Hazardous substances

Hazardous substances

Hazardous substances include paints, solvents, lead, powders, lacquers, paint removers, resins, battery acid, used oils, adhesives, degreasers, surface preparation products, rust converters and removers, and dusts.

Hazardous chemicals are substances and mixtures that can be a health hazard if not handled or stored correctly.

Dusts primarily arise from cutting, grinding and sanding. They have a direct route of exposure to the lung and intestinal tract, and can be an irritant to eyes and the skin. Asbestos dust may also be an issue – read more on page 50.

Vehicle emissions, particularly diesel, are a serious problem in automotive workshops, as are welding and paint fumes.

Health effects

Short-term (acute) health effects from hazardous substances and chemicals may include contact dermatitis, burns to the skin and eyes, vomiting and diarrhoea, irritation to the nose/lungs/throat, headache and occupational asthma.

Long-term (chronic) effects include lung cancer, chronic dermatitis, chronic obstructive airway disease, and damage to the reproductive system, kidneys and liver.

Fire and explosion

The use and storage of flammable and oxidising substances (e.g. gases, solvents, combustible dusts used during powder coating, paints) can create serious fire or explosion hazards when they come into contact with potential ignition sources such as:

- welding or cutting torches
- matches, cigarettes and lighters
- sparks and arcs generated by the discharge of static electricity from poorly earthed equipment and portable electric tools, power points, radios and mobile phones
- burner flames
- frictional sparks
- broken electric light globes that expose the hot filament
- hot surfaces (e.g. operating internal combustion engines, heated wires, glowing metals, overheated bearings)
- products that can be self-heating or result in spontaneous combustion
- catalytic reactions
- chemical reactions (e.g. mixing or decanting hazardous chemicals can generate heat or static electricity).

Exposure standards

You must ensure that workers are not exposed to airborne contaminants above workplace exposure standards.

The list of exposure standards is contained within the publication *Workplace Exposure Standards for Airborne Contaminants* (also available within the Hazardous Substances Information System database). The publication, database and current GHS classification chemicals list can be accessed from **safeworkaustralia.gov.au**.

Health monitoring

Health monitoring by a registered medical practitioner experienced in health monitoring must be conducted where there is a significant risk of workers developing an occupational disease due to exposure to hazardous substances (e.g. Isocyanates) or asbestos.

Further information on health monitoring, including links to Safe Work Australia's guidance material for PCBUs, medical practitioners and workers, can be found on the SafeWork SA website.

safework.sa.gov.au

Asbestos

Hazards/risks

Exposure to dust containing asbestos fibres may exist while repairs are undertaken to brakes, clutches and high-temperature gaskets in older vehicles.

Prohibitions on the supply, sale, storage, use, re-use, installation and transport of asbestos-containing products came into effect across Australia on 31 December 2003. Replacement brake pads, brake shoes and clutch plates that are to be fitted to vehicles in Australia must be asbestos-free.

Despite the prohibitions, the potential for exposure to airborne asbestos fibres in motor vehicle workshops may still remain until asbestos components have been progressively removed from older vehicles.

Safety solutions

Develop and implement a comprehensive asbestos removal management plan for brake, clutch and gasket work. If in doubt, seek advice.

Train workers in safe asbestos removal methods.

Supervise work to ensure that management plan procedures are followed, and regularly review the effectiveness of the plan with workers.

Keep an asbestos register.

Provide disposable personal protective equipment (PPE) that is:

- suitable for the nature of the work and the hazard (e.g. gloves, masks, goggles, face shields, respirators)
- comfortable to wear, and of a suitable size and fit
- maintained, repaired or replaced when required
- used or worn by workers who have been trained in its use and care.

Further information

For more information on identifying asbestos-containing components and controlling health risks from asbestos exposure, refer to the *Code of Practice: How to Manage and Control Asbestos in the Workplace.*

safework.sa.gov.au/cop

Asbestos may also be present in products such as cement wall cladding, tiles, lino or older roof cladding that are part of your workshop building structure, especially if it was built before 1990.

Find out more at **asbestos.sa.gov.au**.

Batteries

Hazards/risks

Lead acid batteries are capable of delivering an electric charge at a very high rate.

Gases released when batteries are charging – hydrogen (very flammable and easily ignited) and oxygen (supports combustion) – can result in an explosion.

The acid used as an electrolyte in batteries is also very corrosive and can cause injuries if it comes into contact with workers.

Electrolyte that has been spilled can also cause significant damage to property and the environment.

Safety solutions

Check the manufacturer's instructions, including Safety Data Sheets, for electrolyte spill containment, clean-up and disposal details, and appropriate personal protective equipment (PPE).

Inform, instruct and train workers in safe procedures for using, handling, charging, storing or maintaining batteries.

Regularly check batteries for signs of physical damage or deterioration.

Ensure spill containment and first aid facilities are available in case of an incident.

Provide PPE that is:

- suitable for the nature of the work and the hazard (e.g. when handling or using batteries or the electrolyte)
- comfortable to wear, and of a suitable size and fit
- maintained, repaired or replaced when required
- used or worn by workers who have been trained in its use and care.

Further information

SafeWork SA *Safety Alert – Lead acid batteries*
safework.sa.gov.au

Confined spaces

Hazards/risks

Larger vehicles may contain internal areas where a hazardous atmosphere may occur by design, or as a result of the work being done.

Spraying inside the cavity of vehicles can cause exposure to hazardous chemicals, unsafe oxygen levels and the potential for fire or explosion.

If environmental conditions in service pits are conducive (e.g. limited natural airflow), concentrations of vapours and/or gases may build up to dangerous levels. Asphyxiation may result, or an explosion or fire may occur if flammable vapours or gases contact an ignition source.

Safety solutions

Eliminate the risk as the preferred option (e.g. carry out the work from outside the space).

Substitute the risk, isolate the risk or apply engineering controls (e.g. consider the nature of a confined space and the internal atmosphere).

A risk assessment must be done. A confined space entry permit completed by a competent person may be used as a record of the risk assessment.

Implement safe work practices.

Ensure workers are trained and competent to work in confined spaces.

Ensure an emergency response procedure is developed specifically for emergencies involving confined spaces, including a safe recovery process.

Ensure a competent stand-by person is placed outside a confined space for support and in case of emergency.

Provide ventilation in service pits.

Provide personal protective equipment (PPE) that is:

- suitable for the nature of the work and the hazard (e.g. masks, goggles, face shields, respirators)
- comfortable to wear, and of a suitable size and fit
- maintained, repaired or replaced when required
- used or worn by workers, who have been trained in its use and care.

Further information

Code of Practice: Confined Spaces

safework.sa.gov.au/cop

A sample *Confined Space Entry Permit* can be found on page 93. This is a sample document for you to personalise and tailor to suit your particular business needs and operations.

Dusts, fumes and gases

Hazards/risks

Workers may be exposed to a variety of airborne substances such as dusts, fumes, gases, vapour, mists and smoke. The aim is to keep concentrations of all airborne contaminants as low as is reasonably practicable, regardless of whether they are known to present a health hazard.

Vehicle emissions, particularly diesel, are a serious problem in automotive workshops, as are welding and paint fumes.

Cleanup of dusts, in particular, can exacerbate the problem through re-suspension, and the risk can be transported from the initial exposure/emission point to another (e.g. by air, wind, on clothing).

Dusts, fumes and gases can also pose a potential fire or explosion risk.

Asbestos dust may also be an issue – read more on page 50.

Dusts, fumes and gases can accumulate or remain suspended in the air long after their production has ceased.

Safety solutions

Regularly inspect and clean ventilation and dust collection systems to remove dust build-up.

Isolate the hazard by either enclosing processes or using remote operation (e.g. pendant controls, enclosed vehicle cabs, control rooms).

Install local exhaust ventilation to capture dust, fumes and gases at the source (e.g. use on-tool extraction when cutting or sanding).

Provide personal protective equipment (PPE) that is:

- suitable for the nature of the work and the hazard (e.g. gloves, masks, goggles, face shields, respirators)
- comfortable to wear, and of a suitable size and fit
- maintained, repaired or replaced when required
- used or worn by workers who have been trained in its use and care.

Adopt good workplace hygiene practices – have a regular cleaning routine, preferably using vacuuming or wet mopping instead of sweeping.

Lunchrooms and/or non-work areas should be considered clean zones, and contaminated PPE must be removed before entering these areas.

Further information

For further information on respiratory protection, refer to Australian Standards:

- *AS/NZS1715: Selection, use and maintenance of respiratory protective equipment*
- *AS/NZS1716: Respiratory protective devices*

SafeWork SA *Safety Alert – Local exhaust ventilation*

safework.sa.gov.au

Refer also to the fact sheet *Controlling construction dust with on-tool extraction* available from

hse.gov.uk/pubns/cis69.htm.

Fire and explosion

Hazards/risks

Fire and explosion can result in catastrophic consequences causing serious injury or death, as well as significant property damage.

They occur when three primary elements come together:

- a fuel source (a flammable or combustible substance)
- an oxygen source (usually in the air)
- an ignition source (sufficient to cause ignition).

Safety solutions

Store flammable materials in their original, clearly labelled and tightly sealed containers, away from heat sources, ignition sources or direct sunlight.

Store flammable and oxidising gases outdoors, in a mesh cage (if possible), and separate them from each other by a distance of at least 5 metres.

Keep flammable, explosive or combustible substances at the lowest practicable quantity.

Remove hazardous substances that are not immediately needed (e.g. keep the quantity of spray material in spray areas to a minimum so that it does not exceed what's required for one day's operations).

Return unused or surplus liquids to their designated containers to avoid mixing different liquids.

Eliminate short circuits.

Have suitable, regularly maintained fire extinguishers readily available.

Ensure workers are trained in the use of fire-fighting equipment.

Consider installing a fixed, automatic fire-fighting system, which should be regularly serviced.

Dispose of all waste materials, including chemicals and paint/solvent-soaked rags, as soon as possible.

Hazardous chemicals

Hazards/risks

Some chemicals act as skin irritants, carcinogens or respiratory sensitisers, with adverse health effects usually arising from exposure through inhalation, direct skin contact or ingestion.

Many chemicals can cause a sudden and very strong reaction when they come into contact with bare skin.

Hazards can result from the chemical or physical properties of some substances – they may be flammable, corrosive, oxidising or explosive.

Substances that can cause contact dermatitis include acids, alkalis, oils, solvents, petroleum products, soaps and detergents. Manufactured products which may affect the skin include synthetic rubber, plastics, fibreglass, resins and glue.

From 2017 South Australia has adopted a new system of chemical classification and hazard communication – the *Globally Harmonised System of Classification and Labelling of Chemicals* (GHS).

This replaces all previous systems and is now used to classify the physical health and environmental hazards of workplace chemicals and to standardise information on labels and Safety Data Sheets (SDS). Visit **safeworkaustralia.gov.au** for more information.

Read more about exposure standards and health monitoring on page 49.

Safety solutions

Ensure the SDS for any chemical in use is readily available. Manufacturers and importers of hazardous substances are required to provide warning labels and SDS which list important information on handling products safely, including potential health effects, precautions for use, safe storage suggestions and emergency first aid instructions.

Maintain a central register of hazardous substances.

Replace lids on containers after each use.

Ensure storage areas are fit for purpose and well ventilated.

If possible, have tasks performed without using the hazardous substance (e.g. by changing the method or process).

Substitute hazardous chemicals or irritating substances with less harmful alternatives, where possible.

Use the smallest amount of chemical necessary.

Train workers in the safe handling, use and storage of chemicals (including information about contact dermatitis).

Provide personal protective equipment (PPE) that is:

- suitable for the chemical substances being used, the nature of the work and the hazard (e.g. gloves, goggles, respirators, barrier creams), and as per the SDS
- comfortable to wear, and of a suitable size and fit
- maintained, repaired or replaced when required
- used or worn by workers, who have been trained in its use and care.

Ensure workers adopt good hygiene and housekeeping practices (e.g. hand washing and drying/cleaning up spills, splashes and sprays).

Ensure trained first aid personnel and facilities are available.

Provide cleansers made from vegetable oil to ensure workers do not use solvents to remove grease and other substances from their hands that will not wash off with soap and water.

Ensure workers promptly treat minor cuts and abrasions, regularly use moisturising creams, and seek medical attention if they experience dermatitis symptoms.

Further information

Code of Practice: Managing Risks of Hazardous Chemicals in the Workplace

For specific information on what a manufacturer or importer must include in an SDS and label:

- *Code of Practice – Labelling of Workplace Hazardous Chemicals*
- *Code of Practice – Preparation of Safety Data Sheets for Hazardous Chemicals.*

safework.sa.gov.au/cop

SafeWork SA *Safety Alert – Contact dermatitis*

safework.sa.gov.au

Product safety recall

Subscribe to the recalls section of the Product Safety Australia website **productsafety.gov.au** for daily recall notifications.

These can then be delegated to one or two responsible workers who are tasked with checking for and removing recalled products from use.

Spray painting and powder coating

Hazards/risks

The processes involved in spray painting and powder coating are particularly hazardous due to a combination of factors such as the use, handling and storage of hazardous substances, and exposure to electrical, fire, explosion, noise and plant hazards.

For some high risk activities, such as spray painting and abrasive blasting, PPE should always be used to supplement higher level control measures.

Read more about exposure standards and health monitoring on page 49.

Safety solutions

Use properly designed spray painting booths, enclosed or partially enclosed.

Inspect and maintain spray booths regularly.

Provide breathing air, if required.

Keep spray booths clear of residues and overspray.

Control spray drift in walkways, public areas and air conditioning intake vents.

Provide personal protective equipment (PPE) that is:

- suitable for the nature of the work and the hazard (e.g. gloves, masks, goggles, face shields, respirators)
- comfortable to wear, and of a suitable size and fit
- maintained, repaired or replaced when required
- used or worn by workers who have been trained in its use and care.

Keep records of PPE maintenance (e.g. filter replacement of respiratory protection).

Further information

Code of Practice: Spray Painting and Powder Coating

safework.sa.gov.au/cop

Australian Standards:

- *AS/NZS 4114.1: Spray painting booths, designated spray painting areas and paint mixing rooms – Design, construction and testing*
- *AS/NZS 4114.2: Spray painting booths, designated spray painting areas and paint mixing rooms – Installation and maintenance*
- *AS/NZS1715: Selection, use and maintenance of respiratory protective equipment*
- *AS/NZS1716: Respiratory protective devices*

Quick safety scans – hazardous substances

Use these quick safety scans to look at key work health and safety (WHS) issues in your workplace. Those items where you tick 'Sometimes' or 'Never' will need action to fix or improve. Use the safety solutions suggested earlier to help you.

Asbestos	Always	Sometimes	Never
All asbestos-containing materials are handled safely and appropriately, as per Codes of Practice	☐	☐	☐
An asbestos removal management plan has been developed	☐	☐	☐
The plan is regularly reviewed in consultation with workers	☐	☐	☐
An asbestos register is kept	☐	☐	☐
Workers are trained in safe asbestos removal practices	☐	☐	☐
Health monitoring is carried out (if required)	☐	☐	☐

Batteries	Always	Sometimes	Never
Workers are trained in safe procedures for using, handling, storing and maintaining batteries	☐	☐	☐
There is a procedure for safe charging of batteries	☐	☐	☐
Batteries are regularly checked for signs of physical damage or deterioration	☐	☐	☐
Appropriate PPE is provided and worn when handling or using batteries or the electrolyte	☐	☐	☐
Spill containment and first aid facilities are available	☐	☐	☐
SDS is available for electrolyte spill containment, clean-up and disposal	☐	☐	☐

Confined spaces	Always	Sometimes	Never
Risk assessments are conducted to determine if your workplace has, or work is carried out in, confined spaces	☐	☐	☐
Confined space risks are identified, eliminated or minimised	☐	☐	☐
Confined space entry permits are completed by a competent person	☐	☐	☐
Workers are trained and supervised when working in confined spaces	☐	☐	☐
A specific emergency response procedure has been developed and drills conducted for confined space emergency and recovery	☐	☐	☐
A competent stand-by person is placed outside the confined space for support and in case of emergency	☐	☐	☐
Task-appropriate PPE is provided and used	☐	☐	☐
Workers are trained in the correct use and care of PPE	☐	☐	☐
PPE is maintained, repaired or replaced as required	☐	☐	☐

Dusts, fumes and gases	Always	Sometimes	Never
Ventilation and dust collection systems are regularly inspected and cleaned	☐	☐	☐
Hazards are isolated by enclosing processes or using remote operation	☐	☐	☐
Local exhaust ventilation is installed, where needed	☐	☐	☐
Air quality is monitored (e.g. workers do not suffer from dry, irritated eyes)	☐	☐	☐
Appropriate PPE is issued and worn	☐	☐	☐
Workers are trained in the correct use and care of PPE	☐	☐	☐
PPE is maintained, repaired or replaced as required	☐	☐	☐
Risk assessments are conducted for processes generating dust, smoke, fumes or gases	☐	☐	☐
Lunchrooms/non-work areas are clean zones	☐	☐	☐
Good workplace hygiene is practiced	☐	☐	☐
Health monitoring is carried out (if required)	☐	☐	☐

Fire and explosion	Always	Sometimes	Never
Flammable liquid storage area is free of ignition sources	☐	☐	☐
Spills are cleaned up quickly	☐	☐	☐
The flammable liquids storage area has spill catchment (e.g. steel drip tray, concrete bund)	☐	☐	☐
Paint and solvent containers are earthed during decanting to stop build-up of static electricity	☐	☐	☐
Flammable liquids are only stored with compatible dangerous goods (e.g. no gas cylinders)	☐	☐	☐
Correct type of fire extinguishers are provided and signed appropriately	☐	☐	☐
Fire extinguishers are regularly maintained	☐	☐	☐
Fire extinguishers are located close to potential hazards (e.g. where flammable substances are used)	☐	☐	☐
Waste materials (e.g. paint/solvent-soaked rags) are disposed of as soon as possible	☐	☐	☐
Rubbish is stored away from flammable substances	☐	☐	☐
Flammable, explosive or combustible substances are kept at lowest practicable quantities	☐	☐	☐
Advisory/warning signage is in place (e.g. *Caution – Risk of Fire/Risk of Explosion*)	☐	☐	☐
You have developed an emergency response plan, and it is tested on an annual basis	☐	☐	☐
Emergency wardens are identified and trained to respond in case of an emergency	☐	☐	☐
Emergency exits/evacuation routes are identified and signposted within the workplace	☐	☐	☐

Hazardous chemicals	Always	Sometimes	Never
Risk assessments are regularly conducted for hazardous chemicals	☐	☐	☐
Safe work procedures are in place and workers are trained in the safe handling, use and storage of hazardous chemicals	☐	☐	☐
Legal requirements are met for storage, disposal and licensing	☐	☐	☐
Workers are trained in the safe handling, use and storage of hazardous chemicals	☐	☐	☐
SDS are available for all chemicals in use	☐	☐	☐
A chemical register is kept	☐	☐	☐
Dermatitis-causing substances are identified	☐	☐	☐
Irritating substances are replaced with less hazardous alternatives	☐	☐	☐
Chemical containers are clearly labelled	☐	☐	☐
Containers are tightly closed when not in use	☐	☐	☐
Chemical storage is appropriate and well-ventilated, in accordance with the SDS	☐	☐	☐
Areas where chemicals are used are adequately ventilated	☐	☐	☐
Good workplace hygiene and housekeeping is practiced	☐	☐	☐
Waste oils and other products are disposed of appropriately	☐	☐	☐
Emergency procedures are in place for management of spills and incidents	☐	☐	☐
Spill kit/containment equipment is readily available and workers trained in its use	☐	☐	☐
Advisory/warning signage is in place	☐	☐	☐
Correct PPE (e.g. gloves, safety goggles, protective clothing, barrier creams) is provided and used	☐	☐	☐
Workers are trained in the correct use and care of PPE	☐	☐	☐
PPE is maintained, repaired or replaced as required	☐	☐	☐
Workers use vegetable oil-based cleansers, not solvents, for hand-cleaning	☐	☐	☐
Workers care for their skin by promptly treating minor cuts and abrasions, and using moisturising creams	☐	☐	☐
Workers seek medical attention if they have dermatitis symptoms	☐	☐	☐
Health monitoring is carried out (if required)	☐	☐	☐

Spray painting and powder coating	Always	Sometimes	Never
Ignition sources are removed	☐	☐	☐
Breathing air is supplied	☐	☐	☐
Spray booth is clear of obstructions and the exit is clear	☐	☐	☐
Spray booth is clear of residues and overspray	☐	☐	☐
Mixing room has adequate ventilation	☐	☐	☐
Spray booth is maintained and calibrated (service and filter change records are up-to-date and kept)	☐	☐	☐
Spray drift into other areas is controlled	☐	☐	☐
Respiratory PPE is provided and used	☐	☐	☐
Workers are trained in the correct use and care of PPE	☐	☐	☐
PPE is maintained, repaired or replaced as required	☐	☐	☐
Advisory/warning signage is in place (e.g. *Respiratory Mask Protection Must Be Worn*)	☐	☐	☐
Health monitoring is carried out (if required)	☐	☐	☐