

# Chemicals and Materials

## Wood Dust - Health Effects

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## Why is wood dust a health concern?

Exposure to wood dust has been associated with health issues due to the natural chemicals in wood or substances in the wood, such as bacteria, moulds, or fungi.

Wood dust is considered carcinogenic to humans (Group 1) according to the International Agency for Research on Cancer (IARC). IARC states that wood dust causes cancer of the nasal cavity (nose area) and paranasal sinuses (spaces in and around the nasal cavity) and of the nasopharynx (upper part of the throat, behind the nose).

Wood dust is also associated with toxic effects, irritation of the eyes, nose and throat, dermatitis, and respiratory system effects which include decreased lung capacity and allergic reactions.

NOTE: This document focuses on the health concerns associated with wood dust from untreated wood. Wood dust is also a safety concern because it can cause a fire or explosion. Please see the OSH Answers on [Combustible Dusts](#) for more information.

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## What activities are likely to produce wood dust?

Wood dust is created during all stages of wood processing such as sawing, routing, sanding and other operations. Workers can also be exposed when the dust becomes airborne such as when removing dust from furniture, maintenance activities, or when cleaning equipment (e.g., emptying the bag from a dust extraction system or vacuum).

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## What are examples of the health issues associated with wood dust?

Irritation, coughing or sneezing are caused by the dust itself. Exposure to excessive amounts of wood dust may irritate the eyes, nose, and throat. Workers may also experience shortness of breath, dryness and sore throat, conjunctivitis (inflammation of the mucous membranes of the eye), and rhinitis (runny nose).

[Dermatitis](#) is common and may be caused by the chemicals in the wood. For dermatitis, the skin may become red, itchy, dry, or blister. [Allergic contact dermatitis](#) may also develop.

Respiratory system effects include decreased lung capacity, and allergic reactions in the lungs such as hypersensitivity pneumonitis (inflammation of the walls of the air sacs and small airways), and [occupational asthma](#). Hypersensitivity pneumonitis may develop within hours or days following exposure and is often confused with cold or flu symptoms because it begins with headaches, chills, sweating, nausea, breathlessness, etc. Tightness of the chest and breathlessness can be severe, and the condition can worsen with continued exposure. Some hypersensitivity pneumonitis conditions may be caused by moulds that grow on the wood (and not by the wood itself). Occupational asthma may also develop. Western red cedar is a wood that has a clear association with the development of asthma.

Toxic effects are specific to the species of wood. The chemicals in the wood may be absorbed into the body through the skin, lungs, or digestive system. When the body absorbs the chemical, the chemical may cause headaches, loss of weight, breathlessness, giddiness, cramps and irregular heartbeat.

While many species of trees have been associated with health effects, table 1 summarizes the health effects from some common types of wood.

**Table 1: Health Effects Reported with Various Types of Woods  
[Adopted from Work Safe Alberta (2009)]**

| <b>Wood Type</b>                    | <b>Health Effects</b>   |
|-------------------------------------|---|
| Alder (common, black, red)          | Dermatitis (black alder); decrease in lung function (red alder)   |
| Aspen                               | No health effects reported  |
| Beech                               | Dermatitis (wood cutter's disease) due to lichens growing on the bark of beech trees, rhinitis, asthma, nasal cancer    |
| Birch                               | Irritant dermatitis   |
| Cedar (western red)                 | Asthma, allergic contact dermatitis, sensitizer, decrease in lung function, eye irritation and conjunctivitis, rhinitis |
| Douglas Fir                         | Contact eczema, decrease in lung capacity   |
| Fir (grand, balsam, silver, alpine) | Skin irritation, dermatitis, rhinitis, asthma, possible decrease in lung function                                       |
| Hemlock                             | Skin irritation, decreased lung function  |
| Larch (European, western)           | Allergic dermatitis from European larch; no reports with western larch  |
| Mahogany                            | Dermatitis, sensitizer  |
| Maple                               | Rhinitis, asthma, Maple Bark Stripper's disease (mould spores in bark)  |
| Oak                                 | Nasal cancer  |
| Pine (white, lodgepole, jack)       | Skin irritation, contact dermatitis, Wood-pulp worker's disease (mould in bark), rhinitis, asthma                       |
| Poplar                              | Contact dermatitis, sensitizer  |
| Rosewood                            | Eczema, allergic contact dermatitis   |
| Spruce                              | Skin irritation, Wood-pulp worker's disease (mould spores in bark), decrease in lung function                           |
| Teak                                | Toxic, dermatitis, sensitizer   |
| Walnut (black)                      | Skin irritation, rhinitis, possible asthma  |
| Yew                                 | Irritation of skin, dermatitis, toxic   |

Be aware that other products used on or in wood may also have hazards. Resins, pesticides, paint, paint strippers, glues, adhesives, waterproofing compounds, lacquers, varnishes, sealants, dyes, and other products are examples. Always read and understand the safety data sheet associated with these products to make sure they are being used, handled, and stored appropriately.

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## What occupations are at increased risk for exposure to wood dust?

Some of the occupations at increased risk for exposure to wood dust include the following:

- Workers employed in logging, sawmills, furniture, and cabinet making
- [Carpenters](#)
- Cleaning or maintenance staff – activities where wood dust is generated or reintroduced
- Construction workers
- Shipbuilding workers

Fine dust that results from the processes such as shaping, routing and sanding are associated with higher exposure levels. Hardwoods generally produce more dust than softwoods when worked in similar conditions. Dry wood tends to produce more dust.

National Institute for Occupational Safety and Health (NIOSH) notes that the chemicals associated with allergic reactions are usually found in the inner parts of a tree, e.g., the heartwood. The workers most often showing reactions are those who do secondary wood processing (e.g., carpenters, joiners, and finishers).

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## How can exposure to wood dust be controlled?

- Know which type of wood is being used and all hazards associated with that wood.
- Substitute with another type of wood with no or fewer known health effects, where possible.
- Reduce dust generation. For example, reduce the need to cut or shape the wood.
- Use an appropriately designed [industrial ventilation system](#), including local ventilation exhaust and the use of high-efficiency particulate (HEPA) filters. The design of the ventilation system will depend on the equipment being used (sanders, shapers, routers, saws, etc.).
- Use on-tool extraction systems.
- Keep tools and blades sharp. As tools dull, they may release more dust into the air.

- Be aware that significant exposure can happen when cleaning (e.g., emptying dust bags) or maintaining equipment.
- Practice good housekeeping. Keep surfaces and floors clear.
- Use cleaning methods that reduce re-introducing the dust into the air. Use wet clean-up methods (e.g., wipe surfaces with a wet rag or mop) or use a vacuum with a HEPA filter.
- Read, understand, and follow health and safety information on the safety data sheet (where available and applicable).
- Provide appropriate education and training that informs employees about the hazards of wood dust exposure, safe work procedures, how to identify when a ventilation system is working appropriately, and the importance of control measures.
- Wear respiratory protection when appropriate.
- Use protective clothing and gloves to reduce skin exposure.
- Practice good personal hygiene (e.g., wash or shower to remove dust from the skin). Wash hands and face when finished a task, and before eating, drinking or smoking. Clean clothes by washing or using a vacuum when washing facilities are not available.
- Bag and seal dust waste to prevent dust from re-entering the air.
- DO NOT use compressed air to blow the dust off of furniture, equipment or clothing.
- To prevent a combustible dust explosion, DO NOT allow wood dust to accumulate, including on ledges, ceiling beams, light fixtures, hidden areas, etc.

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## What is the American Conference of Governmental Industrial Hygienists (ACGIH®) recommended exposure limit for wood dusts?

ACGIH® TLV® – Western Red Cedar TWA: 0.5 mg/m<sup>3</sup> (I), DSEN, RSEN, A4

ACGIH® TLV® – All other species TWA: 1 mg/m<sup>3</sup>

ACGIH® Carcinogenicity: Oak and beech = A1; Birch, mahogany teak, walnut = A2; All other wood dusts = A4

Exposure Guideline Comments: TLV® = Threshold Limit Value. TWA = Time-Weighted Average. (I) = Inhalable particulate matter. DSEN = Dermal sensitization. RSEN = Respiratory sensitization. A1 = Confirmed human carcinogen. A2 = Suspected human carcinogen. A4 = Not suspected as a human carcinogen.

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## If required, what respirators are recommended?

Use respirators as part of a [personal protective equipment program](#). The National Institute for Occupational Safety and Health (NIOSH) recommends the following:

(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus.

Escape:

(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter. Any appropriate escape-type, self-contained breathing apparatus.

APF = Assigned Protection Factor

Recommendations apply only to National Institute for Occupational Safety and Health (NIOSH) approved respirators. Refer to the [NIOSH Pocket Guide to Chemical Hazards](#) for more information.

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Fact sheet first published: 2017-08-03

Fact sheet last revised: 2023-03-28

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