

Pressure-Treated Wood

Pressure-treated lumber is used in applications where decay and insect damage are of concern, such as for playground equipment, decks, telephone poles, building foundations, picnic tables, landscaping ties, wharfs, retaining walls, and fence posts.

Preservative treatment chemicals make the wood inedible for fungi, insects, and other organisms that can destroy wood. Until its use for residential applications was voluntarily restricted by industry in January 2004, copper chromated arsenate (CCA) was the most common wood preservation treatment that a typical homeowner would encounter.



Because of its added toxins, alternatives to CCA are strongly recommended. The arsenic in CCA-treated wood causes a wide range of adverse health effects at low to high doses including nerve damage, vomiting, fatigue, diarrhea, nausea, and the decreased production of red blood cells.



Children are the most vulnerable to the effects of arsenic and have a high exposure risk from playing on CCA-treated play sets in parks, at schools, and at home.

According to the Healthy Building Network, no amount of arsenic is considered safe for children, yet the estimated amount ingested by children who play on CCA-treated wood is well above the EPA allowable limit. In all populations, bladder,

liver, and lung cancers have also been related to exposure from the chemicals used in CCA. The wisdom of not using CCA has finally been acknowledged by the federal government: the U.S. Environmental Protection Agency reached an agreement with manufacturers to eliminate the use of CCA for most playground and residential uses by the end of 2003. However, environmental considerations dictate that CCA-treated wood not be used for *ANY* purpose effective immediately.

Most dimensional lumber, as well as plywood and engineered beams (glulams), can be pressure-treated with CCA alternatives.

Two major alternative wood preservatives should be used instead of CCA: C-A (Copper Azole, sold under the trade name Natural Select; sometimes formulated as CBA, copper boron azole) and ACQ (Alkaline Copper Quaternary, sold under the trade names Preserve or NatureWood.)

C-A

C-A is a copper-based preservative with an organic fungicide. The treated wood is dark honey brown color and turns silver-gray after it weathers. The brown color can be restored by lightly



sanding the outer layer. C-A is clean to the touch, not corrosive to appropriate metal hardware (hot-dipped galvanized or stainless steel fasteners are recommended), and extends the life of wood. It provides long-term resistance to termites and fungal decay in both ground contact and above-ground applications. C-A treated wood can be used for most applications where CCA was typically used, such as decks, walkways, gazebos, picnic tables, and play structures. It can also be used in fresh water immersion applications; however, it is not approved for saltwater use or structural utility poles in high decay regions. The treatment chemicals are very stable, do not vaporize, and are not vulnerable to thermal or photochemical degradation. C-A treated wood can also be stained or painted (oil based stains are recommended).

ACQ

ACQ is a mixture of copper and quat. Like CCA, the copper and quat act as biocides to prevent insects and fungi from attacking the wood. Quat is used in many products that humans touch, from swimming pool chemicals and shampoos to hospital mopping treatments. Wood treated with ACQ has a light tan to olive color. ACQ treated wood can be used in above ground, ground contact, and fresh water immersion applications but is not approved for saltwater applications.

ACQ treated wood does not have a detectable odor from the preservative. It can also be painted and stained with both oil and latex paints. Adhesion of paint and stain on ACQ treated wood performs the same as on untreated wood and out-performs CCA treated wood. It can be corrosive to metal fastenings; hot-dipped galvanized or stainless steel fasteners are recommended.

PRODUCT COMPARISONS

C-A and ACQ-treated lumber

- Active ingredients are significantly less toxic than arsenic-based treatments
- Can be safely disposed of in landfills
- Cannot be used in saltwater immersion applications

CCA-treated lumber

- Leaches arsenic throughout its life, threatening groundwater and anyone/anything in contact with it
- Is an unregulated hazardous waste and should not be disposed of in standard landfills
- Can be used in saltwater immersion applications

Borate

For wood not exposed to water, borate treatment is another CCA alternative that avoids concerns with arsenic toxicity. However, whereas copper-based preservatives chemically bond to the wood, limiting diffusion and leaching of the preservative, borate is diffusible and does not “lock on” to the wood. This means that borate-treated wood cannot be used outdoors or in water submersion applications since the borate can leach out of wood that is continuously exposed to liquid water, eventually rendering the wood unprotected.



An appropriate solution would be to use C-A or ACQ-treated products outside the building moisture barrier, and borate-treated products inside the barrier, such as for sill plates. Borate-treated wood has excellent corrosion resistance and does not require special fasteners. Borate has very low toxicity levels for both people and pets and, unlike heavy metals, is not bioaccumulative; our bodies excrete what they don't need.



Alternatives to Pressure-Treated Lumber

While generally not as durable as treated products, **the heartwood of decay-resistant woods** such as yellow cypress, yew, tamarack, hemlock, white cedar, and redwood may be appropriate substitutions for pressure-treated lumber in many applications. Decay-resistant woods have no known ill health effects, and no chemicals are used in preparing them. Ideally, use lumber certified in accordance with Forest Stewardship Council (FSC) guidelines to assure that it was sustainably harvested.

Plastic and wood-plastic composite lumber are most effective as a replacement for pressure-treated lumber in non-structural applications such as decking.

LEED CREDITS

No LEED credits are applicable for this material in the US Green Building Council's LEED certification program. LEED stands for Leadership in Energy and Environmental Design. To find out more about it, visit www.leedbuilding.org.

ENVIRONMENTAL ATTRIBUTES

Energy Performance

Pressure treated wood has a negligible effect on energy use in its applications.

Resource Impacts

C-A

C-A treated wood contains no EPA listed hazardous constituents and does not require California Prop 65 labeling. However, the chemical solution used for treatment is toxic to aquatic life. It may be disposed of in landfills or incinerated. It is not recommended that the scraps, shavings, or sawdust be composted or used as mulch or animal bedding.

ACQ

Information on the toxins in ACQ indicates that its active ingredients are less toxic than the ingredients in CCA. Some environmental concerns have been raised because of the potential for copper to get washed into storm water. More research is needed on the potential environmental impact of the use of ACQ. The manufacturer, therefore, recommends similar precautions be taken to that of CCA, such as hand washing after contact with treated wood and the wearing of protective gear.

Health Considerations

Due to concerns with copper leaching and toxicity to aquatic life in protected wetland areas, alternatives to all types of copper-based treated wood products, such as concrete piers, should be considered for wetland immersion applications.

C-A

There are currently no EPA precautions regarding its use, and there is not a required Consumer Awareness Program.



ACQ

ACQ treated wood does not contain any EPA-listed compounds or any known or suspected carcinogens, and testing has shown it to have low toxicity.

FUNCTIONAL CONSIDERATIONS

Cost

Some sources report that ACQ and C-A cost about 10-20% more than CCA-treated wood, though the market is shifting as the awareness of CCA's toxicity and the phasing out of its production provides a market for alternatives. ACQ customers have stated that the higher cost was offset by lower hazardous waste costs.

Installation

Alternative pressure treated lumber is used in the same fashion as conventional pressure-treated wood products. Precautions include wearing protective gear such as gloves, goggles, a proper mask, and full clothing coverage. After working with treated wood or pressure-treatment chemicals, clothes should be kept contained in a bag and then washed separately to prevent contamination of other clothing.

Maintenance

For C-A, regular application of a topical water repellent is recommended. Occasional cleaning can revive the early brown color of the wood.

RESOURCES

Manufacturers

Alternatives to CCA-treated lumber are available at most lumber yards and home improvement stores. For product and retailer information, visit the manufacturers' websites or search the Green Materials Database, www.builditgreen.org/guide.

Arch Treatment Technologies, Inc.
(Wolmanized (AC), FrameGuard (Borate))
(866) 789-4567
www.wolmanizedwood.com

Osmose Wood Preserving, Inc.
(NatureWood (ACQ), AdvanceGUARD (Borate), Hi-bor (Borate))
(800) 241-0240
www.osmose.com

Chemical Specialties Inc.
(Preserve, Preserve Plus (ACQ), TimberSaver PT (Borate))
(800) 421-8661
www.treatedwood.com

Wood Treatment Products, Inc.
(EnviroSafe Wood (Borate))
(800) 345-8102
www.eswoodtreatment.com

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