



Attitudes and Awareness about Treated Wood Products: The U.S. South Homeowner Perspective

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Introduction

In 2002, lumber consumption in the U.S. hit an all-time high of 54.7 billion board feet exceeding the previous 1999 record of 54.3 billion board feet (Western Wood Products Association 2003). This was as a result of low interest rates and strong refinancing activity. Lumber demand for the repair and remodeling segment is projected to increase by 3 percent to hit 17.3 billion board feet. Lumber demand for new home starts is strong with 1.6 million units constructed in 2003, consuming 21.2 billion board feet of lumber. Primary species of framing lumber include Douglas-fir, Hemlock-Fir, Spruce-Pine-Fir, and Southern Pine.

U.S. South market share for lumber used in home construction and in repair/remodel market was significant in recent years. For example, in 1998 single-family new home construction, South lumber share accounts for 51 percent of roof systems, 42 percent of floor systems, 40 percent of wall systems, and 53 percent of outdoor structures (Wood Products Council and National Association of Home Builders Anonymous 1999). In the repair/renovation demand segment, in 1997, U.S. South lumber captured 46 percent share in total maintenance and repairs and 32 percent of total alterations market share (Wood Products Council and National Association of Home Builders Anonymous 1998).

Most wood and wood products that are placed in service in exterior applications require a preservative to retard decay and degradation and thus extend the service life of the product. In the U.S. South, Southern pine is the primary lumber species for most exterior and structural applications. It is estimated that 40 percent of all Southern pine lumber is preservative-treated (SFPA 2004). In light of increasing market penetration from non-wood alternatives such as steel, concrete, plastic, and aluminum, it is important for the wood products industry to understand homeowner attitudes and awareness about using treated wood. Strategic decisions can be made to better position treated wood in the market once consumer attitudes are known.

The U.S. South is an ideal location for a study on homeowner awareness about treated wood because of its inherent adverse climate for exterior wood. Wood in this region is naturally degraded by combinations of heat, moisture, insects, decay, mold and other forces such as hurricanes and floods. The most common destructive element currently at the forefront in the U.S. South is the Formosan subterranean termite (*Coptotermes Formosanus*). Even though most notable, this is not the only major problem facing homeowners in Louisiana or other southern states. High humidity and heat can also provide a fertile atmosphere for growth of decay and mold inside walls and attics. The same conditions that tend to favor wood decay (i.e., high moisture) also facilitate mold growth. The biggest concern has been toxic mold (*Stachybotrys chartarum* or *atra*) or similar fungi.

Treated wood

Wood is biodegradable and has natural pathogens. Wood is attacked by fungi, insects and millions of microorganisms, which can decay and rot wood into its fundamental components, a very useful function in nature but not a desirable process for wood as construction element. Wood's Achilles heel comes especially true wherever it comes in contact with the ground or water. But fortunately, modern technology has developed ways of protecting wood from its natural predators, enabling the use of this renewable building material in structures around the world. The process, known as pressure treatment, renders wood useless as food for fungi and insects, ensuring wood's structural soundness and extending its useful service life (CITW 2003, Forintek 2002).

The wood-treatment industry represents a \$4 billion-a-year business in the U.S. In 1997 approximately 727.8 million cubic feet (20.6 million cubic meters) of wood products were pressure treated in the United States (Micklewright 1998). Since its inception in 1933 Chromated Copper Arsenate (CCA)-treated wood was not widely used until the 1970's, at which time it represented less than 15 percent of the treated wood market (Anonymous 2002b, Tom 2001). CCA-treated wood represented nearly 80 percent of the market in the US in the year 2000 (Tom 2001).

A shift in consumer awareness has pressured the treated wood industry to develop and use alternative safe-chemical treated wood products. With emerging consumer awareness and involvement in the treated wood products arena, frequent market sensing is necessary to maintain consumer satisfaction and provide accurate and timely information to consumers.

In response to consumer concerns, the Environmental Protection Agency (EPA) and the treated wood industry have launched a program aimed at increasing consumer awareness about arsenic treated wood. The EPA announced on February 12, 2002 a move away from consumer use of CCA-treated wood products by December 31, 2003, in favor of new alternative wood preservatives (De Rosa, 2002). The transition period will provide consumers with an increased amount of non-CCA treated wood alternatives.

In the U.S. wood preservatives are regulated just as all pesticides are. Wood preservatives are carefully evaluated for safety on a periodic basis, using standard protocols by the Environmental Protection Agency. Wood preservatives are broadly classified as either water-based or oil-based, depending on the chemical composition of the preservative and the carrier used during the treating process. The species of wood and the end-use application dictates the specific preservative used. Water-based preservatives include the following compounds: Chromated Copper Arsenate (CCA), Ammoniacal Copper Zinc Arsenate (ACZA), Copper Dimethyldithiocarbamate (CDDC), and Borate Preservatives which are salts such as sodium octaborate, sodium tetraborate, and sodium pentaborate (United States Department of Agriculture 2000).

The American Council on Science & Health and the EPA have both concluded that CCA-treated wood poses no known health hazard when used appropriately and as instructed. The EPA conducted a review of potential health risks of wood preservatives as a part of a periodic pesticide re-registration from 1978 to 1986. After examining all the evidence, the EPA concluded that the benefits of CCA-preservatives outweighed any potential health risks and re-registered their use (Anonymous 2002c).

In the recent past, the use of arsenic in CCA treated wood has gained mostly negative media attention. This has given consumers cause to worry about arsenic leaching from CCA-treated wood and potential negative health effects such as skin irritations and respiratory problems. Articles have also addressed the safety of playground equipments made of CCA treated wood and arsenic levels in groundwater near CCA treated applications (Hauserman 2001).

In response, the following water-based wood preservatives have been developed recently: Alkaline Copper Quat (ACQ), Ammoniacal Copper Citrate (CC), Copper Azole (CBA) (United States Department of Agriculture 2000). The most common oil-type preservatives are: Creosote; a coal tar distillate, Pentachlorophenol; a crystalline solid, Copper naphthenate; a mixture of naphthenic acids and copper salts dissolved in oil (Anonymous 2002a).

Treated wood perceptions

Public concerns regarding the safety of treated wood are being exacerbated as a result of negative publicity in the media. Public concern can be generally classified as concern for human health and also for the environment. In particular, the focus of most attention has been allegations of detrimental affects on human health due to exposure to copper chromated arsenate (CCA) treated wood. In general, U.S. homeowners generally have a positive opinion regarding the safety and performance of treated wood. A large majority of homeowners have a positive overall perception of treated wood in that they are willing to use the product in or at their home. The major reasons of those unwilling to use treated wood are due to livability and health concerns (Vlosky and Shupe 2002). Donkor et al. (2003) conducted a regional comparison of U.S. homeowner perceptions about treated wood and found that respondents from the South tend to be comparatively amenable on issues related to treated wood. This finding was attributed to high incidence of termites in the South, the often warm, moist climate in this region, and the fact that Southern pine is the species of choice for treating.

A special emphasis has been placed on children's playground equipment. Vlosky and Shupe (2004b) conducted a study to better understand attitudes of children's outdoor play equipment buyers and their buying patterns for treated wood. Thirty-nine percent of buyer respondents currently have outdoor play equipment fabricated with treated wood while 61 percent do not. Thirty-three percent had either a somewhat or very positive perception about treated wood, while 41 percent of respondents fell at the midpoint indicating a neutral position. Of the respondents that have purchased playground equipment fabricated with treated wood, 40 percent were concerned health risks to children. When put in context of other materials used to fabricate playground equipment that respondents plan to purchase, treated wood ranks a distant fourth after plastic, steel, and aluminum.

Homebuilders are important influencers for wood products demand, including treated wood. A previous study by Vlosky and Shupe (2004b) examined what homebuilders think about treated wood. Only 1 percent of respondents had an extremely negative perception of treated wood while 38 percent had a somewhat positive perception and 32 percent had an extremely positive perception.

As mentioned earlier, mold is an issue especially in moist humid environments. A recent study found that ten percent of homeowners believe that mold is an issue in their neighborhoods while 35 percent of home builders and 19 percent of real estate agents believe that that this is an issue in the homes they build/sell (Vlosky and Shupe 2004c). Sixteen percent of homeowners and 11 percent of home builders, respectively, in the study believed that treated wood can prevent mold from forming. The study suggests that education of these respondent groups would be helpful to increase understanding about the risks and measures required to prevent risks from mold related to treated wood.

The Study

The study region is the U.S. South and includes Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Tennessee. The source of sample frame information was 2002 U.S. census data. A sample of 2,000 single-family homeowners was randomly drawn from all homeowners in the region. The sample set was purchased from Best Lists, a national survey list company.

This study was conducted using mailed surveys. In general, sampling, survey procedures, follow-up efforts and data analysis were conducted in accordance with verified techniques (see

Dillman 2000, Fowler 1996). Mail questionnaires were chosen as the most cost effective method of data collection. The method affords a high degree of anonymity and is less limited by rigid time constraints that can impede the effectiveness of other survey methods. Mail survey procedures included a pre-notification letter, a cover letter accompanying the questionnaire, and a reminder follow-up postcard.

Sixty surveys were returned as undeliverable and 313 completed surveys were returned for an adjusted response rate of 16 percent. Study respondents were offered summary results as an incentive for their participation. After pre-testing the survey with forest products corporate managers and forest products marketing graduate students, an iterative process resulted in the final survey instrument. Non-response bias was tested by comparing the frequency of state domicile for the non-respondents in the set of 2,000 single-family homeowners relative to respondents. Using a two-tail t-test, no difference was found for at $\alpha=0.05$.

Results

All states included in the study are represented by respondents although the majority of respondents live in Florida and Georgia with 31 percent and 17 percent, respectively (**Figure 1**). The mean respondent age is 56 years old. A majority of respondents are male (70 percent) and are married or living with a partner (72 percent) and they are fairly educated with 27 percent having an undergraduate college degree and 19 percent having an advanced degree. In 2002, 48 percent of respondents had a household income of \$60,000 or more. 22 percent had income of \$100,000 or more. The majority of respondents are Caucasian (90 percent) or African-American (6 percent). Nearly a third (32 percent) of respondents lives in medium-size cities of 50,000-250,000 people. Twenty percent live in larger cities and the balance live in smaller communities. On average, respondents have lived 19 years in their current residence with a minimum of one year and a maximum of 65 years. Seventeen percent of respondents plan to purchase a home within the next five years.

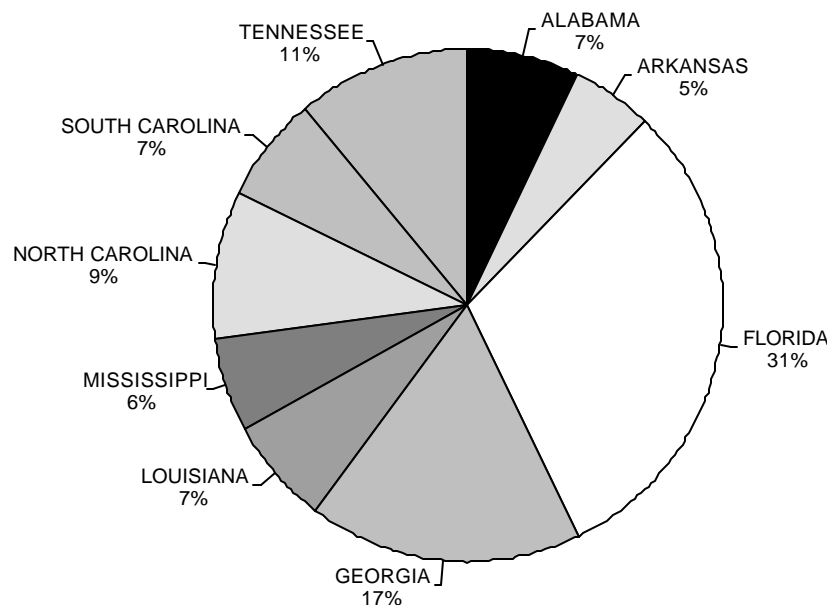


Figure 1. State of Residency (n=310) (Percent of Respondents)

On a 5-point scale anchored on extremely negative to extremely positive, overall, respondents have a very positive perception of treated wood products. Forty-three percent of respondents have an extremely positive perception of treated wood and 35 percent have a somewhat positive perception. Only three percent of respondents had an extremely negative view of treated wood and three percent had a somewhat negative perception. The balance of respondents was positioned at the midpoint. Consistent with these findings, 94 percent of respondents said they would be willing to live in a house that is fabricated in part with treated wood. For the 6 percent of respondents that would not do so, health concerns were cited as the most prevalent reason.

Respondent opinions about treated wood were formed in a number of ways. Friends and newspapers are the most cited means (each with 25 percent of respondents) closely followed by magazines (21 percent), family (20 percent), and television (20 percent). Seventeen percent of respondents said they had no opinion about treated wood. This finding suggests appropriate media for reaching homeowners regarding treated wood education and advertising.

Treated lumber products are used in many applications in respondent current residences. First ranked was treated wood landscaping timbers (57 percent of respondents) followed by decks/outdoor stairs (53 percent of respondents) and other outdoor structures (46 percent). Nearly a third of respondents (31 percent) said they currently have treated wood wall/roof/floor/framing in their homes and 17 percent said they had treated permanent wood foundations. This indicates that market penetration for framing and foundations has taken place and can be used as a selling point for further residential market development for these applications.

At some point in the past, 32 percent of respondents have hired a professional contractor/remodeler to build or install a treated lumber application. In addition to applications at current residences, respondents were asked their general opinion of applications where treated wood would be appropriate (**Table 1**). Outdoor applications were highest ranked (decking-90 percent of respondents, landscape timbers-84 percent of respondents, fencing-82 percent, outdoor stairs-81 percent). Treated permanent wood foundations were deemed appropriate by 66 percent of respondents while over half of respondents believe that treated new-home wood framing (54 percent of respondents) and nearly half (49 percent) say treated remodeled wood framing is appropriate. Other applications where treated wood is deemed appropriate are barns, basement framing footers, hunting blinds, boat docks, floor joists, and home sub-floors.

DECKING	90%
LANDSCAPE TIMBERS	84%
FENCEPOSTS OR RAILS	82%
OUTDOOR STAIRS	81%
RESIDENTIAL FENCING	78%
LATTICE PANELS	66%
PERMANENT WOOD FOUNDATIONS	66%
OUTDOOR FURNITURE	60%
NEW HOME WOOD FRAMING	54%
REMODELLING-WOOD FRAMING	49%
CHILDRENS PLAYSETS/FORTS	43%
HOME SIDING	41%
ROOFING	35%
INDOOR FLOORING	28%

Table 1. Applications where treated wood is deemed appropriate . (Percent of respondents; multiple choices possible) (n=312)

Respondents were asked about their familiarity with various preservative treatments or chemical compounds used to treat lumber. Respondents are most familiar with Creosote (64 percent of respondents) followed by CCA (35 percent), penta (15 percent) and borates (12 percent of respondents). Least familiar were Alkaline Copper Quat (ACQ) (5 percent of respondents), Oxygenated Zinc (AZ) (5 percent of respondents) and Copper Azole (CA) (4 percent of respondents).

Treated wood products branding can help differentiate products in the marketplace. Respondents were asked if they could recall any brands of treated lumber. Fifty-one respondents (16 percent) were able to identify 21 (perceived, not necessarily real) brands. By far, the most cited brand was Osmose (20 respondents) followed by a distant Weyerhaeuser and Lowe's (both with 3 respondents).

As a strong indicator of the need to educate homeowners/consumers about treated wood safety, 69 percent of respondents are not sure if some types of treated wood are safer than others, 22 percent of respondents believe that this is the case while nine percent do not. A number of questions were posed regarding treated lumber safety for specific applications (**Table 2**). A majority of respondents (71 percent either somewhat or strongly agree) are in agreement that with proper use, handling and disposal, treated lumber is entirely safe. 73 percent believe that treated lumber is safe for outdoor human contact applications, 67 percent believe it is safe for builders, 48 percent believe pet/farm animal exposure is safe and 47 percent believe it is safe to children for outdoor play equipment. 41 percent of respondents believe treated lumber is safe (somewhat or strongly agree) for indoor applications and 11 percent think it is safe for food handling applications (e.g. countertops, cutting boards). In addition, 22 percent of respondents have knowledge of Consumer Safety Information Sheets (CSIS's) (as they relate to pressure treated lumber products).

Specific to home framing, 64 percent of respondents believe that treated wood is an acceptable material to use for new home construction framing and 69 percent would frame their house with treated wood if it was certified as safe (either somewhat or strongly agree)

Statement	Strongly Disagree 1	2	Neither Agree Nor Disagree 3	4	Strongly Agree 5	Mean
With proper use, handling and disposal of treated lumber is entirely safe	3%	5%	21%	33%	38%	4.0
Some types of treated lumber are safer than others	1%	2%	43%	24%	30%	3.8
Treated lumber is safe for outdoor human contact applications	5%	3%	19%	31%	42%	4.0
Treated lumber is safe to builders	5%	9%	20%	35%	32%	3.8
Treated lumber is safe to children for outdoor play equipment	10%	14%	29%	22%	25%	3.4
Treated lumber is safe to be near pets or farm animals	9%	14%	29%	25%	23%	3.4
Treated lumber is safe to residents for indoor applications	11%	16%	32%	21%	20%	3.2
Treated lumber is safe for food handling (e.g. Countertops, butcher blocks)	52%	19%	19%	5%	6%	1.9

Table 2. Treated wood safety perceptions (percent of respondents) (n=310)

In addition to safety issues, general treated wood questions were posed to respondents (**Table 3**). Fifty-three percent of respondents believe that they understand the concept of wood treating (either somewhat or strongly agree), while 17 percent disagree (either somewhat or strongly disagree) and 30 percent neither disagree nor agree. There is an apparent need to educate homeowners. Responses to a follow-up statement “I would like more information on proper use, handling and disposal of treated lumber” supports this. 34 percent of respondents strongly agreed and 19 percent somewhat agreed.

Another general question has to do with the willingness-to-pay a premium for treated wood over the non-treated alternative. Sixty-two percent of respondents agreed that they would pay such a premium (either somewhat or strongly agree) while only 17 percent disagreed with this notion (either somewhat or strongly disagree).

An environmental statement “I believe using treated wood can reduce deforestation” resulted in 54 percent of respondents in agreement and 14 percent were in disagreement. Nearly one-third of respondents were neutral on this point. This has implications for selling points for treated wood manufacturers. If this perception can be cultivated, it can be a useful approach for connecting with consumers regarding the benefits of using treated wood products.

Statement	Strongly Disagree 1	2	Neither Agree Nor Disagree 3	4	Strongly Agree 5	Mean
I understand the concept of wood treating.	7%	10%	30%	29%	24%	3.5
I would like more information on proper use, handling and disposal of treated lumber	15%	6%	26%	19%	34%	3.5
I would pay a premium for treated wood products over non-treated wood.	7%	8%	23%	30%	32%	3.7
I believe using treated wood can reduce deforestation.	7%	7%	32%	28%	26%	3.6
I trust treated wood claims made by wood product suppliers.	7%	13%	43%	26%	12%	3.2
Treated lumber emits odors	15%	19%	35%	22%	9%	2.9

Table 3. General treated wood perceptions (percent of respondents) (n=308)

A statement was posed regarding perceived integrity of manufacturers claims; “I trust treated wood claims made by wood product suppliers”. Thirty-eight percent of respondents either somewhat or strongly agreed but 43 percent were neutral and had no opinion. Trust is an important part of the relationship between buyers and sellers. This is particularly important for treated wood products exchange partners due to unique handling and safety issues. It is important for manufacturers and other entities involved in the treated wood value chain to understand what perceptions exist regarding trust. Accordingly, respondents were asked to rate their level of trust for different agencies and entities to have the responsibility of providing builders, remodelers, and consumers with treated wood product safety and handling information (**Table 4**). In addition, respondents indicated if they were unfamiliar with the agency/entity. The Centers for Disease Control was identified as the most trusted entity (2.6 on a 3-point scale of trust) closely followed by universities (2.5), research laboratories (2.4) and the EPA (2.3). Companies that manufacture preservatives, sell treated wood products, treaters, and treated wood associations all were “trusted a little” by respondents (2.0). Least trusted were attorneys (1.4).

Agency or Other Entity	Do Not Trust At All	Trust A Little	Trust A Lot	I Do Not Know What This Is	Mean 1-3 Only
	1	2	3	4	
Centers for Disease Control	7%	26%	62%	6%	2.6
Universities	5%	41%	48%	5%	2.5
Research Laboratories	4%	47%	45%	3%	2.4
Environmental Protection Agency	12%	44%	41%	4%	2.3
 					
National Association of Home Builders	7%	56%	29%	8%	2.2
Federal government	15%	57%	26%	3%	2.1
Healthy Building Network	7%	34%	14%	46%	2.1
State agencies	17%	61%	18%	5%	2.0
 					
Companies that manufacture preservatives used in treating wood	17%	60%	19%	5%	2.0
Companies that sell treated wood products	15%	65%	17%	4%	2.0
Wood products treating companies	17%	66%	14%	3%	2.0
Treated wood products industry associations	15%	54%	15%	16%	2.0
 					
Audubon Society	18%	40%	31%	12%	2.2
Sierra Club	28%	31%	20%	21%	1.9
Greenpeace	36%	35%	18%	11%	1.8
 					
Attorneys	63%	32%	3%	2%	1.4

Table 4. Level of trust regarding the responsibility of providing builders, remodelers, and homeowners with treated wood product safety and handling information. (percent of respondents) (n=310)

Home structural damage caused by termites, particularly the Formosan Subterranean Termite, is a very real and often significant problem in the U.S. South. Over one-third (34 percent) of respondents said that they have experienced termite damage to their homes and 88 percent have taken action to prevent attack by the termites in their home. In order to combat

termites, the most cited action was the use of treated wood (44 percent of respondents) followed by the use of a soil termiticide (42 percent of respondents).

Respondents were also asked their opinion of efficacy of various treatments in protecting houses against termites. Aside from not using wood at all, the top ranked practice was the use of preservative treated wood (3.9 on a 5-point scale: 1= does not protect at all; 3=protects somewhat; 5=greatly protects). This was followed by fumigation (3.6). Least ranked was using untreated wood (1.2) and using a graded gravel ground barrier (2.3).

Summary

As Smith (2004) points out, “unless protected, wood is naturally degraded buy combinations of heat, moisture insects, decay, mold, and other catastrophic forces such as hurricanes and floods.” Climatic conditions in the US South create an environment that promotes wood degradation. Preservative treatments, which are effective deterrents to wood degradation, are often viewed dimly by the public. In this study we looked at US South homeowner awareness of treated wood issues and their perceptions about using treated wood in different possible applications in and around their homes.

In general, respondents had a very positive perception of treated wood products and were familiar and comfortable with treated wood as evidenced by its many uses in a myriad of outdoor applications. More importantly, with implications for softwood lumber demand, were the findings that two-thirds of respondents felt that treated wood was appropriate material for permanent wood foundations and over half felt treated wood is suitable for home framing. There was some confusion among respondents on what types and brands of treatments exist in the marketplace indicating an opportunity for treated wood manufacturers to do a better job of to position and differentiate themselves in the marketplace. Further, homeowner education about treated wood is needed as indicated by 69 percent of respondents saying that are not sure if some types of treated wood are safer than others. Overall, treated wood appears to have a bright future in homebuilding and remodeling application in the US South.

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