No. 238

Health Hazards of Wood Dust

1

Potential Hazard

Exposure to wood dust has been linked to a number of health problems. It can cause irritation and allergic reactions that affect the upper and lower respiratory tract and the skin. It can also lead to more serious asthma-related symptoms, including wheezing and shortness of breath. As well, it has been linked to a rare form of nasal cancer.

Some types of wood dust are more harmful than others. Factors that can increase the risk include:

- the presence of chemicals, such as preservatives, sealers and glues
- the presence of fungal spores and other microbials.

Some components of wood dust have been identified as sensitizers. A sensitizer is a chemical that can cause an allergic reaction after repeated exposure. Sensitized workers can suffer allergic reactions, such as asthma, even when exposed to lower concentrations of the dust.

Types of Wood and Associated Hazards

The wood that most commonly causes allergies is western red cedar. Other wood species suspected of inducing sensitization include California redwood, pine, ash, beech, oak and other exotic species (see Appendix D of the American Conference of Governmental Industrial Hygienists (ACGIH) for a list of trees suspected of inducing sensitization). Dust from hardwoods is usually more harmful, since it is finer and therefore more easily inhaled. Oak and beech dust is most associated with a rare form of nasal cancer, but these are not the only species implicated. The ACGIH has also classified birch, mahogany, teak and walnut dust as a suspected human carcinogen (cancer-causing agent).

The ACGIH defines the carcinogenicity of chemicals according to these categories: A1 – confirmed human carcinogen; A2 – suspected human carcinogen; A3 – confirmed animal carcinogen with unknown relevance to humans; A4 – not classifiable as a human carcinogen; and A5 – not suspected as a human carcinogen. The level of carcinogenicity of various woods is noted in the table below.

Occupational Exposure Limits (OEL)

The table below shows the maximum allowable occupational exposure limit (OEL) that an employer may establish in Manitoba for airborne wood dust from specific types of wood. The limits are based on an eight-hour time-weighted average. For designated materials, including carcinogens, the OEL established by the employer must be as close to zero as possible.

Type of Wood Dust	OEL TWA	Carcinogenicity	Critical Effect(s)
Western Red Cedar	0.5mg/m3 (I)	A4	Sensitizer and asthma
All Other Species	1.0 mg/m3 (I)	oak & beech A1 birch, mahogany, teak, walnut A2 all other woods A4	Impaired lung function, both lower and upper respiratory irritation

Information taken from the 2016 ACGIH
(I) inhalable particulate matter

(see over)

How to Control the Hazard

To prevent health problems caused by wood dust, actions must be taken to reduce the amount of dust that workers are exposed to. This can be achieved through the use of engineering controls, good housekeeping practices, isolation, administrative controls and personal protective equipment (PPE).

Engineering Controls

The main method of reducing exposure to wood dust is the use of 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. On small portable machines, filter bags can capture the wood dust at the source. In order to provide maximum protection, LEV systems must be properly maintained on a regular basis.

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).

Housekeeping Practices

Exposure to wood dust can be reduced by maintaining a clean workplace. This can be achieved by taking the following measures:

- Periodically hand-clean your entire facility, since some dust will escape from even the best exhaust system and eventually accumulate on rafters and other out-of-the-way spots.
- Train employees to recognize, avoid and correct potentially hazardous conditions and behaviours.
- Promote good personal hygiene by training workers and providing accessible and suitable washing facilities.
- Train employees so they are acquainted with the ventilation system, including equipment and building design.
- Never permit 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.
- Provide continuous local exhaust ventilation on all woodworking machines (local exhaust systems must have a suitable collector).
- Vacuum dust rather than sweep it.

Isolation

Isolating the worker from the wood dust may be an option to prevent exposure.

Administrative Controls

Administrative controls such as rotating workers between tasks so they are not exposed to wood dust for the entire shift will help to reduce worker exposure. Proper ventilation may still be required. Training workers on the possible health effects of wood dust is also important.

Personal Protective Equipment (PPE)

Workers who are exposed to wood dust should wear eye protection (safety eyewear), protective clothing and gloves. Also, workers likely to be exposed over the OEL should wear respiratory equipment, though personal protective equipment like respirators should be used as a last resort. LEV should always be used first; if LEV is insufficient, PPE may be required. Only use respirators that have been approved by NIOSH.

A Respiratory Protection Program is required as per the Canadian Standards Association (CSA) Z94.4-11 Section, Use and Care of Respirators. *Respiratory protection is viewed as the last line of defence.*

(see next page)

Medical Surveillance: Western Red Cedar
Implementing a medical surveillance program for workers exposed to western red cedar is recommended. Such a program would include: 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.

Always refer to the appropriate safety data sheet for hazard information and the most appropriate ways to prevent health problems from occurring. Note: wood and products made of wood are exempt.

Reference to legal requirements under workplace safety and health legislation:

- Personal Protective Equipment: Workplace Safety and Health Regulation 217/2006 – Part 6
- Chemical and Biological Substances: Workplace Safety and Health Regulation 217/2006 – Part 36

Also see:

- American Conference of Governmental Industrial Hygienists (ACGIH) – Threshold Limit Values and Biological Exposure Indices

Additional workplace safety and health information available at: www.safemanitoba.com

Revised: August 2016
Last Reviewed/Revised: March 2011