

# CERTIFICATE

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By the Authority Vested By Part 5 of the United States Code § 552(a) and Part 1 of the Code of Regulations § 51 the attached document has been duly INCORPORATED BY REFERENCE and shall be considered legally binding upon all citizens and residents of the United States of America. HEED THIS NOTICE: Criminal penalties may apply for noncompliance.



**Document Name:** AHA A135.5: Prefinished Hardboard Paneling

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OFFICE OF THE FEDERAL REGISTER  
WASHINGTON, D.C.



**American National Standard**

# **Prefinished Hardboard Paneling**



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# Prefinished Hardboard Paneling

Approval Date: January 5, 1995

## **Abstract**

This Standard covers requirements and methods of testing for the dimensions, squareness, edge straightness, and moisture content of prefinished hardboard paneling and for the finish of the paneling. Methods of identifying products which conform to the Standard are included.

## **Foreword**

This Foreword is not a part of American National Standard for Prefinished Hardboard Paneling.

This Standard was originally promulgated under the procedures of the U.S. Department of Commerce National Bureau of Standards and designated as Voluntary Product Standard PS 59-73. This American National Standard was updated in 1982 and 1988. This 1995 revision makes additional corrections and adds metric equivalents.

The development of this American National Standard for Prefinished Hardboard Paneling offers manufacturer, consumer, and the general public concerned with the product an effective guide developed under the consensus procedures of the American National Standards Institute.



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## 1. SCOPE

This Standard covers requirements and methods of testing for the dimensions, squareness, edge straightness, and moisture content of prefinished hardboard paneling and for the finish of the paneling.<sup>1</sup>

## 2. REQUIREMENTS

**2.1. General.** Products represented as complying with this Standard shall meet all of the requirements specified herein. The qualification and test procedures contained in Section 3 are to be used to determine the conformance of products to the requirements of this Standard.

*Note:* Embossed products, because of their varying surfaces and patterns, require the recognition that certain adjustments and allowances are to be made in the evaluation of various physical property requirements found in this Standard. Specific adjustments for embossed products have been designated wherever possible. With certain proprietary finished surface configurations, the manufacturer shall be consulted for specific adjustments in the test procedures.

### 2.2. Dimensions and Tolerances.

The paneling shall have a nominal width of 406 mm (16 in.), 1220 mm (4 ft.) or 1524 mm (5 ft.). The nominal length shall be from 1220 mm (4 ft.) through 3660 mm (12 ft.) in 405 mm (1 ft.) increments. The nominal thicknesses shall be 3.2 (1/8 in.), 4.8 (3/16 in.), and 6.4 mm (1/4 in.).

<sup>1</sup>Other Standards cover: a. Basic Hardboard; b. Hardboard Siding. Physical properties of the hardboard used to manufacture prefinished paneling are set out in American National Standard A135.4-1995 *Basic Hardboard Products* which conform to the requirements of this Standard are included.

The tolerance on the nominal length and width shall be plus or minus 1.6 mm (1/16 inch). The thickness range for each nominal thickness shall be as specified below.

Nominal Thickness		Min.-Max.	
mm	inch	mm	inch
3.2	1/8	2.9-3.9	0.115-0.155
4.8	3/16	4.2-5.2	0.165-0.205
6.4	1/4	5.3-6.7	0.210-0.265

Thickness measurements shall be made in accordance with the applicable method in Part B of ASTM D 1037-93<sup>2</sup>, *Test Methods for Evaluating the Properties of Wood-Base Fiber and Particle Panel Materials*.

**2.3 Squareness.** The lengths of the diagonals of the paneling shall not differ by more than 1.6 mm/m (1/64 in./ft.) of length of the paneling. Opposite sides of the paneling shall not differ in length more than 3.2 mm (1/8 in.).

**2.4. Edge Straightness.** The edges of the paneling shall be straight within 1.6 mm/m (1/64 inch/foot) of length or width, and edges and corners shall be square cut. Edge straightness shall be determined by stretching a string or wire from one corner to the adjacent corner and measuring the widest distance between the string or wire and the panel edge being tested.

<sup>2</sup>Later issues of this publication may be used provided the requirements are applicable and consistent with the issue designated. Copies are obtainable from the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.

**2.5. Moisture Content.** The moisture content of the paneling shall be not less than 2 percent nor more than 9 percent and, within any one shipment, shall not vary by more than 3 percentage points as measured by the moisture content of the modulus of rupture specimens. Moisture content shall be determined in accordance with the applicable test method in Part B of ASTM D1037-93. Since hardboard is a wood-base material, its moisture content will vary with environmental humidity conditions. When the environmental humidity conditions in the area of intended use are a critical factor, the purchaser shall specify a moisture content more restrictive than 2 to 9 percent so that fluctuation in the moisture content of the panel will be kept to a minimum.

**2.6. Hardboard Substrate.** The hardboard substrate of the paneling shall be manufactured primarily of interfelted ligno-cellulosic fibers which are consolidated under heat and pressure in a hot-press to a density of 500kg/m<sup>3</sup> (31 pounds per cubic foot) or greater. The finished product when tested shall have the properties of one of the classes listed in the American National Standard A135.4-1994 and shall have the physical properties specified therein when tested in accordance with the applicable test methods in Part B of ASTM D 1037-93.

**2.7. Finish.** The finish of the paneling shall be either Class I or Class II as specified in Table I, and the properties of each class shall be determined in accordance with the sections of this Standard indicated therein.

**2.8. Workmanship.** All surfaces shall be uniform in appearance throughout, and shall be as free from visible defects in the surface plane as commercially practicable when visually inspected by an individual competent in the field.

**2.9. Flame Spread Index.** A flame spread index for the paneling shall be determined by the Tunnel Test specified in ASTM E 84-91a<sup>3</sup>, *Test Method for Surface Burning Characteristics of Building Materials*, with the paneling mounted with cement backer boards. The panels shall then be classified as follows:

Class	Flame Spread index
I	0 – 25
II	26 – 75
III	76 – 200
IV	over 200

**2.10. Identification.** All paneling represented as conforming to this Standard shall be identified with the reference ANSI/AHA A135.5

### 3. QUALIFICATION AND TEST PROCEDURES

**3.1. Abrasion Resistance.** Abrasion resistance shall be determined in accordance with ASTM D 968-81, *Test Method for Abrasion Resistance of Organic Coatings by Falling Abrasive*.

**3.2. Adhesion.** Clean the surface of the panel with mineral spirits and allow it to dry. Make a cut at least 25 mm (1 in.) long through the finish with a sharp razor blade or equivalent. Apply a piece of 20 mm (3/4 in.) wide flat-back masking tape<sup>4</sup> perpendicular to the cut and press firmly in place by using a wallpaper seam roller. Allow the cut to extend beyond the edges of the tape and the tape to contact the finish for a distance of at least 25 mm (1 in.) on each side of the cut. Allow sufficient excess tape on one side to hold the tape between the thumb and forefinger. Immediately pull the tape free in a slow and even manner at right angles to the cut. Measure the distance from the cut to the point that the finish ceases to be "picked up" by the tape.

*Note:* This test is applicable only to flat surfaces. If a textured product is to be tested, a flat area of the pattern shall be selected. Trial cuts shall be made until either the substrate becomes visible in the bottom of the cut or, in case of intercoat adhesion, the underlying paint film becomes visible in the bottom of the cut. Disregard any cuts of improper depth, curling at the edge of the cut, or excessive chipping adjacent to the cut.

**3.3. Fade Resistance.** Fade resistance shall be tested using Method 1 ASTM G 23-90<sup>5</sup>, *Practice for Operating Light-and Water-Exposure Apparatus*

<sup>4</sup>The masking tape shall be less than one year old, has been properly stored, and shall have an adhesive strength of 50 + 5 g/mm (45 + 5 ounces per inch) when tested in accordance with ASTM Test Method D-3330.

<sup>5</sup>See footnote 2.

<sup>6</sup>See footnote 2.

<sup>7</sup>See footnote 2.

<sup>8</sup>See footnote 2.

(Carbon-Arc Type) for Exposure of Nonmetallic Materials. Gloss shall be determined in accordance with 3.4.

**3.4. Gloss.** Gloss shall be determined in accordance with ASTM D 523-85<sup>6</sup> *Test Method for Specular Gloss*, using a glossmeter geometry of 60°.

**3.5. Heat Resistance.** Place a 100 mm by 100 mm (4 in. by 4 in.) specimen in an oven at 65° C (150°F) for 24 hours.

**3.6. Humidity Resistance.** Place a 150 mm by 300 mm (6 in. by 12 in.) specimen in an atmosphere of 90 percent relative humidity and temperature of 32°C (90°F) plus or minus 1°C (2°F) for 240 hours.

**3.7. Scrape Adhesion.** Scrape adhesion shall be determined in accordance with Method A of ASTM D 2197-91<sup>7</sup>, *Test Methods for Adhesion of Organic Coatings by Scrape Adhesion*.

*See "Note" relative to textured products under 3.2 Adhesion.*

**3.8. Stain Resistance.** Stain resistance shall be tested in accordance with ASTM D 1308-87<sup>8</sup>, *Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes*, using the Spot Test, covered method, and the following staining agents:

- mineral oil (U.S.P.)
- fresh-brewed strong coffee
- china-type marking pencil
- nonsmearing lipstick
- reconstituted lemon juice (10% citric acid by weight)
- carbonated cola drink

<sup>3</sup>See footnote 2.

**Table 1**  
**Properties of Hardboard Paneling Finishes**

<b>Requirements</b>			
<b>Property</b>	<b>Class I</b>	<b>Class II</b>	<b>Reference to paragraph in this Standard</b>
Abrasion resistance	5 liters of sand without marring print <u>or undercoat</u>	3 liters of sand without marring print <u>or undercoat</u>	3.1
Adhesion	Less than 3.2 mm (1/8 inch) of coating "picked up"	Same as Class I	3.2
Fade resistance	100 hours of light exposure with no loss of gloss and only a slight color change when visually inspected by an individual competent in the field	60 hours of light exposure with no loss of gloss and only a slight color change when visually inspected by an individual competent in the field	3.3
Gloss - High	50 units and over	Same as Class I	3.4
Medium	25 to 50 units		
Low	Under 25 units		
Heat resistance	Slight color change when visually inspected by an individual competent in the field	See footnote 11	3.5
Humidity resistance	No blistering, peeling, cracking, crazing, or more than a slight color change when visually inspected by an individual competent in the field	See footnote 11	3.6
Scrape adhesion	6 kilograms	4 kilograms	3.7
Stain resistance	No effect using staining agents (a) through (l)	No effect using staining agents (a) through (f). Not greater than superficial effect using staining agents (g) through (l)	3.8
Steam resistance	No blistering, loosening, or separation of coating	See footnote 11	3.9
Washability	<u>No loss of print or undercoat</u>	Same as Class I	3.10

<sup>11</sup>Class II finish has limited heat, humidity, or steam resistance requirements as it is not meant to be used where these conditions are excessive such as around stoves, furnaces, showers, and bathtubs.

**Note:** Physical properties of the hardboard substrate can be found in the American National Standard ANSI/AHA A135.4-1995, *Basic Hardboard*.

- (g) household ammonia solution (10% ammonia by weight)
- (h) homogenized milk
- (i) alcohol (denatured) 190 proof
- (j) aqueous household bleach (5.5% sodium hypochlorite by weight)
- (k) nail polish remover\*
- (l) 1% trisodium phosphate solution (by weight)

\* Nail polish remover formula:

	Volume
Butyl acetate	24%
Ethyl acetate	28%
Acetone	20%
Isopropyl alcohol	24%
Diglycol laurate	4%

The staining agent shall be allowed to stand on the test specimen for 4 hours, after which time it shall be wiped away using a damp cloth. Any stain remaining shall be gently removed by rubbing with alcohol or lacquer thinner only to the extent required to dissolve water insoluble surface stains. If 24 hours after wiping away the staining agents: (1) the specimen is free of marks and stains, then the staining agent shall be considered as having no effect; (2) any residual mark and/or stain is easily and completely removed by the light application of a mild abrasive cleaner, then the staining agent shall be considered as having only a superficial effect. Test

specimens shall be examined by holding the specimen at arm's length in a vertical position under overhead white fluorescent lamps which produce illumination in the range of 810-1080 lux (75-100 footcandles).

**3.9. Steam Resistance.** A 500 mL narrow-mouth Erlenmeyer flask shall be half-filled with water which shall be maintained at a mild boil at 125 mL/hour evaporation rate. A 100 mm (4 in.) square sample panel shall be suspended 25 mm (1 in.) above the mouth of the flask, with the finished face down, for 8 hours (replenish water as necessary). The back and edges of the specimen shall be protected by an acrylic lacquer at least 25  $\mu$ m (1 mil) dry film thickness which will not soften or lose adhesion at 104°C (220°F). The specimen shall then be allowed to recover for 16 hours before grading. There shall be no more than a superficial change in appearance after testing.

**3.10. Washability.** The washability of the finish with ASTM D 2486-89<sup>9</sup>, *Test Method for Scrub Resistance of Interior Latex Flat Wall Paints*, incorporating the following test equipment and procedures: Use Gardner Washability Machine, Model 105-a, or equivalent, and a Gardner long, hog bristle brush<sup>10</sup>, or equivalent. Cut a specimen 150 mm by 432 mm (6 in. by 17 in.). Determine the gloss of the coating as described in 3.4. and clamp the panel firmly in the pan of the apparatus. Soak the hog

bristle brush in a 3.0 percent solution by weight of trisodium phosphate for 10 minutes and place it on the panel. Pour 10 milliliters of the same solution on the panel, adding more solution from time to time to keep the specimen moist but not soaking wet. Remove the specimen after 3,000 cycles (6,000 separate strokes), rinse with running water, wipe off with clean sponge, and allow the specimen to dry at a temperature of 22°C plus or minus 3°C (72°F plus or minus 5°F) for 2 hours. Redetermine the gloss within the central 200 mm (8 in.) of the brush path in accordance with 3.4. and report the increase or decrease in gloss units.

<sup>9</sup>See footnote 2

<sup>10</sup>Available from Pacific Scientific-Instruments Div., 2341 Linden Lane, Silver Spring, MD 20910. This trade name is used solely for the purpose of description and does not imply recommendation or endorsement. Other such apparatus equal in performance shall be acceptable.