



Government of **Western Australia**  
Department of **Commerce**

Guidance note

# Controlling wood dust hazards at work

Revised 2015

**commission  
for occupational  
safety and health**

## **Foreword**

This guidance note is issued by the Commission for Occupational Safety and Health (the Commission) under the provisions of the Occupational Safety and Health Act 1984 (the OSH Act).

The introduction of the OSH Act enabled the establishment of the tripartite Commission, which comprises representatives of employers, unions and government, as well as experts. It has the function of developing the occupational safety and health legislation and supporting guidance material, and making recommendations to the Minister for Commerce for their implementation. To fulfil its functions, the Commission is empowered to establish advisory committees, hold public inquiries, and publish and disseminate information.

The Commission's objective is to promote comprehensive and practical preventive strategies that improve the working environment of Western Australians. This guidance note has been developed through a tripartite consultative process and the views of employers and unions, along with those of government and experts have been considered.

## **Scope and application of this guidance note**

This guidance note applies to all workplaces in Western Australia covered by the OSH Act. It provides guidance for employers and workers on controlling wood dust hazards and some of the legislative requirements in the OSH Act and Occupational Safety and Health Regulations 1996 (the OSH regulations).

It is not possible to deal with every situation that may be found at workplaces. Therefore, the practical guidance in this document should be considered in conjunction with the general duties in the OSH Act, as well as specific requirements in the OSH Act and the OSH regulations.

## **Legislative framework for occupational safety and health**

### **Occupational Safety and Health Act 1984**

The OSH Act provides for the promotion, co-ordination, administration and enforcement of occupational safety and health in Western Australia. It applies to all industries with the exception of mining and petroleum.

With the objective of preventing occupational injuries and diseases, the OSH Act places certain duties on employers, workers, self-employed people, manufacturers, designers, importers and suppliers.

The broad duties established by the OSH Act are supported by a further tier of statute, commonly referred to as regulations, together with non-statutory codes of practice and guidance notes.

### **Occupational Safety and Health Regulations 1996**

The OSH regulations have the effect of spelling out specific requirements of the legislation.

They may prescribe minimum standards and have a general application, or define specific requirements related to a particular hazard or type of work. They may also allow licensing or granting of approvals and certificates etc.

## **Regulations and codes of practice**

If there is a regulation about a risk in the OSH regulations, it must be complied with.

If there is a code of practice about a risk, either:

- do what the code of practice says; or
- adopt and follow another way that gives the same level of protection against the risk.

If there is no regulation or code of practice about a risk, choose an appropriate way and take reasonable precautions and exercise proper diligence to ensure obligations are met.

## **Guidance notes and guidelines**

A guidance note or guideline is an explanatory document providing detailed information on the requirements of legislation, regulations, standards, codes of practice or matters relating to occupational safety and health, as approved by the Commission.

## **Disclaimer**

Changes in law after this document is published may impact on the accuracy of information. The Commission provides this information as a service to the community. It is made available in good faith and is derived from sources believed to be reliable and accurate at the time of publication

Information in this publication is provided to assist people in meeting occupational safety and health obligations. While information is correct at the time of publication, readers should check and verify any legislation referenced in this publication to ensure it is current at the time of use.

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## Types of wood products

Wood products may be considered in three categories:

- softwoods like pine and cedar;
- hardwoods like oak, teak and jarrah; and
- engineered wood products such as particle board ('chip' board), medium density fibreboard (MDF) and laminated veneered lumber (LVL).

## How can wood dust harm you?

Studies have linked wood dust in workplaces to asthma, bronchitis, lung, sinus and throat irritation, shortness of breath and skin problems. The International Agency for Research on Cancer (IARC), after researching nasal cancer among woodworkers in Europe, has classified wood dust a human carcinogen.

Wood dust from timbers such as beech and oak which is fine enough to be inhaled is known to cause cancer. Other species such as, birch, mahogany, teak and walnut may also be capable of causing nasal cancer. As this is a rare form of cancer, the risk is small and generally restricted to the finishing trades where the dust is fine.

Freshly cut trees contain large amounts of microbes, mainly moulds. The number of these increase if the logs are stored outside and under moist or humid conditions. The microbes can cause inflammation of the airways during debarking, sawing and transport.

While there has been considerable research carried out on European and North American species, relatively little is known about the way dusts from different Australian, African, South American or Asian timbers affect people's health. Each type of timber has its own chemical components and may affect people differently.

Wood dust is combustible, and build-up around the workplace can increase the risk of fire or a dust explosion.

## Chemical exposure from wood products

Engineered wood products such as plywood, fibre boards, particle boards and laminated products contain formaldehyde, which can cause irritation of the respiratory system and eyes, a sore throat and runny nose.

Formaldehyde is classified as carcinogenic to humans, however this health effect has been noted in circumstances of high exposure (such as occupational use of concentrated formaldehyde solution).

Small amounts of formaldehyde may be given off during the cutting or machining of engineered wood products, but this is seldom high enough to cause a problem. Higher levels may accumulate if products are stored in plastic or in unventilated enclosed spaces, or may be found when handling products not manufactured to meet Australian Standards for formaldehyde emission.

Many wood products have been coated with varnishes, lacquers, polishes and other chemicals. These may cause harm to health under some circumstances, and need to be considered when working with wood.

Dusts from second hand timbers may contain toxic paints, preservatives or lead.

There are also many chemicals used for sealing, coating and polishing timber that may pose a hazard to workers during their application. Refer to the material safety data sheet (MSDS) for safety information for these chemicals.

## **Who is at risk?**

People exposed to wood dust at work are at greater risk of developing nose, sinus, throat, lung, and skin conditions.

Health problems may take a long time to develop, and are most common in people who have spent many years at workplaces exposed to high concentrations of wood dust (for example, indoor workplaces with inadequate dust extraction systems).

Dusts from hardwoods are usually finer and therefore more easily inhaled.

Hazardous amounts of wood dust may be generated by jobs like floor sanding, furniture sanding, wood turning, routing, sawing, sweeping and emptying dust filters.

Dust hazards exist in varying degrees from timber felling in the forest to furniture manufacturing and cabinet making in factories and workshops.

The main hazards occur where there is poor natural or mechanical ventilation.

## **Workplace exposure standards for wood products**

Workplace exposure standards (WES) are levels of contaminants in air which must not be exceeded. They are set at a level that is expected to prevent health effects occurring in most workers.

The workplace exposure standard for airborne inhalable wood dust is 1 mg/m<sup>3</sup> for hardwoods and 5 mg/m<sup>3</sup> for softwoods.

The standard for MDF is also 1 mg/m<sup>3</sup> because it can contain hardwood.

The average inhalable wood dust in the breathing zone of the worker must not exceed the WES over an eight hour working shift.

Formaldehyde exposure must be below the WES of 1 ppm when averaged over an eight hour day. Short term exposures should not exceed 2 ppm.

## **Legislation**

### **Duties of employers etc**

Section 19 of the *Occupational Safety and Health Act 1984* requires employers to provide and maintain a work environment in which employees are not exposed to hazards.

Regulations 3.38 and 3.39 of the *Occupational Safety and Health Regulations 1996* require employers, main contractors and self-employed persons to:

- identify toxic atmosphere hazards;
- assess the risk of injury or harm; and
- consider reducing the risk by:
  - (a) an effective ventilation system;
  - (b) an exhaust system that extracts contaminants; and
  - (c) any other means to prevent a person being exposed.

Regulation 5.19 requires compliance with workplace exposure standards.

The law also requires employers and employees to consult in order to resolve safety and health issues in the workplace. If an employee is concerned about his or her health, they should raise the matter with their employer or safety and health representative if there is one.

### **Duties of employees**

Section 20 of the *Act* requires employees to take reasonable care of their own safety and health and avoid adversely affecting the safety and health of others. An employee must comply (as far as reasonably able) with safety instructions, use the protective equipment provided and report work hazards or injuries.

### **Duties of manufacturers, importers and suppliers**

Section 23 of the *Act* requires manufacturers, suppliers and importers of substances for use at a workplace to provide adequate data for the safe use of the substance, both when the substance is supplied, and on request.

### **Duties of suppliers of wood products - Product specifications**

Engineered wood products must be designed and manufactured such that they are safe for the intended use.

Formaldehyde emissions should not exceed the specifications provided in the relevant Australian/New Zealand Standard, for example:

- *AS/NZS 1859.2 Reconstituted wood-based products – specifications – Dry processed fibreboard*. This standard includes formaldehyde emission levels for ultra-low density, low density, medium density and high density dry-processed fibreboards.
- *AS/NZS 4357.0 Structural laminated veneer lumber – specifications*. This standard provides specifications for LVL intended for structural use and includes formaldehyde emission classes.

Other standards may apply in relation to specific intended uses of timber products, covering quality and structural matters.

### **Duties of suppliers of wood products - Information to be provided**

Manufacturers or suppliers of wood products must ensure adequate information is provided to people using the products at workplaces, to inform users about the hazards of the product and recommendations for safe use. This information may be in the form of a material safety data sheet (MSDS) (also called a safety data sheet (SDS)). Information on compliance with relevant Australian Standards should be provided.

## **Control measures**

The preferred and most effective order of control measures is:

### **1. Elimination**

This is possible only if wood is not machined, sawn or sanded, or if all work that produces wood dust is outsourced to another workplace with adequate controls.

### **2. Substitution**

Replacing more hazardous timbers with less hazardous species may be possible if reliable data on health risks is available. For most species however, there is little data available.

Products with lower formaldehyde emissions may be substituted for products with higher formaldehyde emissions.

### **3. Isolation**

Enclose plant or keep workers away from dusty areas.

### **4. Engineering**

#### *Ventilation*

The best way of reducing wood dust at a workplace is by using machines that are enclosed or fitted with effective local exhaust ventilation (LEV).

LEV involves locating an extraction outlet as close as possible to each identified source of dust, and having sufficient air velocity to draw dust away before it becomes airborne. When buying new equipment, choose equipment with integrated dust extraction systems.



On some machines with a single cutting, grinding or sanding face, there may be several sources of dust either thrown, drawn or blown from different parts of the machine. Ideally, each dust source should be controlled by the LEV system.

While most wood dust is from machines, hand sanding fine furniture can be one of the dustiest jobs at the workplace. Hand sanding generally requires the use of respiratory protection.

Formaldehyde risks can be reduced by choosing engineered timber products that have been tested to confirm they comply with the relevant Australian Standards, and using machines with appropriate LEV.

LEV systems consist of a hood to capture the dust, duct work to convey the dust and a mechanism such as a filter or cyclone to remove the dust. Energy to move the air and dust through the system is provided by a fan that is driven by an electric motor.

Each of these components is important and needs to be matched to the job. Specialised knowledge is needed to design an effective LEV system.

Most modern wood working power tools and machines are fitted with one or more local exhaust ventilation hoods or outlets to capture dust.

Small portable machines such as sanders usually have a filter bag attached. These filters generally do not reduce fine dust exposure sufficiently. Larger machines are connected by a duct to a fixed or portable dust collection unit. The filters on these units are more effective. However in either case respiratory protection may need to be worn if workplace exposure standards are likely to be exceeded.

While most modern wood working machines are designed with dust control in mind, the effectiveness of the systems available can vary considerably. Dust control should be considered when purchasing new machinery.

Detailed guidance on the design of ventilation systems for a range of wood working machines is widely available. For example, organisations such as the US National Institute of Occupational Safety and health (NIOSH), the UK Health and Safety Executive (HSE), and the American Conference of Governmental Industrial Hygienists (ACGIH) all publish information on wood working machines. Some of this information is accessible via the internet.

Maintenance of LEV systems is as important as good design. The performance of LEV systems needs to be monitored and the system maintained in accordance with the manufacturer's specifications.

Room exhaust ventilation, or natural ventilation such as an open roller door, is usually inadequate in controlling occupational wood dust hazards.

### **What about older equipment?**

Exhaust ventilation attachments and improvements have also been developed that can be fitted to some earlier machines, for example table saws, band saws, belt sanders and orbital sanders.

Machines and power tools that are difficult to fit with local exhaust ventilation may need to be replaced.

## **5. Administrative controls**

Some examples:

- Use vacuum cleaners – rather than compressed air – to remove accumulated dust from ledges, corners, pits and floors.
- Empty filter bags outdoors, away from work areas, and where the dust will not blow back into the workplace.
- Rotate dusty tasks to reduce workers' exposure times.
- Provide education, supervision and training on wood dust hazards for both managers and employees.
- Monitor risks to ensure they remain as low as possible.
- Workers exposed to wood dust should wash their hands and arms before eating or smoking, especially if handling treated wood.
- Clean work areas frequently.

## **6. Personal protective equipment (PPE)**

Personal protective equipment, such as dust masks or respirators, is a less effective control and should not be used as a substitute for local exhaust ventilation.

PPE is a last line of protection. In some circumstances it may be needed to supplement other measures, to reduce exposure to levels below the workplace exposure standard.

- Respiratory equipment should be manufactured, selected and maintained in accordance with standards AS/NZS 1715 and 1716.
- People with skin sensitive to certain wood dusts should wear suitable protective clothing, eg. coveralls, long sleeves, and properly fitted industrial gloves.

## Further information

Further information relating to many of the matters referred to above may be obtained from:

Chamber of Commerce and Industry

<http://www.cciwa.com/>

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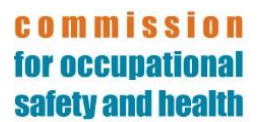
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Comprehensive work safety and health information  
can be found at: [www.worksafe.wa.gov.au](http://www.worksafe.wa.gov.au)

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