

Is Pressure Treated Wood safe or not?

Last Updated: Sunday, December 27th, 2015, Created: Sunday, January 14th, 2007

On January 1, 2004 the wood industry throughout North America has ceased to produce pressure treated wood treated with CCA (chrome, copper and arsenic) for residential use, replacing this chemical with what is generically called 'non-arsenic' treatments, primarily ACQ and Copper Azole (CA), both of which contains no arsenic but much more copper. In 2013 a different technology, MicroPro, arrived in Canada, closing this debate. Read on for the history. For the most current information check the entry 'Living With Pressure Treated Wood'.

Every few years we hear serious claims about health hazards associated with pressure treated wood. What are the facts behind the media's tendency to raise this issue on a regular basis?

As far as I have been able to determine with all the resources at my disposal, the story is, in a nutshell:

-- Pressure treated wood is made with chemicals that are highly toxic in their concentrated liquid state and for this reason the treatment plants are tightly controlled.

-- These chemicals are effectively dispersed into very dilute concentrations and fixed to the cellulose structure of the wood by the pressure treatment process. The extent to which any of these chemicals leach out under typical weathering conditions is considered way under any danger levels by both US and Canadian health authorities.

-- Pressure treated wood is in fact safe to work with and safe to play on.

-- All woods require working precautions related to dust and splinters. Pressure treated wood has special precautions relating to burning it and now new precautions related to cleaning it (see below).

-- The legal actions taken against pressure treated wood tend to succeed in the media, where there is no burden of proof, but consistently fail in the health laboratories and the courts where health hazard claims have not held up to the burden of proof.

-- Because of all of these concerns, pressure treated wood sold for residential use has evolved, essentially from CCA, to ACQ and now to MicroPro formulations and technologies.

With the MicroPro technology, we continue to save millions of trees because our outdoor structures do not rot as quickly as they would without this pressure treatment process, and even the low level of chemical hazard presented by CCA, ACQ and CA pressure treated woods are gone with MicroPro. But read 'Living With Pressure Treated Wood' to see where this issue has evolved to recently, or follow this link for more on the MicroPro technology

That was the short answer. For those of you who are interested, here is the long answer behind it.

Once a tree stops growing, wood decays quickly outdoors. That is part of nature's cycle. From the beginning of time, people have put coatings and paints and water repellents on wood to slow down its eventual decay. In the desert where there is no moisture and at the bottom of the sea where there is no oxygen, wood does not decay. Everywhere else, we have to try to protect it.

If we look at the wood preservative industry in a historical perspective we can better understand that we are not at a static point but at a particular moment in an evolution of wood preservatives. Think back to the paint industry and you can see this clearly.

For the first half of the 1900's we had some really good house paint. Then we learned that lead, which was an important part of what made that "good" house paint, was an element that should not be ingested into our bodies (dust, kid's hands to mouth etc). So lead was removed from paint -- and the paint industry scrambled to create formulas that were as durable and would hold colour as well.

Finally they succeeded, and we again had really good oil based house paint. Then the general air quality movement went into high gear in California and the state moved to eliminate VOC's, Volatile Organic Compounds -- which meant eliminating the solvents in paint -- which meant phasing out oil based paints. That was a real problem because the water based paints certainly did not hold up as well to the elements as the old oil paints. The oil paints couldn't simply be outlawed as we needed

what only they provided, but the pressure was on to develop viable alternatives. Again, with enough work, the latex and 100% acrylic paints have finally come close to the good old oil paint, although some painters still disagree. Things keep changing, as we work towards phasing out products that are not always "dangerous", but where we would rather have more ecologically sound alternatives.

The wood preservative industry came into its own with creosote -- telephone poles and railroad ties. Creosote is still around, but it only works where the wood is high and dry. If you put a creosote railway tie into a garden, and add lots of soaking water, the creosote leaches right out into the soil.

You have probably all used brush applied preservatives at one time or another, but remember how important it was to keep those liquids off of your skin and how little it penetrated into the wood. Spill some and the grass was dead. It was dangerous to use and didn't last very long.

CCA, which stands for "chrome, copper and arsenic", is applied under pressure to force it deep into lumber and then cured in a "fixating" process which attaches these chemicals in a highly dispersed fashion to the cellulose of the wood. This turned out to be economical, safe and long lasting. It has become the standard for preserving wood around the world. There have been efforts to use less toxic chemicals, but Borax based treatments tended to leach out and leave the wood exposed although the better of these have evolved to Copper Azole type B or CA-B. ACQ has been around for a long time but has only become common because of an ecological phase-out of CCA. ACQ has its own problems that you can read about by following the link to 'Living With Pressure Treated Wood'. There are constantly innovators in this field and the formulations will certainly continue to evolve in the search for the ability to extend the life of outdoor wood structures.

So just what is all of this "concentrations" of toxic stuff all about. It would seem that we wouldn't want "any" toxic stuff around. The human reality is that toxicity is almost always a question of quantity. As an example, almost any medicine, even some vitamins, can be "toxic" if taken in too large of quantities. Arsenic, the component that scares the newspapers the most when we talk about CCA, is actually the 20th most common element found on earth. It is found naturally in most soils and exactly the same arsenic that is in CCA can be found in tomatoes. We all have some arsenic in our bodies all the time -- it is part of nature. But it doesn't take too much arsenic before it becomes the poison preferred by medieval enemies. So first you need to understand that the quantity of arsenic that is actually put into a board of pressure treated wood is microscopic. One recent "scandal" in Florida, where an attorney found arsenic in the soil of a playground under pressure treated wood structures and the city council closed down all the parks had a very interesting follow-up that the papers generally failed to report. The levels of arsenic found in the soil were well below those naturally occurring in Utah and other places. The city council opened the parks back up after hearing from health authorities that these levels of arsenic are well below exposure levels of natural arsenic that the human race has lived with for thousands of years.

Then there is this thing about "fixation". Fixation is the process by which the chrome, copper and arsenic become attached or "fixed" to the cellulose fibers. This makes the chemicals very stable, and study after study has shown that yes there is some leaching of the chemicals involved, but even with our modern acid rain, the levels are far below anything that health officials consider a danger to human health. Yes some people get rashes by sitting on pressure treated decks -- although some of those "guilty" decks turned out to be dip treated with wood preservatives and not CCA pressure treated wood at all. Then again some people get rashes sitting on cedar and others are allergic to pine sap. Pressure treated wood is not perfect. Not every pressure treating plant does as good a job as every other plant. Yes there is minute leaching of chemicals. But study after study by health authorities has given it a clean bill of health.

A really interesting part of how CCA and ACQ works is that it does not kill bugs or kill fungus! It does not preserve the wood by its toxicity. What happens is that when the cellulose fibers are fixated with CCA or ACQ, the cellulose becomes non-nutritive. That means that it simply will not feed bugs, and will not feed fungus and other bacteria. It doesn't kill them, it just doesn't nourish them. Hence the wood does not rot because nothing feeds on the cellulose.

Now for the limitations, or problems if you prefer.

You should never burn pressure treated wood of any type. When you do, the cellulose burns off, and

the heavy metals remain behind in the ashes in more concentrated forms. Without the cellulose, the chemicals now become soluble again, like they were before they were fixated to the cellulose, and in this form they are once again toxic. Ashes from pressure treated wood are almost as toxic as the raw chemicals. For some people this is shocking. Somehow, because it started as wood, we should be able to burn it. But there are many things in our houses that will kill us if we burn them -- like all the plastic pipes and the synthetic rugs and drapes. If you want to learn about the toxicity of smoke from burning plastic, just talk to any fireman. So, like many things in our house, don't burn pressure treated wood, bury it -- take it to the dump.

One new caution has shown up based on a study done by professors from the University of Oregon and the University of Toronto, published in the February 2001 edition of the Forest Products Journal. There is only the one study and no confirmation as yet, but in the interests of caution, let me fill you in on their findings. They studied what might possibly be drawn out of pressure treated wood by our modern deck cleaners and restorers -- harsh chemicals that eat into the wood and give us such a nice fresh look to the deck. The results are that four of the common active ingredients in these cleaners do in fact draw out significant quantities of chromium. More precisely, they chemically convert stable trivalent chromium (the stuff fixated into the wood) into leachable hexavalent chromium. That means that the soup of cleaner and dissolved old decking, and the soil below the deck is in fact being contaminated.

Their recommendations are:

"...conversion of trivalent chromium by strong oxidizing treatments such as sodium hypochlorite and sodium percarbonate and alkaline sodium hydroxide and sodium borate. These latter treatments should not be used on CCA-treated wood because of the health and environmental concerns associated with hexavalent chromium." Adam Taylor, P.A. Cooper, Y.T. Ung "Effects of deck washes and brighteners on the leaching of CCA components", Forest Products Journal, Vol. 51, No.2 I have seen no studies about these cleaners with ACQ treated wood.

So take this list of 4 chemicals to the store and check the labels on any deck cleaners or deck restorers before you buy them. To my knowledge, the companies have not responded to this study, or changed any labeling on their products, so it is up to you to check this out for your own safety. The completely safe alternative to using these chemicals to clean a deck is probably to use a water pressure sprayer to clean the deck, with no chemicals, and then recoat it with a water repellent and/or semi-transparent stain. That way there would be no chemical reactions with the CCA ingredients that are fixated to the cellulose fibers.

Is this enough to condemn the use of pressure treated wood? I don't think so. Just remember that if you mix common household bleach with common household ammonia the mixture will give off a deadly gas. I don't think this condemns pressure treated wood -- it just makes us respect the ingredients that make it work so well, and makes us do our homework as homeowners.

In 2007 I wrote: "Someday someone will invent a way to cheat nature out of its decaying wood without any hazards at all to humans or the environment, but until then, the evolving forms of Pressure Treated Wood are certainly reasonable alternatives for the benefits they provide us and the few precautions associated with using them." In 2013, after years of proving itself in the US market, the MicroPro technology came onto the Canadian market fulfilling this dream of preservation of wood without health risks for people or the environment.

Keywords:

Finishes, Finishing, Preserved Wood, Pressure Treated, Health, Safety, Environmental