OakleaWoodcrafts

Wood Dust Safety

Woodworking Dangers

The biggest threat to any woodworker comes not in the form of bodily injury from a power tool, but from *wood dust.* Now often we all minimize the importance of hearing, eye, and overall physical safety when dealing with power tools, it is the small stuff—the tiny and easily overlooked wood dust particles—that can cause the most long-term damage.

So, just how does wood dust affect a woodworker?

Long-Term Damage: Forget about the large chips and visible sawdust: perhaps the most damaging element is the invisible fine dust (sometimes called "coarse inhalable particles" ranging from 2-10 microns). Basically, these tiny bits of sawdust float around the air and linger even after the tools have stopped running. These invisible particles get inhaled and cause tiny wounds and scarring to our lungs: each time this happens, it causes a very small amount of irreversible damage. The immediate effect is unnoticeable, but over long periods of time, this can result in significantly decreased lung capacity, and a number of other health issues.

Irritants: The most common way that wood dust affects a woodworker is by being an irritant. This simply means that it can irritate our skin, our eyes, and our lungs. This can mean reactions such as itching, sneezing, coughing, runny nose, rashes, and asthma-like breathing problems.

Sensitizers: Taking things a step beyond being just irritating, some woods can make us more and more sensitive upon each successive exposure. So even if you don't experience any sort of allergic reaction to the wood or its dust upon first exposure, each time you breathe the dust or handle the wood. Sometimes the eventual reaction can be quite strong, resulting in rashes or boils, severe sinus or respiratory pain/inflammation, or a number of other conditions depending on the wood species.

Toxins: Not nearly as common, some wood is considered to be directly toxic. One example of this is Yew, which even according to ancient Roman knowledge, was capable of causing fatality in certain cases. (See the introduction of the article, Wood Allergies and Toxicity.

Carcinogens: If you look at the toxicity chart of wood species, you'll notice that some species have been shown to cause NPC. That is, Nasopharyngeal carcinoma, or nasopharyngeal cancer.

To see a complete list of all the wood species, along with the most commonly reported reactions to their wood dust, see the Wood Toxicity and Allergen Chart.

Now that we've seen the health detriments to inhaling and being exposed to wood dust, we'll look at some of the ways that can be employed to protect the air that we breath.

Safety Measures

Different safety measures can be employed depending on the operations that are being carried out, but one of the hardest control method is that of controlling dust emissions from a woodturning lathe, and what procedure is being done on the wood. So, there are a variety of protective measures that can be put in place, using many systems.

Starting with the easiest and most common, the ones that can be used in any situation:

	**Dust mask:** Available at a variety of hardware stores, these masks are just disposable cloth with an elastic band. Some of the better ones have an exhalation valve on the front. They're better than nothing, but the serious woodworker would probably do best to find a solution that is more efficient and form-fitting than these disposable products.
	**Respirator:** A step up from a simple dust mask is a respirator. These filter airborne particles with fairly good efficiency, and have replaceable filter pad(s) that can be swapped out when they get clogged, saving money in the long run.One advantage that these units have over their disposable counterparts is that they are made of flexible rubber, which forms a much better seal than cloth/paper masks. There are also larger models and/or optional filter pads that use charcoal to also filter out solvents and other chemicals. These cartridge respirators are a great choice when applying wood finishes in enclosed areas, especially during winter months when ventilation can be difficult.

	**Powered Respirators:** Taking this personal protection one step further, there are also powered respirators which enclose your entire head and actively pump fresh air in/out of the mask. These units offer the ultimate in wood dust protection,
	**Air filter:** Another all-around useful item to have in your shop is an air filter. These are typically ceiling-mounted units that run while you are working in your shop, and collect airborne dust particles with minimal intrusion or hassle. Air filters most commonly will use furnace filters for the pre-filter, with an array of felt-like bag filters on the inside. Depending on how fine of a dust you'd like to filter, you can buy HEPA furnace filters for the pre-filter (though this can slow down the overall CFM through the filter), or washable/reusable filters, or even charcoal filters to remove organic vapour from the air. Yet despite the versatility and convenience of using an air filter, it certainly shouldn't be relied upon as a woodworker's only line of defence against wood dust. It should instead be viewed as a backup: helping in the background while you minimize your exposure to dust in the first place.

Changing the air around in the workspace using Air exhaust systems:

Despite all of helpfulness of the previous items, one of the very best ways you can protect yourself from wood dust is to blow it out of your shop. Just because you can't see any dust doesn't necessarily mean that there aren't any particles left in the air. You may think the coast is clear, and take off your dust mask, but there's probably a host of very fine wood particles still floating around in the air: soon to be in your lungs. This is where an exhaust fan can come in handy. Instead of using so many resources, expensive filters, masks, etc., sometimes the very best thing is to get a breath of fresh air, and exhaust the old, dusty, polluted air out of your shop.

- Disadvantage of utilising this in the winter months is the expense of heating the area
- You will also need to install an intake vent

Dust collector:
A staple tool in every serious wood shop. They usually use 4″ dust collection hose/pipe, and will filter large chips and dust from a variety of woodworking machines. The beauty of a dust collector is that they are designed to create a lot of CFMs of suction, and unlike Vacuum cleaners which use a small internal filter, dust collectors use a giant bag (or a canister) and almost never lose any suction with continued use. You can also outfit your dust collector with an upper felt bag to increase the efficiency of collecting smaller dust particles: a feature that is very helpful when using a collector on a drum sander which creates finer dust.

	**Direction** If installing a dust collector, a general rule is not to reduce the diameter of piping, and particularly with lathes the use of direction device can be useful
	**Cyclone Separator:** Another option on the opposite side of the spectrum, (that is, if you are creating a lot of large wood chips/shavings as from a planer or jointer), is to use a cyclone separator with your dust collector. This is essentially a giant vortex-shaped pre-filter piece that allows larger chunks of wood to drop and fall into a trash can or other large container: prolonging the life of the dust collector's bag and greatly reducing the frequency that you have to empty it. Common tools that are typically used with a dust collector include: tablesaw, jointer, planer, downdraft table, drum sander, and bandsaw. As you can see, most shops would be quite messy if a dust collector wasn't in regular use!

	**Downdraft table:** This is simply a specialized table/platform where sanding or other shaping operations can be done almost dust-free. The table is full of holes or slots, and a vacuum or dust collector is attached, creating a continuous downward suction on the table. There are also stand-alone downdraft tables that have a built-in motor which can be used for industrial types of situations.
	**Vacuum/direct dust extraction:** The last option is to connect a vacuum to a specific tool. This is usually done with a hose adapter of some sort, and the vacuum is only switched on when the tool is running. Some vacs have an auto-on feature to work with a sander or other small tool to kick on when the tool is switch on. In most instances, the tool is actually plugged directly into the vacuum. One advantage to this method is that it can be very precise, so that even though only a moderate amount of suction is created with the vac, it is in just the right place for optimum dust extraction. Vacuums are typically used with mitre saws, sanders, and other small handheld tools that have a dust port. If you don't have an auto-start vacuum, one useful tool that can perform the same function is called the i-Socket. What this small device does is plug into any standard electrical outlet, and has two plug-in sockets: one for a tool, and another for the vacuum. It then will sense when the tool is turned on, and automatically turn on the vacuum as well. It also leaves the vacuum on for a few seconds after the tool has been switched off to help clear any lingering dust from the hose.