Formaldehyde is a widespread, naturally occurring and commercially produced chemical substance. Humans produce and use formaldehyde in normal biochemical reactions. In industry, this chemical is widely used as a building block chemical due to its reactivity and versatility.

Increased public awareness about formaldehyde’s potential health effects has led to concerns about the adhesives used in wood-based products for residential home construction. Questions occasionally arise about formaldehyde emissions from Weyerhaeuser engineered wood products. This technical resource sheet includes answers to many of those questions. Additional information on potential emissions can also be found in the Material Safety Data Sheets (MSDSs) for Weyerhaeuser engineered wood products (EWPs).

How do the existing California Air Resources Board (CARB) Airborne Toxic Control Measure and the new federal Formaldehyde Standards for Composite Wood Products Act of 2010 apply to structural, engineered wood products?
CARB and the federal formaldehyde standard apply only to interior use products such as hardwood plywood, medium density fiberboard, and particleboard. Products used in the construction of a building’s frame are exempt from emission requirements. Therefore, the structural, engineered wood products discussed in this Q&A document, such as Weyerhaeuser oriented strand board (OSB), structural plywood, Trus Joist® TJI® joists, Microlam® LVL, TimberStrand® LSL, and Parallam® PSL, are exempt from both the CARB standard and the federal formaldehyde standard.

Will formaldehyde be released from Weyerhaeuser EWPs, and if so, why is that a concern?
In the adhesive manufacturing process, formaldehyde is reacted with other chemicals to form a liquid resin, which is either used alone or in combination with other substances as the adhesive in engineered wood products. In Weyerhaeuser manufacturing facilities, the adhesive is applied to small pieces of wood, which are then consolidated under heat and pressure to form strong, bonded products. Some adhesives contain low levels of unreacted formaldehyde at the time they are applied to the wood, and additional formaldehyde can be generated in subsequent heating processes. Some of this formaldehyde can become trapped within the finished wood products. Depending on environmental conditions, this formaldehyde may be released and become airborne, and it can have irritant properties if present in sufficient concentrations. Several health agencies also consider formaldehyde a carcinogen. Although most of us have robust defense mechanisms to transform and eliminate formaldehyde from our systems, its inherent toxicity indicates a need to identify potential exposures and understand any subsequent effects.

What is the level of formaldehyde emissions from the Weyerhaeuser EWPs mentioned above?
Independent third-party testing(1)(2) shows that products bonded with either phenol-formaldehyde-based adhesives, phenol-resorcinol-formaldehyde-based adhesives, polymeric MDI (isocyanate) adhesives, or a combination of these, do not emit substantial amounts of formaldehyde. When tested in accordance with the ASTM large chamber test(3), formaldehyde emissions from these products were under 0.10 parts per million (ppm). According to the APA, in many cases the emissions were so low that...
Questions and Answers about Adhesives and Formaldehyde Emissions

they could not be distinguished from the background level of formaldehyde in the fresh air used during testing(4).

How much adhesive is used in Weyerhaeuser EWPs?
Adhesives used in the engineered wood products manufactured or purchased by Weyerhaeuser typically make up less than 6% of the final product weight.

What types of resins are used in Weyerhaeuser EWPs?
The Formaldehyde Standards for Composite Wood Products Act of 2010 defines the categories of resins used in the manufacturing of composite wood products. The “ultra low-emitting formaldehyde resin” category includes melamine-urea-formaldehyde, phenol-formaldehyde, and resorcinol-formaldehyde resins. The “no-added formaldehyde resin” category includes soy, polyvinyl acetate, and methylene diisocyanate (pMDI) resins. While Weyerhaeuser EWPs are not subject to the federal formaldehyde standard, TimberStrand® LSL is made with a resin classified as a no-added formaldehyde resin, and Weyerhaeuser’s oriented strand board is made with a combination of resins that are classified as either no-added formaldehyde or ultra low-emitting formaldehyde. Weyerhaeuser’s plywood and Trus Joist® TJI® joists, Parallam® PSL, and Microllam® LVL use resins classified as ultra low-emitting formaldehyde resins.

Do Weyerhaeuser EWPs meet emissions requirements associated with “green building”, such as those set by LEED?
Yes. Voluntary standards, like the U.S. Green Building Council’s LEED, define and categorize composite products differently than CARB and the federal formaldehyde standard. LEED includes engineered wood products in their definitions, where CARB and the federal formaldehyde standard do not. The adhesives used to make Weyerhaeuser EWPs are classified under CARB and the federal formaldehyde standard as “no-added formaldehyde” or “ultra low-emitting formaldehyde.” Our suppliers confirm that the adhesives used in Weyerhaeuser EWPs have “no added urea formaldehyde resin” as defined by LEED.

The LEED green building standards specify two categories of wood products for low emissions, “Adhesives & Sealants” and “Finished Products”. Do the low emissions of Weyerhaeuser EWPs qualify for credits under both categories?
Weyerhaeuser EWPs delivered to the job site are considered “finished products”, so their low emissions do qualify for LEED’s Finished Product category. However, since the “structural wood adhesives” term referred to under the Adhesive & Sealants category applies only to the construction adhesives used to glue the sheathing to the framing members or to the adhesives used with finished carpentry at the job site, that category does not apply to Weyerhaeuser EWPs.

Given the adhesives used in some Weyerhaeuser EWPs, are any special dust-control precautions necessary when cutting or machining the products?
Drilling, sawing, sanding or machining any wood product generates wood dust. Secondary manufacturers who cut and machine wood or wood-based products must follow OSHA requirements and other regulations regarding dust exposure to control dust and prevent overexposure, fire, and dust explosions. The paint and/or coatings on EWPs may contain titanium dioxide. Wood dust and titanium dioxide are substances known to the State of California to cause cancer. For more information on Proposition 65, visit wy.com/inform.

References:
1. Structural Board Association Technical Bulletin, TB102, <osbguide.com/osbliterature>
2. APA—The Engineered Wood Association, <apawood.org>
3. Determining Formaldehyde Concentrations in Air and Emission Rates from Wood Products Using a Large Chamber. ASTM E1333.