



Pressure-Treated Southern Pine

standards • specifications • applications



www.southernpine.com

The content of this publication has been compiled by the Southern Forest Products Association (SFPA) on behalf of the Southern Pine Council (SPC) as a service to buyers, users, and specifiers of pressure-treated wood building materials. SFPA and Southeastern Lumber Manufacturers Association (SLMA) neither grade, test, manufacture, nor treat lumber products.

The technical information in this publication did not originate with SPC. Information pertaining to Southern Pine grades is based on the *Standard Grading Rules for Southern Pine Lumber, 2002 Edition*, published by the Southern Pine Inspection Bureau (SPIB). Information about pressure-treating use categories and commodity standards is based on the approved standards of the American Wood-Preservers' Association (AWPA).

SFPA and the Southern Pine Council do not warrant the technical data, lumber design, or performance in completed structures.



Photo: © Keith Scott Morton



The Southern Pine Council is a joint promotional body coordinated and supported by members of the Southern Forest Products Association and Southeastern Lumber Manufacturers Association.

Southern Forest Products Association
2900 Indiana Ave. Kenner, LA 70065 USA
504/443-4464 • Fax 504/443-6612

Southeastern Lumber Manufacturers Association
P.O. Box 1788 Forest Park, GA 30298 USA
404/361-1445 • Fax 404/361-5963

www.southernpine.com

Portions of this publication reproduce section R319.3 from the 2006 *International Residential Code for One- and Two-Family Dwellings*, International Code Council, Inc., Falls Church, Virginia. Reproduced with permission. All rights reserved.

<i>Treated Southern Pine: Strong & Versatile</i>	2
<i>The Pressure-Treating Process</i>	2
<i>Types of Wood Preservatives</i>	3
<i>Code Acceptance & Standards</i>	3
<i>AWPA Use Category System</i>	3
<i>Advanced Waterborne Preservatives Replace CCA for Consumer Use</i>	4
<i>Table 1: Advanced Waterborne Preservatives</i>	4
<i>Table 2: Service Conditions for Use Category Designations</i>	5
<i>Table 3: Commodity Specifications</i>	5
<i>Table 4: Guide to Commodity Specifications for End Uses</i>	6-8
<i>Table 5: Southern Pine Preservatives, Retentions, and Exposures</i>	9
<i>Grade & Quality Marks</i>	10
<i>Southern Pine Lumber Grade Descriptions</i>	10
<i>Design Values for Pressure-Treated Applications</i>	11
<i>Tables 6-8: Span Tables for Joists in Wet Service</i>	11
<i>Storage & Fabrication</i>	12
<i>Building Code Requirements</i>	12
<i>Treated Sheathing and Structural Wood Composites</i>	12
<i>Fasteners & Connectors</i>	13
<i>Consumer Use & Handling Guidance</i>	14
<i>Wood: An Environmental Asset</i>	14
<i>Additional Resources</i>	BC

Copyright ©2006. Southern Forest Products Association. All rights reserved.

TREATED SOUTHERN PINE: *STRONG & VERSATILE*

Southern Pine's ease of treatability has made it the preferred species when pressure treatment with wood preservatives is required. The unique cellular structure of Southern Pine permits deep, uniform penetration of preservatives, rendering the wood useless as a food source for fungi, termites and micro-organisms. Some 85% of all pressure-treated wood is Southern Pine, a general group of four tree species: shortleaf, longleaf, loblolly, and slash. Collectively, this species group ranks among the strongest, most versatile wood for structural applications.

Most untreated wood will decompose when four conditions required for decay and insect attack occur: high moisture, a favorable temperature, oxygen, and a food source (wood fiber). If any one of these conditions is removed, infestation and decomposition cannot occur. Eliminating wood fiber as a food source by using pressure-treated wood products is an easy solution. Research shows that wood can be expected to last for many decades when properly treated and installed for its intended use.¹

Figure 1 indicates, by region, the level of wood deterioration throughout the United States. Because deterioration zones range from moderate to severe across most of the country, today's design/build professionals realize the importance of specifying and building with treated wood.

Modern science has developed preservative treatments that are odorless and colorless, and leave the wood paintable and dry to the touch. Treatment with preservatives protects wood that is exposed to the elements, in contact with the ground, or subjected to high humidity.

Not all wood treats the same. Most wood species do not readily accept preservatives, and must first be "incised" or perforated with slits along the wood's surface in accordance with American Wood-Preservers' Association (AWPA) standards. Because of its superior treatability, Southern Pine is one of the few wood species that does not require incising.

Pressure-treated wood is safe and environmentally friendly when properly treated, handled, and installed:

- *Proper handling and use of treated wood poses no increased risk to human or animal health.*
- *Wood preservatives do not aggressively leach into the ground or waterways, drinking water supplies, or adversely affect marine life.*
- *Wood products last much longer with pressure treatment, which helps conserve a valuable, renewable natural resource – our trees.*
- *Alternative products such as plastic composites, require more energy to produce, and may also be aesthetically unacceptable to consumers.*

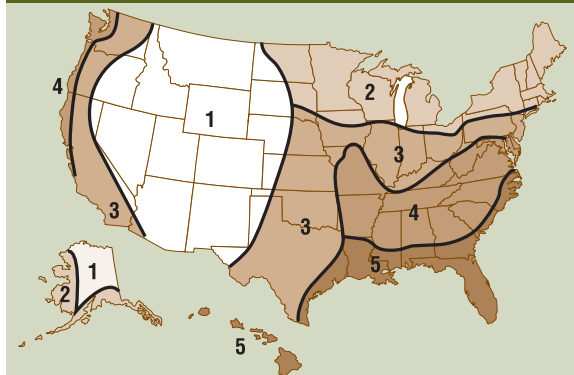
Many of the same safety rules for using untreated wood also apply to the safe use of treated wood. See Consumer Use & Handling Guidance on page 14.

(1) "Comparison of Wood Preservatives in Stake Tests – 2000 Progress Report," Forest Products Laboratory; Research Note FPL-RN-02; U.S. Department of Agriculture



PHOTO: Handyman Club of America

Figure 1: Wood Deterioration Zones



Wood Deterioration Zones:

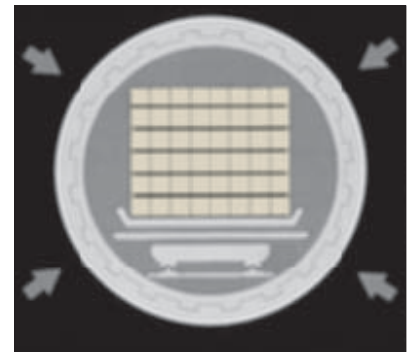
- 1 = low
- 2 = moderate
- 3 = intermediate
- 4 = high
- 5 = severe

SOURCE: AWPA Book of Standards, 2006 Edition

THE PRESSURE-TREATING PROCESS

Pressure-treated Southern Pine is the product of a carefully monitored and controlled process. Preservatives are forced into the wood's cells within a closed cylinder, while under pressure. Widely used copper-based preservatives such as Alkaline Copper Quat (ACQ), Copper Azole (CA-B), and Chromated Copper Arsenate (CCA) react with the wood fiber to form a leach-resistant compound.

The fixation process, bonding the preservative within the wood's fiber, begins during the treating cycle. The time needed to complete fixation can range from several hours to several days depending on the surrounding temperature and humidity, which will vary greatly with locale and seasonal conditions.



TYPES OF WOOD PRESERVATIVES

There are three broad classes of preservatives used for the pressure treatment of wood products:

- **Waterborne** preservatives serve a wide variety of uses, including residential, commercial, marine, agricultural, recreational, and industrial applications.
- **Oilborne** preservatives are used primarily for industrial applications, such as utility poles, piling, posts, glulam beams, and timbers.
- **Creosote** preservatives, including creosote/coal tar mixtures, protect railroad ties, marine pilings, and utility poles.

For most residential, commercial, and marine building applications, waterborne preservatives are commonly specified. A new generation of advanced waterborne preservatives give today's specifier more options than ever before (see Table 1, page 4). Waterborne treatments are clean in appearance, odorless and paintable, plus they are EPA-registered for both interior and exterior use without a sealer.



CODE ACCEPTANCE & STANDARDS

Wood preservatives are accepted for building code compliance either by reference to American Wood-Preservers' Association (AWPA) standards or through the product evaluation process of the International Code Council Evaluation Service (ICC-ES).

AWPA is the principal standards-writing body for wood preservation in the United States. The AWPA *Book of Standards* provides guidance on preservatives, treated wood use and exposure conditions, treatment process, testing, quality control and inspection. AWPA standards ensure that properly treated wood products perform satisfactorily for their intended service condition.

Manufacturers may alternatively qualify for an ICC-ES National Evaluation Report (NER). Pressure-treated wood manufactured and quality-marked under an NER must reference the report number on the product and identify the code-approved inspection agency.

AWPA USE CATEGORY SYSTEM

The AWPA Use Category System (UCS) establishes six major service conditions for typical wood product applications. The UCS helps users identify the exposure condition for specific products and end-use environments, and then specify the acceptable preservatives and retention levels for that application.

Specifiers should become familiar with the Service Conditions for Use Category Designations (Table 2, page 5). Commodity Specifications (Table 3, page 5) designate the general classification of treated wood commodities. Use Categories are referenced in conjunction with The Guide to Commodity Specifications for Treated Wood End-Uses (Table 4, pp. 6-8) to determine the specific Commodity Specification in the *Book of Standards* that lists the appropriate preservative requirements for that use.

Treated wood must meet minimum requirements for preservative penetration and retention for use in a particular service condition. Penetration refers to the depth a preservative must permeate into the wood fiber during the pressure-treating process. Retention levels refer to the amount of preservative that remains in the wood after the pressure-treating process is complete. Retentions are expressed in pounds of preservative per cubic foot (pcf) of wood fiber; the higher the number, the harsher the service condition to which the wood may be exposed.

Code-approved preservatives for treated Southern Pine products are summarized in Southern Pine End Uses, Preservatives, and Retentions (Table 5, page 9). Included are preservative specifications, retention levels, typical applications, and the appropriate Use Category Designation.

When specifying under the Use Category System, include the Use Category designation (Table 2), general Commodity Specification (Table 3), specific End Use (Table 4), Southern Pine preservative and retention level (Table 5), and any special requirements such as pre- or post-treatment preparations (including conditioning and drying). See the specification example at right.

Treated Wood Specification EXAMPLE

Specify appropriate treatments for sawn-lumber joists supporting an outdoor deck.

- Step 1 – Use Category: **UC3B**
(from Table 2: Exterior Construction, Above Ground, Uncoated or poor water run-off Service Conditions. Typical Applications include deck joists)
- Step 2 – General Commodity Classification and Specification Section in the AWPA *Book of Standards*
Sawn Products – A (from Table 3)
- Step 3 – Specific Commodity Classification:
Joists
(from Table 4: Commodity – Joists, Use – Building Construction, Exposure – Above Ground, Exterior)
- Step 4 – Species: **Southern Pine**
Preservatives and retention levels:
Alkaline Copper Quaternary (ACQ-C) to .25 pcf or
Copper Azole (CA-B) to .10 pcf
(from Table 5: Above Ground, Exterior)
- Step 5 – Special Requirements: **None**
(such as pre- or post-treatment preparations, including conditioning and drying such as Kiln Dried After Treatment, KDAT)

ADVANCED WATERBORNE PRESERVATIVES REPLACE CCA FOR CONSUMER USE

Pressure-treated lumber intended for residential and recreational (consumer) use is now manufactured with a new generation of advanced waterborne preservatives: Alkaline Copper Quat (ACQ), Copper Azole (CA-B), and Inorganic Boron (SBX). See Table 1 below. Chromated Copper Arsenate (CCA), the most widely used wood preservative in the past, has been phased out of use in consumer applications. CCA is now exclusively used to pressure treat lumber intended for non-consumer industrial, commercial, and agricultural applications.




Examples of residential and recreational (consumer) applications now using lumber pressure-treated with the new generation of advanced preservatives include:

*Benches • Boardwalks • Fences • Freshwater Marine Piling • Gazebos • Hand Railings • Handicap Access Ramps
Wood Foundations • Lattice • Landscaping Accents • Outdoor Decks • Outdoor Furniture • Pedestrian Bridges • Planters
Play Structures • Pergolas • Porches • Stadium Seats • Steps • Storage Sheds • Structural Framing • Trellises*

Examples of wood products intended primarily for non-consumer applications that may continue to be treated with CCA:

*Lumber and Timber for Salt Water Marine Use • Piles & Poles • Wood for Highway Construction • Poles, Piles & Plywood
Used on Farms • Lumber and Plywood for Permanent Wood Foundations • Round Poles and Posts Used in
Building Construction • Sawn Timber to Support Residential and Commercial Structures • Sawn Crossarms
Structural Glued-Laminated Members • Structural Composite Lumber • Shakes and Shingles*

Table 1: Advanced Waterborne Preservatives for Pressure Treatment of Southern Pine*

Preservative Types	Popular Brand Names	History/Uses
 <p>Alkaline Copper Quat (ACQ)</p>	<p>Nature Wood® Nature Wood® with water repellent Preserve® Preserve Plus® with water repellent</p>	<p>ACQ-treated wood was first introduced in the United States in the 1990s. It has been successfully used in Europe, Japan, New Zealand, Asia, and Australia.</p> <p><i>Uses:</i> ACQ is a fixed preservative approved for full exposure to above ground, ground contact, and freshwater applications.</p>
 <p>Copper Azole (CA-B)</p>	<p>Wolmanized® Outdoor® Wolmanized® Outdoor® with Stabilizy™ additive</p>	<p>Wood products treated with Copper Azole have been used effectively around the world since 1992.</p> <p><i>Uses:</i> Copper Azole is a fixed preservative approved for full exposure to above ground, ground contact, and freshwater applications.</p>
 <p>Inorganic Boron (SBX)</p>	<p>Advance Guard® SillBor® TimberSaver® PT</p>	<p>Wood products treated with Inorganic Boron were initially established in New Zealand in the 1950s. Before being introduced into the United States, borates were widely used in New Zealand, Europe, and South-east Asia.</p> <p><i>Uses:</i> SBX is a diffusible preservative approved only for above ground applications that are continuously protected from liquid water, such as sill plates and other enclosed structural framing.</p>

* This table represents leading preservative types and popular brand names currently available. Additional preservative types and brand names may enter the market in the future.

Table 2: Service Conditions for Use Category Designations¹

Use Category	Service Conditions	Use Environment	Common Agents of Deterioration	Typical Applications
UC1	Interior construction Above ground Dry	Continuously protected from weather or other sources of moisture	Insects only	Interior construction and furnishings
UC2	Interior construction Above ground Damp	Protected from weather, but may be subject to sources of moisture	Decay fungi and insects	Interior construction
UC3A	Exterior construction Above ground Coated & rapid water run-off	Exposed to all weather cycles, not exposed to prolonged wetting	Decay fungi and insects	Coated millwork, siding and trim
UC3B	Exterior construction Above ground Uncoated or poor water run-off	Exposed to all weather cycles, including prolonged wetting	Decay fungi and insects	Decking, deck joists, railings, fence pickets, uncoated millwork
UC4A	Ground contact or fresh water Non-critical components	Exposed to all weather cycles, normal exposure conditions	Decay fungi and insects	Fence, deck, and guardrail posts, crossties & utility poles (low decay areas)
UC4B	Ground contact or fresh water Critical components or difficult replacement	Exposed to all weather cycles, high decay potential, includes salt water splash	Decay fungi and insects with increased potential for biodeterioration	Permanent wood foundations, building poles, horticultural posts, crossties & utility poles (high decay areas)
UC4C	Ground contact or fresh water Critical structural components	Exposed to all weather cycles, severe environments, extreme decay potential	Decay fungi and insects with extreme potential for biodeterioration	Land & fresh water piling, foundation piling, crossties & utility poles (severe decay areas)
UC5A	Salt or brackish water and adjacent mud zone Northern waters	Continuous marine exposure (salt water)	Salt water organisms	Piling, bulkheads, bracing
UC5B	Salt or brackish water and adjacent mud zone NJ to GA, south of SanFran	Continuous marine exposure (salt water)	Salt water organisms, including creosote tolerant, <i>Limnoria tripunctata</i>	Piling, bulkheads, bracing
UC5C	Salt or brackish water and adjacent mud zone South of GA, Gulf Coast, Hawaii, and Puerto Rico	Continuous marine exposure (salt water)	Salt water organisms, including <i>Martesia</i> , <i>Sphaeroma</i>	Piling, bulkheads, bracing
UCFA	Fire protection as required by codes Above ground Interior construction	Continuously protected from weather or other sources of moisture	Fire	Roof sheathing, roof trusses, studs, joists, paneling
UCFB	Fire protection as required by codes Above ground Exterior construction	Subject to wetting	Fire	Vertical exterior walls, inclined roof surfaces or other construction which allows water to quickly drain

Table 3: Commodity Specifications²

Sawn Products	A
Permanent Wood Foundations	A
Posts	B
Playground Material	B
Round Building Poles	B
Crossties	C
Utility Poles	D
Round Timber Piling	E
Wood Composites	F
Marine Applications (Salt Water)	G
Fire Retardants	H
Non-Pressure Applications	I

Specifying Southern Pine: When specifying Southern Pine, include the Use Category designation (Table 2 above), general Commodity Specification (Table 3 at left), specific commodity (Table 4, pp. 6-8), Southern Pine preservative and retention level (Table 5, page 9), and any special requirements such as pre- or post- treatment preparations (including conditioning and drying).

(1) Table 2 is excerpted from the AWPAs *Book of Standards, 2006 Edition*, Section 2, Service Conditions for Use Category Designations. (2) Major classifications of treated wood commodities (A-I) are excerpted from the AWPAs *Book of Standards*, Section 6, Commodity Specifications, which provide detailed information on listed preservative systems and wood species that can be treated for each use exposure condition. (3) The AWPAs Use Category System was introduced in 1999 as a user-friendly format replacing the Commodity (or "C") Standards. The Commodity Standards were deleted from the AWPAs *Book of Standards* beginning with the 2005 edition. Commodity Standards pertaining to Southern Pine only are displayed below for historical reference. For example, the "C" Standards in the AWPAs *Book of Standards, 2001 Edition*, were used as the basis for determining which categories of CCA-treated commodities would be phased out of consumer use as of 2004.

COMMODITY STANDARDS:³ C1 - All Timber Products - Preservative Treatment by Pressure Processes; C2 - Lumber, Timber, Bridge Ties and Mine Ties; C3 - Piles; C4 - Poles; C5 - Fence Posts; C6 - Crossties and Switch Ties; C9 - Plywood; C11 - Wood Blocks for Floors and Platforms; C14 - Wood for Highway Construction; C15 - Wood for Commercial - Residential Construction; C16 - Wood Used on Farms; C17 - Playground Equipment; C18 - Marine Construction; C20 - Structural Lumber: Fire Retardant Treatment by Pressure Processes; C22 - Permanent Wood Foundations, C 23 - Round Poles and Posts used for Building Construction; C24 - Sawn Timber used to Support Residential & Commercial Structures; C25 - Sawn Crossarms; C27 - Plywood Fire Retardant Treatment by Pressure Processes; C28 - Glued Laminated Members; C29 - Lumber and Plywood to be used for the Harvesting, Storage and Transportation of Food Stuffs; C30 - Lumber, Timbers and Plywood for Cooling Towers; C31 - Lumber used Out of Contact with the Ground and Continuously Protected from Liquid Water; C32 - Glue Laminated Poles; C33 - Structural Composite Lumber; C34 - Shakes & Shingles

Table 4: Guide to Commodity Specifications for Treated Wood End Uses

Commodity	Use	Exposure	Use Category	Commodity Specifications	
				Section	Special Reqs.
<i>Bender Board</i>	General	Ground Contact or Fresh Water	4A	A	
<i>Bulkhead Sheathing</i>	Non-marine	Ground Contact or Fresh Water	4A	A	
	Marine	Brackish or Salt Water	5A-5B-5C	G	6.1-6.4
<i>Cant Strips</i>	Building Construction	Above Ground	3B	A	4.1
<i>Composite Lumber (PSL & LVL)</i>	Structural	Above Ground, Exterior	3B	F	
	Highway Structural, general	Ground Contact or Fresh Water	4A	F	
	Highway Structural, important or high decay	Ground Contact or Fresh Water	4B	F	
	Highway Structural, critical or severe decay	Ground Contact or Fresh Water	4C	F	
<i>Cribbing</i>	Highway	Ground Contact or Fresh Water	4C	A	
<i>Crossarms, sawn</i>	General	Above Ground, Exterior	3B	A	4.5
	Critical or hard to replace	Above ground, Exterior	4A	A	
<i>Crossties, Switchties</i>	General	Ground Contact or Fresh Water	4A	C	
	Important and/or high decay	Ground Contact or Fresh Water	4B	C	
	Critical and/or severe decay	Ground Contact or Fresh Water	4C	C	
<i>Decking</i>	Painted/Unpainted	Above Ground, Exterior	3B	A	
	Building Construction, general	Ground Contact or Fresh Water	4A	A	
	Highway Bridge Structural, critical/severe decay	Above Ground	4B	A	4.3
<i>Decks, Residential</i>	Decking, Painted/Unpainted	Above Ground, Exterior	3B	A	
	Joists			A	
	Railing components			A	
	Joists	Ground Contact or Fresh Water	4A	A	
	Support Posts, sawn			A	
<i>Expansion Boards</i>	General	Ground Contact or Fresh Water	4A	A	
<i>Fascia Boards</i>	Painted/Coated	Above Ground, Exterior	3A	A	
	Unpainted	Above Ground, Exterior	3B	A	
<i>Fence Pickets</i>	Painted/Coated	Above Ground, Exterior	3A	A	
	Unpainted	Above Ground, Exterior	3B	A	
<i>Fence Rail</i>	Painted/Coated	Above Ground, Exterior	3A	A	
	Unpainted	Above Ground, Exterior	3B	A	
	Stockyard, Agricultural	Above Ground, Exterior	4A	A	
<i>Floor Plate</i>	Building Construction	Above Ground, potentially wet	3B	A	
<i>Flooring</i>	Above Ground, Interior	Protected, Insect only	1	A	4.1
	Above Ground, Interior	Protected, Damp	2	A	4.1
	Residential/Commercial, Veranda	Above Ground, Exterior	3B	A	4.1
<i>Flooring, block</i>	Above Ground	Low humidity	2	A	
	Above Ground	High humidity	3A	A	
<i>Furniture</i>	Indoor	Protected, Insect only	1	A	
	Outdoor	Above Ground, Exterior	3B	A	
	Outdoor	Ground Contact	4A	A	
<i>Furring Strips</i>	General	Above Ground, Exterior	3B	A	
<i>Gazebo Material</i>	Painted/Coated	Above Ground, Exterior	3A	A	
	Unpainted	Above Ground, Exterior	3B	A	
<i>Glue Laminated Beams</i>	Above Ground, Interior	Protected, Insect only	1	F	
	Above Ground, Interior	Protected, Damp	2	F	
	Above Ground Structural (Painted/Unpainted)	Exterior	3B	F	
	General Structural, Highway structural non-critical	Ground Contact or Fresh Water, low decay	4A	F	
	Highway Important Structural or Saltwater Splash	Ground Contact or Fresh Water, high decay	4B	F	
	Highway Critical Structural	Ground Contact or Fresh Water, severe decay	4C	F	
<i>Handrails/Guardrails</i>	Highway Construction	Above Ground, Exterior	3B	A	4.3
<i>Joists</i>	Above Ground, Interior	Insect only	1	A	4.1
	Above Ground, Interior	Above Ground, Damp	2	A	4.1
	Building Construction	Above Ground, Exterior	3B	A	
	Building Construction	Ground Contact or Fresh water	4A	A	

NOTE: Table 4 is excerpted from the AWPAs Book of Standards, Section 3, Guide to Commodity Specifications for Treated Wood End Uses. See the *Book of Standards* for complete commodity descriptions and special requirements referred to in the last column of this table, Commodity Specifications.

Table 4: Guide to Commodity Specifications for Treated Wood End Uses (cont'd)

Commodity	Use	Exposure	Use Category	Commodity Specifications	
				Section	Special Reqs.
<i>Laminated Veneer Lumber (LVL)</i>	See Composite Lumber				
<i>Landscape Ties</i>	General	Ground Contact or Fresh Water	4A	A	
<i>Lattice</i>	Painted/Unpainted	Above Ground, Exterior	3B	A	
<i>Lumber/Timbers</i>	Above Ground, Interior	Insect only	1	A	4.1
	Above Ground, Interior	Wood exposed to dampness	2	A	4.1
	Above Ground, Exterior, Coated/Painted	All applications	3A	A	
	General, including Agricultural/Farms	Above Ground, Exterior, Uncoated	3B	A	
	Food Harvest & Storage	Above Ground, Exterior		A	
	Roof Decking, Flooring/Subflooring	Above Ground, Exterior		A	4.1
	Food Contact	Above Ground, Exterior		A	
	General, including Retaining Walls, Edging, Agriculture, Mariculture, Boats, Furniture, Gazebos, Compost/Plant/Mushroom Boxes, Flumes	Ground Contact or Fresh Water	4A	A	
	Fire Escapes, Exterior exposed	Above Ground and Ground Contact		A	
	Wet Industrial Processing Areas	Above Ground and Ground Contact		A	
	Cooling Towers	Fresh Water		A	4.4
	Brine Storage, Highway Construction Materials	Ground Contact or Fresh Water		B	4.1
	Playground Equipment	Ground Contact or Fresh Water		B	4.3
	Permanent Wood Foundation	Ground Contact and Above Ground	4B	A	4.2
	Highway Construction, Residential/Business structural support	Ground Contact or Fresh Water		A	4.3
	Crib Walls, Retaining Walls, Important Building Structural, Greenhouse	Ground Contact or Fresh Water		A	
	Marine Out of Water and Above Ground	Salt Water Splash		A	G-2.9
	Marine Out of Water and Ground Contact	Salt Water Splash	4C	A	G-2.9
	Aquaculture	Fresh Water		A	
	Residential/Business structural support	Ground Contact or Fresh Water		A	
Marine, Aqua/Mariculture, Highway, Boats	Brackish or Salt Water	5A-5B-5C	G	6.1-6.4	
Fire Retardant, Fire Protection	Interior	FA	H		
Fire Retardant, Fire Protection	Exterior	FB	H		
<i>Millwork, Trim</i>	Above Ground, Interior	Insect only	1	A	4.1
	Above Ground, Interior	Above Ground, Damp	2	A	4.1
	Painted/Coated	Above Ground, Exterior	3A	A	4.1
	Unpainted	Above Ground, Exterior	3B	A	
<i>Parallel Strand Lumber (PSL)</i>	See Composite Lumber				
<i>Pergola</i>	Pergola	Ground Contact or Fresh Water	4A	A	
<i>Piles, foundation</i>	Building Construction, completely embedded in soil	Ground Contact	4C	E	
<i>Piles, round</i>	Highway Construction	Ground Contact or Fresh Water	4C	E	
	Marine/Highway Construction	Brackish or Salt Water	5A-5B-5C	G	6.1-6.4
<i>Piles, sawn</i>	Residential/Business structural support	Ground Contact or Fresh Water	4B	A	4.3
	Residential/Business structural support, critical	Ground Contact or Fresh Water	4C	A	4.3
<i>Plywood</i>	Above Ground, Interior, Subfloor	Above Ground, Damp	2	F	
	General, including Agriculture/Farms	Above Ground, Exterior	3B	F	
	Food Harvest-Storage-Contact	Above Ground, Exterior		F	
	Roof Decking, Flooring/Subflooring	Above Ground, Exterior		F	2.6
	General, including Edging, Agriculture, Mariculture, Boats, Furniture, Gazebos, Compost/Plant/Mushroom Boxes, Flumes	Ground Contact or Fresh Water	4A	F	
	Brine Storage, Highway Construction Materials	Ground Contact or Fresh Water		F	B-4.1
	Wet Industrial Processing Areas	Ground Contact or Fresh Water		F	
	Fire Escapes, Exterior exposed	Above Ground and Ground Contact		F	
	Marine	Salt Water Splash	4B	F	
	Permanent Wood Foundation	Ground Contact and Above Ground		A	4.2
	Marine/Highway Construction, Boat Building	Brackish or Salt Water	5A-5B-5C	G	
	Fire Retardant, Fire Protection	Interior	FA	H	
Fire Retardant, Fire Protection	Exterior	FB	H		

NOTE: Table 4 is excerpted from the AWPAs Book of Standards, Section 3, Guide to Commodity Specifications for Treated Wood End Uses. See the *Book of Standards* for complete commodity descriptions and special requirements referred to in the last column of this table, Commodity Specifications.

Table 4: Guide to Commodity Specifications for Treated Wood End Uses (cont'd)

Commodity	Use	Exposure	Use Category	Commodity Specifications	
				Section	Special Reqs.
<i>Posts, round, 1/2 & 1/4 round</i>	General, Fence, Highway Construction including guide, sign and sight	Ground Contact or Fresh Water	4A	B	
	Playground Equipment	Ground Contact or Fresh Water	4A	B	
	Building Construction, Highway Construction, including guardrail posts, spacer blocks	Ground Contact or Fresh Water, moderate decay	4B	B	
	Agricultural used as round structural members	Ground Contact or Fresh Water, moderate decay	4B	B	4.2.1
	Brine Storage, Highway	Ground Contact or Fresh Water, moderate decay	4B	B	4.1.2
	Highway Construction, Lighting	Ground Contact or Fresh Water, severe decay	4C	B	
<i>Posts, sawn 4 sides</i>	General, Fence, Deck Support	Ground Contact or Fresh Water	4A	A	
	Highway Construction, general	Ground Contact or Fresh Water		A	4.3
	Playground Equipment	Ground Contact or Fresh Water	4A	B	4.3
	Important Building Structural, Agricultural Use, Spacer Blocks	Ground Contact or Fresh Water, moderate decay	4B	A	
	Building Critical Structural	Ground Contact or Fresh Water, severe decay	4C	A	
<i>Poles, round</i>	Agricultural Use, Utility	Ground Contact or Fresh Water, low decay	4A	D	
	Agriculture, Utility, Highway Construction, Building Structural, Lighting	Ground Contact or Fresh Water, moderate decay	4B	D	
	Utility, Lighting	Ground Contact or Fresh Water, high decay	4C	D	
<i>Poles, sawn</i>	Agricultural/Farm	Ground Contact or Fresh Water	4A	A	
	Structural Building	Ground Contact or Fresh Water, moderate decay	4B	A	
<i>Poles, glue laminated</i>	Utility Poles	Ground Contact or Fresh Water, low or moderate decay	4A-4B	D	6
	Utility Poles	Ground Contact or Fresh Water, high decay	4C	D	6
<i>Purlins</i>	Above Ground, Interior	Insect only	1	A	
		Above Ground, Damp	2		
	Painted/Coated	Above Ground, Exterior	3A	A	
	Unpainted	Above Ground, Exterior	3B	A	
<i>Shakes and Shingles</i>	Painted or Unpainted	Above Ground, Exterior	3B	A	4.6
<i>Siding, beveled or not</i>	Painted/Coated	Above Ground, Exterior	3A	A	4.1
	Unpainted	Above Ground, Exterior	3B	A	
<i>Sill Plates</i>	Interior	Above Ground, Damp	2	A	4.1
<i>Skirtboard</i>	Post Frame Construction	Ground Contact	4A	A	
<i>Stakes, sawn 4 sides</i>	Grape, Agriculture	Ground Contact or Fresh Water	4A	A	
<i>Structural Composite Lumber</i>	See Composite Lumber				
<i>Studs</i>	Building Construction	Above Ground, Interior	2	A	4.1
<i>Ties</i>	Mine and Bridge	Ground Contact or Fresh Water	4A	B	
		Brackish or Salt Water	5A-5B-5C	G	6.1-6.4
<i>Trusses</i>	Roof or Floor	Above Ground	3B	A	4.1
<i>Utility Poles</i>	Distribution, Transmission, Laminated, general	Ground Contact or Fresh Water	4A	D	
	Distribution, Transmission, Laminated, important	Ground Contact or Fresh Water, high decay	4B	D	
	Distribution, Transmission, Laminated, critical	Ground Contact or Fresh Water, severe decay	4C	D	
<i>Veranda Supports</i>	Veranda Supports	Ground Contact or Fresh Water	4A	A	

NOTE: Table 4 is excerpted from the AWPAs Book of Standards, Section 3, Guide to Commodity Specifications for Treated Wood End Uses. See the *Book of Standards* for complete commodity descriptions and special requirements referred to in the last column of this table, Commodity Specifications.

Table 5: Southern Pine End Uses, Preservatives, and Retentions¹

End Use / Service Condition	AWPA Use Category (UC) Designation	Waterborne ²		Oilborne			Creosote				
		Inorganic Boron (SBX) ³	Alkaline Copper Quat - C&D (ACQ)	Chromated Copper Azole - Type B (CA-B)	Copper-8-Quinolinate (Cu8)	Copper Naphthenate (CuN)	Pentachlorophenol - A&C (PCP)	Creosote (CR)	Creosote-Petroleum (CR-PS)	Creosote Solution (CR-S)	
Minimum Retention Requirements – Pounds per Cubic Foot (pcf)											
Lumber, Timbers & Composites											
Above Ground, Interior Dry or Damp . . .	UC1-2	0.17 ³ 0.28 ³	0.25 0.15 ⁴	0.10 0.08 ⁴	0.25	0.02	NR	NR	NR	NR	NR
Above Ground, Exterior	UC3A-B	NR	0.25 0.15 ⁴	0.10 0.08 ⁴	0.25	0.02	0.04	0.40	8.0 ⁸	8.0 ⁸	8.0 ⁸
Ground Contact or Fresh Water											
Non-critical components	UC4A	NR	0.40	0.21	0.40	NR	0.06	0.50	10.0 ⁸	10.0 ⁸	10.0 ⁸
Critical, difficult replacement	UC4B	NR	0.60 ⁵	0.31	0.60	NR	0.075	0.50	10.0 ⁸	10.0 ⁸	10.0 ⁸
Critical structural components	UC4C	NR	NR	0.31	0.60	NR	0.075	0.50	12.0 ⁸	12.0 ⁸	12.0 ⁸
Permanent Wood Foundation (PWF)	UC4B	NR	0.60	0.31	0.60	NR	NR	NR	NR	NR	NR
Cross-ties & Switch-ties	UC4A-C	NR	NR	NR	NR	NR	0.06	0.4	8.0	8.0	8.0
Marine, Salt Water Splash ⁹	UC4B	NR	0.60	0.31	0.60	NR	NR	NR	10.0	10.0	10.0
	UC4C	NR	NR	0.31	0.60	NR	NR	NR	12.0	12.0	12.0
Marine, Brackish or Salt Water	UC5A-C	NR	NR	NR	2.5	NR	NR	NR	25.0	NR	25.0
Dual Treatment											
First Treatment	UC5A-C	NR	NR	NR	1.5	NR	NR	NR		NR	
Second treatment	UC5A-C	NR	NR	NR		NR	NR	NR	20.0	NR	20.0
Round Timber Piling											
Land or Fresh Water Use & Foundations . . .	UC4C	NR	0.80 ⁶	NR	0.80	NR	0.10	0.60	12.0	12.0	12.0
Marine, Brackish or Salt Water											
New Jersey & San Francisco Bay, North NJ to GA & San Francisco Bay, South	UC5A	NR	NR	NR	1.5	NR	NR	NR	16.0	NR	16.0
Florida, Gulf Coast, Hawaii, Puerto Rico	UC5B	NR	NR	NR	2.5	NR	NR	NR	20.0	NR	20.0
Dual Treatment	UC5C	NR	NR	NR	2.5	NR	NR	NR	20.0	NR	20.0
First Treatment	UC5B-C	NR	NR	NR	1.0	NR	NR	NR		NR	
Second Treatment	UC5B-C	NR	NR	NR		NR	NR	NR	20.0	NR	20.0
Poles											
Utility, Low decay	UC4A	NR	NR	0.31	0.60	NR	0.06	0.30	6.0	NR	6.0
Utility, High decay	UC4B	NR	NR	0.31	0.60	NR	0.08	0.38	7.5	NR	7.5
Utility, Severe decay	UC4C	NR	NR	NR	0.60	NR	0.13	0.45	9.0	NR	9.0
Building Construction, Round	UC4B	NR	NR	0.31	0.60	NR	0.10	0.45	9.0 ⁸	NR	NR
Posts											
Commercial-Residential Fence											
Round, half-round, and quarter-round . .	UC4A	NR	0.40	0.21	0.40	NR	0.055	0.40	8.0	8.0	8.0
Sawn four sides	UC4A	NR	0.40	0.21	0.40	NR	0.055	0.50	10.0 ⁸	10.0 ⁸	10.0 ⁸
Highway Construction											
Fence, Guide, and Sign											
Round, half-round, and quarter-round .	UC4A	NR	0.40	0.21	0.40	NR	0.055	0.40	8.0	8.0	8.0
Sawn four sides	UC4A	NR	0.40	0.21	0.40	NR	0.055	0.50	10.0	10.0	10.0
Guardrail and Spacer Blocks											
Round	UC4B	NR	0.50	0.25	0.50	NR	0.069	0.50	10.0 ⁸	10.0 ⁸	10.0 ⁸
Sawn four sides	UC4B	NR	0.50	0.25	0.50	NR	0.069	0.60	12.0	12.0	12.0
Building Construction, Sawn	UC4B	NR	0.50	0.31	0.50	NR	0.069	0.60	12.0	12.0	12.0
Playground Equipment, Round & Sawn . . .	UC4A	NA	0.40	0.21	NA	0.02 ¹⁰	NA	NA	NA	NA	NA

NR – Not Recommended; NA – Not Allowed; (1) Unless otherwise indicated, preservatives and retentions listed in Table 5 are based upon the American Wood-Preservers' Association (AWPA) *Book of Standards, 2006 Edition* (available at www.awpa.com). (2) The AWPA *Book of Standards* also lists Ammoniacal Copper Quat-B (ACQ-B) and Ammoniacal Copper Zinc Arsenate (ACZA) as approved waterborne treatments for Southern Pine; however, these preservative formulations are at present used almost exclusively on difficult-to-treat Western species. (3) SBX may be used above ground where continuously protected from exposure to liquid water in applications such as sill plates or other enclosed structural framing at retentions (B₂O₃ basis) of 0.17 pcf, or 0.28 pcf where Formosan termites are confirmed. (4) ACQ retention of 0.15 is code approved by the International Code Council Evaluation Service (ICC-ES) for decking and other specialties per ICC-ES National Evaluation Reports, NER 628 and 643. CA-B retention of 0.08 is code approved for decking and other specialties per ICC-ES National Evaluation Report, NER 669. (5) ACQ Type D only. (6) ACQ Type C only. (7) CCA is not available for most residential consumer-use lumber applications. (8) Creosote not recommended for this application where a clean appearance and an odor-free environment is important. (9) Salt Water Splash is the exposure of any member of a marine structure which is positioned above mean high tide, but is subject to frequent wetting from wave action or wind which supports intermittent degradation by marine organisms. (10) For above ground use only.

GRADE & QUALITY MARKS

To protect the buyer and consumer, the lumber industry has developed a production system requiring ink-stamped grade marking of each piece of lumber under adequate quality control measures. This assures delivery of the grade specified for its intended use. Lumber grading and marking is monitored and inspected by agencies accredited by the American Lumber Standard Committee (ALSC).

A valid agency grade mark on Southern Pine lumber indicates the product meets structural and appearance requirements established for that grade.

In addition, all treated Southern Pine should be identified with an inspection

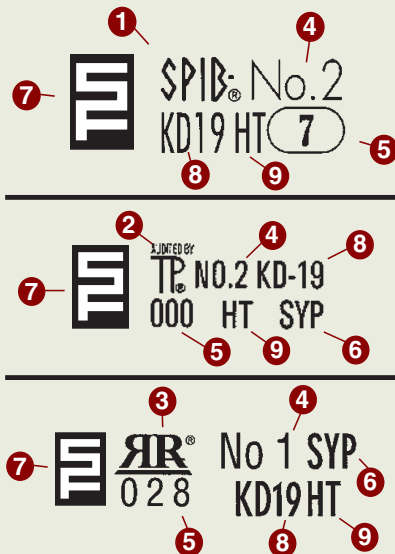
agency quality mark (either plastic end tag or ink stamp) conforming to building code standards (see Code Acceptance & Standards, page 3). For the grade mark to be valid after treatment, the lumber must adhere to the grade

requirements and the moisture content of the grade represented by the mark.

Note: The presence of a plastic end-tag does not necessarily indicate ALSC-accredited treated lumber. The quality mark information should be printed separate from the manufacturer's warranty and guarantee information on the tag.

TYPICAL SOUTHERN PINE LUMBER GRADE MARKS

(ink stamp)



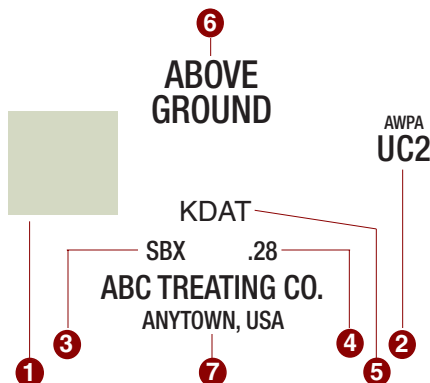
Quality Southern Pine lumber is graded in accordance with the grading rules of the Southern Pine Inspection Bureau (SPIB). SPIB, Timber Products Inspection, Inc., Renewable Resource Associates, Inc. (RRA) and other organizations* are accredited to inspect and grade mark Southern Pine lumber in accordance with SPIB grading rules.

- 1 Inspection Service: Southern Pine Inspection Bureau (SPIB)
- 2 Inspection Service: Timber Products Inspection, Inc. (TP)
- 3 Inspection Service: Renewable Resource Associates, Inc. (RRA)
- 4 Lumber Grade
- 5 Mill Identification Number
- 6 Lumber Species
- 7 (optional) Logo denoting a member mill of Southern Forest Products Association (SFFPA)
- 8 Moisture Content (MC): Kiln-dried (KD) to a maximum of 19%
- 9 Heat Treated

*Note: Other agencies are accredited by ALSC to inspect and grade all or selected Southern Pine products according to SPIB Grading Rules, including: California Lumber Inspection Service (CLIS); Northeastern Lumber Manufacturers Association (NELMA); West Coast Lumber Inspection Bureau (WCLIB); and Western Wood Products Association (WWPA).

TYPICAL QUALITY MARK FOR TREATED LUMBER

(plastic end tag or ink stamp)



- 1 Trademark of inspection agency accredited by American Lumber Standard Committee (ALSC)*
- 2 American Wood-Preservers' Association (AWPA) Use Category
- 3 Preservative used for Treatment
- 4 Retention Level
- 5 Dry or KDAT, if applicable
- 6 Exposure Category
- 7 Treating Company & Location

* Contact the Southern Pine Council for a listing of accredited inspection agencies.

Southern Pine Lumber Grade Descriptions

The following grade descriptions are based on the *Standard Grading Rules for Southern Pine Lumber, 2002 Edition*, published by the Southern Pine Inspection Bureau (SPIB). Southern Pine grade descriptions for products not listed below are detailed in the *Southern Pine Use Guide*, available online at www.southernpine.com.

Dimension Lumber: 2" to 4" thick, 2" and wider

No.1 – Recommended for construction where high strength, stiffness and good appearance are desired.

No.2 – Recommended for most general construction uses where moderately high design values are required. Allows well-spaced knots of any quality.

No.3 – Assigned design values meet a wide range of design requirements. Recommended for general construction purposes where appearance is not a controlling factor. Many pieces included in this grade would qualify as No.2 except for a single limiting characteristic.

No.1 Prime – Recommended where appearance and strength are a consideration. Grade based on No.1 Dimension Lumber except wane and other characteristics that affect appearance are limited.

No.2 Prime – Recommended where appearance and strength are a consideration. Grade based on No.2 Dimension Lumber except wane and other characteristics that affect appearance are limited.

Timbers: 5" x 5" and larger

Select Structural – Recommended where high strength, stiffness and good appearance are desired.

No.1 & No.2 – Similar in appearance to corresponding grades of Dimension Lumber. Recommended for general construction uses.

No.3 – Non-stress rated, but economical for general utility purposes such as bracing, blocking, bulkheading, etc.

Radius Edge Decking: 1 1/4" thick, 4" to 6" wide

Premium – High-quality product, recommended where smallest knots are desired and appearance is of utmost importance.

Standard – Slightly less restrictive than Premium Grade. A very good product to use where a more rustic appearance is desired.

DESIGN VALUES FOR PRESSURE-TREATED APPLICATIONS

Reference design values for Southern Pine lumber are tabulated in the *Design Values for Wood Construction Supplement* of the 2005 *National Design Specification® (NDS)®* published by the American Forest & Paper Association. Reference design values for untreated lumber also apply to lumber pressure treated by an approved process and preservative.

Reference design values are based on normal load duration and dry service conditions; they must be multiplied by applicable adjustment factors to determine adjusted design values. Adjustment factors for untreated lumber also apply to pressure-treated lumber with one exception – in Allowable Stress Design applications allowing an increase with the Load Duration Factor, C_D , that factor cannot exceed 1.6 for structural members pressure-treated with waterborne preservatives.

As an example, common adjustment factors to consider when sizing pressure-treated joists for an exterior application include:

- *Incising Factor, C_i* – A reduction required for difficult-to-treat species that must be incised to meet AWWPA treating standards. This reduction does not apply to Southern Pine because of its ease of treatability.
- *Repetitive Member Factor, C_r* – An increase allowed when at least three joists are in contact or spaced not more than 24" on center and are joined by a load distributing element such as decking.
- *Wet Service Factor, C_M* – A reduction required for lumber used under conditions where the moisture content of the wood in service will exceed 19% for an extended period of time, such as for uncovered outdoor decks regularly exposed directly to rain or other sources of moisture. Members that are protected from the weather by roofs or other means but are occasionally subjected to windblown moisture, such as for covered porches, are generally considered dry applications.

For more information about Southern Pine reference design values, refer to SPC's *Southern Pine Use Guide*.



SPAN TABLES FOR JOISTS IN WET SERVICE

The spans shown below in Tables 6 through 8 are the maximum allowable length of a joist in wet service from face-to-face of its supports. Span lengths are given in feet and inches. Loading conditions are expressed in psf (pounds per square foot). Tables 6, 7, and 8 provide common deck live loads of 40, 60, and 100 psf, respectively. Deflection is limited to span in inches divided by 360 and is based on live load only.

These three span tables are excerpted from SPC's more comprehensive publication, *Maximum Spans for Southern Pine Joists & Rafters*. The spans were computed using standard engineering design formulas for simple span beams with uniform loads. They include the wet-service and repetitive-member adjustment factors described at left.

Table 6: Wet-Service Joists – 40 psf live load, 10 psf dead load, $\ell/360$

Size inches	Spacing inches o.c.	Grade			
		Select Structural	No. 1	No. 2	No. 3
2 x 6	12	10-9	10-7	10-4	9-4
	16	9-9	9-7	9-5	8-1
	24	8-7	8-5	7-10	6-7
2 x 8	12	14-2	13-11	13-8	11-11
	16	12-11	12-8	12-5	10-3
	24	11-3	11-1	10-2	8-5
2 x 10	12	18-1	17-9	17-5	14-0
	16	16-5	16-2	15-10	12-2
	24	14-4	13-6	13-1	9-11
2 x 12	12	22-0	21-7	21-2	16-8
	16	20-0	19-8	18-10	14-6
	24	17-6	16-1	15-5	11-10

Table 7: Wet-Service Joists – 60 psf live load, 10 psf dead load, $\ell/360$

Size inches	Spacing inches o.c.	Grade			
		Select Structural	No. 1	No. 2	No. 3
2 x 6	12	9-5	9-3	9-1	7-11
	16	8-7	8-5	8-1	6-10
	24	7-6	7-4	6-8	5-7
2 x 8	12	12-5	12-2	11-11	10-0
	16	11-3	11-1	10-6	8-8
	24	9-10	9-7	8-7	7-1
2 x 10	12	15-10	15-6	15-2	11-10
	16	14-4	13-11	13-7	10-3
	24	12-7	11-5	11-1	8-5
2 x 12	12	19-3	18-10	18-5	14-1
	16	17-6	16-7	15-11	12-3
	24	15-3	13-7	13-0	10-0

Table 8: Wet-Service Joists – 100 psf live load, 10 psf dead load, $\ell/360$

Size inches	Spacing inches o.c.	Grade			
		Select Structural	No. 1	No. 2	No. 3
2 x 6	12	7-11	7-9	7-6	6-3
	16	7-2	7-1	6-6	5-5
	24	6-4	6-1	5-3	4-5
2 x 8	12	10-5	10-3	9-8	8-0
	16	9-6	9-4	8-4	6-11
	24	8-4	7-8	6-10	5-8
2 x 10	12	13-4	12-10	12-6	9-5
	16	12-1	11-1	10-10	8-2
	24	10-4	9-1	8-10	6-8
2 x 12	12	16-3	15-4	14-8	11-3
	16	14-9	13-3	12-8	9-9
	24	10-4	10-4	10-4	8-0

STORAGE & FABRICATION

All wood products, including pressure-treated products, will continue to lose or gain moisture until they adjust to the conditions of their end-use environment. As a result, proper storage before and during construction is important. Treated lumber should be stacked and stored in the same manner as untreated wood.

JOB SITE STORAGE

Follow these simple rules to help ensure proper storage and product performance at the job site:

- *Inspect lumber upon delivery for proper grade-marking and moisture content, plus other conditions that may require attention, such as mold.*
- *Unload lumber in a dry place – not in wet or muddy areas.*
- *Elevate lumber on stringers to prevent absorption of ground moisture and to allow air circulation. Do not store lumber in direct contact with the ground.*
- *Cover lumber stored in an open area with a material that will give protection from the elements. Polyethylene or similar non-porous covers act as a vapor barrier, so it is important to allow ventilation around the material to prevent condensation on the underside of the covering.*
- *Enclose framing lumber under roof as soon as possible.*
- *Store exterior products (e.g. siding, porch flooring) in a covered outdoor area.*
- *Store interior products (e.g. flooring, millwork) in the enclosed, conditioned area where installation will occur.*
- *Use lumber in the order in which it is received. Inventory rotation is important.*

There is additional protection when lumber comes in paper-wrapped packages or has been treated with a weather-protective coating. However, availability is limited and weather-protective coatings are effective for only about three to six months. Damage to the paper during transportation can reduce its effectiveness, and protection is lost when paper wrappings are removed. For more details, see SPC publications *Southern Pine Use Guide* and *Managing Moisture and Mold*, available at www.southernpine.com.

FABRICATION

Jobsite fabrication cuts and borings should be field treated with copper naphthenate having a minimum 2% metallic solution, in accordance with American Wood-Preservers' Association *Standard M4*.

BUILDING CODE REQUIREMENTS

Pressure-treated Southern Pine is recognized by building codes and regulatory agencies for use in construction. Specific code requirements for pressure-treated wood are detailed in your local building code. As general guidance, building codes require preservative-treated or naturally durable wood for protection against decay and termites in the following applications:

- *Wood in contact with the ground or fresh water*
- *Wood used above ground in contact with concrete or masonry*
Example: Sill plates on a concrete slab
- *Wood used above ground where specified distances from exposed earth are not met*
Example: Floor assembly when wood joists are closer than 18 inches to exposed earth, or wood girders are closer than 12 inches
- *Wood providing structural support and exposed to the weather*
Example: Balcony joists without adequate protection to prevent moisture or water accumulation on the surface or at joints between members
- *Wood floor framing in geographical areas where hazard of termite damage is known to be very heavy*
- *Wood used below the Design Flood Elevation (DFE)*

When used in enclosed locations where drying in service cannot readily occur, pressure-treated wood must have a moisture content of 19 percent or less before being covered.

Treated Sheathing and Structural Wood Composites

Just like lumber, sheathing and engineered wood composites can be treated with preservatives, and are included in the American Wood-Preservers' Association (AWPA) Commodity Specification F.* These products include, but are not limited to, plywood, glued-laminated members, parallel strand lumber (PSL), and laminated veneer lumber (LVL).

Oriented Strand Board (OSB) is available as an option for treated structural sheathing. OSB can be treated with Zinc Borate for resistance to termites, and is suitable for above ground applications that are continuously protected from liquid water.

When drying after treatment is specified for plywood or structural composites, AWPA requires that moisture content not exceed 19% for each piece, or that allowed by national grading rules. APA – The Engineered Wood Association recommends that plywood not exceed 18% moisture content after drying. For more information on engineered wood products, contact APA at www.apawood.org.

*NOTE: Glued-laminated utility poles are included in AWPA Commodity Specification D. Plywood treated for marine applications (saltwater) is included in Commodity Specification G. Plywood treated for Permanent Wood Foundations (PWF) is included in Commodity Specification A.



Building codes require that wood components in contact with concrete, masonry, or the ground be pressure treated or naturally durable.

FASTENERS & CONNECTORS

Metal products in contact with pressure-treated wood must be corrosion resistant. Examples include fasteners (e.g. nails, screws, and bolts), and all connecting hardware (e.g. joist hangers, straps, hinges, post anchors, and truss plates).

One selection criteria for fasteners and connectors should be the potential for corrosion in a particular building application. The 2006 *International Residential Code*, Section R319.3 states, "Fasteners for pressure-preservative and fire-retardant-treated wood shall be of hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. The coating weights for zinc-coated fasteners shall be in accordance with ASTM A153. **Exceptions:** 1. One-half inch (12.7mm) diameter or greater steel bolts. 2. Fasteners other than nails and timber rivets shall be permitted to be of mechanically deposited zinc-coated steel with coating weights in accordance with ASTM B695, Class 55, minimum." Where fasteners are concerned, building codes regard preserved wood as one product regardless of the formulation used for treatment. However, there are differences between copper-based and borate-based preservatives, so clarification is needed.

COPPER-BASED PRESERVATIVES

Hot-dip galvanized or stainless steel fasteners and connectors are recommended for use when lumber is treated with a copper-based preservative. Copper-based formulations may be used in interior or exterior applications and include the traditional Chromated Copper Arsenate (CCA) and advanced products such as Alkaline Copper Quat (ACQ) or Copper Azole (CA-B).

Hot-dip galvanized fasteners and connectors are generally acceptable for above-grade applications. Hot-dip galvanized *fasteners* should meet *ASTM A153*. Hot-dip galvanized *connectors* should meet *ASTM A653*, Class G185 sheet with 1.85 ounces of zinc coating per square foot minimum. Fasteners and connectors used together must be of the same metallic composition to avoid galvanic corrosion (e.g. use hot-dip nails with hot-dip joist hangers).

Type 304 or 316 stainless steel is recommended for maximum corrosion resistance in more severe exterior applications, such as swimming pools and salt-water exposure. Stainless steel fasteners are generally required for below-grade applications such as Permanent Wood Foundations. Stainless steel is also a recommended option for use with ACQ or Copper Azole treated wood at retention levels greater than required for Ground Contact.

Do not use standard carbon-steel or aluminum products in direct contact when lumber is treated with a copper-based preservative. In addition, electroplated galvanized metal products generally have a thinner layer of protection compared to hot-dip galvanized and are typically not accepted by the building codes for use in exterior applications. Spacers or other physical barriers are necessary to prevent direct contact from treated wood when aluminum or electroplated products are used, such as flashing or termite shields. Such barriers should provide complete separation and remain intact for the intend-

ed service life of the metal.

Fasteners and connectors coated with proprietary anti-corrosion technologies are also available for use with copper-based preservatives. Consult individual hardware manufacturers for specifics regarding their performance.

BORATE-BASED PRESERVATIVES

Borate preserved wood (Inorganic Boron – SBX) is limited to Above Ground interior use in dry or damp applications, continuously protected from liquid water. Borate treated wood is not corrosive, according to information provided by preservative manufacturers and suppliers.¹

Arch Wood Protection, Inc. advises: "Code compliant hardware is adequate. While galvanized fasteners and connectors may be preferable, the

use of non-galvanized hardware of sizes and types approved by the code is acceptable when attaching joists, studs, or other framing, provided the wood will remain dry in service, protected from weather and water. Under similar conditions, the use of standard galvanized strapping or mild steel anchor bolts 1/2" in diameter and larger is also acceptable for fastening borate treated wood to foundations."

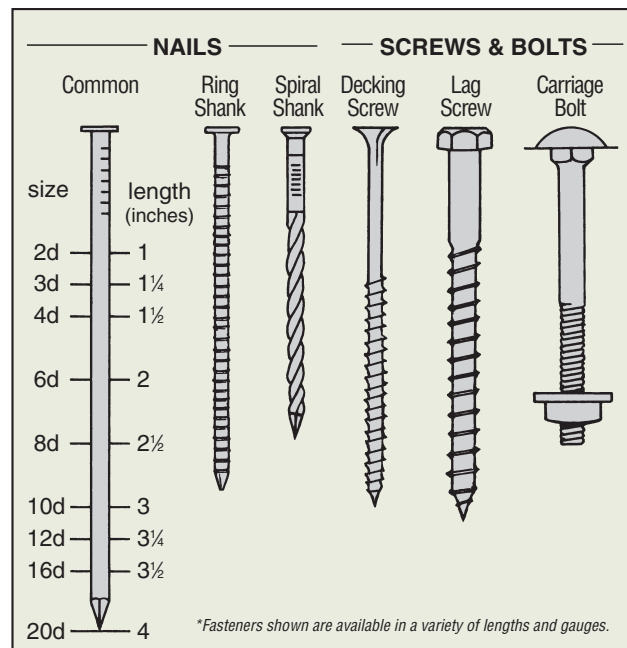
Handling and use guidance from Chemical Specialties, Inc. says, "Borate treated wood can be sawn, nailed, drilled, stained and assembled using standard fastener systems typically used in general wood construction practices."

A consumer article issued by U.S. Borax, Inc. affirms: "Borates don't corrode. Borates are often used as corrosion inhibitors in paints and serve the same purpose

in wood. No special fasteners are required when building with borate pressure treated wood."

The Osmose, Inc. Legacy Report (NER 648) for its borate preservative states, "The corrosion rates for carbon steel, galvanized steel, stainless steel, aluminum, red brass, and copper are not increased...when the treated wood products are used as recommended by the manufacturer and properly sized for the materials selected. The fasteners used with the product shall be carbon steel, galvanized steel, stainless steel, copper, and silicon bronze."

(1) Fastener guidance on borate treated wood from Arch Wood Protection, Inc. (Sill-Bor®); Chemical Specialties, Inc. (Timber-Saver® PT); U.S. Borax, Inc.; and Osmose, Inc. (Advance Guard®) per International Code Council, NER 648.



ADHESIVES

A construction adhesive formulated for treated wood may be used for extra holding power at structural joints and under horizontal decking. These adhesives are not a replacement for nails, screws, or bolts. When selecting any adhesive with treated lumber, be sure the product's label reads "for use with treated lumber." Follow the manufacturer's instructions carefully.

NOTE: This advisory provides a summary of recommendations from a variety of sources. The Southern Pine Council (SPC) does not guarantee the performance of products used in conformance with these recommendations, and does not endorse any type of wood preservative, fastener, or connector. The SPC does not attest to the validity of methodologies used to conduct corrosion tests, and does not attest to the validity of the test conclusions upon which these recommendations are based.

CONSUMER USE & HANDLING GUIDANCE

This guidance applies to wood that has been preserved by pressure treatment with an EPA-registered pesticide to protect it from insect attack and decay. Treated wood should be used only where such protection is important.

Wood preservatives penetrate deeply into and remain in pressure-treated wood for a long time. However, some preservatives may migrate from treated wood into surrounding soil over time and may also be dislodged from the wood surface upon contact with skin. Exposure to certain preservatives may present certain hazards. Therefore, the following precautions should be taken both when handling the treated wood and in determining where to use or dispose of the treated wood.

Use Site Precautions

All sawdust and construction debris should be cleaned up and disposed of after construction.

Do not use treated wood under circumstances where the preservative may become a component of food or animal feed. Examples of such sites would be use of mulch from recycled treated wood, cutting boards, counter tops, animal bedding, and structures or containers for storing animal feed or human food.

Only treated wood that is visibly clean and free of surface residue should be used for patios, decks, and walkways.

Do not use treated wood for construction of those portions of beehives which may come into contact with the honey.

Treated wood should not be used where it may come into direct or indirect contact with public drinking water, except for uses involving incidental contact such as docks and bridges.

Handling Precautions

Dispose of treated wood by ordinary trash collection or burial. 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. Treated wood from commercial or industrial use (e.g., construction sites) may be burned only in commercial or industrial incinerators or boilers in accordance with state and federal regulations.

Avoid frequent or prolonged inhalation of sawdust from treated wood. When sawing and machining treated wood, wear a dust mask. Whenever possible, these operations should be performed outdoors to avoid indoor accumulations of airborne sawdust from treated wood.

When power-sawing and machining, wear goggles to protect eyes from flying particles.

Wear gloves when working with the wood. After working with the wood, and before eating, drinking, toileting, and use of tobacco products, wash exposed areas thoroughly.

Because preservatives and sawdust may accumulate on clothes, they should be laundered before reuse. Wash work clothes separately from other household clothing.



Photo courtesy HANDY Magazine

Safety first. When sawing or machining treated wood, wearing eye protection, a dust mask, and gloves is recommended, a practice applicable when using other sawn or machined building materials.

WOOD: AN ENVIRONMENTAL ASSET

Wood products have so many cost and construction advantages over other building materials that it is easy to forget what an environmental asset it is to use wood.

We sometimes forget that wood is naturally reusable, recyclable, and biodegradable. It is also the best insulator of all structural building materials. Less energy is required to heat and cool a home built with wood, conserving finite fossil fuels. Furthermore, it takes far less energy to transform trees into wood products than it does to manufacture steel, aluminum, masonry, or plastic products. This means less pollution of the air and water, too.

Wood is also renewable. Ores and petroleum used for non-wood products, once used, are not renewable. They are gone forever.

Trees, however, *are* forever. Contrary to popular belief, America is *not* running out of trees. More trees are grown each year in the U.S. than are harvested or lost to disease, insects and fire. A third of America is covered with trees today, more than we had 75 years ago. And being planted at the rate of five million a day — six trees a year for every American.



Finally, remember that a growing forest removes the greenhouse gas carbon dioxide, while giving off life-sustaining oxygen. Can you think of a better environmental exchange than that?

Pressure treatment provides the protection needed to significantly prolong the life of wood products, assuring structural soundness and a long service life. This process greatly reduces the amount of wood that would otherwise be required to replace untreated wood structures damaged by decay or termites, thereby extending our important forest resource. In fact, an estimated 6.5 billion board feet of wood, or the equivalent of building 425,000 new homes, is conserved each year by using pressure-treated wood products.

ADDITIONAL RESOURCES

Complimentary single copies of selected SPC publications are available free upon request, or online as a free PDF download, at www.southernpine.com.

Southern Pine Use Guide (#200)
design values, grade descriptions, sample specifications

Southern Pine Maximum Spans for Joists & Rafters (#202)
span tables for specific lumber grades

Marine Structures (#322)
product selection, design details

Southern Pine Pedestrian Bridges & Walkways (#310)
design & construction recommendations

Raised Floor Systems Design & Construction Guide (#411)
footings & foundations, framing details

A Guide to Southern Pine Porch Flooring (#313)
design specifications and installation

Your Decking Choice: Pressure-Treated Southern Pine (#307)
advantages, product selection, construction guidelines

Termite-Resistant Structures (#308)
termite facts, treatments, costs

Online Continuing Education

Professionals earn CEUs online at southernpine.com/eClassroom

Two seminars available:

"Design, Specify, Build"

"Pressure-Treated Southern Pine"

Participants earn a one-hour continuing education credit for each unit.

Lumber Library CD

Dozens of publications all on one CD, more than 50 titles in all.

PDFs load in a matter of seconds and can be printed with ease.

Trade professionals interested in obtaining a copy should e-mail:

info@southernpine.com.

Southern Pine Questions? Call for HELP!

253/620-7400

The Wood Products Help Desk has information about products and applications.

e-mail: help@southernpine.com

Online PRODUCT LOCATOR

Sourcing Southern Pine products?

Visit the online Product Locator at www.southernpine.com/productlocator.shtml

to find local dealers, distributors, and producers.



Southern Forest Products Association
2900 Indiana Ave. Kenner, LA 70065 USA
504/443-4464 • Fax 504/443-6612

Southeastern Lumber Manufacturers Association
P.O. Box 1788 Forest Park, GA 30298
404/361-1445 • Fax 404/361-5963

Visit SPC online:
www.southernpine.com