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SFPA is a nonprofit trade association that has represented manufacturers of Southern Pine lumber since 1915.

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CONTENTS

Treated Southern Pine: Strong and Versatile 2
The Pressure-Treating Process 2
Types of Wood Preservatives 3
Advanced Waterborne Preservatives Serve Consumer Uses 3
Table 1: Waterborne Preservatives Available for Southern Pine in Consumer Use 3
Table 2: Identification of Preservatives Listed for Southern Pine Products 4
AWPA Use Category System 5
Table 3: AWPA Service Conditions for Use Category Designations 5
Use Category System Replaces Commodity Standard 6
Table 4A: AWPA Commodity Specifications 6
Table 4B: Former AWPA Commodity Standards 6
Specifying Southern Pine "Dried After Treatment" 6
Specifying Coatings for Surface Barrier Wood Protection 6
Table 5A: Sawn Products, AWPA Commodity Specification A 7
Specification Example for AWPA Use Category System 7
Table 5B: Sawn Products, AWPA Preservatives & Retentions 8
Table 5C: End-Use, ICC Evaluation Service 8
Table 6: Posts, AWPA Commodity Specification B 9
Table 7: Crossties and Switchties, AWPA Commodity Specification C 9
Table 8: Poles, AWPA Commodity Specification D 9
Table 9: Round Timber Piling, AWPA Commodity Specification E 10
On the Job Site, Keep it Simple and Follow the Label 10
Other Sources of Treated Wood Product Information 10
Table 10: Wood Composites, AWPA Commodity Specification F 11
Pressure-Treated Wood Composites 11
Table 11: Marine (Salt Water), AWPA Commodity Specification G 12
Code Acceptance and Standards 13
Building Code Requirements 13
Design Values for Pressure-Treated Applications 13
Grade and Quality Marks 14
Southern Pine Lumber Grade Descriptions 14
Fasteners and Connectors 15
Storage 16
Consumer Use and Handling 16
Termite-Resistant Framing 17
A Green Choice: Pressure-Treated Southern Pine 18
Additional Resources BC

TREATED SOUTHERN PINE: STRONG AND 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 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 Protection 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:

- EPA requires the registration of wood preservatives and has routinely monitored their safety and effectiveness since the 1970s. Proper handling and use of treated wood poses no unreasonable risk to human health and the environment.
- Wood preservatives do not aggressively leach into the ground or waterways, 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 and Handling Guidance on page 16.

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

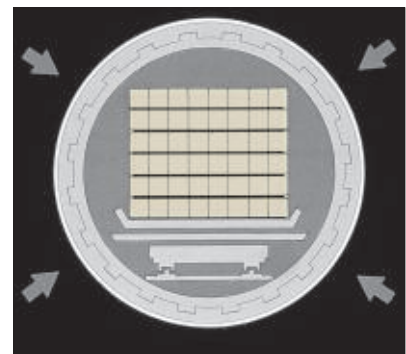
THE PRESSURE-TREATING PROCESS

Pressure-treated Southern Pine is the product of a carefully monitored and controlled process. Within a pressurized cylinder, preservatives are forced deep into the wood cells. The fixation process stabilizes the preservative within the wood fiber. This begins during the treating cycle, but continues after removal from the cylinder. The time needed to complete fixation can range from several hours to several days depending on the type of preservative and weather conditions.



PHOTO: Handyman Club of America

Figure 1: Wood Deterioration Zones



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 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 most often specified. Waterborne treatments are clean in appearance, odorless and paintable, and are EPA-registered for both interior and exterior use without a sealer.



ADVANCED WATERBORNE PRESERVATIVES SERVE CONSUMER USES

Pressure-treated wood products intended for residential and recreational (consumer) applications are now manufactured with a new generation of waterborne preservatives. These preservatives provide the same long-term resistance to termite attack, but contain no components considered hazardous under Environmental Protection Agency regulations.

Examples of typical consumer applications for pressure-treated Southern Pine using advanced waterborne preservatives include:

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

Waterborne preservatives currently available for use with Southern Pine are listed in Table 1.

Table 1: Waterborne Preservatives Available for Southern Pine in Consumer Use		
Service Condition	Waterborne, Non-Copper	Waterborne, Copper-Based
Above Ground, Interior	DCOI + Imidacloprid (EL2) DOT & Polymer Binder Inorganic Boron (SBX) Propiconazole-Tebuconazole-Imidacloprid (PTI)	Alkaline Copper (ACD, ACQ-C, ACQ-D, KDS, KDS-B) Copper Azole (CA-C) Dispersed or Micronized Copper (μCA-C, MCA, MCQ) Copper HDO (CX-A) Copper Naphthenate (CuN-W)
Above Ground, Exterior	DCOI + Imidacloprid (EL2) DOT & Polymer Binder Propiconazole-Tebuconazole-Imidacloprid (PTI)	Alkaline Copper (ACD, ACQ-C, ACQ-D, KDS, KDS-B) Copper Azole (CA-C) Dispersed or Micronized Copper (μCA-C, MCA, MCQ) Copper HDO (CX-A) Copper Naphthenate (CuN-W)
Ground Contact or Fresh Water		Alkaline Copper (ACD, ACQ-C, ACQ-D, KDS, KDS-B) Copper Azole (CA-C) Dispersed or Micronized Copper (μCA-C, MCA, MCQ) Copper Naphthenate (CuN-W)

Chromated Copper Arsenate (CCA) preservative is no longer used in consumer applications, but remains an EPA-approved treatment for non-consumer industrial, commercial, marine and agricultural applications. Examples of non-consumer applications for CCA-treated Southern Pine include:

- Lumber and Timber for Salt Water Marine Use • Piles and Poles • Wood for Highway Construction*
- Poles, Piles and 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 2: Identification of Preservatives Listed for the Pressure Treatment of Southern Pine Wood Products

Classification	Preservative System	Formula Type	Trade Name	Producer(s)	Web Sites	U.S. Code Approvals ¹	Facts and Features
Creosote	Creosote Creosote Solution Creosote Petroleum Solution	CR CR-S CR-PS	Creosote	Coopers Creek Koppers, Inc. KMG-Bernuth, Inc.	CoopersCreekChemical.com Koppers.com KMGB.com CreosoteCouncil.org	AWPA	First commercial U.S. production, 1865. Mainstay for preservation of railroad ties, marine piles, and utility poles.
Oilborne	Copper-8-Quinolinolate	Cu8	Cop-8™	Hoover Treated Wood Products, Inc.	FRTW.com	AWPA	Accepted by U.S. FDA for use in contact with agricultural food products.
	Copper Naphthenate	CuN	CuNap-8™	Merichem Co.	Merichem.com	AWPA	CuN is a low-impact, eco-friendly preservative in service since 1911.
	Pentachlorophenol, Solvent A Pentachlorophenol, Solvent B	PCP-A PCP-C	Penta	KMB-Bernuth, Inc.	KMGB.com PentaCouncil.com	AWPA	First produced in the 1930s. Penta is used for utility poles, bridge timbers, and laminated beams.
Waterborne, Copper Based, Solution	Acid Copper Chromate	ACC	Copper Shield® Industrial Use	Forest Products Research Laboratory	FPRL.com	AWPA	ACC used in the U.S. and Europe since the 1930s.
	Alkaline Copper + DCOI	ACD	Ecolife™ GC	Viance	TreatedWood.com	ESR-2711	Alkaline Copper, non-quat formula
	Alkaline Copper Betaine	KDS KDS-B	Impralit®	Ruetgers Organics	Ruetgers-Organics.com	AWPA, ESR-2500	KDS preservative first introduced in Europe, 1992.
	Alkaline Copper Quat	ACQ-C ACQ-D	Naturewood®	Osmose, Inc.	OsmoseWood.com	AWPA, ESR-1980	ACQ formulations have been used to protect wood products since 1990.
			Preserve®	Viance	TreatedWood.com	AWPA, NER-643	
			DURA-GUARD®	Hoover Treated Wood	FRTW.com	AWPA, NER-628	
	Ammoniacal Copper Quat	ACQ-A ACQ-B	Naturewood®	Osmose, Inc.	OsmoseWood.com	AWPA, ESR-1980	ACQ-A and B and ACZA are approved for Southern Pine, but used almost exclusively on difficult-to-treat Western species.
			Preserve®	Viance	TreatedWood.com	AWPA, NER-643	
	Ammoniacal Copper Zinc Arsenate	ACZA	Chemonite®	Arch Wood Protection	Chemonite.com	AWPA	
	Chromated Copper Arsenate	CCA	Wolmanized® Heavy Duty™	Arch Wood Protection	WolmanizedWoodHD.com	AWPA	With 70 years of service, CCA continues EPA-approved use in heavy-duty applications important to public and private infrastructure such as foundation, highway, electric utility, and salt water marine. For more info, see WoodPreservativeScience.com.
			SupaTimber®	Viance	TreatedWood.com	AWPA	
			CCA	Osmose, Inc.	OsmoseWood.com	AWPA	
CCA			Hoover Treated Wood	FRTW.com	AWPA		
Copper Azole	CA-C	Wolmanized® Residential Outdoor®	Arch Treatment Technologies	WolmanizedWood.com	AWPA, ESR-1721	CA formulations have been used to protect wood products since 1992.	
Copper HDO Type A	CX-A	Protectol CX®	BASF	BASF.com	AWPA, ESR-1863	CX-A has been used throughout Europe since the early 1990s.	
Waterborne Copper Naphthenate	CuN-W	CuNap-8™	Merichem Company	Merichem.com	AWPA	The waterborne formulation of CuN, received AWPA approval in 2006.	
Waterborne, Copper Based, Suspension	Dispersed Copper Azole	μCA-C	Wolmanized® Residential Outdoor®	Arch Treatment Technologies	WolmanizedWood.com	ESR-1721	"Micronized" or "dispersed" formulations reduce impact on aquatic and terrestrial environments, and are less corrosive to fasteners.
	Micronized Copper Azole	MCA™	SustainWood®	Osmose, Inc.	OsmoseWood.com	ESR-2325	
			MicroPro®	Osmose, Inc.	OsmoseWood.com	ESR-2240	
Micronized Copper Quat	MCQ	MicroPro®	Osmose, Inc.	OsmoseWood.com	ESR-1980		
Waterborne, Carbon Based	Tebuconazole + Imidacloprid	EL	Ecolife™	Viance	TreatedWood.com	ESR-2067	Carbon-based preservatives contain no copper and are not corrosive. Approved for interior use, and outdoor use above ground.
	DCOIT + Imidacloprid	EL2	Ecolife II™	Viance	TreatedWood.com	AWPA, ESR-1851	
	Propiconazole-Tebuconazole-Imidacloprid	PTI	Wolmanized® L ³	Arch Treatment Technologies	WolmanizedWoodL3.com	AWPA, ESR-1477	
Waterborne, Borates	Disodium Octaborate Tetrahydrate (DOT) & Polymer Binder		ES+Wood™	Wood Treatment Products, Inc.	ESWoodTreatment.com	ESR-1081	DOT & Polymer Binder approved for outdoor, above ground use.
	Inorganic Boron	SBX	SillBor®	Arch Wood Protection	SillBor.com	AWPA	SBX limited to weather shielded interior use. Contains no copper, not corrosive.
			Advanced Guard®	Osmose	OsmoseWood.com	AWPA, NER-648	
			TimberSaver®	Viance	TreatedWood.com	AWPA	

(1) AWPA – American Wood Protection Association. ESR, Evaluation Service Report, and NER, National Evaluation Report, per International Code Council.

AWPA USE CATEGORY SYSTEM

To perform reliably in service, wood commodities must be pressure treated to designated standards of preservative penetration and retention necessary to endure the expected decay hazard. 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 of wood fiber; the higher the number, the harsher the condition to which the wood may be exposed.

The American Wood Protection Association Use Category (UC) System under Standard U1 specifies categories of exposure that wood commodities typically encounter in service. The UCS helps users identify the exposure condition for specific products and end-use environments, and then specify the

acceptable preservatives and retention levels necessary for that application. Specifiers should become familiar with the Service Conditions for Use Category Designations (Table 3, below). Commodity Specifications (Table 4A, page 6) designate the general classification of treated wood commodities.

Approved preservatives and retentions for treated Southern Pine by end-use, application and exposure condition are summarized by Commodity Specification (Tables 5-10, pages 7-10). When purchasing under the Use Category System, material orders should include the Use Category designation (Table 3), general Commodity Specification (Table 4A), and specific end-use and preservative and retention level (Tables 5-11). Any special requirements such as pre- or post-treatment preparations (including conditioning and drying) should also be indicated. See specification example on page 7.

Table 3: AWPA Service Conditions for Use Category Designations

Use Category	Service Conditions	Use Environment	Common Agents of Deterioration	Typical Applications
UC1 INTERIOR/ DRY	Interior construction Above ground Dry	Continuously protected from weather or other sources of moisture	Insects only	Interior construction and furnishings
UC2 INTERIOR/ DAMP	Interior construction Above ground Damp	Protected from weather, but may be subject to sources of moisture	Decay fungi and insects	Interior construction
UC3A ABOVE GROUND Protected	Exterior construction Above ground Coated and rapid water run-off	Exposed to all weather cycles, not exposed to prolonged wetting	Decay fungi and insects	Coated millwork, siding and trim
UC3B ABOVE GROUND Exposed	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 General Use	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 and utility poles (low decay areas)
UC4B GROUND CONTACT Heavy Duty	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 and utility poles (high decay areas)
UC4C GROUND CONTACT Extreme Duty	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 and fresh water piling, foundation piling, crossties and utility poles (severe decay areas)
UC5A MARINE USE Northern Waters	Salt or brackish water and adjacent mud zone Northern waters	Continuous marine exposure (salt water)	Salt water organisms	Piling, bulkheads, bracing
UC5B MARINE USE Central Waters	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 MARINE USE Southern Waters	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 RETARDANT Interior	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 RETARDANT Exterior	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

NOTE: Table 3 copyright AWPA, *Book of Standards, 2009 Edition*, Section 2, Service Conditions for Use Category Designations.

USE CATEGORY SYSTEM REPLACES COMMODITY STANDARD

The AWPA Use Category (UC) System was introduced in 1999 as a user-friendly format to eventually replace the Commodity (or “C”) Standard for treatment specification. The Commodity Standard was deleted from the AWPA *Book of Standards* beginning with the 2005 Edition. Commodity Standards pertaining specifically to Southern Pine are listed in Table 4B for historical context, due to their continued influence on certain specifications. For example, the “C” Standards in the AWPA *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.

Table 4A: AWPA Commodity Specifications

A Sawn Products	E Round Timber Piling
Permanent Wood Foundation (PWF)	F Wood Composites
B Posts	G Marine (Salt Water) Applications
Playground Material	H Fire Retardants
Round Building Poles	I Nonpressure Applications
C Crossties and Switchties	J Nonpressure Composites
D Poles	K Barrier Protection Systems

NOTE: Major classifications of treated wood commodities (A-K) displayed in Table 4A are excerpted from the AWPA *Book of Standards*, Section 6, Commodity Specifications. Section 6 provides detailed information on listed preservative systems and allowable wood species applicable for each service condition. Specifications and guidance for preservative-treated commodities listed under Commodity Specification H, I, J and K are not included in Southern Forest Products Association publications due to their specialized applications and/or proprietary preservative systems. Contact manufacturers of the preservative systems and/or commodities approved under the particular specifications (H, I, J, K) to determine performance and applicability to their project requirements.

SPECIFYING SOUTHERN PINE “DRIED AFTER TREATMENT”

Wood products treated with waterborne preservatives have very high moisture content after removal from the treatment cylinder. If treated dimension lumber is used for a framing application where it will be covered or enclosed, building codes require a moisture content of 19% or less (see Building Code Requirements, page 13). Therefore, any specification for treated framing should include moisture content requirements after treatment. Re-dried Southern Pine should bear a mark indicating it has been air dried (ADAT or Dry) or kiln dried after treatment (KDAT).

Where drying after treatment is specified for sheathing and composites, AWPA requires that moisture content not exceed 19% for each piece, or that allowed by national grading rules. APA recommends that plywood not exceed 18% moisture content after drying. For details, visit www.apawood.org.

SPECIFYING COATINGS FOR SURFACE BARRIER WOOD PROTECTION

An alternative wood protection system is the “surface barrier” coating. Generally, standard lumber stock (not pressure-preservative treated) is sprayed with a borate-based surface coat. These systems are typically marketed as a defense against one or more of the following hazards – mold, fungal decay, and termite attack. However, surface coatings have limitations.

Specifiers should understand the differences between barrier protection and traditional pressure-preservative treatment. Surface coatings are intended for enclosed, interior framing only, not outdoor structures. The coating is effective as long as it is not breached due to factors such as puncture, surface abrasion or splitting. Recoating field cuts is also recommended. Additionally, surface-coated lumber cannot be substituted for pressure-treated or naturally durable wood required by code for such applications as sill plates in contact with concrete slab or masonry (see Building Code Requirements, page 13).

Table 4B: Former AWPA Commodity Standards (historical reference only)

C1 - All Timber Products – Preservative Treatment by Pressure Processes	C22 - Permanent Wood Foundations
C2 - Lumber, Timber, Bridge Ties and Mine Ties	C23 - Round Poles and Posts used for Building Construction
C3 - Piles	C24 - Sawn Timber used to Support Residential and Commercial Structures
C4 - Poles	C25 - Sawn Crossarms
C5 - Fence Posts	C27 - Plywood Fire Retardant Treatment by Pressure Processes
C6 - Crossties and Switch Ties	C28 - Glued Laminated Members
C9 - Plywood	C29 - Lumber and Plywood to be used for the Harvesting, Storage and Transportation of Food Stuffs
C11 - Wood Blocks for Floors and Platforms	C30 - Lumber, Timbers and Plywood for Cooling Towers
C14 - Wood for Highway Construction	C31 - Lumber used Out of Contact with the Ground and Continuously Protected from Liquid Water
C15 - Wood for Commercial – Residential Construction	C32 - Glue Laminated Poles
C16 - Wood Used on Farms	C33 - Structural Composite Lumber
C17 - Playground Equipment	C34 - Shakes and Shingles
C18 - Marine Construction	
C20 - Structural Lumber: Fire Retardant Treatment by Pressure Processes	

**Table 5A: Sawn Products, AWPA Commodity Specification A¹
End Use Commodities**

End-Use Commodity	Use Category (UC)	End-Use Commodity	Use Category (UC)	End-Use Commodity	Use Category (UC)
<i>Bender Board</i>	4A	<i>Furniture</i>		<i>Millwork, Trim</i>	3A-B
<i>Bulkhead Sheathing, non-marine</i>	4A	Indoor	1	<i>Pergola</i>	4A
<i>Cant Strips</i>	3B	Outdoor, Above Ground	3B	<i>Piles, sawn</i>	
<i>Cribbing, Highway</i>	4C	Outdoor, Ground Contact	4A	Structural support	4B
<i>Crossarms, Sawn</i>		<i>Furring Strips</i>		Structural support, critical	4C
General use	3B	Indoor	2	<i>Poles, sawn</i>	
Critical, hard to replace	4A	Outdoor	3B	Agricultural/Farm	4A
<i>Decking (heavy)</i>		<i>Gazebo Material</i>	3A-B	Structural Building	4C
Above Ground, exterior	3B	<i>Handrails/Guardrails, highway</i>	3B	<i>Posts, sawn</i>	
Building Construction, general	4A	<i>Joists</i>		General, Fence, Highway	4A
Highway Bridge, critical/severe decay	4B	Above Ground, Interior, Dry or Damp	1-2	Agricultural Use, Spacer Blocks	4B
<i>Decks, Residential</i>		Building Construction, Above Ground, Exterior	3B	Important Building Structural	4C
Above Ground		Ground Contact or Fresh Water	4A	Playground, sawn & round, see Table 6	
Decking, Railing Components	3B	<i>Landscape Ties</i>	4A	<i>Purlins</i>	
Joists	3B	<i>Lattice</i>	3B	Above Ground, Interior	1-2
Ground Contact		<i>Lumber/Timbers</i>		Above Ground, Exterior	3A-B
Joists	4A	Above Ground, Interior, Dry or Damp	1-2	<i>Shakes & Shingles</i>	3B
Support Posts (Sawn)	4A	Above Ground, Exterior		<i>Siding, Beveled or Not</i>	3A-B
<i>Expansion Boards</i>	4A	Coated & rapid water run-off	3A	<i>Sill Plates</i>	2
<i>Fascia Boards</i>	3A-B	Uncoated or poor water run-off	3B	<i>Skirtboard</i>	4A
<i>Fence Pickets</i>	3A-B	Ground Contact or Fresh Water		<i>Stakes (sawn), Agricultural</i>	4A
<i>Fence Rail</i>	3A-B	Non-critical components	4A	<i>Studs</i>	1-2
<i>Floor Plate</i>	3B	Critical, difficult replacement	4B	<i>Ties, Mine & Bridge</i>	4A
<i>Flooring</i>		Critical structural components	4C	<i>Trusses</i>	
Above Ground, Interior, Dry or Damp	1-2	Agriculture, Highway, Industrial, Structural		Roof, Dry or Damp	1-2
Residential/Commercial Veranda	3B	Brine Storage & Retaining Walls	4A	Floor, Above Ground	3B
<i>Flooring, Block</i>		Crib Walls & Important Structural	4A	<i>Veranda Supports</i>	4A
Above Ground, low humidity	2	Cooling Towers	4A		
Above Ground, high humidity	3A	Marine Out of Water			
		Salt Water Splash ³ , Above Ground	4B		
		Salt Water Splash ³ , Ground Contact	4C		
		Permanent Wood Foundation (PWF) ¹⁰	4B		

Using Tables 5A, 5B and 5C

In Table 5A above, Sawn Products, identify the End-Use Commodity to be specified and its appropriate Use Category (UC). In Table 5B (page 8), see the corresponding Use Category (UC) column to identify the appropriate preservative and minimum retention required for the specified application and exposure hazard. In Table 5C, (page 8) see the corresponding column for the End Use product and/or exposure hazard. Below are footnotes for Tables 5A, 5B, and 5C and a Specification Example.

Footnotes for Tables 5A, 5B and 5C (1) The terms "Commodity Specification" and "Use Category (UC)" copyright the American Wood Protection Association (AWPA). (2) Preservatives and retentions listed in the "Code Acceptance" section at top of Table 5B are derived from the *AWPA Book of Standards, 2009 Edition*. (3) 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. (4) Creosote not recommended for applications where a clean appearance and an odor-free environment is important. (5) ACC and CCA treated sawn products cannot be used for most consumer-use applications. (6) Ammoniacal Copper Quat-B (ACQ-B) and Ammoniacal Copper Zinc Arsenate (ACZA) are AWPA approved waterborne treatments for Southern Pine; however, these formulations are used almost exclusively on difficult-to-treat Western species. (7) 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 (B203 basis) of 0.17 pcf, or 0.28 pcf where Formosan termites are confirmed. (8) Not to be used in areas of Formosan termites. (9) International Code Council, National Evaluation Reports. (10) Preservative retentions apply to both PWF or FDN grade-marked lumber and plywood. (11) Above ground continuously protected from liquid water. (12) Above ground vertical use fence boards and pickets. (13) Above ground decking and other specialties (railing, spindles, trim and fascia, lattice). (14) Critical structural members and wood foundation systems. (15) Foundation and freshwater piling, round. (16) See Table 2, page 4, for report holders. (17) ICC Evaluation Service Reports (ESR) are only advisory. The local code authority having jurisdiction is always the final decision-maker with respect to acceptance of the product in question.

**Specification Example for AWPA Use Category System:
Treated sawn-lumber joists supporting an outdoor deck**

- 1 – AWPA Use Category: **UC3B**
(from Table 3: Exterior Construction, Above Ground, Service Condition: Uncoated or Poor Water Run-Off. Typical applications include deck joists.)
- 2 – General Commodity Classification and Specification Section in the *AWPA Book of Standards Sawn Products – A* (from Table 4A)
- 3 – Specific End Use Commodity Classification: **Joists**
(from Table 5A: End Use Commodity – Joists, Use – Building Construction, Exposure – Above Ground, Exterior)
- 4 – Species: **Southern Pine**
Preservatives and retention levels: **Alkaline Copper Quat (ACQ-D) to .15 pcf or Copper Azole (CA-C) to .060 pcf**
(from Table 5B: Above Ground, Exterior)
- 5 – Special Requirements: **None**
(such as pre- or post-treatment preparations, including conditioning and drying such as Kiln Dried After Treatment, KDAT)

**Table 5B: Sawn Products – AWP Commodity Specification A¹
Southern Pine Preservatives and Retentions**

Code Acceptance per American Wood Protection Association Book of Standards²

Classification	Preservative System	Use Category (UC) & Minimum Retention Requirements - Pounds per Cubic Foot (pcf)						
		UC1	UC2	UC3A	UC3B	UC4A	UC4B	UC4C
Creosote	Creosote (CR, CR-PS, CR-S) ⁴	8.0	8.0	8.0	8.0	10.0	10.0	12.0
Oilborne	Copper-8-Quinolinolate (Cu8)	0.02	0.02	0.02	0.02			
	Copper Naphthenate (CuN)			0.04	0.04	0.06	0.75	0.75
	Pentachlorophenol (PCP-A & PCP-C)			0.04	0.40	0.50	0.50	0.50
Waterborne, Copper Based, Solution	Acid Copper Chromate (ACC) ⁵				0.25	0.50		
	Alkaline Copper Betaine (KDS)	0.19	0.19	0.19	0.19	0.47		
	Alkaline Copper Betaine (KDS-B)	0.14	0.14	0.14	0.14	0.34		
	Alkaline Copper Quat (ACQ-C)	0.25	0.25	0.25	0.25	0.40	0.60	0.60
	Alkaline Copper Quat (ACQ-D)	0.15	0.15	0.15	0.15	0.40	0.60	0.60
	Ammoniacal Copper Quat (ACQ-A&B) ⁶	0.25	0.25	0.25	0.25	0.40	0.60	0.60
	Ammoniacal Copper Zinc Arsenate (ACZA) ⁶	0.25	0.25	0.25	0.25	0.40	0.60	0.60
	Chromated Copper Arsenate (CCA) ⁵				0.25	0.40	0.60	0.60
	Copper Azole (CA-C)	0.060	0.060	0.060	0.060	0.15	0.31	0.31
	Copper HDO Type A (CX-A)	0.206	0.206	0.206	0.206			
Waterborne, Carbon Based	DCOI + Imidacloprid (EL2)	0.018	0.018	0.018	0.018			
	Propiconazole-Tebuconazole-Imidacloprid (PTI)	0.013	0.013	0.013	0.018			
Waterborne, Borates	Inorganic Boron (SBX) ⁷	0.17	0.17					

**Table 5C: End-Use – ICC Evaluation Service
Southern Pine Preservatives and Retentions**

Code Official Advisory per International Code Council Evaluation Service Report (ESR)¹⁷

Classification	Preservative System	ESR ¹⁶	End Use & Minimum Retention Requirements - Pounds per Cubic Foot (pcf)					
			Above Ground				Ground Contact / Fresh Water	
			Interior ¹¹	Fence ¹²	Decking ¹³	General Use	General Use	Critical ¹⁴
Waterborne, Copper Based, Solution	Alkaline Copper Quat (ACQ-C&D)	628 ⁹	0.15	0.15	0.15	0.25	0.40	0.60
		643 ⁹	0.15	0.15	0.15	0.15	0.40	0.60
		1980	0.20	0.15	0.15	0.20	0.40	0.60
	Alkaline Copper Betaine (KDS)	2500	0.14	0.14	0.14	0.19	0.36	
		2500	0.10	0.10	0.10	0.14	0.27	
		2711	0.13	0.13	0.13	0.17	0.28	0.44
		1980	0.20	0.15	0.15	0.20	0.40	0.60
		1721	0.06	0.06	0.06	0.06	0.15	0.25
Waterborne, Copper Based, Suspension	Copper HDO Type A (CX-A)	1863	0.20	0.20	0.11	0.20	0.30	0.45
		1721	0.05	0.05	0.05	0.05	0.14	0.23
Waterborne, Carbon Based	Dispersed Copper Azole (µCA-C)	2325	0.07	0.06	0.06	0.07	0.16	0.24
	Micronized Copper Azole (MCA)	2240	0.06	0.06	0.06	0.06	0.15	0.23
	Micronized Copper Quat (MCQ)	1980	0.15	0.10	0.15	0.15	0.34	0.60
	Tebuconazole + Imidacloprid (EL)	2067	0.0187	0.0187	0.0187	0.0187		
Waterborne, Borates	DCOIT + Imidacloprid (EL2)	1851	0.0187	0.0187	0.0187	0.0187		
	Propiconazole-Tebuconazole-Imidacloprid (PTI)	1477	0.013	0.018	0.018	0.018		
Waterborne, Borates	DOT & Polymer Binder ⁸	1081	0.50	0.50	0.50	0.50		
	Inorganic Boron (SBX) ⁷	648 ⁹	0.17					

Table 6: Posts, AWP Commodity Specification B¹ – Southern Pine Preservatives and Retentions

AWPA Use Category (UC) Designation	Waterborne				Oilborne				Creosote (CR, CR-PS, CR-S)			
	Copper Azole (CA-C)	Alkaline Copper Betaine (KDS)	Alkaline Copper Quat (ACQ-B, C & D)	Chromated Copper Arsenate (CCA)	Copper Naphthenate (CuN-W)	Copper-8-Quinolinate (Cu8)	Pentachlorophenol (PCP-A & PCP-B)					
End-Use Commodity	Minimum Retention Requirements — Pounds per Cubic Foot (pcf)											
<i>Round, Half Round and Quarter Round</i>												
Highway, Fence, Guide, Sign and Sight	4A	0.15	0.47	0.34	0.40	0.50	0.40	0.11		0.055	0.40	8.0
Guardrail, Spacer Blocks	4B				0.50		0.50			0.069	0.50	10.0
Brine Storage	4B											10.0
<i>Farm Use, Structural Members, Round</i>	4B	0.25			0.60 ²		0.60				0.38	7.5 ⁴
<i>Building Construction, Round</i>	4B	0.25					0.60				0.45	9.0 ³
<i>Playground Equipment</i>												
Sawn	4A	0.15	0.47	0.34	0.40			0.11	0.02 ⁵			
Round	4A	0.15	0.47	0.34	0.40			0.11				
<i>Sawn posts, see Table 5A</i>												

ICC-evaluated preservatives available for this application, see Table 5C, End Use, Ground Contact/Fresh Water, General Use.

Table 7: Crossties and Switchties, AWP Commodity Specification C¹ Southern Pine Preservatives and Retentions

AWPA Use Category (UC) Designation	Oilborne		Creosote (CR, CR-PS, CR-S)		
	Ammoniacal Copper Zinc Arsenate (ACZA)	Copper Naphthenate (CuN)	Pentachlorophenol (PCP-A & PCP-B)		
End-Use Commodity	Minimum Retention Requirements — Pounds per Cubic Foot (pcf)				
<i>Crossties and Switchties</i>	4A-C	0.40	0.06	0.40	8.0

Footnotes for Tables 6, 7 and 8: (1) The terms “Commodity Specification” and “Use Category (UC)” copyright the American Wood Protection Association (AWPA). Preservatives and retentions listed in the “Code Acceptance” section at top of Table 5B are derived from the *AWPA Book of Standards, 2009 Edition*. (2) ACQ-D not recommended. (3) CR only. (4) CR and CR-S only. (5) For above ground use only, such as supports resting on footings above grade.

Table 8: Poles, AWP Commodity Specification D¹ – Southern Pine Preservatives and Retentions

AWPA Use Category (UC) Designation	Waterborne				Oilborne				Creosote (CR, CR-PS, CR-S)			
	Copper Azole (CA-B & CA-C)	Alkaline Copper Quat (ACQ-B)	Ammoniacal Copper Zinc Arsenate (ACZA)	Chromated Copper Arsenate (CCA)	Copper Naphthenate (CuN)	Pentachlorophenol (PCP-A & PCP-B)						
End-Use Commodity	Minimum Retention Requirements — Pounds per Cubic Foot (pcf)											
<i>Round</i>												
Agriculture, Utility, Low Decay	4A	0.31	0.60	0.40	0.60	0.06	0.30	6.0 ⁴				
Agric., Utility, Highway, Lighting	4B	0.31	0.60	0.60	0.60	0.08	0.38	7.5 ⁴				
Building Structural	4B	0.31		0.60	0.60	0.60	0.45	9.0 ³				
Utility, Lighting, High Decay	4C		0.60	0.60		0.13	0.45	9.0 ⁴				
<i>Glue Laminated</i>	4A-B					0.08	0.38	7.5 ³				
<i>Sawn poles, see Table 5A</i>	4C					0.13	0.45	9.0 ³				

ICC-evaluated preservatives available for this application, see Table 5C, End Use, Ground Contact/Fresh Water, General Use or Critical.

**Table 9: Round Timber Piling, AWP Commodity Specification E¹
Southern Pine Preservatives and Retentions**

AWPA Use Category (UC) Designation	Waterborne			Oilborne			Creosote (CR, CR-PS, CR-S)	
	Copper Azole (CA-C)	Alkaline Copper Quat (ACQ-Q)	Ammoniacal Copper Zinc Arsenate (ACZA)	Chromated Copper Zinc Arsenate (CCA)	Copper Naphthenate (CuN)	Pentachlorophenol (PCP-A & PCP-B)		
End-Use Commodity	Minimum Retention Requirements — Pounds per Cubic Foot (pcf)							
Land or Fresh Water Use & Foundations	4C	0.41	0.80 ²	0.80	0.80	0.10	0.60	12.0
Sawn piles, see Table 5A								

ICC-evaluated preservatives available for this application, see Table 5C, End Use, Ground Contact/Fresh Water, Piling.



Round Timber piling and glulam floor beams



Round timber piling



Round timber piling – marine application

Footnotes for Tables 9, 10 and 11: (1) The terms “Commodity Specification” and “Use Category (UC)” copyright the American Wood Protection Association (AWPA). Preservatives and retentions listed in the “Code Acceptance” section at top of Table 5B are derived from the *AWPA Book of Standards, 2009 Edition*. (2) ACQ-C only. (3) CR and CR-S only. (4) Glulam included in Marine Commodity Specification G per AITC 109-2007, American Institute of Timber Construction, Standard for Preservative Treatment of Structural Glued Laminated Timber. (5) Kiln dried after treatment to 18% moisture content or less to meet code requirements for residential and non-residential construction. (6) Creosote not recommended for applications where a clean appearance and an odor-free environment is important. (7) 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. (8) 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.

**ON THE JOB SITE,
KEEP IT SIMPLE AND FOLLOW THE LABEL**

To avoid misuse on the job site, framing crews should follow instructions on required labels affixed to treated wood products, usually a plastic end tag or ink stamp (see page 14). Following are terms and abbreviations typical found on these labels.

- Above Ground Use applications:**
 - Continuously Protected from Liquid Water
 - General Use Framing Lumber
 - Vertical Use Fence Boards
 - Decking Use Only
- Ground Contact Use applications:**
 - Ground Contact (Fresh Water)
- Foundation Use applications:**
 - Permanent Wood Foundation (PWF, FDN)
- Marine Grade applications:**
 - Marine
 - Seawall (This Side Seaward)

OTHER SOURCES OF TREATED WOOD PRODUCT INFORMATION:

American Wood Council www.awc.org
 American Wood Protection Association www.awpa.com
 APA www.apawood.org
 Creosote Council www.creosotecouncil.org
 ICC Evaluation Service www.icc-es.org
 North American Wood Pole Council www.woodpoles.org
 Penta Council www.pentacouncil.com

Railway Tie Association www.rta.org
 Southern Pressure Treaters' Association www.spta.org
 Timber Piling Council www.timberpilingcouncil.org
 Western Wood Preservers Institute www.wwpinstitute.org
 Wood Preservation Canada www.woodpreservation.ca
 Wood Preservative Science Council www.woodpreservativescience.com

Table 10: Wood Composites, AWP Commodity Specification F¹ Southern Pine Preservatives and Retentions

AWPA Use Category (UC) Designation	Waterborne Non-Copper	Waterborne - Copper Based						Oilborne				Creosote (CR, CR-PS, CR-S)							
		Propiconazole-Imidacloprid (EL2)	Alkaline Copper Tebuconazole-Imidacloprid (PTI)	Alkaline Copper Betaine (KDS)	Alkaline Copper Betaine (KDS)	Alkaline Copper Quat (KDS-B)	Copper Quat (ACQ-B, C & D)	Acid Copper (CA-B & CA-G)	Ammoniacal Chromate (ACC)	Chromated Copper Zinc Arsenate (ACZA)	Copper HDO Type A (CX-A)	Copper-8-Quinolinate (CCA)	Pentachlorophenol (PCP-A, PCP-C)	Pentachlorophenol (Cu8)					
Commodity Specification		Minimum Retention Requirements — Pounds per Cubic Foot (pcf)																	
Plywood																			
Interior, Dry or Damp ⁵	1-2	0.17 ⁸	0.019	0.013	0.19	0.14	0.25	0.25	0.060	0.40	0.25	0.25	0.206	0.02	0.04	0.40	8.0 ⁶		
Farm, Subflooring, Roof Decking	3B		0.019	0.018	0.19	0.14	0.25	0.25	0.060	0.40	0.25	0.25	0.206	0.02	0.04	0.40	8.0 ⁶		
Agricultural, Highway, Industrial	4A						0.40	0.40	0.15	0.40	0.40	0.40				0.50	10.0		
Marine, Salt Water Splash ⁷	4B							0.60	0.31	0.60	0.60	0.60					12.0		
Salt Water Immersion, Table 11																			
Permanent Wood Foundation, See Table 5A																			
Glulam Members (treated after gluing)																			
Interior, Dry or Damp	1-2													0.02	0.04	0.30	8.0 ⁶		
Above Ground, Structural	3B													0.02	0.04	0.30	8.0 ⁶		
Highway Structural, Low Decay	4A														0.06	0.60	10.0		
Critical, High or Severe Decay	4B-C														0.75	0.60	12.0		
Glulam Members (treated prior to gluing)																			
Interior, Dry or Damp	1-2				0.19	0.14	0.25 ²			0.25	0.25	0.25		0.02	0.04	0.30	8.0 ⁶		
Above Ground, Structural	3B				0.19	0.14	0.25 ²			0.25	0.25	0.25		0.02	0.04	0.30	8.0 ⁶		
Highway Structural, Low Decay	4A						0.40 ²			0.50	0.40	0.40			0.06	0.60	10.0		
Glulam Poles, see Table 7																			
Parallel Strand Lumber																			
Interior, Dry or Damp	1-2								0.060		0.25	0.25			0.04	0.40	8.0 ⁶		
Structural	3B								0.060		0.25	0.25			0.04	0.40	8.0 ⁶		
Highway, Structural, General	4A								0.15		0.40	0.40			0.06	0.50	10.0		
Critical, High or Severe Decay	4B-C								0.31		0.60	0.60			0.075	0.60	12.0		
Laminated Veneer Lumber																			
Interior, Dry or Damp	1-2																8.0 ⁶		
Structural	3B																8.0 ⁶		
Highway, Structural, General	4A																10.0		
Critical, High or Severe Decay	4B-C																12.0		

ICC-evaluated preservatives available for this application, see Table 5C, End Use, Above Ground and Ground Contact/Fresh Water, General Use.

Footnotes, see page 10.

PRESSURE-TREATED WOOD COMPOSITES

Just like dimension lumber, many composite lumber products (engineered wood) can be pressure treated to resist decay and termite attack. These include plywood sheathing panels, glulam beams, parallel strand lumber, and laminated veneer lumber.

Preservative treated engineered wood products of Southern Pine maintain all of their strength, thermal properties, workability, light weight, and economy. And the specifier gains far more flexibility in wood design for many specialized applications in extreme service conditions.



Pressure-treated glulam beam



Pressure-treated plywood

**Table 11: Marine (Salt Water), AWP Commodity Specification G¹
Southern Pine Preservatives and Retentions**

End-Use Commodity	AWPA Use Category (UC) Designation	Ammoniacal Copper Zinc Arsenate (ACZA)	Creosote (CR, CR-PS, CR-S)		
			Chromated Copper Zinc Arsenate (CCA)		
		Minimum Retention Requirements — Pounds per Cubic Foot (pcf)			
Piles, round					
New Jersey & San Francisco Bay, North	5A	1.5	1.5	16.0 ³	
Mid-Atlantic & San Francisco Bay, South	5B	2.5	2.5	20.0 ³	
Florida, Gulf Coast, Puerto Rico, Hawaii	5C	2.5	2.5	20.0 ³	
Dual Treatment					
First treatment	5B-C	1.0	1.0		
Second treatment	5B-C			20.0 ³	
Freshwater Use, see Table 9					
Piles, sawn					
Dual Treatment					
First Treatment	5A-C	2.5	2.5	25.0 ³	
Second Treatment	5A-C	1.5	1.5	20.0 ³	
Glulam Timber⁴					
Dual Treatment					
First treatment	5A-C	2.5	2.5	25.0 ³	
Second treatment	5A-C	1.5	1.5	20.0 ³	
Solid Sawn Lumber, Plywood, Sheet Pile, Bulkhead Sheathing & Ties, mine/bridge					
5A-C	5A-C	2.5	2.5	25.0 ³	
Lumber/Timbers, Marine Out of Water					
Salt Water Splash, see Table 5A					



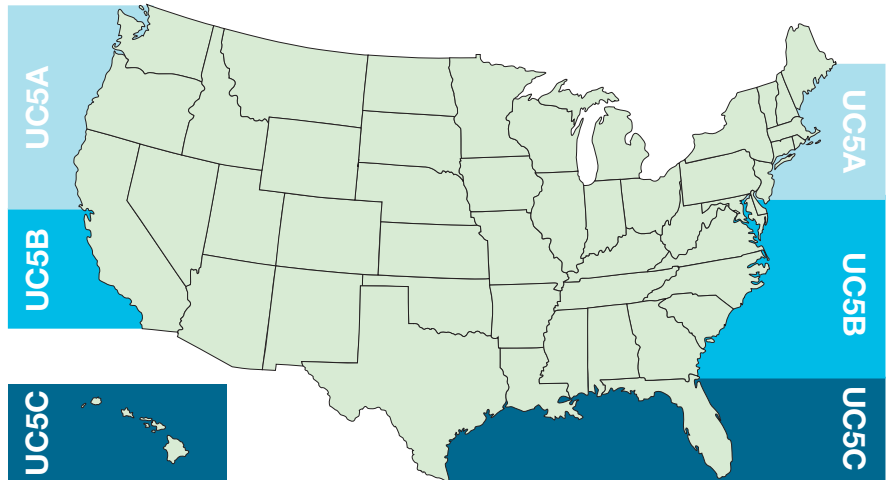
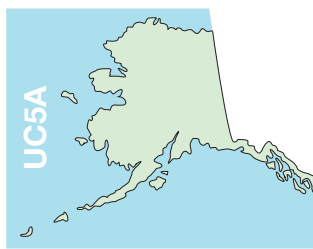
Treated glulams supporting floating dock



Marine (salt water) applications

Footnotes, see page 10.

Marine (Salt Water) Use Categories for U.S. Coastal Waters



Coastal zones and corresponding Use Categories for salt water marine exposure are shown here. Use Category requirements for particular zones are based on the presence of specific marine organisms. The degree of hazard posed by these organisms in a specific coastal zone will determine the appropriate preservative loading. This map is only a general guide and should be supplemented with local information where there is doubt concerning the nature of marine borer activity and selection of an appropriate preservative.

CODE ACCEPTANCE AND STANDARDS

Wood preservatives are recognized in the building code by reference to the American Wood Protection Association (AWPA) *Book of Standards*, or by evaluation for local code acceptance through advisory reports issued by recognized compliance organizations. Pressure-treated wood products must display an approved inspection agency quality mark (see Grade and Quality Marks, page 14) to be code compliant.

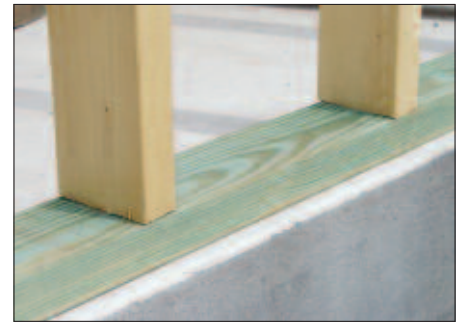
AWPA is the principal standards-writing body for the U.S. wood preservation industry. The *Book of Standards* provides guidance on methods, preservatives, and other technologies which protect wood products. New preservatives are submitted to AWPA for peer review, and if approved, are then listed in the *Book of Standards*.

Alternatively, manufacturers may submit test data to a recognized compliance organization. Typically, preservative manufacturers submit test data to the ICC-ES and obtain an Evaluation Service Report (ESR). However, evaluation reports are only advisory. The local code official having jurisdiction is the final decision maker with respect to product acceptance or rejection.

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. Generally, 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 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 areas where hazard of termite damage is known to be very heavy unless provided with approved methods of termite protection.*
- *When used in locations where drying in service cannot readily occur, codes require that pressure-treated wood have a moisture content of 19% or less before covering or enclosure.*
- *Wood end-cut, notched, or bored at the jobsite shall be field-treated in accordance with AWPA Standard M4. Application of copper naphthenate solution having a minimum 2% metallic solution is specified.*



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



Copper naphthenate solution

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 *National Design Specification*® (NDS)® published by the American Wood Council. 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:

- **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.
- **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.
- **Incising Factor, C_I** – A reduction required for difficult-to-treat species that must be incised to meet AWPA treating standards. This reduction does not apply to Southern Pine because of its ease of treatability.

Refer to SFPA's *Southern Pine Use Guide* for more information.



GRADE AND QUALITY MARKS

To protect the buyer and consumer, the industry has developed a 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 and Standards, page 13). For the quality 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.

SPECIFY QUALITY

It is recommended that the buyer specify pressure-treated wood bearing ink-stamped quality marks and/or plastic end tags denoting the material was produced under supervision of an accredited inspection agency. Use of such marks provides assurance that preservative retention and penetration complies with manufacturing specifications, that the preservative used is EPA-approved, and the lumber is treated in compliance with federal law. Use of treated wood that does not bear an approved agency quality mark will not meet requirements of the International Code Council (ICC).

Typical Southern Pine Lumber Grade Marks – (ink stamp)

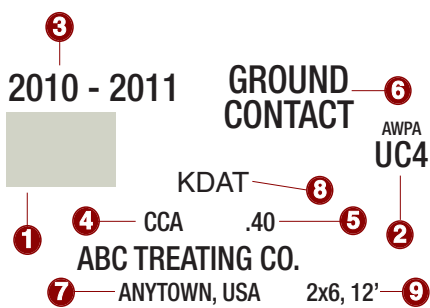


Quality Southern Pine lumber is graded in accordance with the grading rules of the Southern Pine Inspection Bureau (SPIB), Timber Products Inspection, Inc. (TP), Renewable Resource Associates, Inc. (RRA) and other organizations* are accredited to inspect and grade mark Southern Pine lumber in accordance 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 (SFPA)
- 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 ALSC inspection agency mark
- 2 AWPA Use Category
- 3 Year of treatment, if required
- 4 Preservative used for treatment
- 5 Preservative retention
- 6 Exposure category
- 7 Treating company and location
- 8 DRY or KDAT, if applicable
- 9 Length and/or class

Southern Pine Lumber Grade Descriptions

The following grade descriptions are based on the *Standard Grading Rules for Southern Pine Lumber*, 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 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 is 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 is 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 and 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.

FASTENERS AND CONNECTORS

The 2009 International Residential Code (R317.3.1) and International Building Code (2304.9.5.1) have similar requirements for fasteners used with treated wood. The IRC 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. Coating types and weights for connectors in contact with preservative-treated wood shall be in accordance with the connector manufacturer's recommendations. In the absence of manufacturer's recommendations, a minimum of ASTM A 653 type G185 zinc coated galvanized steel, or equivalent, shall be used. 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 B 695, Class 55, minimum."

The codes do not discriminate between types of preservatives and do not take into account exposure conditions, nor do they contain provisions for all metal fittings in contact with treated wood such as flashing. Therefore, clarification is helpful to assist the specifier.

The potential for corrosion of hardware in contact with treated wood occurs when metals in the preservative (such as copper) are different from the metals in the hardware (the iron in steel, or aluminum). In a wet environment these dissimilar metals create a small electrical current that triggers a chemical reaction resulting in galvanic corrosion.

To select proper hardware, the specifier should first consider the end-use application and exposure conditions. In damp or wet exposure, hardware in contact with pressure-treated wood must be corrosion resistant. Hardware includes fasteners (e.g. nails, screws, and bolts) and all connectors (e.g. joist hangers, straps, hinges, post anchors, and truss plates).

COPPER-BASED PRESERVATIVES

Copper-based formulations may be used in applicable interior or exterior applications. These include such products as Chromated Copper Arsenate (CCA), Copper Azole (CA) and Alkaline Copper Quat (ACQ). CA and ACQ have shown a slight increase in corrosion rates on mild steel compared to CCA. However, new "micronized" or "dispersed" copper formulations of ACQ and CA are no more corrosive than CCA.

In damp or wet environment, hot-dip galvanized or stainless steel hardware is strongly recommended in contact with copper-based preservative treated wood. Hot-dip galvanized fasteners should meet ASTM A153. Type 304 or 316 stainless steel is recommended for maximum corrosion resistance in more severe exterior applications, such as swimming pools or within five miles of salt-water. Stainless steel fasteners are generally required for below-grade applications, such as Permanent Wood Foundations or where certain preservatives are specified at retention levels greater than required for Ground Contact.

Due to the potential for galvanic corrosion, standard carbon-steel, aluminum, or electroplated fasteners and hardware are not recommended for use in direct contact with treated wood. 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. 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). Refer to manufacturer web sites listed in Table 2, page 4, for specific



hardware recommendations by preservative type.

When aluminum or electroplated hardware must be used in proximity to treated wood, spacers or physical barriers can be used to protect products such as flashing or termite shields. Barriers should be non-conductive and remain durable for the intended service life of the application. Suitable barriers may include heavy plastic sheeting, rubber, vinyl, or a high quality, non-permeable tar bitumen or epoxy.

Hardware coated with proprietary anti-corrosion technologies is also avail-

able. Consult individual hardware manufacturers for specifics regarding their performance.

NON-COPPER PRESERVATIVES

Non-copper based preservatives include traditional borates for use in interior applications and new carbon-based formulations for outdoor use. These preservatives are less corrosive than their copper-based counterparts, but exposure conditions must always be a primary consideration.

Borate preserved wood (Inorganic Boron – SBX) is limited to Above Ground interior use in dry or damp applications, continuously protected from weather. According to specifications from preservative suppliers, borates are non-corrosive.¹ The same code approved hardware used for untreated wood may be used for borate treated wood in weather protected applications.

Arch Wood Protection, Inc. advises, "Borate treated wood has been found to be no more corrosive than untreated wood; therefore, code compliant hardware is adequate." Viance says borate treated wood, "Can be assembled using standard fastener systems typically used in general wood construction." U.S. Borax affirms, "No special fasteners are required." Osmose, Inc. reports, "The corrosion rates are not increased when [borate] treated wood products are used as recommended."

New carbon-based preservatives are formulated for Above Ground exterior use. Like borates, they are no more corrosive to hardware than untreated wood, but end-use and exposure is the key to proper specification. For example, wood decking treated with a carbon-based preservative will still be exposed to all weather cycles including prolonged wetting.

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.

(1) Borate-treated wood guidance from Arch Wood Protection, Inc. (Sillbor®), Viance (Timbersaver® PT), U.S. Borax, Inc., and Osmose, Inc. (Advance Guard®) per National Evaluation Report, NER 648.

NOTE: This advisory provides a summary of recommendations from a variety of sources. The Southern Forest Products Association (SFPA) 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 SFPA 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.

STORAGE

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. 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.*
- *Whether delivered wet, or kiln-dried after treatment, experienced builders will allow decking or porch flooring to acclimate for one or two weeks prior to installation. Layering the material on stringers to permit air circulation will help promote drying.*
- *Cover lumber stored in an open area with a material that provides 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.*



Additional protection is provided when lumber is paper-wrapped or has been treated with a weather-protective coating. However, availability is limited and weather-protective coatings are effective for only 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 SFPA publications, *Southern Pine Use Guide* and *Managing Moisture and Mold*, available at SouthernPine.com.

CONSUMER USE AND HANDLING

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 some 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 in accordance with state, federal and local regulations. 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.

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.

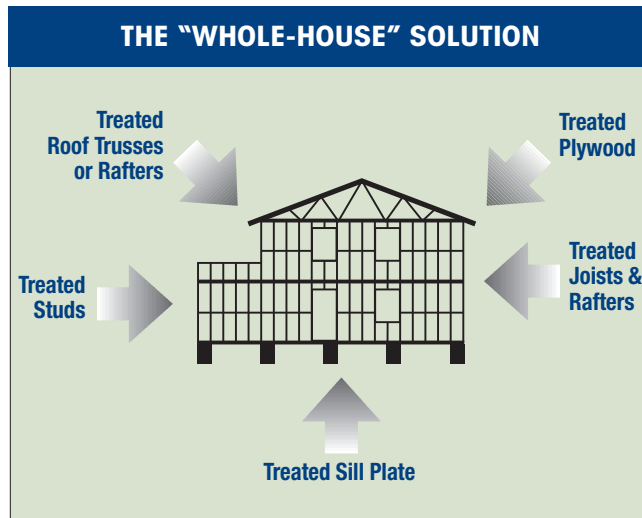


Photo courtesy: HANDY Magazine

TERMITE-RESISTANT FRAMING

To provide built-in termite protection, smart property owners are choosing framing packages of preservative treated lumber. Pressure-treated Southern Pine is a cost-effective and environmentally friendly framing material that resists attack from all termites – including Formosan. This “whole house” termite-resistant framing solution adds a second line of defense when used in conjunction with traditional termite controls such as ground-line treatments and termite barriers.

The alternative cost of repair, eradication, or replacement of framing due to attack by termites in an unprotected structure is almost always exponentially higher than the modest one-time cost of using treated lumber at the time of original construction. Termite-resistant framing is a low-cost “insurance policy” to help protect what is often a person’s single largest investment.



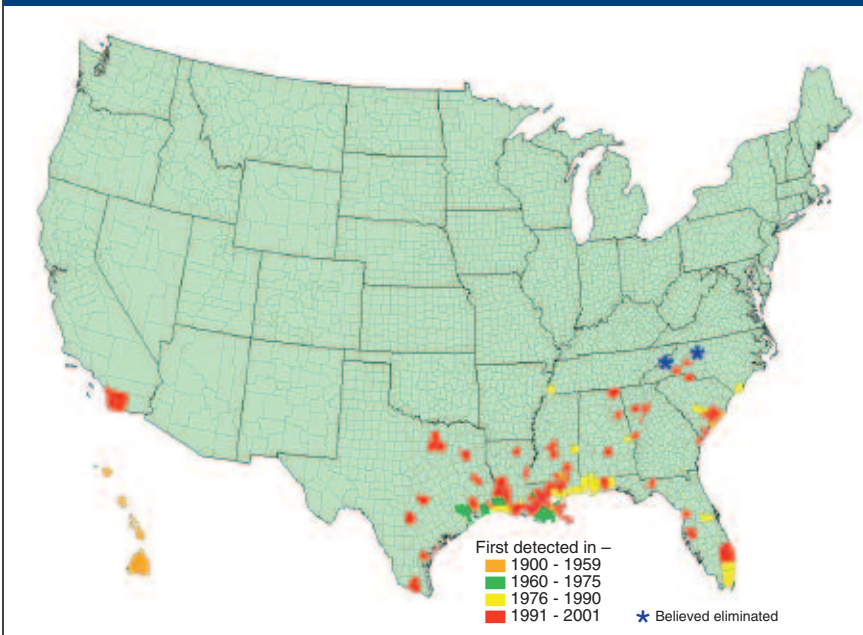
Steel framing is also termite-resistant, but wood-framed homes are far less costly to build. An analysis by the Louisiana Formosan Termite Initiative found that treated framing adds no more than 1.5% to the overall cost of a new home compared to 3.5% for steel.¹ A study in South Carolina found the cost of a steel-frame home to be 14% higher than an identical wood-frame home.²

AWPA-designated service conditions for termite-resistant framing applications are UC1, Interior Construction, Above Ground – Dry, and UC2, Inter-

or Construction, Above Ground – Damp (see Table 3, page 5). Pressure-treated lumber must be specified to be redried after treatment if used for interior applications (see page 6).

(1) Research conducted as part of the Economic Impact Committee, Louisiana Formosan Termite Initiative, Louisiana Department of Agriculture and Forestry, 2000. (2) Partnership for Advancing Housing Technology (PATH), Steel vs. Wood: Cost Comparison, Beaufort (South Carolina) Demonstration Homes, 2002.

COUNTIES WHERE FORMOSAN TERMITES HAVE BEEN FOUND



USDA Agricultural Research Service

Originally a native of mainland China, the Formosan termite is believed to have been introduced to the continental U.S. in military shipments from the Pacific into New Orleans and other Southern ports after World War II. Today, Formosan termites can be found in eight Southern states, California, and Hawaii (see map) and are expected to continue spreading northward as far as Washington State on the West Coast and Massachusetts on the East Coast. It has been described as the most aggressive and destructive termite in the world. A typical colony of native subterranean termites will consume about seven pounds of wood annually, but an active Formosan colony will devour more than 1,000 pounds of wood each year!



A GREEN CHOICE: PRESSURE-TREATED SOUTHERN PINE

Industry quality control standards for the manufacture and preservation of Southern Pine ensure longterm performance and minimize environmental impact. Advances in preservative treatments, environmental management, and sustainable forestry practices make treated wood an ecologically sound building material. Wood preservation also helps conserve forest resources for future generations by greatly reducing the amount of wood needed to replace untreated wood structures prematurely damaged by decay or termites.

Wood is reusable, recyclable, and biodegradable. It is 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. And growing forests remove the greenhouse gas carbon dioxide, while giving off life-sustaining oxygen.

Wood is also renewable. Ores and petroleum used for non-wood products, once used, are gone forever. Trees, however, are forever. Contrary to popular belief, America is *not* running out of trees. One-third of America is covered with trees today. More trees are grown each year in the U.S. than are harvested or lost to disease, insects, and fire. Trees are being planted at the rate of five million a day – six trees a year for every American.

When demand for wood increases, foresters respond by planting more trees. Even though 97% of American homes are framed with wood and North Americans use more wood per capita than anyone else in the world, our forests cover about the same land area as they did 100 years ago. In fact, our forests expanded by 12 million acres from the 1990s to 2005.¹

Finally, the “green” builder chooses locally sourced wood products monitored under recognized forest certification programs, including the American Tree Farm System, Sustainable Forestry Initiative, and the Forest Stewardship Council. These programs are recognized by the National Green Building Standard developed by the National Association of Home Builders and the International Code Council.

(1) State of the World's Forests, 1997 and 2001, and the Global Forest Resources Assessment, 2005.



Wood products help reduce CO₂ emissions.

Wood is the responsible choice for building professionals. Why? Because wood products require less energy to manufacture – meaning fewer greenhouse gasses, like CO₂. And trees use CO₂ to grow, changing greenhouse gases into the building blocks we know as wood. That's why wood products are increasingly being recognized as tools to combat climate change.

How Does Wood Reduce Carbon?



As trees grow, they remove and store carbon from the atmosphere.

Managed forests increase carbon storage by harvesting slower growing trees, and replacing them with younger trees.



Wood products, such as lumber and furniture, store carbon during their life cycle. They are 50 percent carbon by weight.



Recycling wood products allows them to continue to store carbon indefinitely.

ADDITIONAL RESOURCES

The Southern Forest Products Association offers a wide variety of helpful publications for design-build professionals. The titles listed below are available online in PDF. Visit SouthernPine.com to download and to see a listing of all publications.

Southern Pine Use Guide (#200)
grade descriptions, design values, applications, specification guidelines

Southern Pine Maximum Spans for Joists and Rafters (#202)
span tables, design criteria

Aquatic & Wetland Structures (#322)
product selection, design details for marine walkways and light vehicular bridge construction

Raised Wood Floor Foundations (#411)
foundation types, construction details, floor framing spans, cost-saving strategies

Southern Pine Decks and Porches (#305)
product selection, construction guidelines, maintenance

Online Continuing Education

Professionals earn CEUs online at SouthernPine.com/eClassroom

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

Online PRODUCT LOCATOR

Sourcing Southern Pine products?

Visit the online Product Locator at SouthernPine.com/productlocator.shtml

to find local dealers, distributors, and producers.



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