



Specification

Guide for

Wolmanized®

Pressure-Treated

Wood





Wolmanized® Pressure-Treated Wood

Wolmanized® wood is poles, piles, timbers, posts, or plywood that is pressure-treated with CCA preservative to provide structural protection from termites and fungal decay. For 70 years, CCA-treated wood has been specified in a wide variety of applications; as of December 30, 2003, Wolmanized® wood may be produced for only the uses shown in the next section. When used as recommended, CCA-treated wood is harmless to people, plants, and animals. Its use provides environmental benefits as well as decades of service.



When to Specify

Specify Wolmanized® wood and plywood for applications in which conditions conducive to termites and fungal decay are present. This includes wood that will be in contact with water, soil, concrete or masonry, subject to periodic wetting, or exposed to moisture or high humidity. Wolmanized® wood is suitable for a wide variety of applications, including:

- Lumber for Salt Water Use
- Piling
- Poles
- Plywood
- Highway Construction
- Poles, Piles and Posts Used as Structural Members on Farms
- Agricultural fence posts (round, half-round, quarter-round)
- Marine Construction
- Permanent Wood Foundations
- Building Poles and Posts
- Sawn Structural Timbers
- Sawn Crossarms
- Structural Glued Laminated Members
- Structural Composite Lumber
- Shakes and Shingles
- Cooling Towers

For residential and other applications requiring a next-generation preservative, specify Wolmanized® Natural Select® wood (www.naturalselect.com).

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Features & Advantages

- Protection against rot, fungal decay, and termites
- 70 year successful track record
- Easy to work with, repair, and modify with common tools
- Strong, resilient, versatile, and economical
- Backed by Arch Wood Protection, the world's leader in wood preservation technology



What is CCA and How Does It Work?

The chemical used to preserve Wolmanized® pressure-treated wood is a mixture of oxides of copper, chromium, and arsenic and known as CCA. The preservative has been formulated to render wood useless as a food substance for termites and fungi while keeping the wood attractive, clean, odorless, non-staining, and safe to handle when used as recommended.

Unlike the commercially produced trivalent arsenic, the arsenic in Wolman® CCA is in the form of inorganic pentavalent arsenate — a naturally occurring trace element. In the treatment process, described on Page 6, the pentavalent arsenate becomes fixed, or chemically bound, in the wood cells as highly leach-resistant insoluble precipitates.

Chemical Composition of CCA-C

All Wolmanized® wood is treated with CCA-Type C, which is composed of the following:

Hexavalent Chromium (CrO ₃)	47.5%
Copper (CuO)	18.5%
Arsenic (As ₂ O ₅)	34.0%



The effectiveness of preservatives at various retentions in different species is evaluated using test stakes. Arch monitors some 50,000 stakes in plots worldwide.

More on Fixation ...

The reaction of chromated copper arsenate with the wood substrate is termed “fixation” because the preservative compounds are fixed in the treated wood in a highly insoluble state. However, some chemical may migrate from treated wood into surrounding soil over time and may also be dislodged from the wood surface upon contact with the skin. Fixation accounts for the permanency of the preservative in the treated wood, which explains the leach resistance and durability of the product.

The fixation mechanism is complex and the reactions involved are primarily dependent upon wood species, preservative formulation, concentration, and temperature. The result, however, is that the preservative becomes leach-resistant precipitates.

Retention and Penetration

Wolmanized® pressure-treated wood is treated to various retention levels that are intended to protect the wood for particular applications. Retention levels indicate the amount of preservative retained in the wood in a specific assay zone. In North America, retention is expressed in pounds per cubic foot (pcf).

Retention levels or treating quality procedures are marked on Wolmanized® wood. The accompanying table outlines CCA retention levels required by the American Wood-Preservers' Association for various applications.

Retention varies with depth in the wood, so preservative penetration also affects wood longevity. In species with large amounts of sapwood, such as southern and red pine, the preservative must penetrate 2.5 inches or 85% of the sapwood to meet standards. In western species that are predominantly heartwood, the wood is incised to ensure a treated shell, and any cut surfaces should be field-treated in accordance with AWP standard M4 with a preservative containing at least 2% copper.

AWPA Retention Requirements¹		
Application	Use Category	CCA (pcf)
LUMBER, TIMBERS, AND PLYWOOD		
Above ground	1, 2, 3A, 3B	0.25
Ground / Fresh Water Contact	4A	0.40
Salt Water Splash	4B	0.60
Permanent Wood Foundation	4B	0.60
Salt Water Immersion	5B	2.50
POLES AND PILES		
Structural Poles	4B	0.60
Foundation / Fresh Water	4C	0.80
Salt Water Immersion	5B	2.50 ²

¹Wolman® CCA preservative meets or exceeds AWP P5 and Federal Standard TT-W-550. The treating process and the results above meet or exceed Federal Specification TT-W-571 and AWP Commodity Standards as applicable.

²For round piling used in the northern zone (New Jersey and north on the East coast, north of San Francisco Bay on the West coast), a retention of 1.50 pcf is acceptable (UC5A).



AWPA Use Category System

The American Wood-Preservers' Association, which establishes the standards for preservatives and treated wood, is introducing a new Use Category system, based on the service conditions for wood rather than on wood commodities. It is designed to reduce confusion among specifiers and consumers. Most building codes reference AWP standards, so the Use Category system will replace the Commodity standards in codes. At right is a summary of AWP Use Categories. Shown in yellow are ongoing uses for CCA-treated wood.

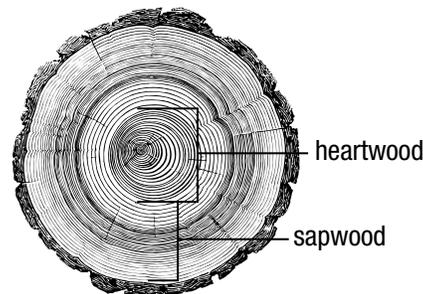
Category		Description	Examples
UC1	Interior, not in contact with ground or foundation	Interior furniture, millwork	
UC2	Interior, subject to dampness	Interior beams, flooring, sill plate	
UC3A	Exterior, above ground, coated	Plywood siding	
UC3B	Exterior, above ground, may be finished	Highway bridge railing	
UC4A	Exterior, ground or freshwater contact in areas with low risk	Fence posts, deck posts, poles	
UC4B	Exterior, ground or freshwater contact, severe environments, high potential for deterioration	Utility poles, building poles, Permanent Wood Foundations	
UC4C	Exterior, ground or freshwater contact, very severe conditions or very critical structural components	Freshwater piling, foundation piling, utility poles in semi-tropical or tropical environments	
UC5A	Saltwater exposure – north of San Francisco and New Jersey	Piling, bulkheads	
UC5B	Saltwater exposure – south of San Francisco on West coast, New Jersey through Georgia on East coast	Piling, bulkheads	
UC5C	Saltwater exposure – south of Georgia, Gulf Coast	Piling, bulkheads	
UCFA	Fire protection, weather-shielded	Framing	
UCFB	Fire protection, exterior	Siding, shakes, stairways	

Recommended Hardware

The conditions that are conducive to attack by fungal decay and termites also promote metal corrosion. Hot-dipped galvanized fasteners (meeting ASTM A 153) and connectors (ASTM A 653 Class G185 sheet), or better, are recommended for protection against the effects of moisture often present where treated wood is used. For Permanent Wood Foundations, use 304 or 316 stainless steel. **Aluminum should not be used in direct contact with this wood.**

Heartwood vs. Sapwood

Typically, the heartwood—or center part of the tree—may be quite dense and less porous than the sapwood—the younger, outer portion of the tree. The heartwood is naturally more resistant to attack by pests, but it is also less accepting of preservative. Therefore, in marine conditions, for example, where wood-destroying organisms are a threat, it is wise to specify wood with a minimum of heartwood exposed (seawall grade) to be assured of adequate preservative protection.



Treatable Species

The following species of wood can be effectively treated with Wolman® CCA preservative in accordance with American Wood-Preservers' Association standards. Although these species are listed by AWWA, reaching required penetration and retention levels is very difficult in some of them. The term "treated to refusal" indicates that the wood has retained as much preservative as possible, but not enough to meet standards or ensure good performance.

- Southern Pine Group
- Ponderosa Pine
- Red Pine
- Hem-Fir Group*
- Jack Pine*
- Lodge Pole Pine*
- Sugar Pine*
- White Pine*
- Radiata Pine
- Caribbean Pine
- Coastal Douglas Fir*
- Western Larch*
- Redwood*
- Sitka Spruce*



**In order to secure penetration of preservative in these species, incising (puncturing the lateral surfaces of the wood) is required.*

Design Values

Since pressure treatment with Wolman® CCA preservative does not alter the natural characteristics of wood, the design values for untreated lumber and plywood should be used in accordance with the National Design Specification for Wood Construction (2001 edition), issued by the American Forest and Paper Association.

Wood products which have been preservative-treated are referenced in Section 4.3.14 and 6.1.4. If lumber is not dried after treatment, or if the end use will result in a moisture content exceeding 19%, wet service factors shall be applied (see 4.1.4 and 4.3.3).

In addition, load duration factors greater than 1.6 shall not apply to structural members. The design values for all acceptable species and grades of lumber are given in the Supplement to the National Design Specification.

Marine Treated Wood/Seawall Grades

Marine treated lumber, timber and piles are pressure-treated with higher concentrations of Wolman® CCA preservative to withstand the harsh exposures and destructive organisms common in marine environments. Retention levels range from 0.40 pcf for soil contact to 2.50 pcf for saltwater immersion. Marine treated wood should be specified for all marine applications, including piling and bulkheads.

To ensure adequate treatment against marine borers, two lumber grades have been established for saltwater applications. "Marine" grade, free of heartwood on all four sides, is appropriate where all sides are vulnerable to marine organisms, such as in jetties. "Seawall" grade, which is suitable for sheet piling, is heartwood-free on one wide side (marked "This side seaward") and on both narrow sides: only the side intended to face earth may have exposed heartwood.

Safety & Handling



The fixation which occurs subsequent to the treating process makes Wolmanized® wood safe for the environment and for the individual user when handled as recommended. Once the Wolman® CCA is fixed in the wood cells, it is highly leach-resistant. With seven decades of usage, its harmlessness to people, plants, pets, and the environment has been documented by academic and governmental researchers and agencies. For studies demonstrating the safety of CCA-treated wood in various applications, see www.wolmanizedwood.com/safe.html.

As a federally registered pesticide, Wolman® CCA preservative undergoes a formal investigation and evaluation by the Environmental Protection Agency periodically. Based on an abundance of documentary evidence, the EPA deems Wolmanized® wood to be suitable for uses described in this brochure. Other agencies also oversee aspects of the production, transportation, and use of CCA and CCA-treated wood. Material Safety Data Sheets are available from the treating companies licensed to manufacture Wolmanized® wood.

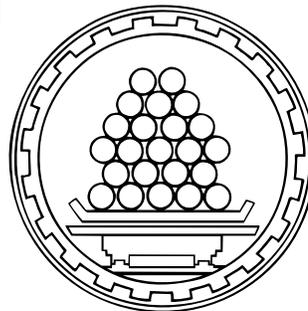
The Wolman® Treating Process

The basic treating process is simple and highly controlled. **1** Lumber, timbers, or plywood is loaded onto small rail or tram cars. The trams are moved into a large, horizontal treating cylinder. **2** The cylinder door is sealed and a vacuum is applied to remove air from the cylinder and the wood cells. **3** Preservative solution is then pumped into the cylinder and **4** the pressure raised to about 150 pounds per square inch, forcing CCA into the wood. Treating time varies depending on species of wood, commodity being treated, and the amount of preservative to be impregnated.

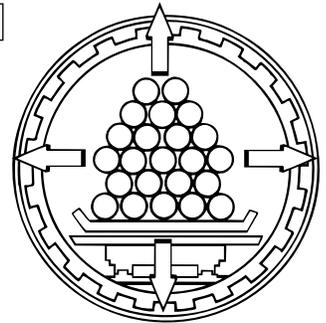
5 At the end of the process, excess treating solution is pumped out of the cylinder and back to a storage tank for later re-use.

6 A final vacuum removes excess preservative from wood cells. The cylinder door is opened and the trams are pulled out. The wood is wet, so it is kept on a concrete pad until any dripping ceases.

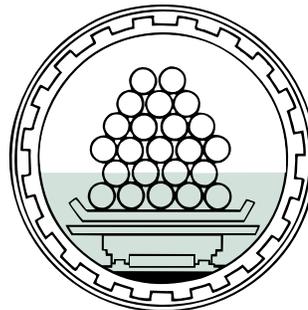
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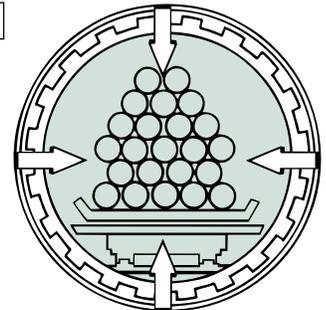
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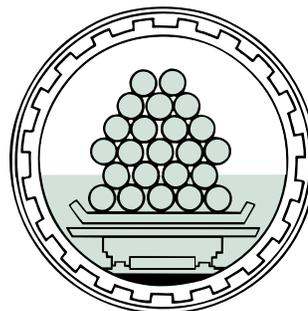
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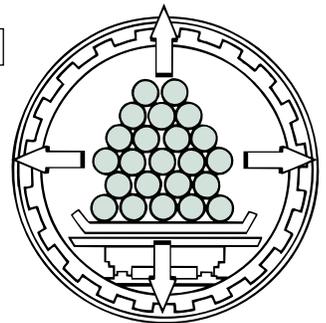
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Model Specification

The following paragraphs are for insertion into a section of generic specifications or generic/proprietary specifications covering rough carpentry to include preservative treated wood. Notes shown in italics should not be included in the final specification.

PART 1 GENERAL

1.01 REFERENCES

- A. American Wood-Preservers' Association (AWPA) 2001 Book of Standards:
- Standard C1, All Timber Products — Preservative Treatment by Pressure Process.
 - Standard C2, Lumber, Timber and Ties (salt water use only).
 - Standard C3, Piles.
 - Standard C4, Poles.
 - Standard C9, Plywood.
 - Standard C14, Wood for Highway Construction.
 - Standard C16, Wood Used on Farms.
 - Standard C18, Marine Construction.
 - Standard C22, Lumber and Plywood for Permanent Wood Foundations.
 - Standard C23, Round Poles and Posts Used in Building Construction.
 - Standard C24, Sawn Timber Used to Support Residential and Commercial Structures.
 - Standard C25, Sawn Crossarms
 - Standard C28, Structural Glued Laminated Members and Laminations Before Gluing.
 - Standard C30, Lumber, Timbers, and Plywood for Cooling Towers (2002 Book of Standards).
 - Standard C33, Structural Composite Lumber.
 - Standard C34, Shakes and Shingles.
 - Standard P5, Waterborne Preservatives.
 - Standard M4, Care of Preservative-Treated Wood Products.
- A. National Institute of Standards and Technology (NIST):
- PS 1, U.S. Product Standard for Construction and Industrial Plywood.
 - PS 20, American Softwood Lumber Standard.

- A. Western Wood Preservers Institute
- Best Management Practices for the Use of Treated Wood in Aquatic Environments.

1.02 QUALITY ASSURANCE

- A. Qualifications:
- Treatment Facility: Provide treated materials that have been produced under the appropriate ASTM or ANSI standard or an ALSC recognized quality assurance program.

1.03 DELIVERY, STORAGE, AND HANDLING

If drying after treatment is selected in part 2, retain the two paragraphs below.

- A. Packing and Shipping:
- Provide waterproof covers for preservative treated wood during shipment.
- Storage and Protection:
- Store preservative treated wood off the ground and protected from the weather.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Preservative: Wolman® CCA Type C; Arch Wood Protection

2.02 MATERIALS

Lumber for preservative treatment must conform to the following specifications. Select grade and species below. Other grades and species may be acceptable, contact Arch to verify.

- A. Lumber: In accordance with NIST PS 20 and as follows:
- Grade: No. 1
 - Grade: No. 2
 - Grade: No. 1 Dense.
 - Grade: No. 2 Dense.
 - Grade: Select Structural.
 - Species: Southern pine.
 - Species: Red pine.
 - Species: Ponderosa pine.
 - Species: Hem-fir.
 - Surfacing: S4S.
 - Surfacing: S1S2E.
 - Surfacing: Rough.
 - Moisture Content: 19%, maximum.

Plywood for preservative treatment must conform to the following specifications. Select panel grade, exposure durability, species group, and structural rating from below.

- A. Plywood: In accordance with NIST PS 1 and as follows:
- Panel Grade: A-C.
 - Panel Grade: B-C.
 - Panel Grade: C-C.
 - Panel Grade: C-D.
 - Exposure Durability: Exterior.
 - Exposure Durability: Exposure 1.
 - Species Group: 1.
 - Species Group: 2.
 - APA Structural Rating: Structural I.
 - APA Structural Rating: Structural II.

- C. Preservative: CCA Type C in accordance with AWPA P5 and formulated using only the oxide form of the chemicals.

2.03 PRESERVATIVE TREATMENT

Select required end uses below.

- A. Pressure Treatment: In accordance with the requirements of AWPA Standard C1 and in accordance with the following standards for indicated end uses:
- Lumber (salt water use only): C2.
 - Piling: C3.
 - Poles: C4.
 - Plywood: C9.
 - Highway Construction: C14.
 - Poles, Piles and Posts Used as Structural Members on Farms: C16.
 - Agricultural Fence Posts: C16.
 - Marine Construction: C18.
 - Permanent Wood Foundations: C22.
 - Building Poles and Posts: C23.
 - Sawn Timbers: C24.

- Sawn Crossarms: C25
- Structural Glued Laminated Members: C28.
- Cooling Towers: C30.
- Structural Composite Lumber: C33.
- Shakes and Shingles: C34.

Select required applications below.

- B. Preservative Retention: In accordance with the specified standard, determined in the specified zone for the following applications:
- Above Ground.
 - Ground or Fresh Water Contact.
 - Wood Foundation or Structural Poles.
 - Salt Water Immersion.

- A. Moisture Content: Drying after treatment is not required.

Select Above or Below.

- B. Moisture Content: Dry after treatment as follows:
- Lumber: 19%, maximum.
 - Plywood: 18%, maximum.
 - Plywood: 15%, maximum (for Permanent Wood Foundation).

Retain below if fixed preservative is required for aquatic environments.

- A. Pressure Treatment of Materials for Aquatic Environments: In accordance with the Best Management Practices published by the Western Wood Preservers Institute.

2.05 SOURCE QUALITY CONTROL

- A. Inspection:
- Untreated Material:
 - Lumber: Provide lumber that has been inspected and graded before treatment by an ALSC recognized grading agency.
 - Plywood: Provide plywood that has been inspected and graded before treatment by a code-recognized inspection and testing agency.
 - Poles: Provide poles that have been inspected and graded before treatment in accordance with ANSI standards.
 - Piling: Provide piling that has been inspected and graded before treatment in accordance with ASTM standards.

- Treated Material: Provide treated material that bears the quality mark of an ALSC-recognized agency which maintains supervision, testing, and inspection of the quality of the product.

PART 3 EXECUTION

3.01 INSTALLATION

Below is not generally required for pine species less than 5 inches thick in the eastern and central U.S. No other special installation specifications are required for preservative treated wood.

- A. Surface Treatment of Field Cuts: Treat field cuts on members that provide structural support to a permanent structure in accordance with AWPA Standard M4.



Other Products in the Wolmanized® Wood Family

Arch Wood Protection and Arch Treatment Technologies produce wood preservatives and additives that enhance the qualities of wood by pressure treatment processing. The companies are licensors of a list of other respected brands of treated wood:



Wolmanized® Natural Select™ wood

www.naturalselect.com

An effective and proven alternative to traditional treated wood commonly used for residential and commercial applications.



Dricon® FRT wood

www.dricon.com

Fire retardant treated lumber and plywood for weather-shielded applications.



FRX™ exterior FRT wood

www.frxwood.com

Fire retardant treated lumber and plywood for exterior applications.



SillBor® wood

www.wolmanizedwood.com/sillbor.htm

Borate-treated wood for sill plate and framing.

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It's wood.

In addition to the treatments that enable the wood to last a long time or resist flames, our brands have all of the environmental and other advantages associated with wood itself. They extend forest resources; the source is a renewable resource grown on managed timberlands, requiring less energy to produce than alternative building materials and offering greater insulation value; and, because of its lighter weight, wood can often be installed with lighter equipment having less environmental impact. Wood offers excellent workability with common construction skills and tools, plus it provides design flexibility and economy. Wood is generally less costly than alternative building materials and is considered easier to work with, not to mention aesthetically preferable in many applications.