

# Public Review Draft

Proposed Addendum n to Standard 189.1-2017

# Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings

Second Public Review Draft (July 2019)  
(Draft Shows Proposed Changes to Current Standard)

This draft has been recommended for public review by the responsible project committee. To submit a comment on this proposed standard, go to the ASHRAE website at [www.ashrae.org/standards-research--technology/public-review-drafts](http://www.ashrae.org/standards-research--technology/public-review-drafts) and access the online comment database. The draft is subject to modification until it is approved for publication by the Board of Directors and ANSI. Until this time, the current edition of the standard (as modified by any published addenda on the ASHRAE website) remains in effect. The current edition of any standard may be purchased from the ASHRAE Online Store at [www.ashrae.org/bookstore](http://www.ashrae.org/bookstore) or by calling 404-636-8400 or 1-800-727-4723 (for orders in the U.S. or Canada).

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## Foreword

The first public review draft added the recent USEPA regulation on composite wood products, which requires that such products be certified as meeting CARB or USEPA guidelines for ultra-low-emitting formaldehyde resins or no-added-formaldehyde resins. The first public review draft also proposed new language to describe lab certification of composite wood and related products more consistently with other building products described in Section 8.4.2. In addition, the first draft clarified the language that relates to a building's weatherproofing system in 8.4.2.1, 8.4.2.2 and 8.5.2.

In response to the first public review, three new definitions were added, others edited, and changes were made to Exception 8.4.2.4 to specifically identify which products are exempted.

*[Note to Reviewers: This addendum makes proposed changes to the current standard. These changes are indicated in the text by underlining (for additions) and strikethrough (for deletions) except where ~~the reviewer~~ instructions specifically describe some other means of showing the changes. Only these changes to the current standard are open for review and comment at this time. Additional material is provided for context only and is not open for comment except as it relates to the proposed changes.]*

## Addendum n to 189.1-2017

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*Add new definitions to Section 3.2 as follows:*

**agrifiber product:** wheatboard or strawboard

**composite wood product:** hardwood plywood made with a veneer or composite core, particleboard, or medium density fiberboard (MDF).

**hardwood plywood:** a hardwood or decorative panel that is intended for interior use and composed of (as determined under ANSI/HPVA HP-1) an assembly of layers or plies of veneer, joined by an adhesive with a lumber core, a particleboard core, a medium density fiberboard core, a hardboard core, a veneer core, or any other special core or special back material. Hardwood plywood does not include military-specified plywood, curved plywood, or any plywood specified in PS-1, or PS-2.

**laminated product:** products in which a wood or woody grass veneer is affixed to a particleboard core or platform, a medium-density fiberboard core or platform, or a veneer core or platform.

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**medium-density fiberboard:** a panel composed of cellulosic fibers made by dry forming and pressing a resinated fiber mat (as determined under ANSI A208.2).

**particleboard:** a panel composed of cellulosic material in the form of discrete particles (as distinguished from fibers, flakes, or strands) that are pressed together with resin (as determined under ANSI A208.1). Particleboard does not include any product specified in PS-2, Performance Standard for Wood-Based Structural-Use Panels.

Revise Section 8.4.2.4 as follows:

**8.4.2.4 Composite Wood Products, Agrifiber Products, ~~Wood Structural Panels~~Hardwood Plywood Products, and AgrifiberLaminated Products.** ~~Composite wood, wood structural panel, and agrifiber products used on the interior of the building (defined as inside of the weatherproofing system) shall contain no added urea-formaldehyde resins. Laminating adhesives used to fabricate on site and shop applied composite wood and agrifiber assemblies shall contain no added ureaformaldehyde resins. Composite wood and agrifiber products are defined as follows: particleboard, medium density fiberboard (MDF), wheatboard, strawboard, panel substrates, and door cores. Materials considered furniture, fixtures, and equipment (FF&E) are not considered base building elements and are not included in this requirement. Emissions for products covered by this section shall be determined according to, and~~ Composite wood products, agrifiber products, hardwood plywood products, and laminated products used inside of the building's weatherproofing system shall comply with one of the following:

- a. For products other than those listed under Exception 1 below and laminated products (Third-party certification shall verify that these products meet the requirements for “Ultra-Low-Emitting Formaldehyde Resins” or “No-Added Formaldehyde-Based Resins” as defined by be submitted indicating compliance with the California Air Resource Board’s (CARB) regulation, Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products. Third-party certifiers shall be approved by CARB.
- b. For products other than those listed under Exception 1 below, third-party certification shall verify that these products meet the requirements for “Ultra-Low Emitting Formaldehyde Resins” or “No-Added Formaldehyde Resins” as defined by the United States Environmental Protection Agency’s (USEPA) regulation, Formaldehyde Standards for Composite Wood Products. Third-party certifiers shall be recognized by USEPA.
- c. b. For all products, emissions shall be determined according to CDPH/EHLB/Standard Method V1.24 (commonly referred to as California Section 01350) and shall comply with the limit requirements for either office or classroom spaces, regardless of the space type. The emissions testing shall be performed by an ISO/IEC 17025 accredited laboratory that has the CDPH/EHLB/Standard Method V.1.2, USEPA Method TO-17 and ASTM Standard Method D5197 within the scope of its accreditation. Third-party certifiers shall be accredited to ISO/IEC 17065 and have the relevant certification program in the scope of accreditation.

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Laminating adhesives applied on-site to fabricate assemblies of composite wood products and agrifiber products shall contain only no-added formaldehyde resins.

**Exceptions to 8.4.2.4:**

1. Structural panel components such as plywood, particle board, wafer board, and oriented strand board conforming to PS-1 or PS-2 and manufactured with moisture resistant adhesive for “Exposure 1” or “Exterior” application as indicated on the panel. Structural composite wood products made with moisture resistant adhesives complying with ASTM D2559 or labeled as bond classification Exposure 1 or Exterior, having no surface treatments with added urea-formaldehyde resins or coatings, and certified according to one of the following industry standards:
  - a. Plywood: PS-1, PS-2, or AS/NZS 2269, BS EN 636, CSA O121, CSA O151, CSA O153, or CSA O325
  - b. Oriented strand board: PS-2 or labeled as bond classification Exposure 1 or Exterior
  - c. Structural composite lumber: ASTM D5456
  - d. Glued laminated timber: ANSI A190.1
  - e. I-joists: ASTM D5055
  - f. Cross-laminated timber: PRG 320
  - g. Finger-jointed lumber: labeled “Heat Resistant Adhesive (HRA)” in accordance with DOC PS-20
2. Office furniture systems and seating.

*Revise Section 8.4.2.1 as follows:*

**8.4.2.1 Adhesives and Sealants.** Products in this category include carpet, resilient, and wood flooring adhesives; base cove adhesives; ceramic tile adhesives; drywall and panel adhesives; aerosol adhesives; adhesive primers; acoustical sealants; firestop sealants; HVAC air duct sealants; sealant primers; and caulks. All adhesives and sealants used ~~on the interior of the building (defined as inside of the weatherproofing system and applied on-site)~~ shall comply with the requirements of either Section 8.4.2.1.1 or 8.4.2.1.2.

*Revise Section 8.4.2.2 as follows:*

**8.4.2.2 Paints and Coatings.** Products in this category include anticorrosive coatings, basement specialty coatings, concrete/masonry sealers, concrete curing compounds, dry fog coatings, faux-finishing coatings, fire-resistive coatings, flat and nonflat topcoats, floor coatings, graphic arts (sign) coatings, high-temperature coatings, industrial maintenance coatings, low-solids coatings, mastic texture coatings, metallic pigmented coatings, multicolor coatings, pretreatment wash primers, primers, reactive penetrating sealers, recycled coatings, shellacs (clear and opaque), specialty primers, stains, stone consolidants, swimming-pool coatings, tub- and tile-refining coatings, undercoaters, waterproofing membranes, wood coatings (clear wood finishes), wood preservatives, and

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zinc primers. Paints and coatings used ~~on the interior of the building (defined as inside of the weatherproofing system and applied on-site)~~ shall comply with either Section 8.4.2.2.1 or 8.4.2.2.2.

*Revise Section 8.5.2 as follows:*

**8.5.2 Materials.** The emissions of all the materials listed below and used ~~within the building (defined as inside of the weatherproofing system and applied on-site)~~ shall be modeled for individual VOC concentrations. The sum of each individual VOC concentration from the materials listed below shall be shown to be in compliance with the limits as listed in CDPH/EHLB/Standard Method V1.1 (commonly referred to as California Section 01350), Section 4.3, and shall be compared to 100% of its corresponding listed limit. In addition, the modeling for the building shall include, at a minimum, the criteria listed in Normative Appendix D of this standard. Emissions of materials used for modeling VOC concentrations shall be obtained in accordance with the testing procedures of CDPH/EHLB/Standard Method V1.1 unless otherwise noted below.

*Modify Chapter 11 Normative References as follows:*

<b>ASTM International</b> <b>100 Barr Harbor Dr.</b> <b>West Conshohocken, PA 19428-2959, United States</b> <b>1-610-832-9585; <a href="http://www.astm.org">www.astm.org</a></b>		
<u>ASTM D5456-18</u>	<u>Standard Specification for Evaluation of Structural Composite Lumber Products</u>	<u>8.4.2.4</u>
<u>ASTM D5055-16</u>	<u>Standard Specification for Establishing and Monitoring Structural Capacities of Prefabricated Wood I-Joists</u>	<u>8.4.2.4</u>
<u>ASTM D2559-12a (2018)</u>	<u>Standard Specification for Adhesives for Bonded Structural Wood Products for Use Under Exterior Exposure Conditions</u>	<u>8.4.2.4</u>
<b><u>APA, The Engineered Wood Association</u></b> <b><u>7011 S. 19th Street, Tacoma, WA 98466-5333</u></b> <b><u>(253) 565-6600; <a href="http://www.apawood.org">www.apawood.org</a></u></b>		
<u>ANSI A190.1-2017</u>	<u>Standard for Wood Products-Structural Glued Laminated Timber</u>	<u>8.4.2.4</u>
<u>ANSI/APA PRG 320-2018</u>	<u>Standard for Performance-Rated Cross-Laminated Timber</u>	<u>8.4.2.4</u>
<b>California Air Resources Board (CARB)</b> <b>1001 "T" Street</b> <b>P.O. Box 2815</b>		

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<p><b>Sacramento, CA 95812, United States</b>  <b>1-916-322-2990; <a href="http://www.arb.ca.gov/homepage.htm">www.arb.ca.gov/homepage.htm</a></b></p>		
<p>No-Added Formaldehyde Based Resins  <u>California Code of Regulations, Title 17, Sections 93120-93120.12</u></p>	<p>Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products. <del>California Code of Regulations, Title 17, Sections 93120-93120.12</del></p>	<p>8.4.2.4</p>
<p><b><u>Composite Panel Association,</u></b>  <b><u>19465 Deerfield Avenue, Suite 306,</u></b>  <b><u>Leesburg, Virginia 20176,</u></b>  <b><u>(703) 724-1128; <a href="http://www.compositepanel.org/contact-us/">www.compositepanel.org/contact-us/</a></u></b></p>		
<p><u>ANSI A208.1-2016</u></p>	<p><u>Particleboard</u></p>	<p><u>8.4.2.4</u></p>
<p><u>ANSI A208.2-2016</u></p>	<p><u>Medium Density Fiberboard (MDF) for Interior Applications</u></p>	<p><u>8.4.2.4</u></p>
<p><b><u>BSI Customer Services</u></b>  <b><u>389 Chiswick High Road</u></b>  <b><u>London, W4 4AL, UK</u></b>  <b><u>+44 345 086 9001; <a href="http://shop.bsigroup.com">shop.bsigroup.com</a></u></b></p>		
<p><u>BS EN 636:2012+A1:2015</u></p>	<p><u>Plywood - Specifications</u></p>	<p><u>8.4.2.4</u></p>
<p><b><u>Canadian Standards Association</u></b>  <b><u>178 Rexdale Blvd.</u></b>  <b><u>Toronto, ON</u></b>  <b><u>Canada M9W 1R3</u></b>  <b><u>416 747 4044; <a href="http://www.csagroup.org">www.csagroup.org</a></u></b></p>		
<p><u>O121-17</u></p>	<p><u>Douglas Fir Plywood</u></p>	<p><u>8.4.2.4</u></p>
<p><u>O151-17</u></p>	<p><u>Canadian Softwood Plywood</u></p>	<p><u>8.4.2.4</u></p>
<p><u>O153-13 (R2017)</u></p>	<p><u>Poplar Plywood</u></p>	<p><u>8.4.2.4</u></p>
<p><u>O325-16</u></p>	<p><u>Construction Sheathing</u></p>	<p><u>8.4.2.4</u></p>
<p><b><u>Decorative Woods Association</u></b>  <b><u>42777 Trade West Dr, Sterling, VA 20166</u></b>  <b><u>(703) 435-2900; <a href="http://www.decorativehardwoods.org">www.decorativehardwoods.org</a></u></b></p>		

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<u>ANSI/HPVA HP-1-2016</u>	<u>American National Standard for Hardwood and Decorative Plywood</u>	<u>8.4.2.4</u>
<p><b><u>Standards New Zealand</u></b>  <b><u>Ministry of Business, Innovation &amp; Employment</u></b>  <b><u>15 Stout Street, Wellington 6011.</u></b>  <b><u>+64 3 943 4259; www.standards.govt.nz</u></b></p>		
<u>AS/NZS 2269.0:2012</u>	<u>Australian/New Zealand Standard: Plywood-Structural</u>	<u>8.4.2.4</u>
<p><b>United States Environmental Protection Agency (EPA)</b>  <b>Ariel Rios Building</b>  <b>1200 Pennsylvania Avenue, NW</b>  <b>Washington, DC 20460, United States</b>  <b>1-919-541-0800; www.epa.gov</b>  <b>ENERGY STAR ® 1-888-782-7937</b>  <b>WaterSense 1-866-987-7367 and 1-202-564-2660</b></p>		
<u>Code of Federal Regulations, Title 40 Part 770 (40 CFR 770), published December 12, 2016</u>	<u>Formaldehyde Standards for Composite Wood Products</u>	<u>8.4.2.4</u>
<p><b><u>National Institute of Standards and Technology (NIST)</u></b>  <b><u>100 Bureau Drive</u></b>  <b><u>Gaithersburg, MD 20899</u></b>  <b><u>301-975-2000; www.nist.gov/standardsgov/voluntary-product-standards-program</u></b></p>		
<u>PS 1-07</u>	<u>Voluntary Product Standard – Structural Plywood, 2007</u>	<u>8.4.2.4</u>
<u>PS 2-04</u>	<u>Voluntary Product Standard – Performance Standard for Wood-Based Structural-Use Panels, 2004</u>	<u>8.4.2.4</u>
<u>PS 20 -15</u>	<u>American Softwood Lumber Standard, 2015</u>	<u>8.4.2.4</u>