

# Combating the Dangers of Pressure-Treated Wood

By David C. White

## **Hazards of PT Wood**

In a November 2003 report, the EPA revealed findings regarding the dangers of using “pressure-treated” (PT) wood in playground equipment, decks, picnic tables and benches, docks, boardwalks, etc. PT wood has been used to build nearly all outdoor wood structures over the last two decades. While PT sounds harmless, it hides the fact that the wood is injected with poisonous compounds to preserve the wood and kill insects. PT uses a preservative known as chromated copper arsenate, or CCA. In January 2002, the ICBO Evaluation Service revealed that, by law, CCA may contain anywhere from 30% to 38% arsenic, a known carcinogen (cancer-producing substance). CCA wood can be found in parks, school playgrounds, and about 50 million American homes.

The Environmental Working Group (EWG) in Washington, D.C. estimates in a May, 2001 report (Poisoned Playgrounds, Arsenic in “Pressure-Treated” Wood) that a 40-pound child who plays daily on CCA wood could be exposed to more than five times the arsenic level allowed under EPA’s drinking water standard. A major concern is that CCA is linked with bladder, lung, and kidney cancer, along with other severe medical problems.

## **How Does CCA Get Into Children?**

In 1998 the Connecticut Department of Public Health stated, “It is now clear that exposure from CCA-treated wood can be the major source of arsenic for children who frequently play on CCA-treated playscapes, treehouses, or decks.” This exposure can come from absorption through the skin or inhalation, although direct ingestion (child’s hand to wood and then hand in mouth) is the leading culprit.

## **CCA Affects Surrounding Soil**

Pressure washing, sanding (both common in deck maintenance), and even rain can release arsenic into the air or into the soil below. Nearly 40% of backyards tested in a 2001-2002 study, performed by EWG and the Univ. of North Carolina-Asheville, had enough arsenic in the soil to qualify as Superfund (Hazardous Waste) Sites. Arsenic, however, is not regulated as a hazardous waste because of a regulatory exemption won by the wood treatment industry years ago. In a June 26, 2002 New York Times article entitled “The Poison is Arsenic, and the Suspect Wood,” A. Liptak stated “... about 30 individual lawsuits have been filed nationwide, involving claims on health effects from sawdust, splinters, and inhalation. Every time one of these cases has been presented to a jury, the plaintiff has prevailed.”

## **Safety Suggestions and Alternatives**

Public interest group pressure on CCA manufacturers and cooperation with the EPA resulted in a voluntary phase-out of CCA manufacture for residential use as of Jan. 1, 2004. Home improvement stores, however, may continue to sell their existing CCA stock. While there are alternatives such as ACQ (a copper-based preservative), the wood industry is downplaying the dangers associated with CCA.

Some of the EPA's suggestions for consumer safety include:

- Sealing the wood every 6 months
- Replacing exposed surfaces with non-CCA wood or composites
- Not pressure washing or sanding the surfaces
- Not using commercial "deck washing" solutions
- Not allowing children to play on rough wood surfaces
- Making children wash their hands after playing.

### **Additional Problems with PT Wood**

Most property owners are familiar with the continuing problems wood decks, playscapes, porches, and ramps possess. One ongoing problem with PT, caused by moisture, freeze-thaw, and ultraviolet (UV) exposure, is children or adults getting splinters from either the wood or the paint. Besides the pain and inconvenience of the splinter, there have been some troubling reports regarding additional health concerns caused by chemicals entering the body via the splinter.

Another problem with PT wood (and other woods or composites) structures is the slip-fall hazard. When moisture forms on the surface, a thin film develops that can be slippery, whether or not there is ice present. While an injury could be both painful and serious, the legal and financial implications to homeowners and Homeowner Associations are staggering.

### **Technological Advances Offer a Revolutionary Solution**

Today, Creative Material Technologies, Ltd. (CMT), of Palmer, MA, is offering an environmentally friendly solution to seal wood (and many other) surfaces with a "waterproof", anti-slip, seamless, and (UV) stable coating that prevents newer PT wood from cracking or weathering and repairs cracks in older PT wood while preventing further splintering. This revolutionary, two-component polyurea-urethane hybrid (PUH) protective coating system has been formulated to enable homeowners, property managers, schools, and communities to economically and safely maintain their PT structures and eliminate the high costs of removal, disposal, and subsequent replacement.

John C. Becker IV, president of CMT, states, "Our 'ProTexDex' [deck restoration] system has been specifically designed to withstand UV, moisture, and the repeated freeze-thaw cycles that damage PT wood. We expect our coating to provide a long lasting 'makeover', both attractive and safe for little hands and bare feet. Our system is poised as one of those breakthroughs that improve the quality of life for everyone while guarding the safety of our children and grandchildren."

### **What is a Polyurea-urethane Hybrid (PUH)?**

(PUH) is a cost-effective, high-performance coating with excellent chemical (acids and bases), solvent, water, oil, and impact resistance qualities to meet a wide variety of demands. It has excellent adhesion to a wide variety of surfaces. It is seamless. PUH is elastomeric, meaning it is flexible and it has memory. It will return to its original cured form after stretching and will survive continued expansion-contraction cycles. In addition PUH is 100% solids, meaning there is no shrinkage and there are no solvents to evaporate; therefore PUH has low or no odor. It

contains zero volatile organic compounds (VOC's), meaning it is environmentally friendly. All of these properties make it ideal for both outdoor and indoor use.

### **Long-Term Solution**

PUH is a UV resistant aliphatic material, excellent in direct sunlight applications. In fact, after more than 7 years of accelerated UV testing, the amount of gloss loss is undetectable to the human eye. In discussing coatings, the first characteristic to decay is gloss, then color, and finally the physical properties. This means it should be very reasonable to expect a functional life of 15 years.

Another useful property of the PUH is its excellent intercoat adhesion. This means that a fully cured coating can later be resprayed or repaired with a new coating that will stick very well to the old surface. This allows for very high quality repair of the coating, if ever needed.

### **Reducing the Risks of Pressure-Treated Wood**

The EPA is continuing its research with a current 18-month study on wood sealers in an attempt to find a sealer that will reduce or eliminate the rate that the arsenic leaches out of the wood. So far, no method has proven effective for more than a few months. Until now, all coatings reportedly investigated by the EPA contain either solvents or water. The revolutionary technology of 100% solids PUH contains neither solvents nor water. Therefore, the PUH coating cures with a higher crosslink density than traditional coatings. This is like comparing a chain link fence to chain mail armor; both have structure, but the armor prevents an arrow from penetrating while the fence cannot.

Traditional coatings and sealants dry on wood at a thickness of about 2 mils (1 mil= 1/1000<sup>th</sup> of an inch). The non-shrinking PUH will cure on the wood at about 40 mils. Therefore, although the hard data is not yet in, it is expected that the PUH will be at least 20 times more effective than traditional brush and spray on sealants. This is factoring in both the molecular structure of the PUH (in comparison to the size of arsenic particles) as well as the sheer thickness of the coating. This significant (~2,000%) improvement over current options has many people excited about the huge potential for this product, both for wooden structures and many other markets as well.

CMT is cooperating with the EPA in their interest to determine the ability of this breakthrough technology to effectively reduce or eliminate arsenic leaching out of PT. Based on CMT's own research, favorable results are anticipated.

### **Maintenance Concerns Beyond PT Wood...**

There is a wide range of issues that can be solved using the PUH technology. Of particular concern to homeowners and property managers can be cracks in concrete (foundations, sidewalks, parking decks, above and below-grade floors, etc.), steel, roofs and roof coatings, and other materials. The resulting water penetration and damage can be quite costly on a number of levels.

Historically, typical solutions have been limited and temporary. Epoxies, for example, are generally strong and chemical resistant, but not elastomeric and cannot survive continued movement without cracking. In addition, epoxies are not UV stable; when exposed to UV rays

they will “yellow”, become brittle, and crack. This is of particular concern with all applications subject to sunlight.

Acrylics, urethanes, and other product chemistries do not possess the combination of properties necessary to tackle the problems. Other non-coating alternatives, such as excavation and re-pouring, quickly become a capital expense and create serious budget and cash flow concerns.

PUH's, on the other hand, are ideally suited to deal with the issues that other products were not designed for. Although not widely popularized [yet], PUH's and their chemical cousins, the pure polyureas, have been utilized for a number of years to repair concrete, as well as protect and coat roofs, water containers (concrete and steel), bridges, and more.

### **Growing Market Need**

New markets for the PUH coating continue to develop. These include anti-graffiti coatings, garage and basement floor coatings, mobile home roofs, pool coatings, and many more. In fact, CMT is planning on bringing applications currently available to the industrial markets to the residential and commercial markets in the near future.

### **Who Applies the Coating?**

All jobs must be installed by a thoroughly trained ProTexDex Authorized Contractor. CMT is currently seeking business-minded individuals interested in joining the expanding network of ProTexDex Authorized Contractors. These contractors obtain an exclusive territory, the specialized equipment, and the training needed to help them succeed.

David White is Director of Public Relations with ProTexDex and Protex-Cote in Palmer, MA. For more information on the deck coating system and other products and services, call (413) 284-0000 or 1-888-477-6839 or visit [www.protexdex.com](http://www.protexdex.com)

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