

Wood/Dust Toxicity

Edited by: Bruce Campbell

For centuries, it's been fairly common knowledge that some woods could hinder your health. As far back as 60 A.D., the Roman historian and naturalist Pliny the Elder described a case where four soldiers actually died after drinking wine from hip flasks made of yew. Of lesser gravity was the experience of a few German sawyers in the early 1700s. It seems they developed chronic irritation of the nose and eyes, as well as headaches, from sawing bald cypress.

What are your chances of a reaction to wood? Statistics say that only 2 to 5% of all people develop an allergic sensitivity to one or more compounds found in wood. But, if you handle a lot of potentially toxic species, and work with them long enough, you increase your chances of an allergic reaction. And, with sufficient exposure, some woods bother almost everyone.

Any dust, including wood dust, mildly irritates the sensitive mucous membranes of your nose and eyes, making you sneeze and tear. The dust of some woods such as western red cedar and rosewood can be especially bothersome. However, other woods, called irritants, can make you even more uncomfortable, with a rash that classifies as either irritant dermatitis or allergic dermatitis. The rash usually has a uniformly red, swollen area that may erupt in blisters, and typically first shows up on the webs of skin between your fingers. Irritant woods include black locust, cocobolo, ebony, oleander, satinwood, sequoia, and yew.

However, for you to get an allergic-type rash, you first must be allergy-prone to one of more of the chemicals found in certain woods called sensitizers. And, it may take repeated contact for your body to develop a great enough allergy for it to react (the so-called "latency period of as little as five days and up to 6-8months). If you do eventually get a reaction, the rash will look like poison ivy - red with small, individual, itchy bumps. Sensitizer woods include cypress, balsam fir, beech, birch, elm, greenheart, mahogany, maple, myrtle, redwood, sassafras, spruce, walnut, willow, western red cedar, and teak.

In addition to the actual wood dust, molds frequently trigger reactions, too. One that actually grows in wood happens to be extremely potent: *Cryptostroma corticale*. This mold lives happily between the bark and sapwood of many hardwood trees, especially favoring maple and birch. It's responsible for the marbled spalling that woodturners prize, and for "maple bark stripper's disease," a condition with all the symptoms of a severe respiratory allergy.

If you have an aspirin allergy, be wary of willow and birch. Both of these species possess significant concentrations of salicylic acid (the predecessor of aspirin) and very sensitive individuals might only need casual exposure, such as a whiff of sawdust, to react.

Never say "no" to a dust mask. Among woodworkers, the chances of developing nasal and sinus cancer run about 5-40 times greater than non-woodworkers. Although researchers haven't identified the exact cancer-causing compound (primarily because the disease has a latency period from 30 to 50 years), some evidence points to dust from wood with high tannin content, such as chestnut, oak, redwood, western red cedar, and hemlock.

If you are sensitive to wood dust, work in a well ventilated area (this also reduces the risk to mold), avoid unseasoned wood as much as possible, and wash or shower frequently. If you develop persistent rashes or respiratory problems, contact your physician or dermatologist. (source of above: <http://www.city-net.com/albertfp/toxic.htm>)

There is an interesting list of Internet sites at <http://www.davidillig.com/awg/safety.html> where you can find additional information.

The chart below is a blend of information from two sources. The first is an article which appeared in American Woodturner in June 1990 (originally posted to rec.woodworking by Bruce Taylor (I took it from the Ohio Valley Woodturners Guild <http://w3.one.net/~ovwg/Tips-Toxicity.html>). The second is an article prepared by Roy Banner, a woodturner from Torrance, California who almost lost his life in 1989 to anaphylactic shock after turning pieces of exotic wood (see <http://www.mimf.com/archives/toxic.htm>). Roy has assembled his data over the years from various sources. I can't judge with any authority the validity of the information and it's up to the you to further research any wood yourself. Take this as a jumping off point. You might also want to check out The Botanical Dermatology Database at <http://bodd.cf.ac.uk/BoDDHomePage.html> although I found it pretty hard to follow, technically.

A final note; this data does not take into consideration the added effect of formaldehyde in plywood, treated woods, sodium compounds in white pine to prevent blue stain, etc. Also, I am not aware of any work to study the interactions of

woods and chemicals such as oils, glues, stains, etc. Bottom line - ensure good ventilation and good respiratory protection when you work in the shop.

Wood Toxicity Chart

Wood	Reaction	Site	Source	Ptncy ³	Incidence	Risk ⁴
Afromosia	I	E,R	D	GREAT	RARE	M
Alder	I	E,S,R	D	GREAT	?	?
Angelico	I	E,S,R	D	GREAT	?	?
Arborvitae	I	R	?	?	?	?
Ash	I	R	?	?	?	?
Bald Cypress	S	R	D	SMALL	RARE	L
Balsam Fir	S	E,S	LB	SMALL	COMMON	L
Beech	S,C	E,S,R	LB,D	MEDIUM	COMMON	M
Birch	S	R	W,D	MEDIUM	COMMON	M
Black Locust	I,N	E,S	LB	GREAT	COMMON	H
Blackwood	S	E,S	W,D	MEDIUM	COMMON	M
Boxwood	S	E,S	W,D	MEDIUM	COMMON	M
Cashew	S	E,S	W,D	SMALL	RARE	L
Chechem	I	E,S,R	W,D	GREAT	RARE	M
Cocobolo	I,S	E,S,R	W,D	GREAT	COMMON	H
Dahoma	I	E,S	W,D	MEDIUM	COMMON	M
Ebony	I,S	E,S	W,D	MEDIUM	COMMON	M
Elm	I	E,S	D	SMALL	RARE	L
Fir	I	E,S	W,D	SMALL	RARE	L
Goncalo Alves	S	E,S	W,D	MEDIUM	RARE	L
Greenheart	S	E,S	W,D,S	EXTREME	COMMON	H
Guarea	S	E,S	D	EXTREME	RARE	H
Hemlock	C	R	D	?	UNCOMMON	?
Iroko	I,S,P	E,S,R	W,D	GREAT	COMMON	H
Katon	I	R	?	?	?	?
Kingwood	I	E,S		?	?	?
Mahogany,American	S,P	S,R	D	SMALL	UNCOMMON	L
Mahogany,African	S	S,R	D	GREAT	RARE	H
Mansonia	I,S N	E,S	W,D D	GREAT SMALL	COMMON	H
Manzinilla	I	R	D	?	RARE	?
Maple (Spalted)	S,P	R	D	GREAT	COMMON	H
Mimosa	N		LB	?	UNCOMMON	?
Myrtle	S	R	LB,D	MEDIUM	COMMON	M
Oak	S C	E,S	LB,D D	MEDIUM ?	RARE UNCOMMON	L
Obeche	I,S	E,S,R	W,D	GREAT	COMMON	H
Oleander	DT	N,C	D,W,LB	EXTREME	COMMON	H
Olivewood	I,S	E,S,R	W,D	GREAT	COMMON	H
Opepe	S	R	D	SMALL	RARE	L
Padauk	S	E,S,R	W,D	SMALL	RARE	L
Pau Ferro	S	E,S	W,D	SMALL	RARE	L
Peroba Rosa	I	R,N	W,D	GREAT	UNCOMMON	M
Purpleheart	I,S	N	W,D	MEDIUM	COMMON	M
Quebracho	I C	R,N ?	LB,D D	MEDIUM SMALL	COMMON UNCOMMON	M L
Redwood	S,P C	E,S,R	D D	MEDIUM ?	RARE UNCOMMON	L
Rosewoods	I,S	E,S,R	W,D	EXTREME	UNCOMMON	H
Satinwood	I	E,S,R	W,D	GREAT	COMMON	H
Sassafras	S DT	R N	[D,W,LB D	SMALL SMALL	COMMON RARE	L L

	Reaction	Site	Source	Potency	Risk	
	C	R	D	SMALL ?	UNCOMMON	L ?
Sequoia	I	R	D	SMALL	RARE	L
Snakewood	I	R	W,D	MEDIUM	RARE	L
Spruce	S	R	W,D	SMALL	RARE	L
Stavewood	I	R	?	?	?	?
Verawood	I	E,R	W,D,S	MEDIUM	COMMON	M
Walnut, Black	S	E,S	W,D	MEDIUM	COMMON	M
Wenge	S	E,S,R	W,D	SMALL	COMMON	L
Willow	S	R,N	D,W,LB	SMALL	UNCOMMON	L
Western Red Cedar	S	R	D,LB	GREAT	COMMON	H
Teak	S,P	E,S,R	D	MEDIUM	COMMON	M
Yew	I	E,S	D	MEDIUM	COMMON	M
	DT	N,C	W,D	EXTREME	COMMON	H
Zebrawood	S	E,S	W,D	MEDIUM	RARE	L

Index of Meanings

Reaction:	C ¹ - nasopharyngeal cancer, DT - direct toxin, I ² - irritant, S ² - sensitizer, N - nausea/malaise, P - pneumonitis & alveolitis (hypersensitivity and/or pneumonia)
Site:	C – cardiac, E – eyes, R – respiratory, S – skin
Source:	D - dust, LB – leaves & bark, W - wood, S - smoke
Risk:	L – low, M – moderate, H - high

[1] Cancer of nose and sinus: Statistics show that woodworkers have a 40 per cent greater chance of nasal cancer than the general population. However, the majority of statistics on nasal cancer are based on data from 1920-1960 when the furniture industry became highly mechanized with little or no dust control methods.

[2] Irritant or Sensitizer: Woods are either an irritant which cause a reaction fairly rapidly after exposure and will cause a similar reaction repeatedly, or sensitizers which may have a latency period of hours or months and may require repeated handling before reaction occurs. Sensitizer's are the more severe, because once you're sensitized, you're sensitized for life and the reactions only get more dramatic.

[3] Potency: This is the potential of the wood or sawdust doing harm and would vary with the individual. i.e., those who are allergy prone might think twice about working with wood classed as extremely potent.

[4] Risk: This is a qualitative assessment of the risk of a given wood doing serious harm. It is derived by combining the Potency and Incidence measures as follows:

	SMALL	MEDIUM	GREAT	EXTREME
RARE	L	L	M	H
UNCOMMON	L	M	M	H
COMMON	L	M	H	H

Chart References:

1. *_Woods Toxic to Man_*, author unknown
2. Woods, B., Calnan, C.D., "Toxic Woods." *_Br. Journal of Dermatology_* 1976
3. *_ILO Encyclopedia of Occupational Health and Safety_* 1983
4. Lame, K., McAnn, MEDIUM., *_AMA Handbook of Poisonous and Injurious Plants_*, AMA 1985
5. *_Poisondex_*, Micromedix Inc. 1990
6. *List of woods and toxicity characteristics*, Roy Banner, 1989