PRESSURE TREATED WOOD: ARSENIC AND LACE

By:

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Kurtis B. Reeg is a member of Leritz, Plunkert & Bruning, P.C., in St. Louis, MO, having served as the National Chair of the Products Liability Group of one of the nation's largest law firms. For twenty-five years, Mr. Reeg has focused his litigation practice in the fields of products liability, insurance, toxic torts, environmental law and alternative dispute resolution. He has handled numerous cases of national importance, including the W.R.Grace nationwide asbestos insurance coverage litigation, the ground-breaking Minnesota Landfill Clean-up Act litigation, the Burlington Northern R.R. noise-induced hearing loss litigation, and the Goodyear Entran II hydronic heating hose litigation across the country. He has served as a Coordinating Counsel for one major P & C insurer for more than a decade, and counts numerous insurers as his clients. Mr. Reeg is a frequent lecturer at legal and insurance meetings and seminars. He has published numerous articles for and is a member of the Defense Research Institute (DRI), the Federation of Defense and Corporate Counsel (FDCC), the International Association of Defense Counsel (IADC), the Missouri Organization of Defense Lawyers (MODL), the ABA, and the Missouri and Illinois Bars. He is a member of the bars of the U.S. Supreme Court, the Second, Seventh and Eighth Circuit Courts of Appeal, and numerous federal district courts across the county. He has tried and has numerous reported cases to his credit in more than 12 states, and was the recipient of the FDCC's 2001 Andrew C. Hecker Award for the best article in the Federation's major publication, *The Quarterly*. Dubbed "Mr. Toxic Torts" by SkyRadioNet, he was featured in August, 2003, in a month-long program regarding toxic tort litigation and its impact on America.

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By Kurtis B. Reeg

Wood dust and wood-related issues have been and continue to be matters of interest and importance to the United States and other governments, the North American wood products industry, the consuming public and, increasingly, the insurance industry. A related category of wood products which has garnered specific interest is pressure treated wood. Lumber manufacturers and producers have used a chemical compound mixture containing inorganic arsenic, copper and chromium called Chromated Copper Arsenate (CCA) as a wood preservative since the 1940's. The CCA is injected into the wood by a process which uses high pressure to saturate the wood products with the chemicals. The CCA preservative protects wood from dry rot, fungi, and in particular, molds, termites, and other pests that can threaten the integrity of wood products. However, various governments around the world, including the U.S., Canada, England, and the European Commission, have been concerned over the last three decades of the health and environmental risks, especially to children's health, from arsenic-treated wood through ingestion and inhalation of arsenic-contaminated matter in playgrounds, along with land, air and water pollution involved in landfills, burning of such material, and the use of such wood in and near bodies of water. As associations between wood dust and various cancers began to develop in the UK and other European countries in the mid-1960's and early 1970's, a parallel body of information began to target CCA wood, forcing governmental and industry concerns to unify their interests in protecting the public against the hazards of arsenic which have been known for centuries. This article is intended to raise awareness of the issue for insurance professionals.

The Science and Mechanics of Arsenic

Inorganic arsenic has been recognized as a human poison for many centuries. It is highly toxic but is a naturally occurring grayish-white metal-like substance. Inorganic arsenic is formed when elemental arsenic combines with oxygen, chlorine or sulfur. Inorganic arsenic has been used as a poison in herbicides and pesticides and is a colorless, odorless effective poison. It has been used to kill everything from rats, to stray dogs, to husbands, wives and lovers.

When used as a component of wood preservatives, the concentration of CCA in wood for above ground use averages between 0.1% - 0.2%. Higher levels of arsenic range from 0.4%-1.8% when employed for marine and wood foundation applications. Millions of board feet of CCA wood have been produced each year, and are used in the construction of decks, picnic tables, playground equipment, highway sound barriers, telephone poles and docks. Besides protecting the wood from harmful organisms such as fungi and termites, the benefits of using CCA preservatives include reducing the use of limited forest and wood products such as redwood and extending the life of the wood.

Environmental concerns associated with CCA wood include arsenic being trans-located to soil and water as a result of leeching from the wood, runoff from lumber yards, and sawdust, and the physical deterioration of the wood. Other potential environmental concerns included the disposal (landfilling) of CCA wood and the impact on beneficial marine organisms near docks built with CCA wood.

Human exposure to arsenic through ingestion or inhalation occurs: when it is dislodged from CCA wood surfaces (such as ingestion by hand to mouth); during construction (through inhalation of sawdust from grinding or sawing or ingestion by hand to mouth); by plant (vegetable) intake (ingestion); through work in and around soil (inhalation of dust and ingestion by hand to mouth); direct contact; or by burning the wood (hence, inhalation--it is amazing that some people actually burn this material in their fireplaces). Incineration does not destroy arsenic. A single 12 foot 2' x 6' of pressure treated CCA wood contains about 27 grams (27,000 mg) of arsenic, enough arsenic to kill more than 200 adults. Thus, it is illegal to burn pressure treated wood in all 50 states and many countries.

Additionally, CCA wood ash tastes salty, which is a natural attractant to animal life and accounts, in part, for homeowners and nasty neighbors using it to treat roaming pets. Tablespoons of CCA wood ash have reportedly killed an 1100 lb. cow. This Old House Magazine, March/April 1998 at 118-125. A couple from Sauk Rapids, Minnesota, had their dairy herd of 18 Holsteins break down a neighbor's fence and eat salty CCA ash. The cows found a pile of CCA wood ash which had been illegally dumped and one cow died of arsenic poisoning four days after ingestion of the ash. Thus, the effects on household pets and various wildlife are predictable.

Exposure Mechanisms

We are not dealing with a man-made substance in its elemental form. Inorganic arsenic is found in many kinds of rocks, especially copper and lead-containing ores. When these ores are smelted to extract the copper or lead, most of the arsenic is collected for pesticides. Indeed, everyone is exposed to low levels of inorganic arsenic because it

was always present in soil, water and air (ala asbestos). It is also present in cigarette smoke, originating from the insecticides used on tobacco plants. Remember, arsenic can be taken into the body by ingestion, breathing and, to a much lesser extent, by absorption through the skin. Additionally, arsenic is lethal on a cumulative basis, for multiple sub-lethal doses received over a period of several weeks can accumulate to achieve the lethal dose—thus, the dead husbands, wives and lovers. In small doses, it is a well-established carcinogen.

Arsenic Toxicity

The estimated acute lethal dose of inorganic arsenic in humans is 0.6 mg/kg/day (*ATSDR, 1989*). This means that a 70 kg (150 lb.) adult has a toxic level of .042 grams of inorganic arsenic. For a 20 pound child this works out to 6 mg or .006 grams. Remember the 12 foot CCA 2' x 6' has 27 grams or 27,000 mgs of arsenic, so don't use a splinter for a toothpick!

Arsine gas is produced when elemental or inorganic arsenic is combined with zinc compounds or certain fungi. Arsine gas has been used as a nerve gas weapon by reacting zinc and arsenic in the presence of an acid. So, wooden boat docks in the Northeast, an area of acid rain, theoretically create the potential for arsine gas. Arsine gas at low levels, such as 3-10 ppm, can be toxic and generate illness in the form of hemolysis, hemoglobinuria, jaundice, hemolytic anemia, and necrosis of the renal tubules. *RAIS Toxicity Profile: Arsenic (1992); ACGIH (1986)*. After a period of months, cumulative hemolytic effects manifest themselves in breathlessness, severe exercise intolerance and tachycardia, coupled with vague neurological symptoms which can also lead to blackouts. Removal from the source of arsine gas may not always suffice, because a

latency period of 1-6 months permits the development of compensatory polycythemia, an abnormal increase in the number of red blood cells.

Lengthy low level exposure of the arsine gas leads to an additional stage of illness which has similarities to the onset of acute arsine gas poisoning, including brown urine, headache and delirium. There is a progressive paralysis of the legs and accompanying foot drop, wrist drop, ataxia and vertigo. Recovery from sub-lethal exposure is slow, ranging from six months of variable paralysis to a recovery time of 2-4 years. Depending on the exposure, there is also a possibility of nerve damage affecting the extremities, particularly the hands and fingers.

While the effects of arsine gas on infants and the fetus are not well documented, there is some serious antidotal evidence. In the late 1950's, the New Zealand military treated bedding used for crib pads with an arsenic compound as a fungicide. However, a fungus known as *scopulariopsis breviculis* reacted with the arsenic and emitted an arsine gas as a by-product. This arsine gas may have been responsible for a certain rate of infant mortality from SIDS, manifesting itself as cot death. The rate of SIDS was abnormally high in military families where arsenic was used as a fungicide on the official issued bedding.

Additionally, there has been mention of the same fungus as responsible for wallpaper and paste poisoning in 19th Century Europe. The arsenic was used on a wallpaper paste which metabolized with the wall fungus releasing arsine gas.

The signs of arsenic poisoning are variable. Mild poisoning from inhalation results in loss of appetite, nausea and fatigue, whereas more severe exposures include pins and needles tingling in the legs, cramps in calf muscles, heat and irritation in the

throat and stomach, including a garlic-like metallic taste in the mouth, vomiting, loose stools, and neurological effects including restlessness, chronic headaches, apathy, fainting, dizziness, convulsions or coma. Long-term exposure can lead to development of the white crescent moon configuration over a majority of the fingernail, a darkening of the skin, skin lesions, a skin rash, the appearance of warts on the palms, soles and torso, and mottled spotting of the skin pigmentation.

There are only limited antidotes for the treatment of arsenic poisoning and the best that can be done immediately after ingestion is induction of vomiting. Chelating agents bind tightly to metals like arsenic and mercury and can be of assistance, as they are in the treatment of lead poisoning.

One of the more well-known articles describing the medical/toxic effects of arsenic is Peters H.A., *et al*, Seasonal Exposure to Arsenic from Burning CCA Treated Wood, JAMA 251:(18) 2393-96 (1984). That article described a Wisconsin family who burned CCA scrap wood in their furnace for winter heating. Their hair fell out, all suffered severe, recurring nose bleeds, fatigue and debilitating headaches. The parents complained of blacking out for several hours followed by long periods of extreme disorientation. Both children experienced frequent seizures described as grand mal. The symptoms were finally traced to minute amounts of arsenic laden dust leaking from the furnace as fly ash. Various house plants and fish also died, victims of copper poisoning from the same dust. Hearing loss among children has also been associated with arsenic poisoning.

CCA wood was and is not only a *cause celebre* due to its toxicity, but it also has its "poison" advocates and nay sayers, along with other proponents of the toxins *de jure*.

In North America, that vociferous CCA lay critic (the CCA Erin Brockovich) is Canadian Deborah Barrie, who launched her own website www.noccawood.ca. (get it—no CCA wood!) Ms. Barrie is rankled at the Canadian government, in some measure as a result of a scientific study done by a Dr. Dieter Riedel, which allegedly focused on the hazards of CCA wood in playground equipment in the 1980's but which study was allegedly "shelved by our government." Ms. Barrie called for a total ban of CCA treated wood (which, by the way, the government essentially implemented) and dislikes the phase out of such products, discussed below. She complains that industrial use of such products will still be allowed, although residential and other limited consumer use will be phased out, thus leaving "carpenters, linemen and the environment at risk [this author doubts she is either of these]." She wants a warning sent to every home in Canada highlighting the possible dangers and symptoms of arsenic poisoning. She also claims to have a study from the 1980's "of a man who bleed [sic] seven pints of blood after building picnic tables." She calls on all Canadians to write specific decision-makers in the U.S., Canada and the European Commission to "help keep our children, our environment, and ourselves" safe.

Precautions When Using CCA Treated Wood

There is little doubt that arsenic and CCA treated wood present certain challenges to consumers and the environment. The EPA (www.epa.gov) suggests that certain precautions be taken when using such wood. For example, it should not be used where the preservative may become a component of food or animal feed. Examples would be the use of mulch from recycled arsenic treated wood, cutting boards, countertops, animal bedding, and structures for the storage of human food or animal feed. Additionally, only

clean-surfaced CCA treated wood should be used for patios, decks and walkways. It should not be used where it may come in direct or indirect contact with drinking water (all states have established limits for arsenic in drinking water). Moreover, as noted above, it should not be burned in open fires or in stoves, fireplaces or residential boilers. Inhalation of sawdust from treated wood should be minimized and a dust mask or respirator should be worn when sawing, sanding or machining treated wood. Whenever possible, use of this product should be limited to the outdoors. Additionally, the EPA suggests wearing gloves when working with CCA treated wood. After working with the wood, and before eating, drinking, or using the toilet, exposed areas should be washed with soap and water thoroughly. In addition, preservatives and sawdust may accumulate on work clothes and they should be laundered separately from other clothes. These precautions are mainly common sense.

The Development of Governmental Limitations

In May, 2001, groups known as the Environmental Working Group and the Health Building Network petitioned the Consumer Product Safety Commission to ban the use of CCA treated lumber for playground equipment. The CPSC undertook an evaluation of the amount of CCA a child might be exposed to while playing on such playground equipment. In addition, the EPA took up consideration of CCA pressured treated lumber under the authority granted it by the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). Other groups began investigations as well. For example, the Connecticut Agriculture Experiment Station conducted a field study of copper, chromium and arsenic in the soils underneath decks built from pressure treated wood. A total of 85 soil samples was taken from under seven decks which ranged in age from 4 months to 15

years. Control soil samples were also taken. The control levels were found to be at 17 mg/kg for copper (Cu), 24 chromium (Cr), and 4 arsenic (Ar). The average levels in the studied soils were 75 Cu, 43 Cr, and 76 As. The arsenic levels in the soil ranged from 3-350 mg/kg. The amounts in the soil tended to increase with deck age. Finally, the average amount of arsenic (75 mg/kg) exceeded the state limit of 10 mg/kg.

The Connecticut Agricultural Experiment Station also studied arsenic being dislodged from CCA treated wood surfaces, such as that used in playgrounds. David Stilwell, of the Department of Analytical Chemistry at the Connecticut Agricultural Experiment Station in New Haven, Connecticut, has published the results of these studies at www.case.state.ct.us/PlantScienceDay/1999PSD/arsenic99.htm. Various pressure treated wood was purchased and a total of 336 wipe samples were taken on a periodic basis for up to two years. Additionally, wipe samples were taken from wooden playgrounds built with CCA pressure treated wood. While the results will not be detailed here, the amount of arsenic dislodged from wood surfaces on the playgrounds was considerably less than that reported from wood purchased at lumber yards. Mr. Stilwell did not have an explanation for the difference. Moreover, the arsenic levels from vertical surfaces were higher than that of horizontal surfaces, although, again, he did not have an explanation for the distinction. He goes on to attempt to extrapolate the amount of arsenic possibly ingested from touching these surfaces, but those speculations are suspect. One interesting finding was that the coating of a surface barrier over the CCA pressure treated wood reduced the amount of arsenic dislodged from the surface by 95%.

Finally, the Connecticut Agricultural Experiment Station tested the uptake of arsenic in planted romaine lettuce. Romaine lettuce was container grown in media with

either CCA sawdust or CCA wood blocks. The lettuce grown along side the CCA wood blocks contained 1.7 mg/kg arsenic while the lettuce grown in media containing CCA sawdust contained .43-4.1 mg/kg arsenic respectively. The control grown lettuce contained less than .4 mg/kg of arsenic. These results seem inconclusive at best and suspect at worst.

Various industrial groups have also taken up the cause. The Recreation Resources Service, associated with North Carolina State University, has published findings from the Forest Products Laboratory on coatings reducing the leaching from CCA pressure treated wood. Latex primer followed by outdoor latex paint, oil base primer followed by oil base paint, and two coats of penetrating oil semi-transparent deck stain all reduced the leaching of arsenic, chromium and copper by 99%.
Detailed information on this study can be obtained from the Wood Preservation and Fire Research Wood Unit, Forest Products Laboratory at 608-231-9411 (phone), 608-231-9592 (fax), or from Stan Lebow at slebow@fs.fed.us.

The American Wood-Preservers' Association (AWPA) has also adopted various standards for pressure treated wood. The standard relevant to wooden playground equipment is standard C17-00, "Playground Equipment Treated with Inorganic Preservatives – Preservative Treatment by Pressure Processes." This standard can be found in the AWPA Book of Standards which introduced the Use Category System (UCS) in 1999. The appropriate use category for wooden playground equipment is UC-4A. This is the category for wood and wood-based materials in contact with the ground, fresh water or other situations favorable to deterioration. Also note that there are quality marks on pressure treated lumber which identify the year of treatment, proper exposure

conditions, the kiln treatment of wood, a trademark of the applicable inspection agency, the preservative used, the treating company and location, the retention level and the applicable AWPA standard. Individuals buying CCA pressure treated wood will find an enhanced end tag providing this information along with safe handling information.

On September 24, 2001, the USEPA sought public input regarding CCA treated wood. Several draft guidelines for sampling and analyzing such wood in playground equipment were released for a public review and comment. On December 13, 2001, the EPA released the findings of its panel of scientific experts. On February 12, 2002, the EPA announced a voluntary decision by the lumber industry to transition from the consumer use of CCA treated lumber by December 31, 2003, in favor of alternative wood preservatives. This transition affected virtually all residential uses of CCA treated wood, including wood as play structures, decks, picnic tables, landscaping timbers, residential fencing, patios and walkways/boardwalks. According to the EPA announcement, EPA will not allow CCA products for any residential uses by January, 2004.

Thus, we are in the transition period. It is important to note that EPA Administrator Kristi Whitman, in her press release of February 12, 2002, stated the following:

> EPA has not concluded that CCA treated wood poses unreasonable risks to the public for existing CCA treated wood being used around or near their homes or from wood that remains available in stores. EPA does not believe there is any reason to remove or replace CCA treated structures, including decks or playground equipment. EPA is not recommending that existing structures or surrounding soils be removed or replaced. While available data are very limited, some studies suggest that applying certain penetrating coatings (e.g., oil-based semi-transparent stains) on a regular basis (one re-application per year or every other year depending

upon wear and weathering) may reduce the migration of wood preservative chemicals from CCA treated wood. www.yosemite.epa.gov/opa/admpress.nsf

Thus, while the EPA, in conjunction with the industry, is shifting away from the further production and use of CCA pressure treated lumber, the hazard associated with CCA wood is minimal, according to EPA.

Alternatives to CCA Treated Lumber

Industry has focused on alternatives for the pressure treated lumber we so often use around our homes and at playgrounds. Obviously, one alternative is to use wood that does not require treatment, such as a cedar or redwood. However, redwood is limited in its availability and somewhat endangered, while cedar is often prohibitively expensive. Other alternatives include the use of woods treated with Ammoniacal Copper Quaternary (ACQ) and recycled plastic lumber. ACQ treated wood contains no EPA listed hazardous compounds and meets the International Conference of Building Officials (ICBO) and American Wood Preservers Association (AWPA) standards for above ground and ground contact lumber. ACQ treated wood typically costs 7%-12% more to purchase than CCA treated lumber. Also, recycled plastic lumber has gained acceptance in a wide variety of applications, is extremely durable and requires little maintenance. Unfortunately, it is not intended for primary structural load-bearing applications such as posts, joints and beams. Recycled plastic lumber products average 20%-50% more in cost then the price of wood, but recycled plastic lumber manufacturers guarantee their product to last up to 50 years. Clearly, plastic lumber is gaining acceptance. The

Massachusetts government developed a 1990 state contract for its use in benches, tables, landscape timbers, playground equipment, and various other applications.

Other Governments

Health Canada in Ottawa, Ontario, announced a similar transition to that in the U.S. with a termination date of December 31, 2003. As it stated, "This agreement is identical to the voluntary label changes for CCA treated wood that were recently proposed in the United States." Health Canada's re-evaluation notice stated:

> As part of this agreement, wood treaters will no longer use CCA to treat wood for non-industrial uses such as play-structures, decks, picnic tables, landscaping timbers, residential fencing, patios, walkways and boardwalks. Remaining stocks of wood treated prior to December 31, 2003 can still be sold in stores and be used for residential construction in Canada. Already-built structures containing CCA treated wood are not affected by this action. CCA will continue to be used for industrial applications such as highway construction, utility poles and pilings. PMRA [Pest Management Regulatory Agency] has not concluded that CCA treated wood poses any unreasonable risk to the public or the environment.
>
> The transition to non-CCA treated wood has been facilitated by the PMRA's completion of priority reviews of the two alternative wood treatment products, ACQ (Amine) and Copper Azole.

www.hc-sc.gc.ca/pmra-arla; pmra_publications@hc-sc.gc-ca. Poor Ms. Barrie; she is frustrated at a market-wide voluntary recall of the product she condemns! No doubt the replacements will be subject to ridicule and vituperation as well.

Finally, the European Commission and its EU Scientific Committee are also studying CCA pressure treated wood. It invited public comment until February 8, 2002. Most of the replies were from the woodworking industry which talked about the negative economic impact of suggested restrictions on CCA pressure treated wood. Yet, the EU

noted that in the UK alone, sales of CCA pressure treated wood decking increased from 5 million pounds in 1997 to 100 million pounds in 2001, with a forecast of 130 million pounds by the end of 2002. To the best of this author's knowledge, the European Commission is still analyzing the situation, but noted both the US and Canadian ban on CCA treated wood for 2004.

http://europa.eu.int/comm/enterprise/chemicals/markrestr/arsenic/consultation.htm

Conclusion

Clearly, the continuing use of CCA pressure treated lumber is on the decline. Yet, millions of board feet of CCA treated wood remain in place in various applications. The plaintiffs' bar has tried to promote litigation arising from arsenic poisoning and exposure to pressure treated wood. http://treated-wood-arsenic-poisoning.com. Yet, even as the plaintiffs' bar has noted, litigation over CCA treated wood has been largely unsuccessful. In 1996, a New York court dismissed a case regarding inadequate labeling and negligent testing on the grounds of FIFRA pre-emption, and dismissed the claim of negligent testing for lack of evidence. *Sirico v. Beckerle Lumber Supply Co.,* 227 A.D.2d 396, 642 N.Y.S. 2d 55 (App. Div. 1996). Moreover, in March 2002, a Federal Court in Florida purportedly dismissed a class action against manufacturers and vendors of pressure treated wood finding lack of causation and proof of injury, but no citation was found. Other claims for strict liability, medical monitoring, negligence, fraud and breach of implied warranty were all supposedly dismissed.

While litigation efforts directed at CCA wood exposure have been limited to date, recall that it was not until the EPA wrote its standard for the removal of asbestos from schools, and issued other public warnings and finally bans regarding asbestos, that the

asbestos debacle of the last 30 years began. This scenario has similarly evidenced itself in electro-magnetic field (EMF) litigation, lead paint litigation and in the current thimerosal (mercury-containing vaccine preservative in most childhood vaccines) litigation wars. Based on litigation trends in the last 50 years, this author believes that despite the voluntary recall and the government bans, litigation regarding CCA wood and arsenics poisoning/pollution has not yet really begun, much less seen its zenith. Instead, one can predict that as CCA wood is withdrawn from the market, the public inquires why and learns (ostensibly for the first time) of its hazards, there will be a crescendo in CCA wood litigation from many quarters.

The plaintiffs' bar has repeatedly proven resourceful in kicking various industries while they are down. The cause of CCA pressure treated lumber is still being picked up by various advocates and governments. Clearly, land, water and air release of arsenic is a matter for serious medical, scientific and legal analysis. While it will be interesting to see what course any additional litigation regarding CCA pressure treated lumber takes, this author recommends that claims professionals and their counsel remain alert for a wave of arsenic poisoning and CCA wood-related litigation.