured in one continuous production run and presented for vendor's inspection at one time.

4.3.1 For Acceptance Tests: In accordance with ASTM D 1037.

4.3.2 For Preproduction Tests: As agreed upon by purchaser and vendor.