

Implications for the Future of Treated Wood in Four U.S. Demand Sectors

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Introduction: The U.S. treated wood industry is evolving as new products emerge, technology advances, and environmental concerns increase. The U.S. preservative-treated wood industry has come under close scrutiny recently due to allegations of adverse health consequences of humans as a result of exposure to chromium copper arsenate (CCA) treated lumber. The U.S. preservative treated wood industry voluntarily agreed with the U.S. Environmental Protection Agency (EPA) to end the production of CCA-treated wood as of December 31, 2003. In addition, the EPA released a draft preliminary probabilistic risk assessment for children who contact chromated copper arsenate (CCA) treated playsets and decks. The EPA does not believe there is any reason to remove or replace CCA-treated structures, including decks and playground equipment. Nor is the EPA recommending surrounding soils be removed or replaced (EPA 2003).

Concern regarding treated wood disposal and contact with humans has resulted in increased public awareness in recent years. Many different groups either use, specify or come into contact with treated wood products. The authors have been researching many of these populations regarding their perceptions and attitudes about treated wood (Vlosky and Shupe 2002, 2004a,b,c). This presentation summarizes research results from four of these U.S. user and influencer sectors: homebuilders, homeowners and children's playset buyers and sellers. We will conclude with some comments on the implications of these findings for the future of the treated wood industry.

Materials and Methods

Four separate U.S. national studies were conducted using mailed surveys. In general, sampling, survey procedures, follow-up efforts and data analysis was conducted in accordance with well-documented and verified techniques (Dillman 2000). Mail survey procedures included a pre-notification letter, a cover letter accompanying the initial questionnaire, a follow-up postcard, a second follow-up letter and a second questionnaire mailing. The source of sample frame information was U.S. census data. The sample sets were purchased from Best Lists, a national survey list company.

Results and Discussion

New Home Buyers

Of the 1,500 surveys mailed, 98 were either undeliverable or unusable. Of the adjusted sample size (1,402), 451 useable surveys were returned for an adjusted response rate of 32%. As seen in **Table 1**, energy efficiency is the most important criteria to respondents when considering the purchase of a new home. Regionally, respondents in the West ranked this highest. Additional economic factors, initial cost of the house and resale value were ranked next. Once again, they were highest ranked in the West. Resistance to wood destroying insects also ranked high in the South, and ranked fourth overall. On average, all factors were ranked 4.0 or higher on a 5-point scale indicating that these factors are all important to respondents in all regions.

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Table 1. New House Purchase Criteria (homeowners)

Scale: 1=least important to 5=most important

(Highest ranked criteria by region is in bold)

	Total	West	North Central	Northeast	South
Energy efficient	4.7	4.9	4.7	4.8	4.6
Cost of the house	4.6	4.7	4.6	4.5	4.5
Resale value	4.6	4.7	4.6	4.6	4.5
Resistance to wood destroying insects	4.4	4.5	4.2	4.4	4.6
Resistance to wind damage	4.2	3.9	4.2	4.3	4.3
Resistance to flooding	4.2	3.8	4.0	4.3	4.3
Free from as many chemicals as possible	4.0	4.3	4.0	4.2	4.0

Respondents were asked to rate resistance to weather exposure for a number of building materials (Table 2). In the category of “more than 25 years”, concrete and steel were highest rated followed by naturally durable wood species such as cedar and redwood. Treated wood was next. Of interest to treated wood manufacturers is the fact that over two-thirds of the respondents believe that treated wood will last 11-25 years in exposed conditions.

Table 2. Perception of the Number of Years Materials Last in Weather Exposed Above Ground (Percent of Respondents) (homeowners)

	0-10 Years	11-25 Years	More than 25 years
Concrete	2%	24%	73%
Steel	6%	22%	72%
Naturally durable species (cedar, redwood)	19%	56%	25%
Treated lumber products	18%	67%	15%

The first fundamental treated wood question was with regard to respondents’ overall perception of this product. 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. However, this positive perception of treated wood was not supported by the fact that 53 percent of respondents said they had concerns about using this product in building a home. Of the respondents that said they had concerns, there was no statistical difference between regions, with 21 percent in the North Central, 25 percent in the South, 23 percent in the West and 31 percent in the Northeast.

For the 53 percent of respondents that said they had concerns about using treated wood in building homes. The greatest concern was the perceived health risk followed by a closely related concern, long-term exposure to treated wood. This suggests that for increased usage of treated wood by homebuilders, they need to be provided with unbiased information on appropriate applications and real or imagined safety issues about treated wood.

Respondents developed their opinions about treated wood in a variety of ways. The top ranked methods, in order, were word-of-mouth through friends, magazines, newspapers and television. There are a number of brands of treated wood on the market. Respondents were asked if they thought that some types of treated wood were safer than others. Thirty percent believed this to be the case but over half did not know. These findings indicate that industry-wide education, perhaps through homebuilder associations and the media are appropriate channels to reach this sector and that there are opportunities for individual manufacturers to position their products in the marketplace and generate brand awareness.

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New Home Builders

The sample frame for the study consists of the top 500 home builders by sales. Of the 500 surveys mailed, 98 were either undeliverable or unusable. Of the adjusted sample size (467), 116 useable surveys were returned for an adjusted response rate of 25%.

Two-thirds of respondents said they understood the concept of wood treating while 11 percent said they did not and 26 percent had no opinion. Twenty-eight percent believed that using treated wood can reduce deforestation, 49 percent had no opinion and 22 percent felt this was not the case. Thirty-nine percent of respondents trusted safety claims made by treated wood manufacturers, 24 percent did not and 37 percent had no opinion. This suggests that treated wood manufacturers have an unfulfilled role to play in educating homebuilders about treated wood and building trust.

Fifty-one percent of respondents said they would recommend that their clients pay a premium for treated wood over the non-treated alternative. An important question was what builders believe would be the actual premium that their clients would in fact pay a premium for treated wood over the non-treated alternative. We asked respondents what they thought customers would pay for treated wood over a hypothetical base of \$500/MBF for a non-treated alternative. Twenty-four percent of respondents did not believe that clients would pay a premium. Three percent of respondents believed this premium to be 2 percent, 14 percent thought it was 3 percent and 19 percent of respondents believed the premium was 5 percent. Thirty percent of respondents believed that clients would pay more than a 5 percent premium. It is important to note that the use of treated wood is typically mandated by building codes for wood applications with ground contact and concrete contact. Although we investigated if respondents were willing to pay, or suggested that their clients would pay a premium, they may not have a choice. They may be required to use treated wood by code.

In addition to perceptions of chemicals/compounds that are contained in treated wood products, respondents were asked to evaluate the health risk to humans for a number of chemicals/compounds in general (**Table 3**). Arsenic heads the list with 60 percent of respondents stating that it poses a significant risk to human health. The perception of health risk drops sharply for the remaining chemicals. Interestingly, 2 percent felt that water and 1 percent felt that oxygen posed significant health risks, respectively. Many respondents had no opinion indicating a lack of knowledge about many of the chemicals listed.

Table 3. Perceptions of health risk to humans from exposure to selected chemicals/elements (n=115) (home builders)

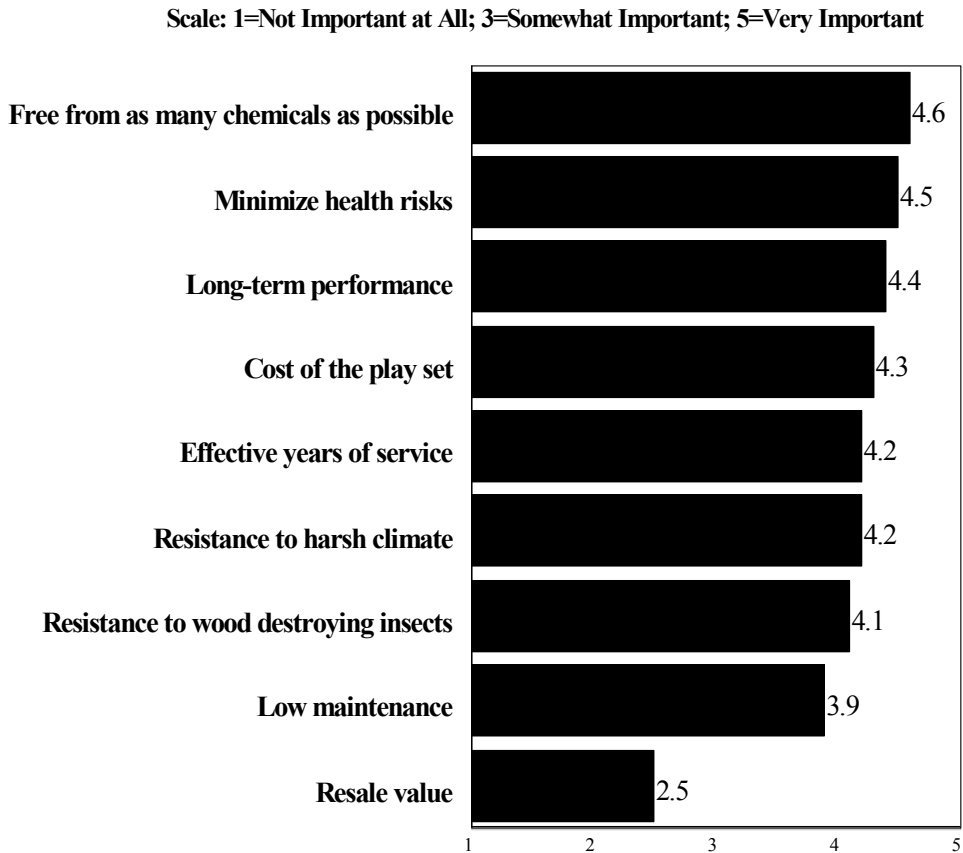
	1	2	3	4	5	
Chemical	Poses No Health Risk		Somewhat of a Health Risk		Poses a Significant Health Risk	No Opinion
Arsenic	1%	3%	7%	15%	60%	14%
Chromium	5%	12%	14%	15%	19%	35%
Boron	6%	9%	16%	8%	5%	56%
Hydrogen	42%	14%	7%	3%	3%	31%
Zinc	5%	16%	29%	11%	5%	34%
Water	61%	12%	9%	0%	2%	16%
Borax	14%	13%	18%	6%	4%	45%
Copper	26%	19%	20%	10%	9%	16%
Oxygen	68%	9%	4%	2%	1%	16%

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Playset Manufacturers

A census of 188 playset manufacturers was surveyed and the adjusted response rate was 37 percent. As seen in **Figure 1**, minimization of chemicals and health risks are the most important criteria to respondents when considering the materials they use to manufacture children's playsets. These are closely followed by performance, cost, and years of service. Resistance to wood destroying insects was highest ranked in the South, and ranked seventh overall. On average, all factors (except low maintenance and resale value) were ranked 4.0 or higher on a 5-point scale indicating that these factors are all important to respondents.

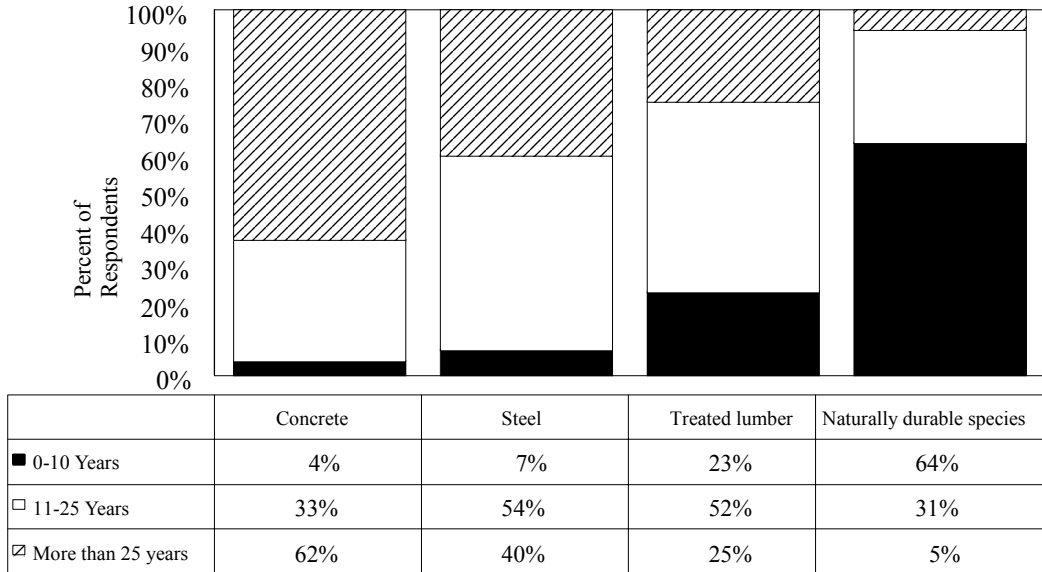
Figure 1. Materials Purchase Criteria (playset manufacturers)



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Respondents were asked to rate resistance to weather exposure for a number of playset manufacturing materials (**Figure 2**). In the category of “more than 25 years”, concrete and steel were highest rated followed by naturally durable wood species such as cedar and redwood. Over two-thirds of respondents believe that treated wood will last 11-25 years in exposed conditions.

Figure 2. Resistance to Weather Exposure for Manufacturing Materials (playset manufacturers)



Forty-eight percent of manufacturer respondents currently fabricate outdoor play equipment with treated wood. When put in context of other materials respondents use for playground manufacturing, treated wood ranks third (48 percent of respondents) after plastic (67 percent of respondents) and steel (56 percent of respondents).

A fundamental treated wood question posed to respondents was with regard to their overall perception of this product. Fourteen percent of respondents had an extremely negative perception of treated wood with an additional 18 percent having a somewhat negative perception. Eighteen percent had a somewhat positive perception and just over a quarter (27 percent) had a very positive perception.

Of the 25 respondents that manufactured playground equipment with treated wood, 12 percent were concerned about legal or liability issues. Health risks to children, lack of knowledge on long-term effects of human exposure and replacement costs were considered to be concerns by 6 percent of respondents. This low level of concern is supported by the fact that although 48 percent of respondents currently use treated wood to manufacture playground equipment, 64 percent of the total respondents said they would do so. For the 36 percent of respondents that said they would not use treated wood, the major reasons for this are the perceived health risks followed by a closely related concern, long-term exposure to treated wood. Forty-one respondents do not know enough about treated wood while 36 percent are concerned about product performance.

Playset Buyers

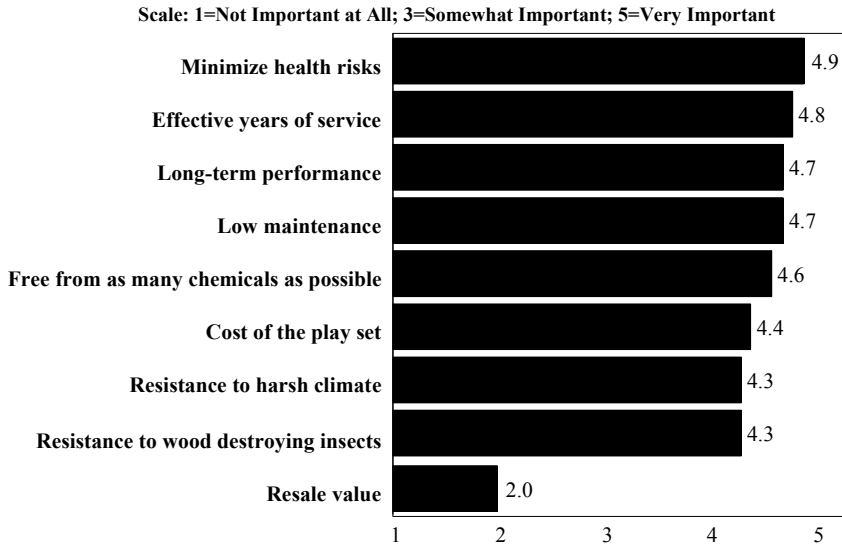
We surveyed 2,800 daycare centers, elementary schools (public and private), secondary schools, municipal recreation commissions, county parks, and city parks. The adjusted response rate was 17%. Respondents were asked a number of questions regarding play set fabrication materials in general. This helps to understand where treated wood is positioned in the minds of respondents.

As seen in **Figure 3**, minimization of health risks is the most important criteria to respondents when considering the materials in children’s play sets that they purchase. This is closely followed by effective

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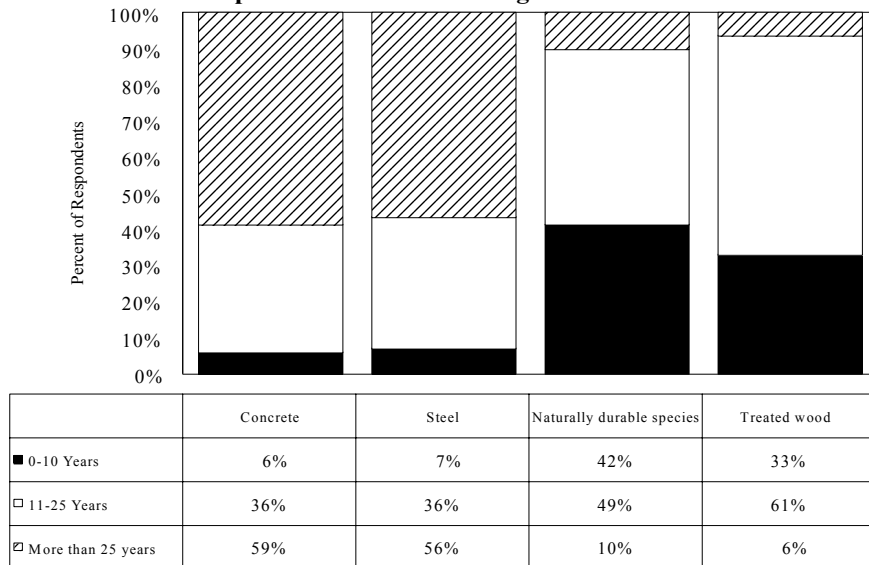
years of service, performance, maintenance, and being free from chemicals. Resistance to wood destroying insects was ranked near the bottom of the list with only resale value ranking lower. On average, all factors (except resale value) were ranked 4.0 or higher on a 5-point scale indicating that these factors are all important to respondents.

Figure 3. Playset purchase criteria (playset buyers)



Respondents were asked to rate resistance to weather exposure for a number of play set manufacturing materials (**Figure 4**). In the category of “more than 25 years”, concrete and steel were highest rated followed by naturally durable wood species such as cedar and redwood. Treated wood was next and only 1 percent of respondents felt that untreated wood would last more than 25 years in exposed weather conditions. Of interest to treated wood manufacturers is the fact that over two-thirds of respondents believe that treated wood will last 11-25 years in exposed conditions.

Figure 4. Resistance to weather exposure for manufacturing materials



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Thirty-nine percent of buyer respondents currently have outdoor play equipment fabricated with treated wood while 61 percent do not. When put in context of other materials contained in current buyer playground equipment, treated wood ranks third (39 percent of respondents) after plastic (71 percent of respondents) and steel (57 percent of respondents). Aluminum was next at 30 percent of respondents followed by concrete (14 percent).

The first fundamental treated wood question posed to respondents was with regard to their overall perception of this product. Nine percent of respondents had an extremely negative perception of treated wood with an additional 18 percent having a somewhat negative perception. Twenty-three percent had a somewhat positive perception and 10 percent had a very positive perception. Fully 41 percent of respondents fell at the midpoint indicating a neutral position on this scale.

Of the 168 respondents that have purchased playground equipment fabricated with treated wood, 40 percent were concerned about health risks to children. A related concern, lack of knowledge on long-term effects of human exposure and weathering resistance were ranked second (33 percent of respondents). Thirty percent were concerned about legal or liability issues and 23 percent had concerns about replacement costs. Overall, 56 percent would not purchase treated wood play equipment.

When put in context of other materials used to fabricate playground equipment that respondents plan to purchase, treated wood ranks a distant fourth (8 percent of respondents) after plastic (44 percent of respondents), steel (32 percent of respondents), and aluminum (20 percent of respondents).

Respondents that currently do not have playground equipment with treated wood were asked why they would not be willing to purchase playground equipment made with this material. Over two-thirds (67 percent) of the 395 respondents said the reason was concerns about health risks to children, followed by long-term performance concerns (57 percent of respondents), and a lack of knowledge on long-term effects of human exposure to treated wood (45 percent of respondents). Thirty-five percent feel that it is a poor fabrication material and 11 percent cited materials cost.

Conclusions

These studies uncovered a number of findings that are relevant to treating industry as well as users of treated wood products. The criteria that these for groups use in making purchase decisions, selling decisions, business decisions vary. Accordingly, it is important to segment the market and look at the issues, concerns, needs and wants of each group separately.

All of the four groups are aware of the materials they use to build or buy products that can be made with treated wood. Their concerns can range from home energy efficiency with homeowners to liability issues with playground equipment manufacturers to health and safety issues for playground equipment buyers.

A commonality across groups is the perception that treated lumber products will last between 10 and 25 years in weather exposed above group conditions. In addition, most respondents believe that other building materials such as plastic and steel result in more harm to the environment as a result of the manufacturing process than treated lumber.

Perceptions about treated wood are generally positive with a majority of builders and homeowners currently using treated wood in the homes they build/own. Of those that are unwilling to use treated wood in their home, health concerns is the major concern.

There seems to be a general misunderstanding about treated wood as evident by high percentages across respond groups that reported having little or no understanding the concept of wood treating or treated wood consumer information sheets. Moreover, a majority of respondents desire additional information on treated wood. The misunderstanding of treated wood by the public may be the cause of a credibility problem for the wood industry. For example, with homeowners, a minority of respondents indicated that they trust wood claims made by wood product suppliers. Individual wood products companies were the least trusted entity to provide consumers with treated wood safety and handling information, and environmental organizations were the most trusted.

It is evident that respondents are using and have plans to continue to use treated wood. However, there is a general misunderstanding of the properties of treated wood, which may be the cause for consumer fear of safety and lack of trust of information from the industry. Ultimately, customer behavior will

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determine treated wood product offerings, materials, and promotional efforts and the treating industry should meet the challenge head-on, be proactive and develop effective strategies.

References Cited

Dillman, D. A. 2000. *Internet and Mail Surveys: the Tailored Design Method*. John Wiley & Sons. New York, New York.

Environmental Protection Agency (EPA). 2003. Draft preliminary probabilistic risk assessment for children who contact chromated copper arsenate (CCA) treated playsets and decks. http://www.epa.gov/pesticides/factsheets/chemicals/draft_cca_qa.htm

Sinclair, S.A. and P.M. Smith. 1990. Product awareness and physical risk perceptions of consumers of treated lumber. *Wood Fiber Sci* 22(1):80-91.

Vlosky, R.P. and T.F. Shupe. 2002. Homeowner attitudes and preferences for building materials with an emphasis on treated wood products. *Forest Prod. J.* 52(7/8):90-95.

Vlosky, R.P. and T.F. Shupe. 2004a. U.S. home builder perceptions about treated wood. *Forest Prod. J.* 54(10):41-48.

Vlosky, R.P. and T.F. Shupe. 2004b. An exploratory study of home builder, new-home owner, and real estate agent perceptions and attitudes about mold. *Forest Prod. J.* 54(12):289-295.

Vlosky, R.P. and T.F. Shupe. 2004c. Buyer perceptions and purchasing patterns related to treated wood use in children's playground equipment. *Forest Prod. J.* 54(12):307-312.