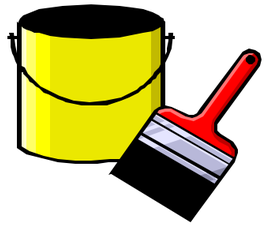
How Can Arsenic Exposures from Treated Wood Be Reduced?

For existing CCA-treated structures, the best way to minimize arsenic leaching is to seal the wood by applying a sealant every two years. This practice is in accordance with the wood manufacturer's recommendations for maintenance of CCA-treated wood. Further, it is consistent with a California law requiring CCA-treated playground equipment purchased by the state to be sealed every 2 years. Proper sealants will not only help keep the wood from cracking and splintering, it can also greatly decrease the amount of arsenic that forms a dislodgeable residue on the wood's surface. Sealants are also expected to minimize the amount of arsenic that would reach the soil. Data from the Connecticut Agricultural Experiment Station suggest that oil-based stains can be effective sealants, which is consistent with recent articles in Consumer Reports (May, 1997, June, 1998) that compared the ability of different types of sealants to preserve wood.



Handwashing is effective in reducing exposure, but this is only practical once a child is finished playing. Sealants are the best way to protect children from arsenic exposure from CCA-treated wood.

Are there Alternatives to CCA-treated Wood?

Yes. When selecting building materials for new outdoor structures, you may consider alternatives to CCA-treated wood. Redwood and cedar are naturally rot-resistant as are wood-plastic composite building materials. Wood boards that are pressure-treated with alternative techniques that don't use CCA are free of the arsenic leaching problem.

Handling and Disposal Precautions:

⇒ Do not burn CCA-treated wood. Disposal should be through ordinary trash collection or burial.

⇒ Sawing or sanding of the wood requires special precautions: perform the work outdoors on a dropcloth so that sawdust can be collected and discarded; wear a dust mask if there will be frequent or prolonged exposure to the sawdust; wash hands and clothing immediately after completing the work.

⇒ Do not use CCA-treated wood for wood chips or mulch.

Who Can I Contact for more Information?

Health Questions:

Connecticut Department of Public Health
Environmental & Occupational Health Assessment Program
860-509-7740

Questions About Handling & Sealing of CCA-treated wood & Alternative Materials:

Connecticut Agricultural Experiment Station
203-974-8602

FACT SHEET

May 2007

Connecticut Department of Public Health
Environmental Health Section
Environmental & Occupational Health Assessment Program
410 Capitol Avenue MS# 11EOH, PO Box 340308
Hartford, CT 06134-0308 (860) 509-7740
http://www.dph.state.ct.us/EOHA

WHAT YOU NEED TO KNOW ABOUT

PESTICIDES USED IN PRESSURE-TREATED WOOD

Main Points:

- **If not properly sealed, wood that is pressure-treated with a pesticide known as CCA can leach (release) arsenic.**
- **Arsenic is easily taken up onto hands from simple contact with the wood surface.**
- **It is important to prevent exposure because arsenic can cause cancer and other health effects. Young children are most at risk.**
- **These exposures to arsenic can be greatly reduced. See the recommendations below.**

Recommendations

- **Seal existing CCA-treated structures (decks, playscapes) every 2 years with a sealant such as an oil-based stain.**
- **Keep children and pets out of under-deck areas where arsenic may have leached in the past.**
- **Don't grow edible plants near CCA-treated decks.**
- **Insert a plastic liner on the inside of CCA-boards used to frame garden beds.**
- **Follow safe handling guidelines if you use CCA-treated wood in building projects.**

Background

Chromated copper arsenate (CCA) is a pesticide commonly used in pressure-treated wood. It protects the wood from deterioration, thus prolonging the life of outdoor wood structures such as decks and children's play equipment.

Recent studies have shown that rainwater leaches (releases) CCA from the treated wood. This can lead to contamination of soil beneath the wood structure. Also, a significant pesticide residue (fine coating) can be left on the wood's surface. This pesticide residue can easily be wiped (or dislodged) from the wood surface and picked up on hands or clothing.

Another way people may encounter the leached pesticide is when CCA-treated boards are used to frame garden beds. Questions have been raised about whether plants can take up the leached pesticide.

This fact sheet answers common questions about pesticide exposure from CCA-treated wood, and provides recommendations for preventing exposure.

Pesticides in Pressure-treated Wood: What are the Health Concerns?

The most toxic part of the CCA pesticide formulation is arsenic. Arsenic is a known human carcinogen which can also be toxic to the skin and internal organs. These effects require long-term exposure and take years to develop. At high doses arsenic is an acute (immediate) poison that can cause death. However, the levels of exposure possible from arsenic in wood are too low to cause such acute effects. The major health concerns are that daily contact with arsenic leached from CCA-treated wood might, under certain circumstances, lead to an increased risk for cancer or other long-term health effects.

Doesn't Pressure-Treatment Lock Pesticide Into the Wood?

Not Completely. During treatment, the boards are dipped into a CCA bath under high pressure. This forces arsenic into the wood but it doesn't seal the wood against the weather. Once in the environment, rainwater can penetrate into the wood and dissolve arsenic, bringing it back up to the surface. Cracking of the wood as it ages speeds up the leaching process. New boards may also have a surface residue of arsenic-containing pesticide that had not penetrated into the wood during the treatment process. The amount that leaches is enough to contaminate soil immediately below and next to the wood structure, and to leave a residual coating of dislodgeable arsenic on the wood surface.

How much Arsenic can be Picked Up from the Wood Surface?

Studies performed at the Connecticut Agricultural Experiment Station, as well studies in California and Maine, and by the U.S. (Consumer Product Safety Commission) and Canadian governments show that arsenic is readily available on the surface of CCA-treated boards. The amount of arsenic that children can pick up from these boards may be greater than arsenic exposure from other sources. Arsenic is a natural trace element present in soil, drinking water, food, and air. 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. Arsenic is easily taken up onto hands from simple contact with the wood surface. Young children with frequent hand to mouth activity may swallow some of this arsenic. While the amount taken up depends upon many factors, studies show that new boards (direct from the lumber yard) and older boards (those in use for years) both have a significant amount of arsenic on the surface. Given the widespread use of CCA-treated wood, it is possible for a child to be exposed to dislodgeable arsenic at home, at a playground, and at school, making this an everyday kind of exposure for such children.

Arsenic is easily taken up onto hands from simple contact with the wood surface.

Isn't the Contaminated Soil also a Health Concern?

Yes, but not as large a concern as the arsenic on the wood surface. A recent study at the Connecticut Agricultural Experiment Station showed that the soil beneath CCA-treated wood decks can become contaminated with arsenic to levels 10 to 20 times above the normal background level. While this represents a release of arsenic to the environment, the contamination is confined to immediately below the deck. Since children do not normally play beneath decks or other CCA-treated structures, this source of arsenic should not lead to high levels of exposure. However, children should be prevented from playing underneath CCA-treated structures, including backyard playscapes, to minimize exposure to soil which may be contaminated with arsenic.

Soil beneath public playscapes can also be contaminated by arsenic leached from CCA-treated wood. However, the ground beneath public playscapes is usually covered with sand or wood chips as a safety feature in case of falls. Arsenic readily leaches through sand and so should not reach levels of concern in sand beneath public playscapes. Studies conducted on playscape sand by the Swedish and Canadian governments support this conclusion. Wood chips used to cover the ground underneath playscapes may be contaminated with arsenic. However, they are not expected to lead to substantial arsenic exposure unless a child actually puts the wood chips in his/her mouth.

Who Is Most Likely to be Exposed?

Young children (under 6 years of age) who play on CCA-treated decks or playscapes are expected to receive the greatest exposure to arsenic leached from wood. Children in this age category may play for extended periods on backyard or playground structures and they exhibit frequent hand-to-mouth activity. They are also most likely to play for periods of time underneath playscapes or decks.

Older children and adults who spend considerable amounts of time playing on or working with CCA-treated structures may also receive significant exposures. Further, people who frequently eat on CCA-treated picnic tables that are not properly sealed may receive greater exposures.

Can Garden Plants Take Up Enough Arsenic to be a Concern?

CCA-treated boards used to frame garden beds can be expected to leach arsenic into the soil next to the boards. The leached arsenic is expected to mix with the remaining soil in the bed as the soil is turned over and prepared for planting. This will decrease the concentration of arsenic in the soil through dilution. This dilution effect combined with the evidence that plant uptake of arsenic is fairly small, suggest that the amount of arsenic in produce grown in such beds will not be a health concern. The Connecticut Agricultural Experiment Station is planning to further evaluate plant uptake of arsenic. As an added precaution, they suggest lining the inside surface of CCA-treated framing with plastic to minimize the mixing of leached arsenic into the garden bed.

Should Soils be Tested for Arsenic Contamination?

There is very little need to test soils for leached arsenic. Rather, the key precaution is that soils beneath and directly adjacent to CCA-treated wood structures not be used for play or gardening activities.

Can Wells become Contaminated from Arsenic Leaching?

Drinking water wells may be located in close proximity to CCA-treated wood structures. Groundwater is not expected to be an important source of exposure to leached arsenic. The reason is that arsenic binds to many soil types preventing it from reaching groundwater. Further, the rate of arsenic leaching from backyard decks and playscapes is likely too small to affect groundwater quality under most conditions.