



# SAFE WORK



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## Health Hazards of Wood Dust

Exposure to wood dust has long been associated with a variety of adverse health effects. Health effects can include irritation (most common), allergic reactions and a rare nasal cancer. Wood dusts are a complex mixture of cellulose fibres, resins and contaminants such as fungal spores and other microbials, wood preservatives, coatings, sealants and glues (e.g. formaldehyde, pentachlorophenol, glycols, copper naphthanate, etc.) This mixture makes it difficult to determine a specific irritant or allergen. Particle size is another important factor. The smaller the dust particle the further it will travel into the lungs; symptoms of inflammation or allergy may develop after repeated exposure.

The *irritation* symptoms are generally caused by the physical, mechanical nature of wood dust particles. This may affect the eyes, upper and/or lower respiratory tract or the skin. *Allergic* symptoms are less common and always involve sensitization of the individual to a particular component(s) of the wood dust. This too may involve the skin, eyes, upper and lower respiratory tract including more serious symptoms of asthma such as wheezing and shortness of breath. Prolonged wood dust exposure in the woodworking industry is associated with a rare form of nasal cancer.

The most common wood causing allergy is Western Red Cedar. It has its own Occupational Exposure Limit. Other wood species may also cause allergic reactions – e.g. Balsam Fir, Spruce, Redwood, Beech, Birch, Mahogany, Oak, Walnut and other exotic species. Dusts from hardwoods are usually finer and therefore more easily inhaled. Oak and Beech are most associated with the rare form of nasal cancer but other wood species are also implicated. In addition, the ACGIH has classified Birch, Mahogany, Teak and Walnut as suspected human carcinogens.

Always refer to the appropriate MSDS for hazard information and the most appropriate ways to prevent health problems from occurring.

The table below shows the current Time Weighted Average (TWA) guidelines adopted by the American Conference of Governmental Hygienists (ACGIH) in 2005 and used in Manitoba. Following each of the TWA's, there is a brief explanation of the basis for setting the limit. *This will alert users to the potential for compounding effects when using more than one species of wood. Employers must comply with the current ACGIH guidelines, keeping worker exposure to a minimum.*

WOOD DUSTS (Type; Examples)	TWA	TLV BASIS – Critical effect(s)
Western Red Cedar	0.5mg/m <sup>3</sup>	Western Red Cedar has been adopted for 2005 by the ACGIH as a confirmed sensitizer.
All Other Hardwoods and Soft woods	1.0 mg/m <sup>3</sup>	Change for 2005 from 5mg to 1mg/m <sup>3</sup> Impaired lung function, both lower and upper respiratory symptoms
Allergenic species: Examples – Balsam Fir; Beech; Birch; Ebony; Mahogany; Oak; Redwood; Spruce; Black Walnut	1.0 mg/m <sup>3</sup>	Sensitizers, asthma, respiratory, lung function

\*See Appendix D of the ACGIH Guidelines to view a list of trees suspected of inducing sensitization

## Controlling Exposure to Wood Dust

Woodworking facilities are inherently prone to fires and explosions, mainly due to the accumulation of dust. Preventing or controlling the buildup of dust is a key means for controlling fire and explosion hazards as well as preventing health hazards discussed earlier. Employers can protect worker exposure to wood dust through a combination of engineering and work practice controls.

### Engineering Controls

Because wood dust is emitted at high velocity (from high RPM equipment such as saws and sanders), the primary method of control is with local exhaust ventilation (LEV), which removes dust at or near its source. Exhaust hoods should be located as close as possible to the emission source (on the woodworking machinery itself, or nearby), and have an efficient air cleaning device. In order to provide maximum protection, it is vital that the LEV system be properly maintained:

- Check and clean ducts and dust collectors at specified regular intervals.
- Inspect ducts to ensure that they are not loose, broken, or damaged.
- Check the V-belts on the drive units of belt-driven exhaust fans for slippage or breakage.
- Refer to the latest edition of *Industrial Ventilation, A Manual of Recommended Practice* for the appropriate duct velocity to effectively remove light, dry saw dust, heavy wood chips, and green shavings, and to prevent these from plugging the system.

Note: New or retrofitted ventilation systems must be approved by the local authorities prior to installation (i.e. municipal authorities / Office of the Fire Commissioner).

*Sanders, shapers, and routers generally produce the greatest amount of dust. Conventional means for exhausting these machines are not very effective. The National Institute of Safety and Health (NIOSH) in the USA has developed new, innovative methods for controlling dust exposure from these machines that either increase the exhaust volume or velocity, or supply pressurized air to help blow dust particles from the machine into an exhaust hood.*

### Work Practice Controls

The primary work practice control to limit exposure to wood dust is good housekeeping. Good housekeeping includes:

- Periodic hand cleaning of your entire facility, as some dust will escape from even the best exhaust system and eventually accumulate on rafters and other out-of-the-way spots.
- Training employees to recognize, avoid, and correct potentially hazardous conditions and behaviors.
- Promoting good personal hygiene by training workers and providing accessible and suitable washing facilities.
- Training employees so that they are acquainted with the special equipment and aspects of building and ventilation design related to dust control.
- Never permitting blow-down of accumulated dust with compressed air. Blowing dust with compressed air will create the type of dust cloud that presents the greatest health hazard.
- Providing continuous local exhaust ventilation on all woodworking machines (the local exhaust systems must have a suitable collector).

Personal Protective Equipment – includes eye protection (safety glasses/goggles), protective clothing and gloves, and respiratory equipment. Note: a) use only respirators that have been NIOSH approved, b) a Respiratory Protection Program is required as per the Canadian Standards Association (CSA) Z94.4-02 Section, Use and Care of Respirators. *Respiratory protection is viewed as the last line of defense.*

### Medical Surveillance: Western Red Cedar

A prudent measure would be to implement a medical surveillance program for workers exposed to western red cedar. This includes: medical screening, pre-placement medical evaluation, periodic medical evaluations, and biological monitoring. Early allergy detection and consequent exposure elimination is the main purpose of such medical surveillance.

### **Consult the following resources for additional information:**

*Wood Dust: Hazard Recognition*

U.S. Department of Labour; OSHA

<http://www.osha.gov/SLTC/wooddust/recognition.html>

*Guidance Note: Controlling Wood Dust Hazards at Work*

Consumer and Employment Protection

SafetyLine; Government of Australia

<http://www.safetyline.wa.gov.au/PageBin/guidswa0051.html>

*A Guide for Protecting Workers from Woodworking Hazards*

Small Business Safety Management Series

U.S. Department of Labor

Occupational Safety and Health Administration, OSHA 3157 (1999)

<http://www.osha.gov/Publications/OSHA3157.pdf>

*The Woodworking Industry Health and Safety Guide (Revised 2001)*

Available for purchase through the Industrial Accident Prevention Association (IAPA) by calling 1-888-506-8888.

(Contains safe practices on a wide variety of topics, including tools, glass, wood dust and ergonomics.)