Certified Low-Emission Composite Wood Products

Last Updated: 06/16/2017

Scope

In all living spaces, utilize third-party certified low-emission composite wood materials that are designed to reduce human exposure indoors to individual VOCs. The How to Find Indoor airPLUS Compliant Low Emission Products document provides guidance on identifying compliant products including industry databases and examples of product labeling.

These specifications apply to:

- Structural Plywood and oriented strand board
- Hardwood plywood
- Particleboard and MDF products
- Cabinetry

See the Compliance Tab for related codes and standards requirements, and criteria to meet national programs such as DOE's Zero Energy Ready Home program, ENERGY STAR Certified Homes, and Indoor airPLUS.
Description

Formaldehyde is traditionally used as part of the adhesive, or “binding agent,” in composite wood products such as particleboard, plywood, medium density fiberboard (MDF), and oriented strand board (OSB). Elevated levels of formaldehyde, which becomes a gas at room temperature, can cause burning sensations in the eye, nose, and throat; nausea; difficulty breathing. It can also trigger attacks in people with asthma. High levels of exposure may cause some types of cancers.

The rate of release of formaldehyde from products such as pressed wood or textiles can vary. Emission levels of newer pressed wood products are generally higher than that of older products and can increase with high indoor temperatures or humidity.

On July 7, 2010, President Obama signed the Formaldehyde Standards for Composite Wood Products Act into law. This legislation, which adds a Title VI to the Toxic Substances Control Act (TSCA), establishes limits for formaldehyde emissions from composite wood products: hardwood plywood, medium density fiberboard, and particleboard. The national emission standards in the Act mirror standards previously established by the California Air Resources Board for products sold, offered for sale, supplied, used, or manufactured for sale in California. Learn more.

Using certified products lowers occupants’ risk of exposure to high levels of formaldehyde from construction materials. These Indoor airPLUS specifications can be implemented by requiring documentation of material certification for each material submittal package from sub-contractors. Any submittal requirements, such as manufacturer documentation of product certifications, should be clearly outlined in the project specifications and/or subcontractor bid package. Information for each third party certification and emissions standard required by Indoor airPLUS can be found in the report How to Find Indoor airPLUS Compliant Low-Emission Products.

The report provides guidance on identifying compliant products including industry databases and examples of product labeling. The guide also includes more detailed descriptions of the compliant third-party standards and certifications applicable to low-formaldehyde composite wood. Utilize this guide when outlining detailed product certifications to be included in the project specifications and/or subcontractor bid package.
Ensuring Success
To ensure Indoor airPLUS Item 6.1 requirements are met, incorporate the requirements for product certification into the project’s specifications and/or bid package. Require documentation of product compliance for each product submittal from sub-contractors and suppliers.
Climate
No climate specific information applies.
Training

Right and Wrong Images
None Available
Compliance

The Compliance tab contains both program and code information. Code language is excerpted and summarized below. For exact code language, refer to the applicable code, which may require purchase from the publisher. While we continually update our database, links may have changed since posting. Please contact our webmaster if you find broken links.

DOE Zero Energy Ready Home (Revision 07)

Exhibit 1 Mandatory Requirements.
Exhibit 1, Item 1) Certified under the ENERGY STAR Qualified Homes Program or the ENERGY STAR Multifamily New Construction Program.
Exhibit 1, Item 6) Certified under EPA Indoor airPLUS.

EPA Indoor airPLUS (Revision 04)

6.1 Composite Wood

Download How to Find Indoor airPLUS Compliant Low Emission Products, which provides guidance on identifying compliant products including industry databases and examples of product labeling.

NOTE: The following requirements pertain to ALL composite wood products installed in the home during construction. Examples include but are not limited to: structural panels, cabinetry, shelving, trim, doors, stair treads, flooring, etc. See exceptions.

- Structural plywood and oriented strand board (OSB): Use only products certified compliant with:
  - PS1 or PS2, as appropriate, and made with moisture-resistant adhesives as indicated by “Exposure 1” or “Exterior” on the American Plywood Association (APA) trademark.

- Hardwood plywood: Use only products certified compliant with:
  - Formaldehyde emissions requirements of ANSI/HPVA HP-1-2016; OR
  - California Air Resources Board (CARB) Airborne Toxics Control Measure (ATCM) Phase II to Reduce Formaldehyde Emissions from Composite Wood Products; OR
  - EPA Toxic Substances Control Act (TSCA) Title VI certified.

- Particleboard and MDF products: Use only products certified compliant with:
  - CARB ATCM Phase II to Reduce Formaldehyde Emissions from Composite Wood Products; OR
  - EPA Toxic Substances Control Act (TSCA) Title VI certified; OR
  - Formaldehyde emissions requirements of ANSI A208.1 (particleboard) and A208.2 (MDF); OR
  - ECC Sustainability Standard by the Composite Panel Association; OR
  - GREENGUARD or GREENGUARD GOLD Certification.

- Cabinetry: Made with component materials (plywood, particleboard, MDF) that are certified to comply with:
  - The appropriate standards above; OR?
  - Registered brands or products produced in plants certified under the Kitchen Cabinet Manufacturers Association’s (KCMA) Environmental Stewardship Certification Program (ESP 05-12); OR
  - GREENGUARD or GREENGUARD GOLD Certification for Cabinetry.

Exceptions to Item 6.1 per the CA ATCM and EPA’s TSCA Title VI:

- Windows that contain composite wood products are exempt from the requirements of this section if the window product contains less than five percent by volume of HWPW, PB, or MDF combined in relation to the total volume of the finished window product.

- Exterior doors and garage doors that contain composite wood products are exempt from the requirements of this section if either: (A) the doors are made from composite wood products manufactured with no added formaldehyde based resins or ULEF resins; or (B) the doors contain less than three percent by volume of HWPW, PB, or MDF combined in relation to the total volume of the finished exterior door or garage door.

Note: “No added formaldehyde” (NAF) or “Ultra-low emitting formaldehyde” (ULEF) products that are specifically manufactured under a limited exemption from the CARB ATCM to Reduce Formaldehyde Emissions from Composite Wood Products or EPA’s TSCA Title VI rule are compliant with Indoor airPLUS.
More Info.

Access to some references may require purchase from the publisher. While we continually update our database, links may have changed since posting. Please contact our webmaster if you find broken links.

Case Studies
None Available

References and Resources*

1. **An Update on Formaldehyde**
   - **Author(s):** U.S. Consumer Product Safety Commission
   - **Organization(s):** U.S. Consumer Product Safety Commission
   - **Publication Date:** January, 2013
   
   Updated detailed information about Formaldehyde.

2. **DOE Zero Energy Ready Home National Program Requirements (Rev. 07)**
   - **Author(s):** U.S. Department of Energy
   - **Organization(s):** DOE
   - **Publication Date:** May, 2019
   
   Standard requirements for DOE's Zero Energy Ready Home national program certification.

3. **Formaldehyde**
   - **Author(s):** U.S. Environmental Protection Agency
   - **Organization(s):** EPA
   - **Publication Date:** October, 2014
   
   Detailed information about Formaldehyde including health effects and strategies to reduce exposure.

4. **How to Find Indoor airPLUS Compliant Low Emission Products**
   - **Author(s):** U.S. Environmental Protection Agency
   - **Organization(s):** EPA
   - **Publication Date:** October, 2015
   
   Companion document to the Indoor airPLUS Construction Specifications, providing guidance on identifying compliant products, including industry databases and examples of product labeling.

5. **Indoor airPLUS Construction Specifications Version 1 (Rev. 03)**
   - **Author(s):** U.S. Environmental Protection Agency
   - **Organization(s):** EPA
   - **Publication Date:** October, 2015
   
   Document outlining specifications that were developed by the U.S. Environmental Protection Agency (EPA) to recognize new homes equipped with a comprehensive set of indoor air quality (IAQ) features.

6. **The Role of Laminates and Coating as Emissions Barriers in Composite Wood Panels**
   - **Author(s):** Composite Panel Association
   - **Organization(s):** Composite Panel Association
   - **Publication Date:** January, 2001
   
   Document addressing multiple surfacing options for composite wood panels with regards to their abilities to act as emission barriers.

7. **VOC Emission Barrier Effects of Laminates, Overlays and Coatings for Particleboard, Medium Density Fiberboard (MDF) and Hardboard**
   - **Author(s):** Composite Panel Association
   - **Organization(s):** Composite Panel Association
   - **Publication Date:** January, 2003
   
   Technical bulletin addressing surfacing options in regards to composite wood panels and their emission barrier capabilities.

8. **Voluntary Product Standard PS 2-04, Performance Standard for Wood-Based Structural-Use Panels**
   - **Author(s):** National Institute of Standards and Technology
   - **Organization(s):** National Institute of Standards and Technology
   - **Publication Date:** December, 2004
   
   Standards for requirements, performance, construction, workmanship and others for structural-use panels.
Contributors to this Guide

The following authors and organizations contributed to the content in this Guide.

U.S. Environmental Protection Agency, Indoor airPlus program and PNNL.