

Environmental Considerations of Treated Wood

National Park Service – Pacific West Region

Overview

In support of the mission of the National Park Service, making wise decisions about using wood treatments will help protect the natural areas and biodiversity of our parks, and the health of our employees.

Preservative-treated wood's most important benefit is its resistance to water, fungal, and insect damage. Extending the life of wood products reduces the demands on forests for replacement lumber and reduces maintenance and replacement costs. Historic wooden structures that must be repaired with compatible materials or replaced with in-kind materials make durability even more important. Treated woods are nearly impervious to rot and insects, making them good for outdoor use. Wood treated with chromated copper arsenate (CCA) poses certain environmental and health risks, including the leaching of chemicals such as arsenic and chromium into the environment and workers' risk of exposure to hazardous chemicals. Disposal of treated wood also proves to be an issue, particularly disposal by incineration. Due to these concerns, manufacturers of treated wood and the EPA reached an agreement to end the sale of CCA-treated wood for most lumber products, effective January 1, 2004. The following offers less-toxic alternatives to CCA, handling and use precautions, and other recommendations when considering using treated wood.

Due to the toxicity and potential effects on health and the environment, the Presidio Trust implemented a policy on the use of pressure treated lumber. Standard operating procedure now prohibits the use of CCA, ACZA, CZC, ACC, and Pentachlorophenol. All dimensional lumber is now treated with ACQ as an alternative.

Site and Selection Recommendations for Using Treated Wood

- Use treated wood only when necessary.
- **Use wood treated with non-arsenic, non-chromium preservatives specified below.**
- For above-ground projects that will not be exposed to harsh elements, use untreated wood and paint and seal it.
- When possible and appropriate, use naturally durable, untreated wood such as cedar and redwood, particularly for applications where people or animals will come into contact with wood, or in ecologically sensitive areas.
- Consider alternatives such as metal or plastic composite lumber when appropriate.
- Different chemical treatments are suitable for different woods and conditions. Refer to the American Wood Preservers' Association (AWPA) Commodity Standards for recommendations on what treated wood to use in different conditions.
- Use mechanical and other barriers such as termite shields, termite mesh, and sand barriers, to prevent infestation and reduce requirements for wood treatment. (www.awpa.com) Also use construction techniques such as minimum 18" between the grade and bottoms of exposed joists in crawl spaces; and proper landscaping, drainage, and plant locations.
- Treated wood should not be used where it may come in direct or indirect contact with public drinking water, except for uses involving incidental contact such as docks and bridges. Do not use treated wood when it may come into direct or indirect contact with drinking water for animals or livestock.
- Treated wood should not be used where it will be in frequent or prolonged contact with bare skin (for example, chairs and other outdoor furniture).
- Treated wood should not be used in residential, industrial, or commercial interiors except for laminated beams or for building components that are in ground contact and are subject to decay or insect infestation and where two coats of an appropriate sealer are applied.

Application & On-Site Treatment Recommendations for All Treated Wood

- Where possible, pre-cut wood before treatment. Dry lumber after treatment to a moisture content of 19%.
- Treat both ground-contact and non-ground-contact lumber and plywood in accordance with AWPA Commodity Standards: C1-01, C1-00, and C9-00. (www.awpa.com)
- **ACQ is suspected to corrode galvanized steel faster than CCA, which should be taken into consideration when choosing steel products. Use stainless steel or hot-dipped galvanized fasteners and fittings. Do not use aluminum hardware.**
- Do not brush, clean, or cut pressure-treated wood over water bodies or near ecologically sensitive areas.
- American Association of State Highway and Transportation Officials (AASHTO) M133 standards require that each piece of treated wood be marked appropriately. They require certification for each lot of treated wood indicating preservative used, penetration in millimeters, and retention in kilograms per cubic meter. They also require providing

written certification that Best Management Practices (BMPs) were utilized in treating timber members, including a description of the BMPs used. (www.wwpinstitute.org)

- If incising wood, do so and make all dimensional cuts and holes in the wood before pressure treatment.
- Do not over-treat. Follow Best Management Practices and manufacturer recommendations to ensure minimal leaching, particularly during application.
- Use proper precautions and follow manufacturer instructions carefully when treating wood on site. Incorrect application procedures are the most common cause of spills, accidental contamination, and risks to human health.
- Always ensure that all preservatives are adequately fixed in wood. Reject lumber with surface residue of white salts. Wood that is kiln-dried after treatment and/or prefinished with sealer is preferable.
- During delivery, storage, and handling, protect treated wood from high humidity and moisture.
- Treated wood should not be burned in open fires or in stoves, fireplaces, or residential boilers because toxic chemicals may be produced as part of the smoke and ashes.
- Avoid frequent or prolonged skin contact with treated wood; when handling the treated wood, wear long-sleeved shirts and long pants and use gloves impervious to the chemicals (for example, gloves that are vinyl coated).
- Avoid frequent or prolonged inhalation of sawdust from treated wood. When sawing and machining treated wood, wear a dust mask and eye protection. Whenever possible, these operations should be performed outdoors to avoid indoor accumulations of airborne sawdust from treated wood. Indoor sawing, sanding and other machining should be performed with adequate ventilation and dust-collection equipment.
- After working with the wood, and before eating, drinking, and use of tobacco products, wash exposed areas thoroughly.

Types of Preservatives

ACQ Preserve Treated Wood

Ammoniacal copper quaternary (ACQ) can be used to a variety of applications in above-ground or ground-contact applications. ACQ is a water-based treatment which contains no arsenic or chromium. “Quat” is a quaternary ammonium compound that kills copper-tolerant fungi and is a disinfecting detergent containing nitrogen. ACQ received Scientific Certification Systems “Green Cross and Globe” label and is approved by the American Wood Preservers Association. Wood treated with ACQ can be painted or stained due to the water-based formula. ACQ is marketed under the name **Preserve®** and **Preserve Plus®**, the oldest of the alternatives to CCA-treated wood. **NatureWood®** by Osmose is another ACQ preservative. **ProGuard™** is HomeDepot’s trademark ACQ treatment. Because of the toxicity of copper to aquatic organisms and because ACQ may leach, it is not recommended for applications near aquatic ecosystems.

Copper Boron Azole

Copper Boron Azole (CBA) is a water-based treatment free of arsenic and chromium. Wolmanized Natural Select Wood manufactures CBA-treated wood and is marketed under the name **Natural Select™**. CBA is approved for above-ground and soil-contact applications and is considered part of the new generation of green building wood preservatives containing no EPA-listed hazardous constituents.

Boron-Based Preservatives

Bora-Care® is a boron-based wood treatment that protects against termites, carpenter ants, wood-destroying beetles, and decay fungi. **Tim-Bor®** is a similar wood preservative except that it does not contain glycol, as Bora-Care® does. Borate products are not effective in damp or wet areas. Despite research efforts, no effective means has yet been found to keep borate preservatives from leaching out of wet wood. Appropriate applications include interiors and above-ground use. Other Boron-based treatments include Shellguard® and Guardian® by Perma-Chink Systems.

Price Comparison

	2 x 4 x 8	2 x 6 x 8	5/4 x 6 x 8
ACQ Treated Lumber	\$4.12	\$6.08	-
Cedar	\$7.65	\$11.73	-
Choice Dek Composite Lumber	-	-	\$12.81

Utility Poles

The most common wood treatment for utility poles has traditionally been Pentachlorophenol (penta) and creosote, both of which contain known carcinogenic chemicals. The National Park Service discourages the purchase of utility poles treated with penta or creosote. Copper Naphthenate (CN) is an oil-based preservative that does not contain arsenic or chromium and

is considered a less toxic alternative to penta and creosote. Other alternatives include pole liners or wraps that are shrink-wrapped onto the pole.

References and Resources

Best Management Practices for the Use of Treated Wood in Aquatic Environments, Western Wood Preservers Institute
<http://wwpinstitute.org/pdffiles/bmpsinaquatic2.pdf>

Conrad Forest Products
www.conradfp.com

American Wood Preservers Institute
www.preservedwood.com

Western Wood Preservers Institute
www.wwpinstitute.org

American Wood Preservers' Association
www.awpa.com

EPA's Topical and Chemical Fact Sheets
www.epa.gov/pesticides/factsheets/chemicals/1file.htm

Connecticut Department of Environmental Protection
<http://dep.state.ct.us/wst/recycle/lumber.htm>

Environmental Building News – V 12 No 3, V 11 No 2, V 10 No7/8, V 6 No 3
www.buildinggreen.com

California Proposition 65
www.calprop65.com

Vendors

Wolmanized Natural Select Wood

Arch Wood Protection, Inc.
Smyrna, GA
770-801-6600
www.wolmanizedwood.com
www.naturalselect.com

ACQ Preserve Treated Wood

Chemical Specialties, Inc.
Charlotte, NC
800-421-8661, 704-522-0825
www.treatedwood.com

Tim-Bor and Bora-Care

Nisus Corporation
Rockford, TN
800-264-0870, 865-577-6119
www.nisuscorp.com

Advance Guard

Osiose Wood Preserving, Inc.
Griffin, GA
800-241-0240
www.osiose.com

NatureWood

Osiose Wood Preserving, Inc.
Griffin, GA
800-241-0240
www.osiose.com

LifeTime

Valhalla Wood Preservatives, Ltd.
Calgary, Alberta, Canada
250-538-5516
www.valhalco.com

Shellguard and Guardian

PermaChink Systems
800-548-1231
www.permachink.com

ProGuard

Timber Specialties Co.
Trademarked by Home Depot
www.proguardbackyard.com