

Sustainable Landscape Construction: *Materials and Products — Wood Preservatives¹*

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WOOD PRESERVATIVES, which are regulated by the EPA (Environmental Protection Agency), are pesticides used to kill insects and other destructive organisms. Because they are toxic and persistent, they can have impacts on human health, particularly during production and disposal. Although the EPA called for a voluntary phase-out of lumber treated with chromate copper arsenate (CCA), disposal of this material remains a concern because of the possibility of copper or arsenic leaching in landfills. Recycling treated lumber with other lumber as landscape mulch also presents a health risk because CCA-treated wood leaches toxic heavy metal preservative chemicals into soil. Treated wood also cannot be incinerated because the arsenic becomes airborne and is eventually deposited on soil and surface waters. It is considered toxic waste and must be disposed of in commercial or hazardous waste landfills.

New wood preservation treatments that do not use heavy metals (copper) or solvents and that have few environmental and health risks are being developed. Micro-manufactured sodium silicate is a new heat treatment that converts the silicate in wood into a microscopic layer of insoluble glass, which makes the wood inaccessible to insects and fungi. A new pressure process with borates (sodium salts that are effective against fungi and insects) and a polymer binder is being used to fix the borates into the wood so that they will not leach in water. Thermal modification of wood is a chemical-free technology that changes the sugars that support mold and fungus by exposing wood to high heat and steam. Construction techniques that help mitigate environmental damage and health concerns of wood preservatives include:

USE STRATEGIES

- **Avoid using oilborne preservatives.** Oilborne substances, such as coal tar creosote or pentachlorophenol (PCP) have been classified as “restricted use pesticides” by the EPA because they continue to release toxins after application. Leaching can pollute groundwater, soil, and plant life.

- **Avoid using wood that has been pressure treated with toxic substances.** Persistent bioaccumulative toxins (PBTs) like CCA and any other known carcinogens or toxins in a wood material make it unsuitable for use.
- **Use BMP-certified treated wood.** “BMP” stands for Best Management Practices, and BMP certification lets you know a given wood material is safe to use. Treated wood without BMP certification should be considered toxic and unsafe to use.
- **The least toxic preservative treatments are water-borne zinc, fluoride, copper, and boron salts.** The most common alternative to CCA is alkaline copper quat (ACQ). Use second-generation copper-based waterborne wood preservatives as an alternative to copper-based wood preservatives.
- **Use the lowest-strength preservative treatment feasible for the situation.** Weak formulas for joists and planks, and strong for wood that touches the ground.
- **Design details of wood structures to prevent moisture uptake.** Most moisture is absorbed at the end of timber, so angle cuts that allow drainage and end caps and concrete footings with slopes for drainage are important.
- **Use safe protective finishes.** To prevent discoloration and mildew on preservative-treated wood, use penetrating finishes that repel water and have a natural mildewcide. Pigmented finishes will protect from UV damage.

Adapted from:

Calkins, M. (2009). *Materials for sustainable sites: A complete guide to the evaluation, selection, and use of sustainable construction materials*. Hoboken, NJ: John Wiley & Sons, Inc.

Smith, C., Clayden, A. & Dunnett, N. (2008). *Residential landscape sustainability: A checklist tool*. Oxford, UK: Blackwell Publishing Ltd.

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