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HEALTH & SAFETY FOCUS

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While there are a handful of universally toxic woods (e.g., yew), for most woods and woodworkers, toxicity is a complex but fundamentally individual matter. Some people will react to minor exposures to a given wood, while others can work that species with no obvious effect. What matters most is how we are exposed to those chemicals, how our bodies can react, and how we can protect against exposure to those chemicals.

Routes into the body

For wood to cause a toxic reaction in a person, chemicals from that wood have to make their way into the body. These chemicals are contained in the solid wood, in wood shavings or splinters, and in the particles of wood dust, which can be as small as 10 microns (equivalent to 1/25000 of an inch). The smaller the particle, the easier our body can absorb the chemicals it contains. This is one reason diverse reactions to wooden cooking implements (e.g., unfinished walnuts) and porous or decorative cutting boards generally are less common and less severe than other exposures. The three most common routes by which wood chemicals enter our bodies are through contact with skin, by inhalation, and through contact with the eyes.

The most common toxic reaction to wood is skin irritation. Your skin is the largest organ of your body, and it can absorb chemicals: the particles of wood dust the same way it absorbs nicotine from nicotine patches. Your skin exists in part to protect you from the outside world, so when it detects a toxic chemical it can cause a reaction – irritation of the skin – the severity of which will depend on the potency and quantity of the toxin for that person. The best way to protect your skin from wood chemicals is to protect it from wood particles by wearing long sleeves, pants, covering your neck, and wearing gloves if safety permits.

Many woodworkers may have experienced respiratory reactions like nose and throat irritation or asthma after working with wood. This happens when you inhale wood particles, exactly the same way you might inhale tobacco smoke or nicotine vapor. Our lungs are specialized for this function – to rapidly exchange chemicals between our blood and the air (normally we are wanting

to take in oxygen gas and let out carbon dioxide gas). Sometimes, intentionally or otherwise, we co-opt this powerful system to move other chemicals into the body. When we do this inadvertently with fine wood dust particles, we are giving our body a possible double assault. First, the smaller the particle is, the easier it is for any chemicals in it to be extracted, so the amount of wood chemical absorbed could be large. Second, in the long term, wood dust of any species in the respiratory system can become carcinogenic.

Your lungs are not the only way wood chemicals can be absorbed by breathing. You also can accidentally ingest wood dust when not wearing a mask, either directly through your mouth, or by the dust becoming trapped in the mucous membranes of the nose and passed to the back of the throat and swallowed. And, as anyone who has done any sanding with inadequate mask filtration knows, your nasal passages and sinuses can retain evidence of which woods you were sanding even the next day. The

duration of exposure can continue for hours after the initial exposure event. The way to protect your respiratory system from wood particles is very simple: prevent the dust from entering your body. If you can afford it, a dust collection system is the best option. If you cannot do this, some woodworkers connect a vacuum system to their machines to reduce the amount of wood particles in the air. Even with a good dust collection system, it is prudent to wear a mask at all times. Use a mask that fits snugly, seals, and has appropriate filters – these are available for a little less than \$24 in the market.

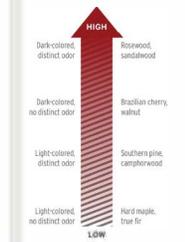
Although many people forget about them as a venue for chemical absorption, they are another point of entry for wood chemicals. Eye irritation is a common reaction in woodworkers, and the intensity of the irritation depends, as with the skin, on the type and amount of chemical. Some chemicals absorbed through the eyes affect virtually everyone (e.g., when you dice a fresh onion), but others will, like most wood chemical exposures, depend on the individual. Most woodworkers protect their eyes from large wood particles; however, not all safety glasses protect the eyes from fine particles and dust, so it is suggested to use eye protection that is effective for both.

As you may have noticed, the way to keep wood chemicals away from your body when woodworking is to use adequate personal protective equipment (PPE) and site safety equipment. If PPE is not used, or it fails and wood chemicals do come in contact with the body, there is the possibility of any of a range of reactions, from no observable reaction to various toxic responses.

The body's toxic responses to wood chemicals

The chemicals in wood are as diverse as wood species are, and knowledge

ESTIMATE WOOD TOXICITY



about the toxicity of these chemicals can vary. For example, most known is the allergic reaction to the toxin (furoshiol) in poison ivy (which also occurs in the wood and is anecdotally known to cause grief if sanded or burned and inhaled); less widely known is the compound juglone in black walnut (which causes lameness in horses) or the toxicity of taxines in yew that may cause cardiac arrest. When available, it is good to cross-check a new wood with a list of known toxic woods, their chemical constituents, their reported effects on the body, from acting as irritants, to causing allergic reactions.

For simple dermatitis, once the irritant chemicals are washed away or broken down by your body, symptoms disappear in hours to days or weeks. For more serious true allergic responses, subsequent reactions even to small amounts of the wood or dust can cause much more dramatic allergic response, which can include rashes and dermatitis, restriction of airways, and/or anaphylaxis. It is critical that after experiencing a reaction to a wood, any

future work with that wood be under controlled conditions with careful use of PPE and access to emergency medical assistance.

The danger posed by specific woods

Fortunately, some research has been done on the toxicity of wood and wood dust. We direct you to the expanded version of this story on hardwoodfloorsmag.com for several lists of woods and their toxic reactions so that you can make informed choices at the outset of a project.

If you are going to work with a species not included in such lists, you could rank the likelihood of a wood causing a toxic reaction as shown in this graphic. These are general guidelines, of course, but as a toxic reaction is based on specific chemicals triggering a response, the greater the diversity and concentration of chemicals in wood, the more likely the wood is to be problematic. Not all chemicals have color or odor, but when color or odor are present, they are imparted by chemicals. For these reasons you should always be cautious when working with a new wood, even if it is light-colored and odorless. In addition to the threats posed by the wood's natural chemicals, wood may contain chemicals from wood preservatives or adhesives, or have surface molds, any of which can cause their own toxic reactions in the body.

To conclude, and we cannot stress this enough – always use PPE. Don't inadvertently conduct an uncontrolled medical experiment in your shop or at the job site. ■

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For additional resources about wood toxicity, check out the extended version of this story on HARDWOODFLOORSMAG.COM