American National Standard

Engineered Wood Trim

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ANSI A135.7-2012 (R2020)

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American National Standard

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Abstract

This Standard covers requirements and methods of testing for the properties of Engineered Wood Trim intended to be used as architectural trim. While primarily for exterior applications, these products can also be used indoors.

Foreword

(This Foreword is not a part of the American National Standard for Engineered Wood Trim.)

Engineered Wood Trim is a wood based product used for both interior and exterior trim for building construction. Engineered Wood Trim is produced in many of the thicknesses and profiles associated with traditional solid lumber trim. The surfaces may be smooth or textured and are normally factory primed.

The Standard was originally approved by ANSI in 2012. Engineered Wood Trim is an exterior composite trim that is a non-load bearing architectural trim used primarily as soffit, fascia, band boards and door and window trim. It is not to be used as a structural material and has no structural performance require-ments. In the absence of a specific trim standard, some composite trim manufacturers have manufactured their products to meet or exceed ANSI A135.6-2006, the Hardboard Siding Standard. The trim standard is a specific standard for composite trim to clarify and distinguish it from other exterior wood product standards. This 2020 reaffirmation contains no substantive changes to the 2012 standard.

The development of the American National Standard for Engineered Wood Trim 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.

Consensus for this Standard was achieved by use of the ANSI Canvass Method. The following organizations, recognized as having an interest in Engineered Wood Trim standards, were contacted prior to the approval of this Standard. Inclusion in this list does not necessarily imply that the organization concurred with the proposed Standard as submitted to ANSI.

APA —The Engineered Wood Association

Collins Products, LLC

Element Materials Technology

ICC-ES Evaluation Services, LLC

JELD-WEN

Louisiana-Pacific Corporation

Masonite International

National Association of Home Builders

Uniboard Canada Inc.

University of Minnesota

1. SCOPE

This Standard covers requirements and methods of testing for the dimensions and physical properties of Engineered Wood Trim at the time of manufacture. Compliance with this Standard should not be interpreted as a guarantee for flawless performance under all conditions for either a specified or an indefinite period of time.

2. DEFINITIONS

2.1. Engineered Wood Trim is manufactured primarily from inter-felted lignocellulosic fibers that 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. Trim is the woodwork in the finish of a building especially around openings and at corners that is intended to be decorative and/or provide protection for joints covered by the product. Typical exterior trim includes corner boards, fascia, brick mold and window trim. Because Engineered Wood Trim is not intended to be used as a structural material, it has no structural load-bearing performance requirements.

2.3. Laminated trim consists of two or more layers of Engineered Wood Trim glued together to form a product of the specified thickness. Some trim is manufactured without laminating.

3. REQUIREMENTS

3.1. General. All Engineered Wood Trim 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.

Annex A contains a suggested specimen cutting diagram (Figure 1) and shall be used as guidance for selecting test specimens whenever possible. Throughout this Standard, the metric values represent the standard and English values are offered in parentheses for informational purposes.

3.2. Surface Finish. Engineered Wood Trim is produced with a variety of surface textures. The exposed face and sides shall be factory primed. Ends and backs of the trim may also be factory primed.

3.3. Properties. Engineered Wood Trim covered by this standard shall fall into one of two performance grades: Grade 1 or Grade 2. Required properties for Grade 1 and Grade 2 of Engineered Wood Trim are shown in Table 1. Note that Grade 2 has stricter performance requirements than Grade 1.

3.4. Glue Line Durability. When present, glue lines shall be tested in accordance with the method outlined in section 4.3.

3.5. Identification. All Engineered Wood Trim represented as conforming to this Standard shall be identified with the reference ANSI A135.7 either directly on the product, on the product packaging, or on the appropriate shipping documents.

4. TEST PROCEDURES

4.1. Weatherability of Substrate (Engineered Wood Trim)

A) Apparatus.
Forced-air circulation oven capable of 105°C±3° (220°F±5°).

1) Minimum circulation rate is to be 7.1 m^3/min. (250ft^3/min).
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 depth of 50 mm(2 in) of distilled water at 38°C±3°(100°F±5°).
4) Freezer maintained at -15°C ± 3°(5°F±5°).
5) Rack capable of suspending test specimens in water bath to a depth of 25 mm±3.2 mm (1 in ± 1/8 in).

B) Test Specimen
Specimen shall be 50 mm (2 in) by at least 150 mm (6 in) with no primer on test edges. The dimensions of the specimen shall be measured to an accuracy of ±0.3%. 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 50 mm (2 in) dimension with micrometer anvil centered on the 2-inch end of the specimen so that repeatable measurements can be taken. Record the measurement to the nearest 0.02 mm(0.001 in).

3) Suspend specimen in vertical position with measured end in water bath to a depth of 25 mm (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 18.5 hours.

   b) Place specimen in an oven set at 105°C(220°F) for 30 minutes.

   c) Place specimen in freezer at -15°C (5°F) for 2 hours.

   d) Place specimen in an oven set at 105°C(220°F) for 30 minutes.

   e) Place specimen in freezer at -15°C (5°F) for 2 hours.

   f) Place specimen in an oven set at 105°C(220°F) 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 equilibrium moisture content at 50%±2% relative humidity and 20°C±3° (68°F±5°).

7) Measure thickness as in paragraph 4.1.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 4.1.C.4.f. Specimens shall be sealed in a plastic bag at room temperature (20°C±3°, 68°F±5°).

4.2. Weatherability of Primed Substrate[1]**.** Unprimed products shall be primed before testing. This test is not applicable to factory prefinished product. 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 or excessive chipping next to the cut.

A) Apparatus
A weathering appliance of type D or DH as described in ASTM G153-04, “Standard Practice for Operating Enclosed Carbon Arc Light Apparatus Exposure of Nonmetallic Materials”.

B) Procedure

1) The primed trim 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 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.

A1.) Alternate Apparatus Alternate method for using Xenon arc weatherometer, per ASTM G155-05a, “Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials.

B1.) Procedure

1) The primed trim specimen shall be placed in the weathering appliance and tested for 300 cumulative hours using the following cycle:

   a) Expose the specimen to 102 minutes of light only followed by 18 minutes of light with a water spray.

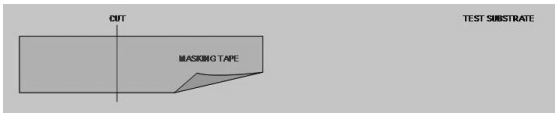
   b) Remove the specimen from the weathero-meter and allow the specimen to rest for at least 48 hours at a constant temperature of 20°C±3° (68°F±5°) and 50%+2% relative humidity. During this time period, specimens shall not come into direct contact with each other.

   c) Inspect as described in 4.2.C.

[1] 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, curling at the edge of the cut, or excessive chipping next to the cut.

2) Clean the surface of the specimen prepared in paragraph B, and a control specimen A as follows. Following the appropriate safety precautions and using the appropriate safety equipment and ventilation, clean the *primed* surface of the specimen with regular mineral spirits (not low odor mineral spirits) as follows. Saturate an absorbent 100% cotton cheesecloth wipe[B] with mineral spirits. Let any excess solvent drip from the wipe prior to wiping, then immediately wipe the primed surface of the specimens with light manual pressure. Allow specimens to dry. Use a fresh wipe and solvent for each test area.

   Make a cut at least 25 mm (1 in) long into the test finish with a new sharp #11 X-ACTO blade mounted in an X-ACTO #1 precision blade holder C or equivalent.



   Apply a piece of 25 mm (1 in) wide flatback masking tape[D] perpendicular to the cut and press firmly in place by using the roller specified in ASTM D3330/D3330M-04, "Standard Test Method for Peel Adhesion of Pressure-Sensitive Tape[E]." Roll twice in each lengthwise direction; forward and back, twice.

   Allow the cut to extend beyond the edges of the tape and the tape to contact the finish for a distance of at least 50 mm (2 inches) on each side of the cut.

   Allow sufficient excess tape on one side, or extend the tape tab as needed with an additional length of tape, to perform a 90° peel adhesion. For interlaboratory comparison or when results are contested, conduct adhesion testing using a constant-rate-of-extension (CRE) tension or peel tester, per ASTM D3330/D3330M-04, "Standard Test Method for Peel Adhesion of Pressure-Sensitive Tape," Test Method F—Single Coated Tapes at 90° Angle.[F] Another option is 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. For either technique, measure the distance from the cut to where the finish ceases to be "picked up" by the tape. The surface is deemed flat when no light appears between the surface and a straight edge resting upon the surface.

3) With paint and smooth trim specimens at 20°C±3°C (68°F±5°C), apply an acrylic latex paint using a No. 60 wire wound rod drawdown bar to give 0.08 ± 0.03 dry mm (3 ± 1 mil dry) thickness. The paint shall be formulated in accordance with Rohm & Haas Formulation W-264-8. Allow the paint to dry for 7 (+2 / -0) days at 20°C±3° (68°F±5°) 50±5% RH. If the specimen's surface can not be coated evenly, use a 120 grit sanding block to chamfer the specimen's edge prior to applying the topcoat.

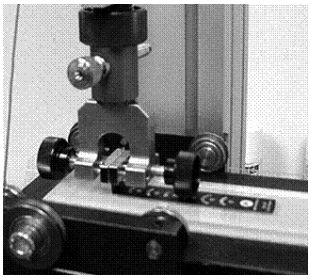
4) Using the specimen prepared in paragraph B.3., repeat the adhesion test described in paragraph B.2.

Note (A) Conducting paint adhesion testing on a control board, as well as an exposed board, will help determine if adhesion properties change as a result of exposure.

Note (B) The following product, or an equivalent, will meet this requirement: Fisherbrand Cheesecloth wipes, certified to be 100% pure cotton of reagent grade quality. Available from Fisher Scientific.

Note (C) X-ACTO #1 blade holder and #11 blades are available through many retail sources.

Note (D) The masking tape shall be procured within the past six months, have been properly stored at 21°±3°C (70°±5°F) & 50%±2% Relative Humidity, and shall have an adhesion to stainless steel strength of 7.1 ± 0.7 N/10mm (65 ± 6 oz. per in) when tested in accordance with ASTM Test Method D3330/D3330M-04, "Standard Test Method for Peel Adhesion of Pressure-Sensitive Tape." Per the manufacturer's specifications, 3M #250 Flatback Masking Tape meets these requirements, but adhesion strength should be verified within 7 days of all tests.



Note (E) ASTM D3330-04, section 6.4.1 A steel roller 85 ± 2.5 mm [3.25 ± 0.1 in.] in diameter and 45 ± 1.5 mm [1.75 ± 0.05 in.] in width, covered with rubber approximately 6 mm [0.25 in.] in thickness, having a Shore scale A durometer hardness of 80 ± 5." The surface shall be a true cylinder void of any convex or concave deviations. The mass of the roller shall be 2040 ± 45 g [4.5 ±0.1 lb]. 6.4.2 No part of the apparatus shall increase the mass of the roller during use. The roller shall move either mechanically or by hand at the rate of 10 ± 0.5 mm/s [24 ± 0.5 in./min]. A mechanically operated roller is recommended when results are contested.

Note (F) ASTM D3330-04, section 16.2 Double back the folded end of the tape at a 90° angle and peel 25 mm [1 in.] of the tape from the panel." Place the panel into a fixture clamped to the moving jaw of the adhesion tester so that it will maintain a peeling angle at 90° during the peeling of the next 75 mm [3 in.] of tape and the free end of the tape into the other jaw. Operate the moving jaw at 5.0 ± 0.2 mm/s [12 ± 0.5 in./min]. This method allows for an even uniform pulling of the test tape.

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.

D) Definitions For the purpose of this procedure, 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 the substrate or of the top coat from the primer coat.

4.3. Glue Line Durability

A) Test Specimen
A test sample shall consist of six (6) 50 mm by 50 mm (2 in by 2 in) test specimens. The dimensions of the specimen shall be measured to an accuracy of ±0.3%.

B) Procedure
The test specimens shall be completely submerged in boiling water for a period of 2 hours. Immediately following the 2 hour boil, the specimens shall be placed into a forced-air circulation oven at a temperature of 105°C±30 (220°F±5°F) for a period of 24 hours. After the 24 hour oven drying period, the samples shall be removed from the oven and allowed to cool prior to inspection.

C) Inspection
The test specimens shall be inspected for visual delamination or separation at the glue-line joints. If the joints appear to be intact on all 6 specimens, the test is considered to have passed. If any of the 6 specimens show complete glue-line delamination the test is considered to have failed.

Table 1.
Properties of Engineered Wood Trim

PROPERTY	GRADE 1 REQUIREMENT	GRADE 1 REQUIREMENT	TEST METHOD[a,b]
Water Absorption, percent based on weight (max avg. per panel)	12	10	Section 36. Submerge the specimens horizontally under water. Specimen size shall be 3″ x 6″.[c]
Thickness Swelling, percent (max avg. per panel)	8	5	Section 36. Use a 19 mm (3/4″) anvil on the micrometer. Submerge the specimens horizontally under water. Specimen size shall be 3″ x 12″.
Weatherability of Substrate, percent (max percent residual swell)	15	10	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. Less then 3.2 mm (0.125 in) of coating “picked up”.	Same	4.2 of this Standard.
Linear Expansion, 30-80% RH(max percent)	0.35	Same	Section 24 and Notes 47 and 48 Specimens shall be cut parallel with the long dimension of the trim.
Modulus of Rupture, MPa (psi) (min avg. per panel)	9.6(1,400)	Same	Section 33. Test 3 specimens parallel.
Moisture Content, (percent)[d]	4–9	Same	Section 37.
Glue line durability— Following Boil	No complete delamination on any individual specimen.	Same	4.3 of this Standard.
Nail-head pull-through, N (lb) (min avg per panel)	670 (150)	Same	Section 15 except that specimens shall be tested in the dry condition. Three 6-penny (2.9 mm, 0.113 in wire diameter) common nails shall be used per specimen. The nails shall be driven into the specimen at least 25mm (1in) apart. The holding fixture shall consist of a plate with a 38mm (1-1/2 in) diameter opening centered in it, and the speed of testing shall be at a rate of 3.2-4.5 mm (0.125-0.175 in) per minute. For embossed products, disregard thickness.

[a] Unless otherwise indicated, the test method reference pertains to sections in Part B of ASTM D 1037-06a Standard *Test Methods For Evaluating Properties of Wood-Base Fiber and Particle Panel Materials*

[b] Condition specimens as described in Section 6 of ASTM D 1037-06a.

[c] In cases of dispute regarding the amount of water absorbed, specimens of 12 inches in length shall be cut from lap widths that can yield widths closer to the 12 inch width specified in ASTM D 1037-06a.

[d] Since Engineered Wood Trim is a wood-based 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 more restrictive than four to nine percent so that fluctuations in the moisture content of the trim are kept to a minimum. A moisture content between four and nine percent shall be determined at the time of shipment from the manufacturer.

Annex A
(Informative)

Figure 1 TRIM CUTTING DIAGRAM

(Not To Scale)

Any available width greater than or equal to 88.9 mm (3½″)

---------- 1219 mm (48″) ----------

Piece A

1″ end trim and ¼″ edge trim

WA & TS 152.4 by 305 mm (6″ by 12″)	W of S 76.2 by 305 mm (3″ by 12″)	W of PS 76.2mm by 152 (3″ by 6″)	LE 76.2 by 305 mm (3″by 12″)	MC 76.2mm by 152 (3″ by 6″)

Pieces B, C and D

6 Glue Line Samples 50.8 by 50.8 mm (2″ by 2″, 2 per each Piece B,C,D)	Nail-head pull-through 76.2mm by 152mm (3″ by 6″) MOR 76.2 mm by 50.88 mm + (610xTKS) Max = 660 mm (3″ by 2″+(24xTKS) Max = 26″)

Note: A total of 6 glueline specimens shall be tested; 2 specimens from pieces B,C,and D.

COMPOSITE PANEL ASSOCIATION

Founded in 1960, the Composite Panel Association (CPA) is dedicated to advancing the North American wood–based panel and decorative surfacing industries. CPA represents both industries on technical, regulatory, quality assurance and product acceptance issues. CPA General Members include the leading manufacturers of particleboard, medium density fiberboard (MDF) and hardboard, representing about 95% of North American manufacturing capacity.

CPA Associate Members include manufacturers of decorative surfaces, furniture, cabinets, mouldings, doors and equipment, along with laminators, distributors, industry media and adhesive suppliers. All are committed to product advancement and industry competitiveness.