

Ask Jon Eakes

OVERVIEW: Living with Pressure Treated Wood

Last Updated: Tuesday, February 23rd, 2021, Created: Tuesday, October 14th, 2008

This entry has been updated in 2013 and you may want to jump to the last paragraph to see the positive current state of Pressure Treated Wood.

Is pressure treated wood safe or not? Is the wood used to build my deck a few years ago now banned? There is a lot of confusion about pressure treated wood but the bottom line is "don't worry", although you do need to understand pressure treated wood to know how to work and live with it. Lots of people think that the old CCA wood has been banned, but that isn't actually true. The wood preserving industry has voluntarily withdrawn CCA-treated lumber from sale for residential use. It will continue to be used in commercial and industrial applications. For the history of this debate check the database entry [Is Pressure Treated Wood safe or not?](#) Here's the current story...

When wood gets wet and dries, it cracks but doesn't rot. When wood is totally submerged, like the bottom of dock pilars or logs in the bottom of the river, there is no oxygen and they don't rot either. When wood is constantly wet but has access to oxygen, like right at ground level for fence posts, or the space where two pieces of a deck overlap, there is both constant wet and oxygen -- wood rots. For years we used paint on fences and decks and telephone poles and railway ties were soaked in creosote. Both still rotted, especially where they came into contact with wet soil. Creosote was better at preserving wood than paint, but it was dirty and would leach out into gardens. So the wood industry invented pressure treated wood: a chemical mix called CCA, which stands for "chrome, copper and arsenic," was forced deep into the wood and "fixed" to the cells of the wood fibres in a drying process. This has proven very effective at extending the life of outdoor wood.

Under certain conditions some of this CCA mixture can leach out of the wood and sit on the surface or go into the soil below. A number of ecological groups have been lobbying against the use of CCA because they consider the potential for arsenic to leach out of the wood to be a health hazard. For lots of people, I think just the word "arsenic" is scary. Keep in mind that arsenic is all around us in our natural environment, including for example in the normal everyday tomato. So the issue isn't really whether there is arsenic or not in the wood or in the preservative leaching out of it but are the concentrations high enough to be toxic. To my knowledge, no one has yet convinced any court of law that this is a danger. Rather than continuing to fight about it, the industry acknowledged that CCA treated wood was a more powerful wood preservative than is necessary for residential decks and fences, so they agreed that as of January 1, 2004, across North America they would replace the CCA treated wood sold to the consumer with other formulations like ACQ and CA-A, which they generally refer to as "non-arsenate" preserved wood. CCA will continue to be used for more demanding applications like telephone poles.

So, what if you have a structure built with CCA treated lumber sitting in your back yard? There's no reason to panic. I haven't heard of any health official anywhere suggesting we should remove our decks, fences, or even play structures that are made with CCA-treated wood. Even if you are worried about the presence of arsenic, any preservative that is going to leach out will have leached out in the first year or two of the life of the structure. The old structures are simply not a danger. If you're still worried, or if you have a structure you just built recently with CCA-treated lumber, simply keep a good coat of water repellent or paint on the wood, something you need to do to keep it from splintering anyway. You won't come into contact with the chemicals and water won't get into the wood to leach any of the CCA out.

Things have changed -- ACQ as a transition

ACQ was a transitional formulation between CCA and MicroPro, the current best choice. There are two things to be aware of with ACQ. The new formulations of ACQ contain much more copper than CCA does, which make them about twice as corrosive to many metals. That means we need to think twice about the fasteners we use as we enter the domain of building material incompatibility. Actually

by 2008 we have evolved from ACQ-C to ACQ-D which is more fastener friendly, but still requires a careful choice of brackets, nails and screws.

Untreated nails are totally unacceptable while hot dipped galvanized nails and brackets are now considered a "minimum" protection for the metal; before it was just "recommended". Be careful, not all fasteners and brackets have the same thickness of zinc in the galvanization process and hence not the same degree of protection against corrosion. Prior to the introduction of high copper concentrate PTW quality galvanization was considered to be G60, or 0.60 oz of zinc/square foot of metal. How about the special green "deck" screws? If they are labeled "ACQ OK" they are in fact equivalent to double hot dipped galvanized fasteners, but not up to the SS 304 standards. Now, Simpson Strong-Tie makes their "standard" material G90 -- 50% thicker zinc and they actually recommend for such projects as outdoor decks to use their ZMAX brand which is twice the protection at G185.

Actually for severe moisture areas, or salt water areas or just for those who want to play safe, the fasteners and brackets should be stainless steel (grade 304 or better). In fact in any area where the wood is constantly wet, like on the coast, you should be using SS fasteners and SS brackets in all outdoor structures. How do you know if a screw or bracket is Stainless Steel 304 or better if it is not identified as such? Put a magnet to it. If the magnet sticks it may technically be in the category of Stainless Steel but it has an iron content, and it can rust. If the magnet will not stick, it is SS 304 or better.

Another common technique has recently been developed of putting a rubber type of barrier membrane between the high copper concentrate PTW and the galvanized steel brackets. This prevents the direct wood steel contact on the bracket surface where water can easily sit. Several different "membranes" are showing up in the stores to accomplish this, such as Simpson's T-PTBARRIER. This is a good half way measure short of using expensive and hard to locate Stainless Steel brackets and supports. Always use galvanized fasteners with galvanized brackets, and stainless steel fasteners with stainless steel brackets -- don't mix metals!

ALUMINUM

One other note, the copper in ACQ treated lumber will react very strongly with any aluminum, corroding aluminum fasteners and aluminum brackets very quickly. Even Aluminum siding will blister if mounted in contact with ACQ strapping or used as trim on an ACQ deck. Always separate the aluminum from the treated wood. Some people use rubber membranes as above, but that leaves fastener problems. Aluminum siding is best installed with aluminum nails, but aluminum nails cannot be driven into ACQ treated wood. The work around is to attach 1x3 untreated strapping to the treated wood with galvanized nails and then the aluminum siding to the untreated strapping with short aluminum nails. The strapping is weather protected and should not rot.

Just in case you were hoping that the ACZA or other treatments with ammonia carriers may get us out of these problems, be forewarned that they have proven to be even more corrosive to fasteners! To date only the borax treatments are less corrosive, but they leach out and leave the wood unprotected. Even here the original CA-A has evolved removing the Borax in exchange for more copper giving what is called Copper Azole CA-B; less leaching, more fastener corrosion. Things are indeed constantly changing seeking better performance with adjusted trade-offs. It just makes it a bit difficult trying to understand what it is that we are buying at any given moment.

There is of course the possibility of working with a wood that is harder than cedar and even more resistant to rot, a good contender for the job if we can get a good supply : Larch.

The second issue with high copper concentrate PTW like ACQ and CA-B is that the copper can cause problems for micro-organisms in fresh water lakes. Many ecologists are opposed to the use of ACQ for docks or boardwalks in cottage country and I think they are right. So what do you use? The old CCA treated wood would be a good alternative, if you can find it. Otherwise you may be forced to use cedar, which isn't as strong and won't last terribly long in water. Or you will have to go with metal, plastic or concrete.

As for working with the lumber, we should continue to follow the rules for any wood with any chemicals on it, even painted cedar: wear gloves when working, wear a dust mask if you are breathing dust, and don't burn it -- take it to the landfill instead.

The whole reason for using pressure treated wood is to extend the life span of wood structures, and save a lot of trees while we are at it. That objective has never gone away.

MicroPro treatment

MicroPro, MCA, is the latest of the formulations for pressure treated wood. Here there are much the same ingredients as in ACQ, the difference being that microscopically ground copper is actually forced inside the wood cells where it cannot come out. This means no more corrosive effect on fasteners or aluminum caused by the copper, no more problems with fresh water lakes and still no arsenic or chrome. Years after MicroPro had taken over the US market, it finally got through Canadian approvals (2012) and has since become the standard pressure treated wood in Canada. Follow this link for the whole story of this great advance in chemistry -- answering the consumer demand for both durability and safety.

KEBONY WOOD

A viable replacement for pressure treated wood is a softwood processed to act like a hardwood which some refer to as cooked or artificially petrified wood. Kebony is often used to replace exotic hardwoods as a more environmentally responsible decking. See the Kebony story here.

Keywords:

Decks, Fasteners, Preserved Wood, Pressure Treated, Aluminum, Environmental, Security, Safety, Overview, Health, Wood

Article 2049

www.joneakes.com