



PRESERVE WISE

Exploring the environmental benefits in using preserved wood products

Life cycle assessments and preserved wood

In today's environmentally conscious world, it's important to consider the impacts of not only our actions but our decisions on what to use. This is particularly true for building materials used to construct the structures where we live, work and enjoy for recreation.

All building materials have an impact on the environment, starting from when the raw materials are extracted and manufactured into a product to its use in a structure through the end of its service life. All these must be considered when it comes to the environment.

When choosing materials for the full range of needs today, from infrastructure applications to what we use to build structures, preservative-treated wood is one of the most environmentally friendly building material available today.

Objective perspective

Too often, promoters select one or two subjective qualities to cloak their products as "green." A common claim is that a product can be recycled, thus it is safe for the environment. However, such simplified claims ignore the complexity of assessing the true environmental impact of a building material.



Life cycle assessments, or LCAs, were developed to provide a full cradle-to-grave analysis of a material's earth friendliness. LCAs are an objective, qualitative evaluation of a material, guided by internationally recognized standards such as ISO 14044 Environmental Management.

The wood preserving industry commissioned a number of LCAs comparing preservative-treated wood to other materials, including composite plastics, steel and concrete used in infrastructure and structural applications. These assessments provide an unbiased view of the full environmental impacts for each material that should be considered.

Sustainability

Many of the resources used to make products are finite. However, wood is the only building material that is naturally renewable. Modern forestry practices in the U.S. and Canada ensure that forests can continue to provide wood for products while balancing other needs such as water, wildlife and recreation.

Each year, more than 1 billion trees are replanted in the U.S. annually and Canada replants an estimated 600 million trees each year. As a result, the amount of forestland in North America has remained stable, with more than 50 consecutive years of net forest growth exceeding forest harvests.

Much of the wood that is pressure treated comes from forests certified as sustainable. These products are certified under independent programs such as the Sustainable Forestry Initiative (SFI) and the Forest Stewardship Council (FSC). SFI has certified more than 350 million acres in North America as sustainable, while FSC certifies some 170 million acres on the continent.

Preservative treating adds to wood's sustainability. Preserved wood products typically remain in service for 40 years or more, providing enough time so new trees can be grown to become a resource for replacement products.

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Environmental impacts

While sustainability is important, it should not be the only criteria for judging a material's full environmental impact. That's why LCAs offer a more comprehensive, impartial basis to compare materials. Under international standards, the impacts are quantified for the following:

- Greenhouse gas emissions
- Acid rain potential
- Smog potential
- Eutrophication (accumulation of harmful algae or plant growth in water)
- Ecotoxicity

Peer-reviewed LCAs are available comparing the following products:

- Decking – Preserved Wood vs. Wood Plastic Composites
- Framing – Preserved Wood vs. Galvanized Steel
- Utility Poles – Preserved Wood vs. Steel, Concrete and Composite Fiberglass
- Marine Pilings – Preserved Wood vs. Steel, Concrete and Plastic
- Rail Ties – Preserved Wood vs. Concrete and Plastic
- Guard Rail Posts – Preserved Wood vs. Steel and Concrete

Overall, the LCAs for each product category show much lower environmental impacts for preserved wood compared to alternative materials. For nearly every product, preserved wood has lower impacts in each of the five environmental indicators. Preserved wood also had significantly lower fossil fuel and water use compared to alternative materials.

The differences in specific impact indicators can be stark. For example, plastic composite decking consumes 13 times as much fossil fuel compared to wood decking. Utility poles made from steel or fiberglass create seven times more greenhouse gases vs. wood poles. Concrete rail ties contribute 100 times more ecotoxic air emissions to the environment than wood.

Carbon sequestration

Wood that is converted into a product has another environmental advantage – it sequesters, or locks in carbon removed from the environment. Trees absorb atmospheric carbon dioxide and convert it into wood fiber. When a tree dies and the wood deteriorates, the carbon is released back into the environment.

When wood is pressure treated, the deterioration cycle is lengthened by many decades, holding that carbon in place. Considering how much wood is used in infrastructure, this sequestered carbon is significant.

There are some 150 million preserved wood poles and 100 million wood crossarms in service today. Together they account for an estimated 100 million metric tons of CO² removed from the environment.

Alternative materials, by comparison, add CO² to the atmosphere during extraction and production. Even when these materials are recycled, much more carbon is added to the environment through higher energy use during recycling and remanufacturing.

Making the right choice

Every building material has an impact on the environment. Therefore, users must balance the needs of what they design and build against the potential impacts. The best way to achieve that balance is by relying on objective, impartial data instead of promotional claims and extrapolations. On that basis, preserved wood offers the most sustainable and environmentally friendly choice in building materials.

For more information, including summaries of the LCAs comparing preserved wood to alternative materials in the applications listed above, go to the Environmental Benefits section at the web site PreservedWood.org:

preservedwood.org/the-story/environmental-benefits

More detailed environmental journal articles on the LCAs also are available online from the Treated Wood Council:

treated-wood.org/Publications.html