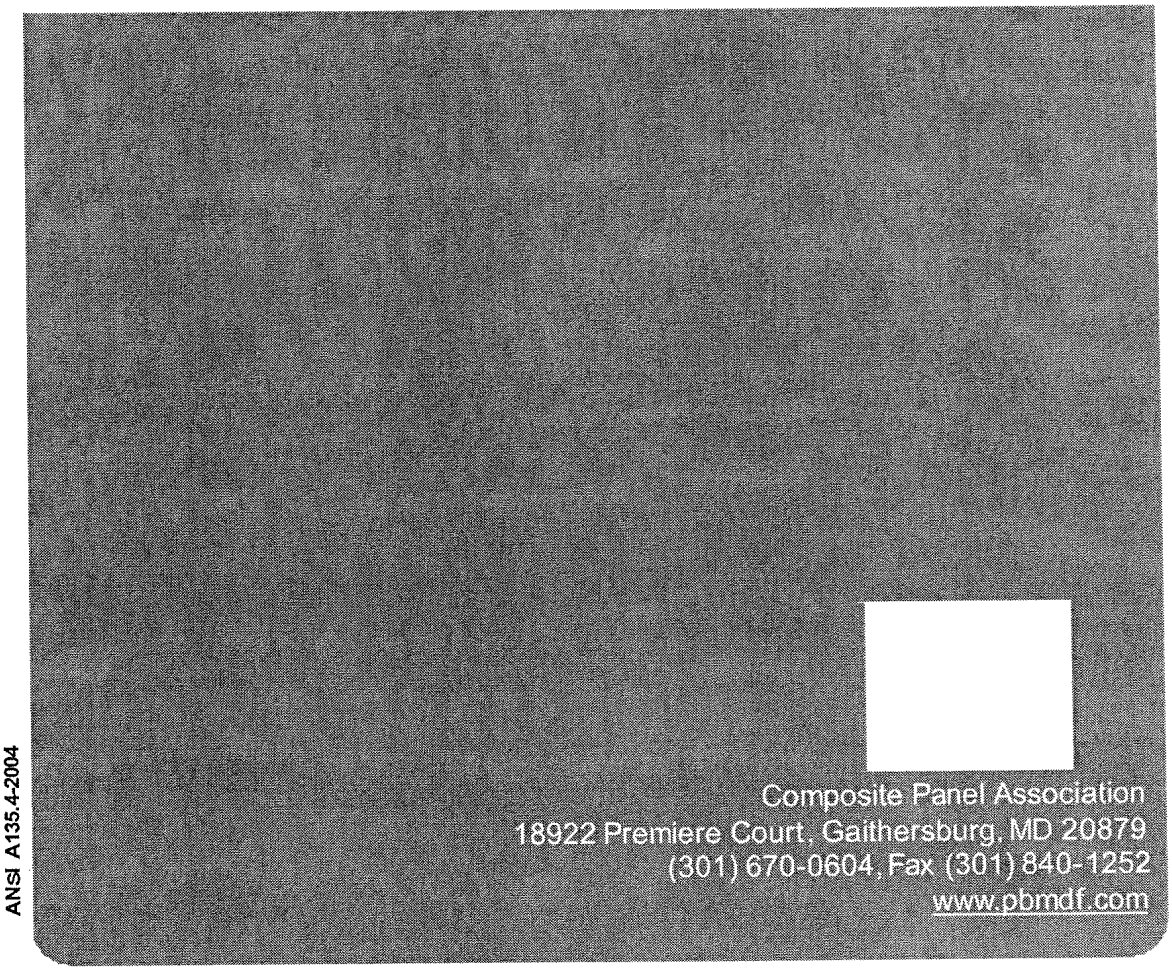
ANSI A135.4-2004
Approved March 11, 2004

American National Standard

Basic Hardboard



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ANSI A135.4-2004

ANSI A135.4-2004, Basic Hardboard

American National Standard

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ANSI A135.4-2004 Basic Hardboard

Abstract This Standard defines hardboard, covers requirements and test methods for water absorption, thickness swelling, modulus of rupture, tensile strength, surface finish, dimension s, squareness, edge straightness, and moisture content of five classes of basic hardboard. Where appropriat e, test methods in ASTM D 1037 are required. Methods of identifying hardboard that conforms to this Standard are provided.

Foreword (This Foreword is not a part of American National Standard for Basic Hardboard.) Basic hardboard has numerous uses, from wall paneling to furniture components, to a variety of utility boards for home and industry.

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 58-73. The 1982 revision was published with adjustments to physical properties listed in Table I which reflected the state of the art. In 1988 the Standard was reaffirmed without change. The 1995 revision made editorial corrections and added metric equivalents. This 2004 revision makes only editorial changes.

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

Consen sus for this standard was achieved by use of a canvass body and ANSI's Essential Requirements for due process. The following organizations, recognized as having an interest in hardboard standards, were contacted prior to the approval of this standard. Inclusion in this list does not necessarily imply that the organization concurred with the submittal of the proposed standard to ANSI.

AFCO Industries Inc.
AKZO Nobel Coatings, Inc.
CraftMaster Manufacturing, Inc.
Georgia-Paci fic Corporation
ICC Evaluation Services, Inc.
Jeld-Wen R&D
Kitchen Cabinet Manufacturers Assn.
Louisiana-Pacific Corporation
Manufactured Housing Institute
Masonite International Corporation
Institute for Building Technology and Safety
Stimson Lumber
Stork □ Twin City Testing Corp.
Temple-Inland
USDA Forest Products Laboratory
University of Illinois

1. SCOPE

This Standard covers requirements and methods of testing for the water resistance, modulus of rupture, tensile strength, surface finish, dimensions, squareness, edge straightness, and moisture content of five classes of basic hardboar d. Hardboard siding and prefinished hardboard paneling are covered by separate American National Standards. Methods of identifying hardboard that conforms to this Standard are provided.

2. DEFINITION

2.1. Basic Hardboard. Hardboard is a panel manufactured primarily from inter-felted lignocellulosic fibers which are consolidated under heat and pressure in a hot-press to a density of 500 kg/m^3 (31 lbs/ft^3) or greater. Other materials may be added to improve certain properties, such as stiffness, hardness, finishing properties, resistance to abrasion and moisture, as well as to increase strength, durability, and utility.

2.2. Surface. Hardboard panels are available with either one (S1S) or two (S2S) smooth sides.

3. REQUIREMENTS

3.1. General. All hardboard represented as complying with this Standard shall meet all of the requiremen ts specified herein. The inspection and test procedures contained in this section are to be used to determine the conformance of products to the requirements of this Standard.

3.2. Classes. The hardboard shall be classified based on the physical properti es shown in Table 1. The properties shall be determined in accordance with the applicable test methods in Part B of the American Society for Testing and Materials (ASTM) D 1037-99 *Test Methods for Evaluating the Properties of Wood- Base Fiber and Particle Panel Materials*, except that, when testing modulus of rupture, speci mens greater than 9.5 mm (3/8 inch) thick shall be tested accordi ng to Part A, Section 14 of this reference.

3.3. Surface Finish. The smooth surfaces shall be as free from visible variations in the surface plane as commercially practicable when visually inspected by an individual competent in the field

3.4. Dimensions and Tolerances. The hardboard panels shall have a nominal width of 1220 mm or 1524 mm (4 feet or 5 feet). The nominal length of the panels shall be as agreed upon by the purchaser and the seller. The tolerance on the nominal width and length shall be plus or minus 1.6 mm/m (1/64 inch/linear foot). The nominal thicknesses shall be as designated in Table 2. Thickness rang es shall be as specified in Table 2 when measured in accordance with the applicable test method in Part B of ASTM D 1037-99.

3.5. Squareness . The length of the diagonals of the hardboard panels shall not vary by more than 1.6 mm/m (1/64 inch/foot) of length of the panels. Opposite sides of the panels shall not vary in length more than 3.2 mm (1/8 inch).

3.6. Edge Straightness. The edges of the hardboard panels shall be straight within 1.6 mm/m (1/64 inch/foot) of length or width. Edge straightness shall be determined by stretching a string or wire from one corner and measuring the widest distance between the string or wire and the panel edge being tested.

3.7. Moisture Content. The moisture content of the hardboard shall be not less than 2 percent nor more than 9 percent and, within any one shipment, shall not vary by more than 3 percent age 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 D 1037-99. Since hardboard is a wood-base material, its moisture content will vary with environmental humidity conditions. When the humidity conditions in the area of intended use are a critical factor, the purchaser should specify a moisture content range more restrictive than 2 to 9 per cent so that fluctuation in the moisture content of the panel will be kept to a minimum.

3.8. Marking and Identification. All basic hardboard which is represented as conforming to this Standard shall be identified by either of the following methods when requested by the purchaser:

(a) Each board shall be marked with a colored vertical stripe or stripes which indicates the class of the board. The marking for the different classes shall be as follows:

Class	Number and color of stripes
Tempered	1 Red
Service Tempered	2 Red
Standard	1 Green
Service	2 Green
Industrial	1 Blue

The stripe or stripes shall be applied to the four edges of a board as follows:

On the short sides of the board, the stripe should be applied 75 mm (3 inches) from the left hand corner (as determined when the marker faces the side being marked); on the long sides of the board, the stripe should be applied 75 mm (3 inches) from the right hand corner as determined when the marker faces the side being marked. See Figure 1 for an example of the placement of the markings. Stripes shall be 13 mm (1/2 inch) in width. When two stripes are used they shall be 25mm (1 inch) apart.

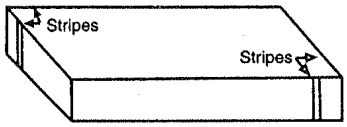

Figure 1. A stack of hardboard showing placement of markings.

(b) The shipment or order shall be accompanied by a written certification stating the class of the hardboard and that the hardboard conforms to the requirements of this Standard.

ANSI A135.4-2004 Basic Hardboard

Table 1

Classification of Hardboard by Thickness and Physical Properties

Class	Nominal thickness		Water resistance (max. average per panel)		Modulus of rupture (min. average per panel)		Tensile strength (min. average per panel)			
			Water absorption based on weight	Thickness Swelling			Parallel to surface		Perpendicular to surface	
	mm	inch	percent	percent	MPa	psi	MPa	psi	MPa	psi
	2.1	1/12	30	25						
	2.5	1/10	25	20						
1	3.2	1/8	25	20						
Tempered	4.8	3/16	25	20	41.4	6000	20.7	3000	0.90	130
	6.4	1/4	20	15						
	7.9	5/16	15	10						
	9.5	3/8	10	9						
	2.1	1/12	40	30						
	2.5	1/10	35	25						
2	3.2	1/8	35	25						
Standard	4.8	3/16	35	25	31.0	4500	15.2	2200	0.62	90
	6.4	1/4	25	20						
	7.9	5/16	20	15						
	9.5	3/8	15	10						
	3.2	1/8	35	30						
3	4.8	3/16	30	30						
Service-Tempered	6.4	1/4	30	25	31.0	4500	13.8	2000	0.52	75
	9.5	3/8	20	15						
	3.2	1/8	45	35						
	4.8	3/16	40	35						
4	6.4	1/4	40	30						
Service	9.5	3/8	35	25	20.7	3000	10.3	1500	0.34	50
	11.1	7/16	35	25						
	12.7	1/2	30	20						
	15.9	5/8	25	20						
	6.4	1/4	50	30						
5	9.5	3/8	40	25						
Industrialite	11.1	7/16	40	25	13.8	2000	6.9	1000	0.17	25
	12.7	1/2	35	25						
	15.9	5/8	30	20						

ANSI A135.4-2004 Basic Hardboard

Table 2
Thickness Ranges for hardboard Panels

Nominal Thickness			Thickness Range (min.-max.)	
mm	inch		mm	inch
2.1	1/12	(0.083)	1.8 □ 2.3	0.070 □ 0.090
2.5	1/10	(0.100)	2.3 □ 2.8	0.091 □ 0.110
3.2	1/8	(0.125)	2.9 □ 3.9	0.115 □ 0.155
4.8	3/16	(0.188)	4.2 □ 5.2	0.165 □ 0.205
6.4	1/4	(0.250)	5.3 □ 6.7	0.210 □ 0.265
7.9	5/16	(0.312)	7.4 □ 8.5	0.290 □ 0.335
9.5	3/8	(0.375)	8.9 □ 10.2	0.350 □ 0.400
11.1	7/16	(0.438)	10.4 □ 11.7	0.410 □ 0.460
12.7	1/2	(0.500)	12.1 □ 13.3	0.475 □ 0.525
15.9	5/8	(0.625)	15.2 □ 16.5	0.600 □ 0.650

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The Composite Panel Association (CPA) was founded in 1960, and represents the North American industry on technical, regulatory, quality assurance and product acceptance issues. Membership currently includes 37 of the leading producers of industry products. Together they represent 92% of the total manufacturing capacity of North American particleboard (PB), medium density fiberboard (MDF), hardboard (HB) and other compatible products.

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ANSI A135.5-2004
Approved March 11, 2004

American National Standard

Prefinished Hardboard Paneling

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ANSI A135.5-2004

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ANSI A135.5-2004, Prefinished Hardboard Paneling

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. The 1995 revision made editorial corrections and adds metric equivalents. This 2004 revision makes only editorial changes.

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

Consen sus for this standard was achieved by use of a canvass body and ANSI's Essential Requirements for due process. The following organizations, recognized as having an interest in hardboard standards, were contacted prior to the approval of this standard. Inclusion in this list does not necessarily imply that the organization concurred with the submittal of the proposed standard to ANSI.

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AKZO Nobel Coatings, Inc.
Georgia-Paci fic Corporation
ICC Evaluation Services, Inc.
Jeld-Wen R&D
Kitchen Cabinet Manufacturere Assn.
Louisiana-Pacific Corporation
Manufactured Housing Institute
Masonite International Corporation
Institute for Building Technology and Safety
Stimson Lumber
Stork □ Twin City Testing Corp.
USDA Forest Products Laboratory
University of Illinois

ANSI A135.5-2004, Prefinished Hardboard Paneling

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. [1]

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.

[1] 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 A135.4-2004 Basic Hardboard Products which conform to the requirements of this Standard are included.

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.).

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 1037-99, 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 in./ft.) 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.

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 D 1037-99. 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 lignocellulosic fibers which are consolidated under heat and pressure in a hot-press to a density of 500kg/m^3 (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 A135.4-2004 and shall have the physical properties specified therein when tested in accordance with the applicable test methods in Part B of ASTM D1037-99.

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 84-03, *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 A135.5.

3. QUALIFICATION AND TEST PROCEDURES

3.1. Abrasion Resistance. Abrasion resistance shall be determined in accordance with ASTM D 968-93(2001), *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[2] 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 (2 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 inter-coat adhesion, the underlying paint film becomes visible in the bottom of the cut. Disregard any cuts of improper depth, curling at the edge or the cut, or excessive chipping adjacent to the cut.

3.3 Fade Resistance. Fade resistance shall be tested using Method 1 ASTM G 23-01, *Practice for Operating Light-and Water-Exposure Apparatus (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 523-99 *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.

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

3.6. Humidity Resistance. Place a 150 mm by 300 mm (6 in. by 12 in.) specimen in at 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 2197-02, *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 1308-02, *Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes*, using the Spot Test, covered method, and the following staining agents:

(a) mineral oil (U.S.P.)
(b) fresh-brewed strong coffee
(c) china-type marking pencil
(d) non-smearing lipstick
(e) resonstituted lemon juice (10% citric acid by weight)
(f) carbonated cola drink
(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 25µm (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 2486-00, *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 [3] 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.

[3] 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 recommendat ion or endorsement. Other such apparatus equal in performance shall be acceptable.

ANSI A135.5-2004, Prefinished Hardboard Paneling

Table 1
Properties of Hardboard Paneling Finishes

	Requirements		
Property	**Class I**	**Class II**	**Reference to paragraph in this Standard**
Abrasion resistance	5 liters of sand without marring print or undercoat	3 liters of sand without marring print or undercoat	3.1
Adhesion	Less than 3.2 mm (1/8 in.) 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 Medium Low	50 units and over 25 to 50 units Under 25 units	Same as Class I	3.4
Heat resistance	Slight color change when visually inspected by an individual competent the field	See footnote 4	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 4	3.6
Scrape adhesion	6 kilograms	4 kilograms	3.7
Stain resistance	No effect using staining agents (a) through (i)	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 4	3.9
Washability	No loss of print or undercoat	Same as Class 1	3.10

[4] 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 A135.4-2004, *Basic Hardboard.*

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ANSI/AHA A135.6-1998
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American National Standard

Hardboard Siding

ANSI / AHA A135.6-1998

Hardboard Siding

Abstract:

This Standard covers requirements and methods of testing for the dimensions, straightness, squareness, physical properties, and surface characteristics of hardboard siding. Definitions of trade terms used and methods of identifying products that comply with the standard are included.

Foreword:

(This Foreword is not a part of American National Standard for Hardboard Siding.)

Hardboard siding is a wood-based product used for exterior wall covering. Hardboard siding is manufactured as panel or lap sidings in smooth and textured surfaces, unfinished, factory primed for painting or prefinished.

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 60-73. This American National Standard is published with updated provisions which reflect the present state of the art. This 1998 revision makes editorial changes, adds metric equivalents and adds 80% RH as the specified maximum for linear expansion testing, while 90% RH remains as an alternative.

The development of this American National Standard for Hardboard Siding offers manufacturers, consumers, and the general public an effective guide developed under the consensus procedures of the American National Standards Institute.

AHA

American Hardboard Association

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1. SCOPE

This Standard covers requirements and methods of testing for the dimensions, straightness, squareness, physical properties, and surface characteristics of hardboard siding at the time of manufacture.[1] Definitions of trade terms used and methods of identifying products that comply with this Standard are included.

2. CLASSIFICATION

This Standard covers the following types and surfaces of hardboard siding:

2.1. Types. Lap Siding – Long strips designed to be installed with the long dimension oriented horizontally. This siding is embossed, grooved, and/or smooth on the face. Panel Siding – Wide sheets designed to be installed with the long dimension oriented vertically. This siding is embossed, grooved, and/or smooth on the face.

Note: Embossed products, because of their varying surfaces and patterns, require the recognition that certain adjustments and allowances must 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 finished siding surface configurations, the manufacturer shall be consulted for specific adjustments in the test procedures.

2.2. Surfaces. Unprimed – Siding that has only the surface characteristics provided by the basic manufacturing process.
Primed – Siding that has been factory coated with a primer to provide a surface ready for field applied paint.
Prefinished – Siding that has been factory painted, stained or, film overlaid, which does not require additional painting at the time of installation.

3. REQUIREMENTS

3.1. General. Products represented as complying with this Standard shall meet all of the requirements specified herein. The inspection and test procedures contained in Sections 3 and 4 are to be used to determine the conformance of products to the requirements of this Standard.

3.2. Dimensions and Tolerances. The dimension tolerance for hardboard siding shall be plus 0 mm(0 in) and minus 4.8 mm(3/16 in) from the agreed upon nominal length and width. Thickness shall be as specified in Table 1. Thickness shall be determined in accordance with Sections 151-154 of American Society for Testing and Materials ASTM D1037-96, *Standard Test Methods For Evaluating Properties of Wood-Base Fiber and Particle Panel Materials*[2,3] except that test specimens shall be selected in accordance with Section 3.5 and Figure 1 of this Standard.

3.3. Edge Straightness. Trimmed edges shall conform to a straight line extending from corner to corner on the same edge, with no deviation greater than 1.3 mm/m(1/64 in/ft) of edge length.

Table 1.
Thicknesses and Ranges for Hardboard Siding

Nominal Thickness		Ranges min. - max.	
mm	inch	mm	inch
6.4	1/4(0.250)	5.59-6.73	0.220-0.265
9.5	3/8(0.375)	8.25-9.53	0.325-0.375
11.1	7/16(0.438)	9.55-11.43	0.376-0.450
12.7	1/2(0.500)	11.45-13.33	0.451-0.525

3.4. Squareness. For panel siding, the difference between lengths of the face diagonals shall not differ by more than 1.3 mm/m(1/64 in/ft). For lap and panel siding, opposite sides of the siding shall not vary in length more than 3.2 mm(1/8 in).

3.5. Physical Properties. The siding shall be manufactured primarily of interfelted ligno-cellulosic fibers, consolidated under heat and pressure in a hot-press to a density of not less than 500 kg/m^3(31 lbs/ft^3) and shall have the properties specified in Table 2 when tested in accordance with the test methods indicated therein. Specimens shall be selected for testing as diagrammed in Figure 1.

3.6. Linear Expansion. With the adoption of this Standard, the specific relative humidity range for measuring Linear Expansion is 30 to 80%. Values for 30 to 90% have been left in this revision to allow a transition period. The 30 to 90% values will be deleted during the next revision. It is not intended that the test be run at both relative humidity ranges. When reviewing Linear Expansion data, it is essential to know which range was used so that the matching requirement in Table 2 is applied.

4. INSPECTION AND TEST PROCEDURES

4.1. Weatherability of Substrate

A. Apparatus
1. Forced – air circulation[4] oven capable of 105°C±3°(220°F±5°).
2. Micrometer reading to 0.02 mm (0.001 in) with an anvil diameter of 19 mm(3/4 in).
3. Water bath capable of holding a minimum of 50 mm(2 in) of distilled water at 38°C±3° (100°F±5°).
4. Freezer maintained at -15°C ± 3° (5°F±6°).
5. Rack capable of suspending test specimens in water bath to a depth of 25mm±3.2mm (1 in±1/8 in).

[1] *Other Standards cover:*
a. Basic Hardboard ANSI/AHA A135.4
b. Prefinished Hardboard Paneling ANSI/AHA A135.5

[2] *Later issues of this publication may be used providing the requirements are applicable and consistent with the issue designated. Copies are obtainable from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428.*

[3] *For embossed products, replace Paragraph 160 in ASTM D1037 with the following: Take two measurements on each sample. Each measurement should be taken at the highest point along 25mm(1 in) lines which are perpendicular to the long edges of the sample. These lines shall be at the mid points of the edges and extend in from the sample edges 25mm(1 in) The two measurements should be averaged for each sample.*

[4] *Minimum circulation rate is to be 7100 L/min. (250 ft^3/min).*

B. Test Specimen

Specimen shall be a nominal 50mm (2 in) by at least 150mm(6 in) with no primer on test edges Remove any primer from edges by sawing away 3.2 mm(1/8 in).

C. Procedure

1. Condition specimen to equilibrium moisture content at 50%±2% relative humidity and 20°C±3° (68°F±5°).
2. Measure the thickness of the edge to be submerged at the center of the 50mm(2 in) dimension with micrometer anvil centered on the edge of the specimen so that repeatable measurements can be taken. Record the measurement to the nearest 0.02mm(0.001 in).
3. Suspend specimen in vertical position with the measured end in water bath to a depth of 25mm (1 in). Specimens should be no closer than 6.4mm(1/4 in) from each other or the container wall.
4. Cycle specimen in the following sequence:
   a. Immerse the measured end of the specimen in 38°C(100°F) distilled water for 18-1/2 hours.
   b. Place specimen in 105°C(220°F) oven for 30 minutes.
   c. Place specimen in freezer at 15°C (5°F) for 2 hours.
   d. Place specimen in 105°C(220°F) oven for 30 minutes.
   e. Place specimen in freezer at 15°C (5°F) for 2 hours.
   f. Place specimen in 105°C(220°F) oven for 30 minutes.
5. Repeat cycle an additional 5 times using fresh distilled water at the start of each cycle.
6. After 6 complete cycles, condition specimen to equilbrium moisture content at 50%±2% relative humidity and 20°C±3° (68°F±5°).
7. Measure thickness as in paragraph C.2., calculate and report average percent residual swell using the following formula:

$$\% \text{ Residual Swell} = \frac{100(C_F - C_I)}{C_I}$$

where: C_I=Conditioned Initial Thickness

C_F=Conditioned Final Thickness

Note: Should scheduling necessitate a hold in the test cycle, it must be done at the conclusion of 4.f. Specimens shall be sealed in a plastic bag at room temperature.

4.2. Weatherability of Primed Substrate[5]

A. Apparatus

A weathering appliance of type D or DH as described in ASTM G23-95 *Practice for Operating Light and Water-Exposure Apparatus (Carbon-Arc Type) for Exposure of Nonmetallic Materials.*[6]

B. Procedure

1. The primed siding specimen shall be placed in the weathering appliance and tested for 3 weeks using the following cycle:
   a. Expose the specimen to 102 minutes of light only followed by 18 minutes of light with a spray.
   b. Repeat (a) for a total of 20 hours.
   c. Allow the specimen to rest for 4 hours.
   d. Repeat (a), (b), and (c) for 5 days and then allow the specimen to rest for 48 hours at a constant temperature of 20°C±3° (68°F±5°) and 50%±2% relative humidity. During this time period, specimens shall not come into direct contact with each other.
   e. Complete three 7 day cycles and then inspect as described in 4.2.C.
2. Clean the surface of the specimen prepared in paragraph B.1. with mineral spirits and allow it to dry. Make a cut at least 25mm (1 in) long through the finish with a sharp razor blade or equivalent.[7] Apply a piece of 19mm(3/4 in) wide flat-back masking tape[8] 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 25mm (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 where the finish ceases to be "picked up" by the tape.
3. With paint and siding specimens at 20°C±3° (68°F±5°), apply an acrylic latex paint using a No. 60 drawdown bar to give approximately 0.03 dry mm (1-1/2 dry mil) thickness. The paint shall be formulated in accordance with Rohm &Haas Formulation W-264-7. Allow the paint to dry for 24 hours.
4. Using the specimen prepared in paragraph B.3., repeat the adhesion test described in paragraph B.2.

[5]Unprimed products shall be primed before testing.

[6] See footnote 2.

[7]This test is applicable only to flat surfaces. If a textured product is to be tested, a flat area of the pattern should be selected. Trial cuts should be made until either the substrate becomes visible in the bottom of the cut or, in the case of intercoat adhesion, the underlying paint film becomes visible in the bottom of the cut. Disregard any cuts of improper depth, cutting at the edge of the cut, or excessive chipping next to the cut.

[8]The masking tape shall be less than one year old, have been properly stored, and shall have an adhesive strength of 55±6 g/mm(45±5 oz. per in) when tested in accordance with ASTM Test Method D-3330.

Table 2. Physical Properties of Hardboard Siding

Property	Requirement	Test Method
Water absorption, percent based on weight (max avg per panel)	12	Section 163 and 164.
Thickness swelling, percent (max avg per panel)	8	Section 163 and 164. For embossed products, use a 19mm (3/4 in) anvil on the micrometer.
Weatherability of substrate (max percent residual swell)	20	4.1. of this Standard. For embossed products, measure the thickness at a spot of no slope or minimal slope.
Weatherability of primed substrate	No checking, erosion, flaking or objectionable fiber raising. Adhesion -- Less then 3.2mm (0.125 in) of coating "picked up"	4.2. of this Standard.
Linear expansion 30-80% RH. (max percent) Specific Method	Nominal Thickness (in) / Maximum Linear expansion % 6.4 (1/4) 0.31 9.5 (3/8) 0.33 11.1 (7/16) 0.35 12.7 (1/2) 0.35	Sections 107-110 and Notes 38 and 39. -- Lap siding shall be cut parallel with the long dimension of the siding. Report maximum RH used.
Linear expansion 30-90% RH (max percent) Alternate Method	Nominal Thickness (in) / Maximum Linear expansion % 6.4 (1/4) 0.36 9.5 (3/8) 0.38 11.1 (7/16) 0.40 12.7 (1/2) 0.40	Sections 107-110 and Note 38. -- Lap siding shall be cut parallel with the long dimension of the siding. Report maximum RH used.
Nail-head pull-through, kg (lb) (min avg per panel)	68(150)	Section 54-60 except that specimens shall be tested in the dry condition. Three 6-penny (2.9mm 0.113 in) wire diameter & 5.3mm (17/64 in) head diameter nails shall be used per specimen. The nails shall be driven into the specimen at least 25mm (1 in) apart. The holding fixture shall consist of a plate with a 38mm (1-1/2in) diameter opening centered in it, and the speed of testing shall be at a rate of 3.2-4.5mm (0.125-0.175 in) per minute. For embossed products, disregard thickness.
Lateral nail resistance kg (lb) (min avg per panel)	68(150)	Sections 41-46 except that specimens shall be tested in the dry condition. One 8-penny (3.3mm 0.131 inch diameter) nail shall be used per specimen spaced 9.5mm (3/8 in) from any specimen edge[c]. Testing speed shall be 3.2-4.5mm (0.125-0.175 in) per minute. For embossed products, disregard thickness.
Modulus of rupture, MPa (psi) (min avg per panel)	12.4 (1800) for 9.5 (3/8 in), 11.1 (7/16 in), & 12.7mm (1/2 in) thick 20.7 (3000) for 6.4mm (1/4 in) thick	Sections 155-158 except that specimens of sidings having a nominal thickness of 11.1 & 11.7mm(7/16 & 1/2 in) shall have a span of 100mm (4 in) between supports.
Hardness kg (lb) (min avg per panel)	205(450)	Sections 68-73. For embossed products, conduct test on backside only.
Impact mm (in) (min avg per panel)	225(9)	Sections 91-95 except that the initial drop shall be 225mm(9in). Failure shall be when a visible fracture occurs at the bottom surface of the specimen.
Moisture content[d], Percent	4-9 incl., and not more than 3 percent variance between any two boards in any one shipment or order.	Sections 165 and 166.

[a] Unless otherwise indicated, the test method reference pertains to sections in ASTM D1037-96. See footnote 2.

[b] Condition specimens as described in Section 150.

[c] Galvanized nails may bend; therefore, a steel carding pin or steel drill rod of the same diameter is recommended.

[d] 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 should specify a moisture content range more restrictive than 4 to 9 percent so that fluctuation in the moisture content of the siding will be kept to a minimum.

C. Inspection

Inspect for any visible defect including (checking, objectionable fiber raising, cracking, erosion or flaking) after 3 weeks. For the procedures described in paragraphs B.2. and B.4. note the amount of film removed.

5. DEFINITIONS

For the purpose of this Standard, the following definitions shall apply:

Checking - Slight breaks in the primer coat that do not penetrate to the substrate.

Cracking - Breaks in the primer coat which allow the substrate to become visible.

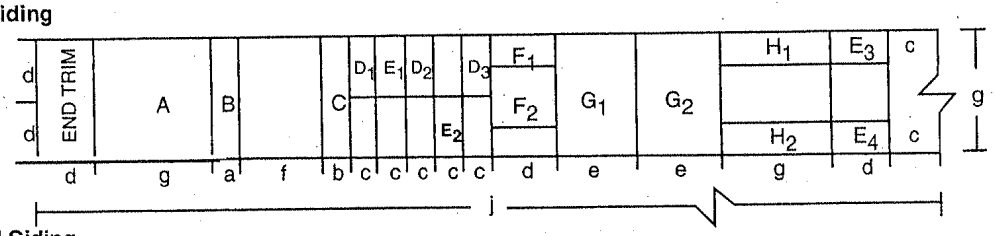
Erosion - The wearing away of the primer coat to expose the substrate.

Fiber Raising - The swelling of individual wood fibers on the board surface which causes them to be raised above the plane of the board surface.

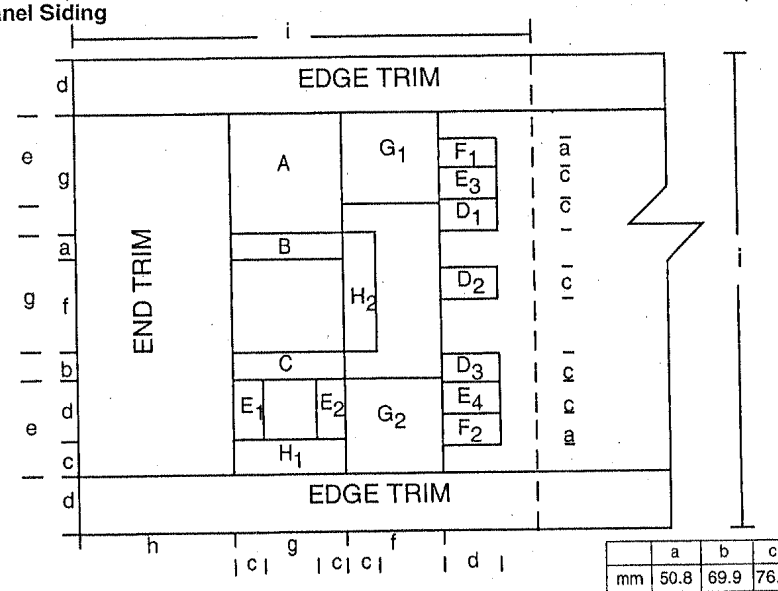
Flaking - The detachment of the primer coat from its substrate.

Figure 1. Test specimen cutting diagram for hardboard siding.[9]

Lap Siding



Panel Siding



A-Water absorption and thickness swelling
B-Weatherability of substrate
C-Weatherability of primed substrate
D-Nail-head pull-through and lateral nail resistance
E-Modulus of rupture and thickness
F-Hardness
G-Impact
H-Linear expansion

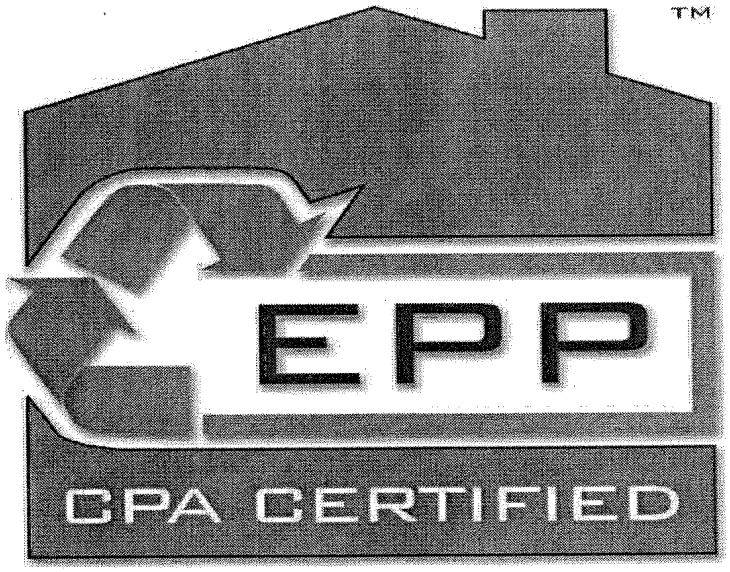
[9] Grooved sidings shall be cut so that all strength properties are tested on the ungrooved sections of the board. When lap siding is fabricated in narrower widths than shown in the cutting diagram, the specimens shall be the maximum width possible. Modulus of rupture specimens shall be long enough to provide for the required span plus 50mm(2 in).

Test Specimen Dimensions

	a	b	c	d	e	f	g	h	i	j
mm	50.8	69.9	76.2	152	229	254	305	406	1219	2438
in	2	2 3/4	3	6	9	10	12	16	48	96

COMPOSITE PANEL ASSOCIATION

ENVIRONMENTALLY PREFERABLE PRODUCT SPECIFICATION CPA 2-06



Approved by CPA Board of Directors
May 10, 2006

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CPA GRADEMARK CERTIFICATION PROGRAM ENVIRONMENTALLY PREFERABLE PRODUCT SPECIFICATION CPA 2-06; MAY 10, 2006

BACKGROUND

Environmentally preferable product, as defined by Federal Executive Order 13101, are "products and services (that) have a lesser or reduced effect on human health and the environment when compared to other products and services that serve the same purpose". Furthermore, various states have adopted policies promoting sustainability to "reduce adverse impacts on natural habitats and species". The Composite Panel Association (CPA) adopted this voluntary Environmentally Preferable Product Specification (EPPS) to promote the fulfillment of these goals. CPA will certify products to this EPPS within its ANSI accredited third party Grademark Certification Program.

PURPOSE

This EPPS has been developed to provide assurance that products conforming to it have been independently certified to meet certain environmentally preferable characteristics, including fiber usage and formaldehyde emissions. Certification to these criteria assures the consumer that these products exhibit enhanced environmentally friendly characteristics.

SCOPE

This EPPS applies to all grades of particleboard, medium density fiberboard (MDF) and hardboard that have been engineered and produced for all applications. This EPPS defines particleboard, MDF and hardboard, classifies all acceptable fiber types used in the production of particleboard, MDF and hardboard, and establishes maximum formaldehyde emission limits.

DEFINITIONS

Particleboard

"A generic term for a composite panel primarily composed of cellulosic materials (usually wood), generally in a form of discrete pieces or particles, as distinguished from fibers, bonded together with a bonding system, and which may contain additives." Reference: ANSI 208.1 – 1999.

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Medium Density Fiberboard

"A composite panel products composed primarily of cellulosic fibers and a bonding system cured under heat and pressure. MDF density is typically between 500 kg/m^3 (31 lbs/ft^3) and 1000 kg/m^3 (62 lbs/ft^3)." Reference: ANSI 208.2 - 2002.

Hardboard

"Hardboard is a panel manufactured primarily from inter-felted lignocellulosic fibers which are consolidated under heat and pressure in a hot press to a density of 500 kg/m^3 (31 lbs/ft^3) or greater. Others materials may be added to improve certain properties, such as stiffness, hardness, finishing properties, resistance to abrasion and moisture, as well as to increase strength, durability, and utility." Reference: ANSI A135.4-2004, ANSI A135.5-2004, ANSI A135.6-1998.

FIBER CLASSIFICATION

This EPPS recognizes the environmental benefits of utilizing the variety of fiber source opportunities available today, which include both wood based and non-wood based cellulose fiber, and follows the U.S. Government guidelines on the classification of raw materials used in the manufacturing sector. Specifically, the Federal Trade Commission (FTC) has defined recycled materials as follows:

> "Materials that have been recovered or otherwise diverted from the solid waste stream, either during the manufacturing process (pre-consumer), or after consumer use (post-consumer). To the extent the source of recycled content includes pre-consumer material, the manufacturer or advertiser must have substantiation for concluding that the pre-consumer material would otherwise have entered the solid waste stream. In asserting a recycled content claim, distinctions may be made between pre-consumer and post-consumer materials. Where such distinctions are asserted, any express or implied claim about the specific pre-consumer or post-consumer content of a product or package must be substantiated." Reference: Federal Register 16 CFR Part 260.

Further, the U.S. Environmental Protection Agency (EPA) defines recovered materials as follows:

> "Waste materials and by-products which have been recovered or diverted from solid waste, but does not include those materials and

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by-products generated from, and commonly reused within, an original manufacturing process." Reference: 42 U.S.C. 6903 (19).

Based on these definitions, the following fiber classifications represent the acceptable fiber types covered by this EPPS used in the manufacture of composite panel products:

Recycled Fiber

Pre-Consumer Recycled includes fiber generated as a waste from manufacturing and converting processes such as scrap, trimmings and cuttings that have been diverted from the solid waste stream following the manufacturing and converting process. This material must have undergone processing before becoming a waste to be included in this category. Examples of this category include planer shavings, plytrim, sawdust, fines, chips and bagasse.

Post-Consumer Recycled includes fiber from products that have completed their life as a consumer item and have been diverted or recovered from the solid waste stream after having been used and/or disposed of by the consumer following their intended use. Examples of this category include used pallets, recycled furniture and cabinet waste, construction waste and demolition waste.

Recovered Fiber

Fiber in this category has been recovered as a by-product of an agricultural crop or public/private tree maintenance program where the fiber generated is used on a secondary basis not related to the original agricultural or ornamental function. For definitional purposes, this fiber has been sub-categorized as wood and non-wood.

Wood Fiber is generated from the removal of woody biomass from both urban and non-urban sources as part of a management prescription, maintenance or hazard tree program, pre-commercial thinning or salvage operation where the removal of such fiber does not adversely affect soil nutrient or structure. Examples of this category include fruit tree pruning's, park tree removal, logging slash and culled timber.

Non-Wood Fiber is generated as a by-product of an agricultural crop where the cellulose is other than woody biomass. Removal of this fiber must not adversely affect soil nutrients or structure. Examples of

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this category include straw from wheat, rice, barley or other cereal/grain operations.

Fiber omitted from this specification is fiber generated from the harvest of commercial timber for the sole purpose of converting that timber into chips, shavings or sawdust to then be used in the manufacture of composite panel products. Commercial timber is defined as timber that can be used to produce lumber or plywood. This restriction only applies to the main bole of the tree and does not include the slash or other recoverable by-product resulting from timber harvesting.

FIBER REQUIREMENT

100% of the fiber used in products certified, as conforming to this EPPS, must be either recycled fiber, recovered fiber or a combination of both, as described in this EPPS.

FORMALDEHYDE EMISSIONS REQUIREMENT

The formaldehyde emission requirements for this specification have been approved by the CPA Board of Directors and may change from time to time. The effective date for compliance to this new emission requirement is July 1, 2006. The emission levels are considered preferable because they reflect a lower level compared to the ANSI A208.1-1999 Table A and ANSI A208.2-2002 standards.

Unfinished Particleboard. Formaldehyde emissions from unfinished particleboard must be less than or equal to 0.20 ppm using the Large Chamber Test Method (ASTM E1333). Particleboard products will be evaluated at the typical loading rate for particleboard of 0.13 ft^2/ft^3. Particleboard that uses a bonding system other than Urea Formaldehyde, may qualify for "Exempted" status under section 6.3 of the EPP Grademark Manual. One exception to this requirement is for Grade LD of ANSI A208.1-1999 (Door Core) products. Grade LD is allowed a loading ratio of 0.04 ft^2/ft^3 as per section 3.4 of ANSI A208.1-1999.

Unfinished MDF. Formaldehyde emissions from unfinished MDF must be less than or equal to 0.20 ppm using the Large Chamber Test Method (ASTM E1333). MDF products will be evaluated at the typical loading rate for MDF of 0.08 ft^2/ft^3. Special arrangements will be made for MDF manufacturers who wish to have the MDF tested at the higher loading ratio of 0.13 ft^2/ft^3. MDF that uses a bonding system other than Urea Formaldehyde, may qualify for "Exempted" status under section 6.3 of the EPP Grademark Manual.

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Hardboard. Formaldehyde emissions from unfinished hardboard must be less than or equal to 0.20 ppm using the Large Chamber Test Method (ASTM E1333). There are no specifications in the three relevant hardboard standards (ANSI A135.4, ANSI A135.5, ANSI A135.6) that require or recommend a loading ratio for hardboard products. Hardboard is most similar to MDF and will be tested with the loading ratio of MDF at 0.08 ft^2/ft^3. Hardboard that uses a bonding system other than Urea Formaldehyde, may qualify for "Exempted" status under section 6.3 of the EPP Grademark Manual.

This EPPS CPA 2-06 was approved by the CPA Board of Directors on May 10, 2006, has an effective date of July 1, 2006 and supersedes EPPS version CPA 1-02.

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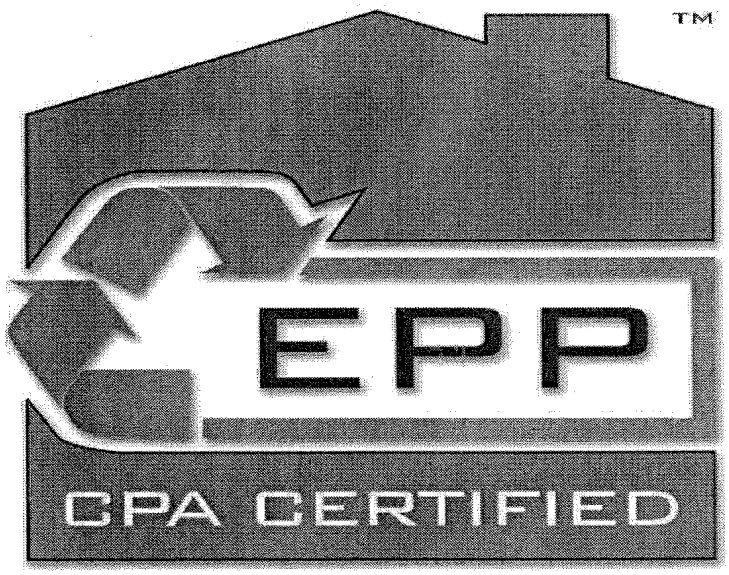
COMPOSITE PANEL ASSOCIATION

ENVIRONMENTALLY PREFERABLE PRODUCT SPECIFICATION CPA 2-06



Approved by CPA Board of Directors
May 10, 2006

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CPA GRADEMARK CERTIFICATION PROGRAM
ENVIRONMENTALLY PREFERABLE PRODUCT
SPECIFICATION CPA 2-06; MAY 10, 2006

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Medium Density Fiberboard

"A composite panel products composed primarily of cellulosic fibers and a bonding system cured under heat and pressure. MDF density is typically between 500 kg/m^3 (31 lbs/ft^3) and 1000 kg/m^3 (62 lbs/ft^3)." Reference: ANSI 208.2 – 2002.

Hardboard

"Hardboard is a panel manufactured primarily from inter-felted lignocellulosic fibers which are consolidated under heat and pressure in a hot press to a density of 500 kg/m^3 (31 lbs/ft^3) or greater. Others materials may be added to improve certain properties, such as stiffness, hardness, finishing properties, resistance to abrasion and moisture, as well as to increase strength, durability, and utility." Reference: ANSI A135.4-2004, ANSI A135.5-2004, ANSI A135.6-1998.

FIBER CLASSIFICATION

This EPPS recognizes the environmental benefits of utilizing the variety of fiber source opportunities available today, which include both wood based and non-wood based cellulose fiber, and follows the U.S. Government guidelines on the classification of raw materials used in the manufacturing sector. Specifically, the Federal Trade Commission (FTC) has defined recycled materials as follows:

> "Materials that have been recovered or otherwise diverted from the solid waste stream, either during the manufacturing process (pre-consumer), or after consumer use (post-consumer). To the extent the source of recycled content includes pre-consumer material, the manufacturer or advertiser must have substantiation for concluding that the pre-consumer material would otherwise have entered the solid waste stream. In asserting a recycled content claim, distinctions may be made between pre-consumer and post-consumer materials. Where such distinctions are asserted, any express or implied claim about the specific pre-consumer or post-consumer content of a product or package must be substantiated." Reference: Federal Register 16 CFR Part 260.

Further, the U.S. Environmental Protection Agency (EPA) defines recovered materials as follows:

> "Waste materials and by-products which have been recovered or diverted from solid waste, but does not include those materials and

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by-products generated from, and commonly reused within, an original manufacturing process." Reference: 42 U.S.C. 6903 (19).

Based on these definitions, the following fiber classifications represent the acceptable fiber types covered by this EPPS used in the manufacture of composite panel products:

Recycled Fiber

Pre-Consumer Recycled includes fiber generated as a waste from manufacturing and converting processes such as scrap, trimmings and cuttings that have been diverted from the solid waste stream following the manufacturing and converting process. This material must have undergone processing before becoming a waste to be included in this category. Examples of this category include planer shavings, plytrim, sawdust, fines, chips and bagasse.

Post-Consumer Recycled includes fiber from products that have completed their life as a consumer item and have been diverted or recovered from the solid waste stream after having been used and/or disposed of by the consumer following their intended use. Examples of this category include used pallets, recycled furniture and cabinet waste, construction waste and demolition waste.

Recovered Fiber

Fiber in this category has been recovered as a by-product of an agricultural crop or public/private tree maintenance program where the fiber generated is used on a secondary basis not related to the original agricultural or ornamental function. For definitional purposes, this fiber has been sub-categorized as wood and non-wood.

Wood Fiber is generated from the removal of woody biomass from both urban and non-urban sources as part of a management prescription, maintenance or hazard tree program, pre-commercial thinning or salvage operation where the removal of such fiber does not adversely affect soil nutrient or structure. Examples of this category include fruit tree pruning's, park tree removal, logging slash and culled timber.

Non-Wood Fiber is generated as a by-product of an agricultural crop where the cellulose is other than woody biomass. Removal of this fiber must not adversely affect soil nutrients or structure. Examples of

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this category include straw from wheat, rice, barley or other cereal/grain operations.

Fiber omitted from this specification is fiber generated from the harvest of commercial timber for the sole purpose of converting that timber into chips, shavings or sawdust to then be used in the manufacture of composite panel products. Commercial timber is defined as timber that can be used to produce lumber or plywood. This restriction only applies to the main bole of the tree and does not include the slash or other recoverable by-product resulting from timber harvesting.

FIBER REQUIREMENT

100% of the fiber used in products certified, as conforming to this EPPS, must be either recycled fiber, recovered fiber or a combination of both, as described in this EPPS.

FORMALDEHYDE EMISSIONS REQUIREMENT

The formaldehyde emission requirements for this specification have been approved by the CPA Board of Directors and may change from time to time. The effective date for compliance to this new emission requirement is July 1, 2006. The emission levels are considered preferable because they reflect a lower level compared to the ANSI A208.1-1999 Table A and ANSI A208.2-2002 standards.

Unfinished Particleboard. Formaldehyde emissions from unfinished particleboard must be less than or equal to 0.20 ppm using the Large Chamber Test Method (ASTM E1333). Particleboard products will be evaluated at the typical loading rate for particleboard of 0.13 ft^2/ft^3. Particleboard that uses a bonding system other than Urea Formaldehyde, may qualify for "Exempted" status under section 6.3 of the EPP Grademark Manual. One exception to this requirement is for Grade LD of ANSI A208.1-1999 (Door Core) products. Grade LD is allowed a loading ratio of 0.04 ft^2/ft^3 as per section 3.4 of ANSI A208.1-1999.

Unfinished MDF. Formaldehyde emissions from unfinished MDF must be less than or equal to 0.20 ppm using the Large Chamber Test Method (ASTM E1333). MDF products will be evaluated at the typical loading rate for MDF of 0.08 ft^2/ft^3. Special arrangements will be made for MDF manufacturers who wish to have the MDF tested at the higher loading ratio of 0.13 ft^2/ft^3. MDF that uses a bonding system other than Urea Formaldehyde, may qualify for "Exempted" status under section 6.3 of the EPP Grademark Manual.

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Hardboard. Formaldehyde emissions from unfinished hardboard must be less than or equal to 0.20 ppm using the Large Chamber Test Method (ASTM E1333). There are no specifications in the three relevant hardboard standards (ANSI A135.4, ANSI A135.5, ANSI A135.6) that require or recommend a loading ratio for hardboard products. Hardboard is most similar to MDF and will be tested with the loading ratio of MDF at 0.08 ft^2/ft^3. Hardboard that uses a bonding system other than Urea Formaldehyde, may qualify for "Exempted" status under section 6.3 of the EPP Grademark Manual.

This EPPS CPA 2-06 was approved by the CPA Board of Directors on May 10, 2006, has an effective date of July 1, 2006 and supersedes EPPS version CPA 1-02.

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