GUIDANCE NOTE

Safe use of Chemicals in the Woodworking Industry

WorkSafe
Western
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COMMISSION

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Contents

Safe use of chemicals in the woodworking industry

This Guidance Note is one of three publications dealing with woodworking industry hazards:

- chemicals,
- wood dust, and
- guarding woodworking machinery.

Some chemicals used in the woodworking industry are classed as hazardous by the *Occupational Safety and Health Regulations 1996*, and have specific safety requirements.

These include substances used to treat, preserve, paint, remove paint, varnish, stain, lacquer, clean, seal and glue furniture and wood products.

More detailed advice on the chemicals in each of these substances should be obtained from the manufacturer's Material Safety Data Sheet (MSDS), which must be provided by the supplier and made readily available for people working with or near the chemicals.

Who is at risk?

People involved in the manufacture, repair or restoration of furniture and other wood products, or in the building industry, may be exposed to hazardous chemicals. They include carpenters, joiners, painters, cabinetmakers, assemblers, apprentices, handy-persons and, to some extent, people who sand wood before painting.

What are the hazards?

Chemicals used in woodworking can cause a number of health problems. Each hazardous chemical therefore needs to be identified, assessed and controlled to minimise health risks to employees.

Some chemicals are hazardous when they are stored, decanted, mixed or applied. Other hazardous chemicals, e.g. in treated wood or wood products, may be hazardous if inhaled when the wood is sawn, planed, sanded, turned or drilled.

Some glues, resins and isocyanate based paints and varnishes have caused occupational asthma.

Some solvents can cause respiratory irritation and skin sensitisation (e.g. dermatitis). Solvents can also be absorbed into the bloodstream through skin contact.

Epoxy resins and timber preservatives can cause localised dermatitis and other skin effects.

Medium Density Fibreboard (MDF) when machined can emit two hazardous substances, wood dust and formaldehyde. Wood dust hazards are discussed in the Woodworking Industry Guidance Note, *Controlling Wood Dust Hazards At Work*, published by the WorkSafe Western Australia Commission.

Formaldehyde risks are discussed in this Guidance Note under the heading "What are the health effects?"

How do I know what chemicals I am using?

Chemicals used in the woodworking industry must be labelled. The label must contain basic information about the product and the hazards. More detailed information is available in the Material Safety Data Sheet, which should be available for every hazardous substance used in your workplace.

New timber products are usually labelled by the manufacturer and provide information on the chemicals used. It is more difficult to identify chemicals used on second hand timber. Some information can be obtained from WorkSafe and the Department of Health Western Australia.

In the absence of this information, it is safer to assume there is a hazard and precautions taken to avoid skin contact, breathing in or swallowing the wood dust.

▲ ***Labelled container of adhesive showing additional information.***

How can I be exposed to chemicals?

Most of the chemicals in or applied to wood or wood products may enter the body through breathing, swallowing or skin contact.

Inhalation (breathing in) is the most significant route:

- Chemicals such as adhesives, paint strippers, paints, varnishes, stains and water-based wood preservatives are all chemicals that can be inhaled either as droplets or fumes.
- Detailed information on reducing the risk of inhaling isocyanate vapours and fine droplets containing isocyanates is provided in the WorkSafe Western Australia Commission Guidance Note *Controlling Isocyanate Hazards at Work*.

Absorption through skin contact:

- Some wood preservatives and solvents can be absorbed through the skin.
- Substances such as epoxy resins and timber preservatives can cause local skin effects such as dermatitis.

Swallowing:

- This usually happens through lack of personal protective equipment or poor personal hygiene. Chemicals can be swallowed through biting contaminated fingernails, eating or smoking with contaminated hands or wearing contaminated clothing.

It can also happen when inhaled dust is swallowed, e.g. wood dust containing preservatives such as copper chrome arsenic (CCA).

What are the health effects?

Chemicals used in wood working have varying health effects and information on these can be obtained from the MSDS. Generally chemicals used fall into the following categories:

Solvents

Solvents are used for cleaning wood products (e.g. thinners, mineral turpentine) and stripping paint (e.g. mixtures of methylene chloride and methyl ethyl ketone or MEK).

Solvents have the following health effects:

- Solvent droplets or vapours irritate the eyes, nose and throat.
- When inhaled, solvent fumes have a narcotic effect. Symptoms include dizziness, headaches, light-headedness and nausea. At high concentrations they can cause unconsciousness and even death.

▶ ***Using personal protective equipment when cleaning with solvent.***

- Prolonged or repeated skin exposure can cause dryness, cracking and dermatitis.
- Solvents can be absorbed into the bloodstream through skin contact. Broken or cut skin may allow solvent to be absorbed more quickly.
- High exposure may cause damage to the nervous system, liver and the kidneys.
- Most solvents used in the woodworking industry are highly flammable.
- Methylene chloride (also known as dichloromethane) is found in some paint strippers. It is not flammable but it is listed as a suspected carcinogen (cancer causing) by the National Occupational Health & Safety Commission.

▲ ***Using personal protective equipment when applying lacquer in a spray booth.***

Resins and Coatings

Resins and Coatings are used for decorative finishes and to protect timber. Health effects vary depending on the chemical properties. Examples include:

- Two part polyurethane coatings. The isocyanate curing agents can cause irritation to the respiratory tract and sensitisation (asthma).
- Epoxy resins. The curing agents can cause dermatitis and asthma.

- Lead based paints. These are no longer used on wood but may be found on some old, second hand timber. Lead can build up in the body and cause damage to organs such as the kidneys, and to the nervous system and reproductive systems.

Other coatings and stains are available. Information on the health effects should be obtained from the label and MSDS.

Preservatives

Treated timber is used in structures likely to be exposed to fungi and insect attack. Timber used in woodworking is generally not treated. Nevertheless caution needs to be taken with old or second hand timber that may have been treated with chemicals.

Preservatives include CCA (copper chrome arsenic), creosote, boron, copper and tin compounds.

These preservatives can be inhaled if wood dust is generated or swallowed when eating or smoking with contaminated hands. Some (e.g. creosote, CCA and tin compounds) can be absorbed through the skin. Preservatives can also be inhaled if treated timber is burnt.

▲ ***Untreated pine (on left). Pine treated with CCA (on right).***

The health effects of timber preservatives vary. For example:

- Creosote can cause skin, eye and respiratory irritation. It can also make the skin more sensitive to light and increase the risk of skin cancer.
- The arsenic in CCA preservatives can cause a range of toxic effects on the kidneys, liver, nervous system and blood. The chromium can cause toxic effects as well as chrome ulcers. Both chromium and arsenic can cause cancer.

Information should be obtained for the specific chemical before working with treated timber. This can be achieved by requesting a MSDS.

Glues and MDF

There are several common types.

PVA wood glues used to make joins are relatively low in toxicity and do not produce high concentrations of fumes. They may however cause irritation to the skin.

Urea formaldehyde glues are commonly used for laminating and gluing veneers, and in the manufacture of MDF and chipboard. They produce formaldehyde gas when curing.

Formaldehyde:

- irritates the eyes, nose and throat;
- can sensitise individuals. Symptoms include shortness of breath, wheezing, cough and tightness in the chest;

▲ ***Bundled and stacked Medium Density Fibreboard (MDF).***

- is listed as a category 2 carcinogen by the National Occupational Health & Safety Commission. This means it should be treated as if it was carcinogenic to humans.

For more detailed and specific health effects and precautions for use of each hazardous substance, look at the MSDS that must be made available by the employer. It is the responsibility of the supplier to provide the MSDS to the employer.

What is the risk to my health?

The risk to a person's health is dependent on a number of factors, including;

- the nature of the substance;
- the work process;
- the level of exposure (eg how much is in the air, what controls are in place); and
- for how long a person is exposed.

A risk assessment must be carried out by the employer to determine the level of risk arising from the use of each hazardous substance. This should be done in consultation with the employees and health and safety representatives. Occupational exposure standards have been established for many of the chemicals used in this industry. These are levels that should not be exceeded. Examples include solvents, isocyanates and formaldehyde. Additional information to assist with risk assessment can be found in the MSDS for each of the chemicals involved.

Advice on measuring exposure levels in workplaces can be sought from WorkSafe.

Assistance in understanding the information on the MSDS may be necessary.

Further information on risk assessment can be found in the National Occupational Health and Safety Commission publication *Guidance Note for the Risk Assessment of Health Risks arising from the use of Hazardous Substances in the Workplace [NOHSC:3017(1994)].*

What controls can be used?

Controls should be selected in this order of effectiveness:

Elimination - don't use a chemical if you don't need to.

Substitution - replace a hazardous chemical with a less hazardous one.

Isolation - isolate the work, or separate those doing the work and those in the general area from the hazard.

Engineering controls - general dilution ventilation, local exhaust ventilation or spray booths.

Administrative controls - reduce the time length of exposure by means such as job rotation, rosters etc.

Personal Protective Equipment - use appropriate respirators, goggles, gloves and protective clothing when other methods are not practicable, or as additional precautions.

Several of these options can be used together to achieve higher levels of protection.

The MSDS will inform you of the types of controls appropriate for each chemical.

▲ ***Brush application may be an alternative method for some work.***

What information and training is required?

The purpose of training is to provide information and skills that will allow employees to work safely and to react appropriately if things go wrong.

- Workers must be informed of all identified hazards in the workplace.
- They must be given information, instruction, training and supervision in safe working procedures, including selection, fitting, use, storage and maintenance of personal protective equipment.
- Workers should know how to identify hazards and to report them to a supervisor.
- Training on hazardous substances must include potential health effects of the substances used, control measures, correct use of protective equipment and the need for and details of health surveillance.
- Workers from non-English speaking backgrounds may have special needs. They should be provided with information in their first language and increased supervision if necessary.
- Workers must be trained in cleaning up chemical spills, if required to do so, and in emergency evacuation procedures.
- Training should be ongoing, with regular revision of safe procedures.
- Training should be documented.

▲ ***Only trained persons should enter areas where hazardous materials are used.***

Material Safety Data Sheets (MSDS)

MSDS provide important information needed for the safe use of hazardous substances in the workplace. They contain important information that allows a hazardous substance to be used safely. This includes:

- Company details - e.g. name, address, emergency phone number.
- Identification - e.g. product name, other names, UN number, Dangerous Goods class, Poisons Schedule.
- Physical properties - e.g. appearance, vapour pressure, boiling point, solubility.
- Ingredients - e.g. chemical name, CAS number (an unique number that is assigned to an individual chemical), proportions.
- Health effects - eg long term, short term.
- Precautions for use - e.g. ventilation, other engineering controls, exposure standards.
- Personal protection - e.g. respiratory, eye, skin protection.
- Storage & transport - e.g. storage conditions, dangerous goods class.
- Spills and disposal - e.g. clean up procedures and precautions, disposal.
- Fire & explosion - e.g. fire fighting recommendations, decomposition products.

MSDS are produced by the manufacturer and must be provided to the workplace by the supplier. Employers are responsible for obtaining MSDS and providing them to employees for all chemicals used at their workplace. Employers must ensure that employees understand any information provided to them.

If there are no MSDSs readily available, the employee should ask for them.

What storage controls are there for chemicals?

General principles should involve:

- storing hazardous substances in a cool, lockable, enclosed area with adequate ventilation;
- storing incompatible substances separately and avoiding risks of mixing and cross contamination;
- ensuring all labels remain intact on all containers and packaging;
- where chemicals are decanted into smaller containers, the new container must be adequately labelled. As a minimum the label must contain the name of the product, risk and safety phrases;

▲ ***Signage of a chemical store.***

- limiting access to chemical storage areas to authorised people only;
- ensuring flammable, explosive or toxic substances are stored away from possible sources of electric spark, heat or flame;

- checking all containers against leakage or seepage and keeping lids and caps tightly sealed;
- ensuring forklift and other mobile plant operators are formally trained in safe procedures for chemical containers;
- appropriate fire fighting and emergency equipment;
- monitoring atmospheric contamination and temperature levels in storage areas;
- a well developed evacuation procedure with regular drills for situations such as fire, chemical spills or accidents, and earthquakes.

Chemicals classed as dangerous goods must be stored in accordance with the *Storage of Dangerous Goods Regulations* administered by the Department of Minerals and Petroleum Resources. For further information contact the Department of Minerals and Petroleum Resources on 9222 3333.

There are specific requirements for isocyanates. The WorkSafe Western Australia Commission Guidance Note on *Controlling Isocyanate Hazards at Work* covers these requirements.

Storage of particleboard and MDF

Plywoods, fibre boards, particle boards, MDF and laminated products may continue to give off small amounts of formaldehyde after they leave the manufacturer. These products should be stored in a well ventilated area to avoid the build up of formaldehyde.

Disposal of preservative treated timber

Timber that has been treated with preservative needs to be disposed of appropriately. For further information contact your local council or shire or the Department of Environmental Protection on 9222 7000.

As a general rule, treated and painted timber should not be burned.

First aid facilities

First aid facilities should be appropriate for the hazards in the workplace and should comply with the WorkSafe Western Australia Commission Code of Practice *First Aid, Workplace Amenities and Personal Protective Equipment.* Specific first aid requirements for the type of chemical used can be found in the manufacturer's MSDS. This will provide guidance on measures to be taken when exposure has occurred through inhalation, skin contact, splashes to the eyes or ingestion. Employees may require some assistance in interpreting this data. Assistance may be obtained from employers, manufacturers or WorkSafe. The information from MSDS should be readily available in case of an emergency.

What the law says

The *Occupational Safety and Health Act 1984* says that as far as is practicable, employers must provide and maintain a work environment in which employees are not exposed to hazards. This includes providing a safe system of work, instruction, training, information, supervision and personal protective equipment where appropriate.

The *Act* says employees must take reasonable care of their own safety and health and avoid adversely affecting the safety and health of others. They must comply, as far as possible, with safety instructions, use personal protective equipment provided and report hazards or injuries.

Chemicals that have certain adverse health effects are classified as hazardous substances. The *Occupational Safety and Health Regulations 1996* set down specific requirements for workplaces that use hazardous substances. These cover things such as:

- labelling of containers;
- Material Safety Data Sheets (MSDS);
- induction and safety training;
- risk assessment and control;
- health surveillance; and
- record keeping.

The *Regulations* say employers, main contractors and self employed persons must:

- identify hazardous substances;
- assess the risk of injury or harm; and
- reduce the risk by:
  1. preventing exposure to the hazardous substance;
  2. means other than personal protective equipment; or
  3. where 1 and 2 are not practicable, by the use of personal protective equipment.

The *Regulations* set out specific requirements for manufacturers and suppliers of hazardous substances. Manufacturers must prepare MSDSs and ensure that they are available. Suppliers must label hazardous substances and provide MSDSs to purchasers at the time of purchase and then as requested.

Checklist for Hazardous Substances in the Workplace

This checklist should be completed in workplaces where hazardous substances are used and there may be significant risk of injury or disease as a result of exposure to the substances.

Item	Workplace indicators	yes	no
Register & MSDS - The register of hazardous substances is complete and readily available	Hazardous substances list is complete		
	Complete set of MSDSs available		
	Register readily available		
Labels - Hazardous substances are properly labelled	Original containers have manufacturer's label.		
	Decanted containers labelled with name, risk and safety phrases		
Risk Assessment - Risk assessment has been completed for all hazardous substances and the assessment is recorded in the register.	Risk assessment done for all hazardous substances		
	Record of assessment in the register		
	Report available where risk is significant		
Risk Controls - Practicable control measures have been implemented and maintained to reduce risk associated with the use of hazardous substances.	Risk adequately controlled		
	Hierarchy of controls taken into account		
	Appropriate first aid and emergency facilities provided		
Training - People required to work with hazardous substances have been provided with adequate information, instruction and training.	People who may be exposed to hazardous substances have been trained		
	Record of training includes: health effects, controls, safe work methods, and PPE/clothing		
Health Surveillance - Health surveillance is undertaken where appropriate. This may not be applicable to the workplace.	For substances in Schedule 5.3 if there is a risk - eg lead, isocyanates, asbestos and organophosphorous insecticides: appointed medical practitioner		

Contacts for further information

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www.safetyline.wa.gov.au

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