



ACT Health

Hazardous Chemicals Procedure

For managers and workers

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Purpose

The purpose of this document is to inform ACT Health Directorate (ACTHD) managers and workers about the WHS requirements for using, handling, generating and storing hazardous chemicals at a workplace. This procedure supports the Work Health and Safety (WHS) Guideline.

Scope

This procedure applies to the management of hazardous chemicals and dangerous substances, which have specific WHS requirements, that are procured, created, used, handled, stored or disposed of by ACTHD.

This procedure is based on, and uses, material from relevant WHS codes of practice accessed from the [ACT Legislation Register](#). For the latest information on ACT legislation see <https://www.legislation.act.gov.au/>. These codes of practice are designed to be used by duty holders to implement WHS legislation.

Where a domestic chemical (such as dishwashing liquid) is used for its intended purpose, the only safety requirement is for the chemical to be used in accordance with the label and any safety instructions provided by the manufacturer or supplier.

There are specific requirements that are not addressed in this procedure for:

- radiation sources (refer to the [Radiation Safety Management Procedure](#) for more information)
- lead risk work (refer to the *WHS Regulation, Part 7.2*)
- asbestos (refer to section 18 of the [WHS Guideline](#) for more information).

Roles and Responsibilities

Position	Responsibilities
Director-General and Deputy Directors-General, who are officers in accordance with the WHS Act.	<ul style="list-style-type: none">• Ensure that ACTHD applies appropriate resources to:<ul style="list-style-type: none">○ ensure that the risks of hazardous chemicals are managed, and○ comply with the WHS Act and WHS Regulation.
People Strategy and Culture Branch	<ul style="list-style-type: none">• Develop and review the ACTHD WHSMS and provide information about WHS requirements, including changes in WHS legislation and risk assessments.

Position	Responsibilities
Managers	<ul style="list-style-type: none"> • Select chemicals that have the lowest level of toxicity and will perform the required tasks • Maintain a register of workplace hazardous chemicals • Consult with workers and ensure that they understand the hazardous chemicals that they are exposed to • Ensure that risk assessments are undertaken for hazardous chemicals and that the safety precautions specified in the SDS are implemented • Ensure that prohibited chemicals are not used and that restricted chemicals are only used with the required approval • Ensure that the correct SDS for a hazardous chemical is held and accessible to workers • Ensure that air monitoring is undertaken if a hazardous chemical exposure could exceed the exposure standard • Ensure that hazardous chemicals have correct safety signs and labels • Ensure that, where specified quantities of hazardous chemicals are held, that placards are displayed and that a hazardous chemical manifest is available to ACT Fire and Rescue • Ensure that the workplace emergency procedures address hazardous chemical risks, including spills and atmospheric release risks • Maintain the health monitoring program, including providing resources, maintaining a schedule and providing time • Ensure that hazardous chemicals are disposed of correctly.
Workers	<ul style="list-style-type: none"> • Follow safety procedures and instructions • Implement the safety precautions specified in the SDS • Report any incidents or injuries • Report any symptoms that might be an indication of exposure to a hazardous chemical • Participate in consultation processes.

What is a Hazardous Chemical?

Under the WHS Regulation, a hazardous chemical is any substance, mixture or article that satisfies the criteria of one or more [Globally Harmonized System of Classification and Labelling of Chemicals](#) hazard classes, as modified by Schedule 6 of the WHS Regulation. Some hazard classes and categories of the GHS are excluded by the WHS Regulation.

A chemical is classified as hazardous based on the inherent properties of the substance, mixture, article or process that may cause adverse effects to organisms or the environment. There are two broad types of hazards associated with hazardous chemicals, which may present an immediate or long term injury or illness to people.

These are:

- **Health hazards** - These are properties of a chemical that have the potential to cause adverse health effects. Exposure usually occurs through inhalation, skin contact or ingestion. Adverse health effects can be acute (short term) or chronic (long term). Typical acute health effects include headaches, nausea or vomiting and skin corrosion, while chronic health effects include asthma, dermatitis, nerve damage or cancer.
- **Physicochemical hazards** - These are physical or chemical properties of the substance, mixture or article that pose risks to workers other than health risks, as they do not occur as a consequence of the biological interaction of the chemical with people. They arise through inappropriate handling or use and can often result in injury to people and/or damage to property as a result of the intrinsic physical hazard. Examples of physicochemical hazards include flammable, corrosive, explosive, chemically reactive and oxidising chemicals.

The simple way to identify if a chemical is classified as hazardous is to read the SDS. In addition, the Safe Work Australia [Hazardous Chemical Information System](#) provides an internet advisory service that assists managers and workers to find information on chemicals that have been classified in accordance with the [Globally Harmonized System of Classification and Labelling of Chemicals](#) (GHS) by an authoritative source, such as the European Chemicals Authority (ECHA) or the National Industrial Chemicals Notification and Assessment Scheme (NICNAS).

Regulatory Requirements

The regulatory requirements for hazardous chemicals are maintained in:

- Work Health and Safety Regulation 2011, Chapter 7
- [Work Health and Safety \(Managing Risks of Hazardous Chemicals in the Workplace Code of Practice\) Approval 2022.](#)

There are additional requirements for the transport of dangerous goods by road or rail. [The Dangerous Goods \(Road Transport\) Act 2009](#) regulates the movement of dangerous goods by road.

In addition, some substances are regulated as dangerous substances under the [Dangerous Substances Act 2004](#) if they have certain properties, for example explosives or security sensitive substances.

The majority of the chemicals held or used by ACTHD are hazardous chemicals and must be managed in accordance with the WHS Regulation and the code of practice.

Procedure

Procurement of chemicals

Effective risk management of hazardous chemicals starts with the design of a work task and the decision to use a hazardous chemical. ACTHD will select chemicals that have the lowest level of toxicity and will perform the required tasks. Alternatives to the use of chemicals will also be considered.

The procurement process for a hazardous chemical must consider (in addition to the requirements above) the:

- work environment where the hazardous chemical will be used, including ventilation and air monitoring requirements
- views of the workers who will use the hazardous chemical
- existing competencies of the workers who will use the hazardous chemical, including the availability of training to improve capability, if required
- storage of the hazardous chemical, including placards and manifest requirements
- environmental impact of disposing of the hazardous chemical
- impact on the security arrangements at the workplace and the workplace emergency plan.

A formal risk assessment is required for hazardous chemicals used in significant quantities or used on an ongoing basis as part of the procurement process, and before the hazardous chemical is used.

In some cases, managers may need to make a one off purchase of a chemical. This can be undertaken without a documented formal risk assessment. However, the manager must still consider the toxicity of the chemical to be purchased, consult with workers and implement risk controls. It is important to remember that the value of the purchase does not equate to the risk involved.

Risk management

The risk management procedures detailed in [Section 3 – Risk Management](#) apply to hazardous chemicals.

The person or the risk assessment team undertake to assess a hazardous chemical must be able to:

- interpret the information on the label and SDS
- understand the conditions under which the work is undertaken and to foresee potential problems
- communicate and consult effectively with manufacturers, importers, suppliers, managers, technical specialists and workers

- analyse the information assess the exposures and risks
- accurately report the findings.

The person or risk assessment team may need to obtain external professional assistance to assist or undertake a risk assessment, for example when:

- information is required about the design an air-monitoring strategy
- the assessment requires the collection and analysis of samples
- information is required to design, installation and maintenance of control measures such as ventilation systems or fire protection systems
- to interpret monitoring and testing results.

The risk assessment of the hazardous chemical must consider the exposure standard for the hazardous chemical, including the action required to ensure that the exposure standard is not exceeded (including undertaking air monitoring, where required).

- provide health monitoring to workers exposed to the specific hazardous chemicals listed in schedule 14 of the WHS Regulation
- provide information, training, instruction and supervision to workers who use a hazardous chemical - competency-based industry training courses are available
- control ignition sources and accumulation of flammable and combustible substances (including not storing or using flammable and combustible substances in an enclosed environment that is not electrically safe)
- include the specific safety instructions for a hazardous chemical , included in a safety data sheet (SDS) and on the warning label in standard operating procedures
- apply the personal protective equipment (PPE) specified in the SDS for users to ware.

The business unit must ensure that no person at the workplace is exposed to a substance or mixture in an airborne concentration that exceeds the relevant exposure standard for the substance or mixture.

Exposure standards and air monitoring

Exposure standards represent the airborne concentration of a particular substance or mixture that must not be exceeded. There are three types of exposure standard:

- **8-hour time-weighted average:** the average airborne concentration of a particular substance permitted over an eight-hour working day and a five-day working week,
- **peak limitation:** a maximum or peak airborne concentration of a particular substance determined over the shortest analytically practicable period of time which does not exceed 15 minutes
- **short term exposure limit:** the time-weighted maximum average airborne concentration of a particular substance permitted over a 15-minute period.

Exposure standards are based on the airborne concentrations of individual substances that, according to current knowledge, should neither impair the health of, nor cause undue discomfort to, nearly all workers. They do not represent a fine dividing line between a healthy and unhealthy work environment.

Chemicals with workplace exposure standards are listed in the Workplace Exposure Standards for Airborne Contaminants. These exposure standards are also available from the Hazardous Chemical Information System (HCIS) on the Safe Work Australia (SWA) website. The HCIS database contains additional information and guidance for many substances. Although exposure standards may also be listed in Section 8 of the SDS, you should always check the Workplace Exposure Standards for Airborne Contaminants or HCIS to be certain. Guidance on interpreting exposure standards is available in the [Guidance on the Interpretation of Workplace Exposure Standards for Airborne Contaminants](#).

The following information can be used to estimate the level of exposure to a hazardous chemical:

- the quantities used
- the frequency and duration of exposure
- the effectiveness of the controls already in place
- whether workers are working directly with the substance.

The common methods for estimating the exposure to hazardous chemicals are shown in the following table.

Method	Comments
Personal sampling	To determine inhalation exposure
Static area sampling	To determine the level of airborne concentrations of chemicals, however this method is not acceptable for determining compliance with exposure standards.
Air monitoring	Monitoring the workplace contaminant levels for chemicals with exposure standards may be required out to comply with the WHS Regulation. This should be carried out by a person such as an occupational hygienist with skills to carry out the monitoring according to the appropriate standard and to interpret the results. Results from air monitoring indicate how effective the workplace controls are, for example whether ventilation systems are operating as intended. Records of air monitoring for airborne contaminants with exposure standards must be kept and be available to workers who are exposed.

Method	Comments
Observation	For example, looking for evidence of fine deposits on people and surfaces, or the presence of dusts, mists or fumes visible in the air (for example, in light beams), or the presence of odours. Simple tests such as indicator tubes or dust lamps. However, in most cases the amount of exposure may vary throughout the day, so such tests may not establish workers' exposure with confidence, and it may be necessary to undertake detailed air monitoring. For chemicals that present a significant hazard, managers should consider undertaking air monitoring to determine the level of exposure

Risk assessment options

The type of risk assessment that should be conducted will depend on the nature of the work being performed.

A **basic assessment** consists of:

- reviewing the labels and the SDS of the hazardous chemicals and assessing the risks involved in their use
- deciding whether the hazardous chemicals in the workplace are already controlled with existing control measures, as recommended in the SDS or other reliable sources, or whether further control measures are needed.

A **generic assessment**, which involves assessing a particular workplace, area, job or task and the assessment and applying the results to similar work activities that involve the use of the same chemical. When conducting a generic assessment, it is important that the workplace, tasks and hazardous chemicals being assessed are identical in characteristics, properties, potential hazards and risks. Generic assessments must not be used for very high risk chemicals such as carcinogens.

A **detailed assessment**, which must be undertaken when:

- there is a significant risk to health
- for very high risk chemicals such as carcinogens, mutagens, reproductive toxicants or sensitisation agents
- when there is uncertainty about the risk of exposure.

Sensitive workers may still be at risk of exposure to some chemicals, even if monitoring indicates that exposure is below the exposure standard. Exposure standards do not represent a 'no-effect' level. It is important to manage the risk to sensitive workers and to keep exposure to any hazardous chemical, including those that do not have exposure standards, as low reasonably practicable.

Some chemicals, such as isocyanates, are known to be sensitisers and can induce an adverse reaction in workers at levels well below the exposure standard once sensitisation has occurred. If a worker becomes sensitised to a chemical, the exposure standard for that chemical is no longer relevant and control measures, such as improving engineering controls or job rotation, must be implemented.

Information about interpreting exposure standards is available at Safe Work Australia's [Guidance on the Interpretation of Workplace Exposure Standards for Airborne Contaminants](#).

Prohibited and restricted chemicals

The WHS Regulation contains prohibitions or restrictions on certain hazardous chemicals (certain carcinogens) except in specified circumstances. These hazardous chemicals are listed in Schedule 10 of the WHS regulation.

ACTHD must not use a prohibited hazardous chemical and must only use a restricted hazardous chemical with the prior approval of the Director-General. The request for approval should be submitted through People Strategy and be accompanied by an approved risk assessment.

Safety data sheets

The business unit must obtain the current SDS from the manufacturer, importer or supplier of a hazardous chemical. The SDS must comply with the GHS, which generally means the SDS must be less than five years old.

The Work Health and Safety (Preparation of Safety Data Sheets for Hazardous Chemicals Code of Practice) Approval 2022 details the requirements for an SDS.

Where it is not reasonably practicable to comply with the WHS Regulation and prepare an SDS for a hazardous chemical that is a research chemical, waste product or a sample for analysis (because the hazard properties are not fully known), then an acceptable SDS is one that:

- is written in English
- states the name, Australian address and business telephone number of the manufacturer or importer (if relevant)
- states the chemical identity or structure of the chemical, or chemical composition, as far as is reasonably practicable
- states that full identification or hazard information is not available for the chemical, and in the absence of such information a precautionary approach must be taken to handling or storing the chemical
- states any known or suspected hazards

- states any precautions that must be taken in using, handling or storing the chemical, to the extent such precautions have been identified.

Warning labels

Each hazardous chemical, including containers used to decant a hazardous chemical, must be labelled¹.

[Hazardous chemical labels and signs](#) must comply with the [Work Health and Safety \(Labelling of Workplace Hazardous Chemicals Code of Practice\) Approval 2022](#) and GHS requirements.

The labels must include the:

- hazard pictogram
- signal word/s
- hazard statement/s
- precautionary statement/s.

The business unit must also ensure that all containers or pipework that are used with hazardous chemicals are labelled with safety signs.

Reduced labelling is permitted for hazardous chemicals that are:

- supplied in small containers
- research chemicals or samples for analysis, or
- decanted or transferred.

When the identity of a or sample for analysis is not known this should be indicated. Labels for samples for analysis should include as much hazard information as possible, based on the identity and the known or suspected hazards. Where labelling the actual laboratory container is impractical due to its size or the conditions under which it is used, other methods of providing the information can be used, for example:

- a sign attached to the laboratory area next to the location where the samples are placed before testing
- a sign attached to supporting apparatus (for example a fume cabinet)
- a secure swing tag, or
- labelling an outer container.

Therapeutic goods must be labelled in accordance with Therapeutic Goods Administration (TGA) requirements when they are intended for:

- human consumption

¹ Where the entire amount of a decanted hazardous chemical will be used immediately, labelling of its container is not required.

- intake or administration to or by a patient or consumer, or
- use for therapeutic purposes.

If a chemical has an expiry date it must be provided on the label. Chemicals may degrade or decompose over time, and this may:

- change the hazard classification of the chemical, or
- cause a change to the potency or stability of that chemical that is below its acceptable specifications (for example, ethers may form explosive peroxides over time).

If a chemical is identified (apart from a sample) that is not labelled and its composition is not known it must be clearly marked on the container, for example by attaching a label to the container with the statement: **Caution—Do Not Use—Unknown Substance**.

Other labelling requirements

Some products have hazards consistent with GHS hazard classes and categories, but do not meet the definition of a hazardous chemical because they are not substances, mixtures or articles. For example, products where the active ingredient is a live bacterium.

Other products may have hazards that are not classified under the GHS, such as radioactive materials. The GHS requirements for labelling hazardous chemicals do not apply to these products, however business units must still identify, communicate and manage risks. GHS label elements should not be used if the product is not classifiable under the GHS.

While friable asbestos is a hazardous chemical, bonded asbestos containing material (ACM) is not. ACM does not require a GHS complaint label, but must have a danger label that identifies the ACM and includes relevant safety precautions.

Hazardous chemical register

All hazardous chemicals must be included in a business unit hazardous chemical register. The register:

- can be a spreadsheet of a database
- must record the details of the hazardous chemical, where it is stored and the purposes it is used for
- must be available for inspection by HSRs and workers.

Maintaining a register of hazardous chemicals at each workplace (using [Chemwatch](#) or a hard copy document - domestic chemicals used for their intended purpose do not need to be included). Where Chemwatch is used to maintain the hazardous chemical register all workers must have ready access to this information.

Storage

ACTHD business units must establish storage and handling infrastructure and procedures to ensure the safe storage of hazardous chemicals, including:

- identifying risk of physical or chemical reaction of hazardous chemicals and ensuring the stability of hazardous chemicals, including ensuring that [incompatible chemicals are not stored together](#)
- storing flammable gasses and liquids in accordance with the SDS and the manufacturer's or supplier's instructions
- storing and handling gasses in cylinders in accordance with the requirements of AS/NZS 4332: The storage and handling of gases in cylinders
- providing a spill containment system for hazardous chemicals, if necessary
- providing fire protection systems, firefighting equipment and emergency and safety equipment that selected with regard to the hazardous chemicals present
- establishing warning placards and outer warning placards at the workplace, for specified (larger) quantities of a hazardous chemical (where the quantity exceeds that specified in schedule 11 of the WHS Regulation)
- maintaining a manifest for larger quantities of hazardous chemicals (where the quantity exceeds that specified in schedule 11 of the WHS Regulation) and providing notification to the regulator of the manifest quantities
- ensuring the stability and support of containers for bulk hazardous chemicals, including pipework and attachments.

Disposal

ACTHD business units must establish storage and handling infrastructure and procedures to ensure the safe disposal of hazardous chemicals, including:

- ensuring that hazardous chemicals are only disposed of by a licenced operator, and
- where hazardous chemicals are stored or distributed through pipelines, procedures are created and followed to safely decommission the storage and handling systems.

Emergency systems

The workplace emergency plans and documents for the workplace must:

- include a manifest of each hazardous chemical, if the quantity of a class of hazardous chemical at a workplace exceeds the manifest quantity for that hazardous chemical
- ensure that the emergency system and plan is designed and built for the types of hazardous chemicals at the workplace in the quantities in which they are used, handled, generated or stored, and the conditions under which they are used, handled, generated or stored

- consider the type and quantities of hazardous chemicals at the workplace and the type of emergency equipment required to respond to an emergency, contain and clean up spills and assist workers in conducting emergency procedures safely
- ensure that workers who are required to respond to emergencies (for example to clean up spills) are trained (training requirements should be specified in the standard operating procedure and in the learning needs analysis²)
- ensure that equipment is:
 - located so it is readily accessible for all workers if an emergency arises
 - maintained, inspected and tested
 - compatible with the hazardous chemicals they may come in contact with.

The emergency equipment that may be required in the workplace may include:

- over packs such as oversized drums for containing leaking containers
- absorbent material suitable for the chemical likely to be spilled
- booms, plates and/or flexible sheeting for preventing spillage from entering drains and waterways
- fire extinguishers appropriate to the hazardous chemicals stored at the workplace
- neutralising agents such as lime and soda ash
- suitable pumps and hoses for removing spilled material
- first aid kits (including antidotes for specific chemical exposures, where required)
- emergency showers and eye wash stations (refer to the Eyewash and Emergency Shower Procedure)
- hand tools such as mops, buckets, squeegees, and bins
- suitable protective clothing and equipment to protect the personnel involved in the clean-up.

Reviewing control measures

The business unit must ensure that any measures implemented to control hazardous chemical risks are reviewed. Common review methods include workplace inspections, consultation, testing and analysing records and data.

The control measures must be reviewed (and revised if necessary):

- when the control measure does not control the risk
- if atmospheric monitoring indicates that there are concentrations of airborne contaminants that approach (for example reaching greater than half of) the exposure standard

² Refer to the WHS Training and Competency Procedure for information about determining training requirements.

- before a change at the workplace that is likely to give rise to a new or different risk to health and safety that the measure may not effectively control, including a change to:
 - the workplace or work environment
 - a system of work, a process or a procedure
- a new relevant hazard or risk is identified
- the result of consultation indicates that a review is necessary
- a health and safety representative requests a review
- if an SDS or register of hazardous chemicals is changing or has changed
- if a health monitoring report for a worker advises that a worker has been exposed to an elevated level of the chemical or metabolites for that hazardous chemical, or the worker has contracted an injury or disease, or
- every five years.

Records Management

WHS documents must be retained in accordance with the relevant [retention and disposal schedule](#). For example:

- records of notifiable incidents and risk assessments must be retained for 30 years
- records of hazardous chemicals, safety policies and guidelines must be retained for 75 years from the date of last action
- safety investigations in respect of major accidents and inspection of hazardous chemicals and dangerous substances, must be retained for 75 years
- WHS manuals, guidelines and procedures must be retained for 75 years after the procedures are superseded
- health monitoring records must be retained for 75 years
- asbestos management plans must be retained for 75 years from the date that the asbestos is disposed of
- generally other WHS records, including audits and first aid treatment records, must be retained for 5 years.

Managers should refer to the WHS Regulations and the Territory Records (Records Disposal Schedule – Territory Administrative Records Disposal Schedules – Occupational Health & Safety (OH&S) Records Approval 2009 (No.1) when making decisions about the retention and destruction of WHS records.

More information is available at [Records Management](#).

Implementation

This procedure will be published on HealthHQ and include in the Policy Register. People Strategy will communicate information about the requirements of the procedure to:

- managers
- workers
- health and safety representatives.

Compliance with the procedure will be checking during safety inspections, safety investigations and audits.

References and Related Documents

Legislation

- [*Dangerous Substances Act 2004*](#)
- [*Work Health and Safety Act 2011*](#)
- [*Work Health and Safety Regulation 2011*](#)
- [*Work Health and Safety \(Managing Risks of Hazardous Chemicals in the Workplace Code of Practice\) Approval 2022*](#)
- [*Work Health and Safety \(Preparation of Safety Data Sheets for Hazardous Chemicals Code of Practice\) Approval 2022*](#)
- [*Work Health and Safety \(How to Manage and Control Asbestos in the Workplace Code of Practice\) Approval 2020*](#)
- [*Work Health and Safety \(Labelling of Workplace Hazardous Chemicals Code of Practice\) Approval 2022*](#)

References and Standards

- AS 2243.2:2021: Safety In laboratories Part 2 Chemical aspects and storage
- AS/NZS 4332: The storage and handling of gases in cylinders
- AS/NZS 60079.10: Explosive atmospheres—Classification of areas—Explosive gas atmospheres
- AS 1020: The control of undesirable static electricity
- AS 2714: The storage and handling of organic peroxides
- AS 3780: The storage and handling of corrosive substances
- AS 4326: The storage and handling of oxidizing agents
- AS/NZS 5026: The storage and handling of Class 4 dangerous goods
- [*Guidance on the Interpretation of Workplace Exposure Standards for Airborne Contaminants*](#)
- [*Hazardous chemical labels and signs*](#)

Supporting Documents

- [WHS Guideline](#)
- [WHS Requirements for Plant and Equipment](#)
- [Health Monitoring to Protect Workers from Harmful Exposures Procedure](#)
- [Eyewash and Emergency Shower Procedure](#)

Definitions

Term	Definition
ADG Code	The Australian Code for the Transport of Dangerous Goods by Road and Rail, as in force or remade from time to time, approved by the Transport and Infrastructure Council. The ADG Code is accessible at the National Transport Commission website www.ntc.gov.au .
Biological monitoring	The measurement and evaluation of a substance, or its metabolites, in the body tissue, fluids or exhaled air of a person exposed to that substance, such as blood lead level monitoring. Also known as health monitoring.
Combustible substance	A substance that is combustible and includes dust, fibers, fumes, mists or vapours produced by the substance.
Container	Anything in or by which a hazardous chemical is, or has been, wholly or partly covered, enclosed or packed, including anything necessary for the container to perform its function as a container.
Dangerous substance	Dangerous substance means a substance that, in accordance with the <i>Dangerous Substances Act 2004</i> is — (a) classified— (i) as an explosive under the Australian Explosives Code; or (ii) in class 1 (Explosives) under the ADG Code; or (b) asbestos; or (c) a security sensitive substance; or (d) prescribed by regulation to be a dangerous substance; or (e) declared under subsection (2) to be a dangerous substance.
Decant	Means to transfer a hazardous chemical from a correctly labelled container to another container within a workplace. Such a container may range from a small flask in a laboratory to a large vessel that is used to contain reaction components prior to use in a mixing or reaction process. Decant does not include rebottling or repacking a chemical for supply to another workplace.

Term	Definition
Exposure standard	An exposure standard published by Safe Work Australia in <i>the Workplace Exposure Standards for Airborne Contaminants</i> .
Flash point	The lowest temperature (corrected to a standard pressure of 101.3 kPa) at which the application of an ignition source causes the vapours of a liquid to ignite under specified test conditions.
GHS	The <i>Globally Harmonized System of Classification and Labelling of Chemicals, 3rd Revised Edition</i> , published by the United Nations as modified by Schedule 6 to the WHS Regulations.
Hazard category	A division of criteria within a hazard class in the GHS.
Hazard class	The nature of a physical, health or environmental hazard under the GHS. <i>Note: This includes dangerous goods.</i>
Hazardous area	An area in which: <ul style="list-style-type: none"> an explosible gas is present in the atmosphere in a quantity that requires special precautions to be taken for the construction, installation and use of plant, or a combustible dust is present, or could reasonably be expected to be present, in the atmosphere in a quantity that requires special precautions to be taken for the construction, installation and use of plant.
Hazardous chemical	A substance, mixture or article that satisfies the criteria for a hazard class in the GHS (including a classification referred to in Schedule 6 of the WHS Regulations), but does not include a substance, mixture or article that satisfies the criteria solely for one of the following hazard classes: <ul style="list-style-type: none"> acute toxicity—oral—category 5 acute toxicity—dermal—category 5 acute toxicity—inhalation—category 5 skin corrosion/irritation—category 3 serious eye damage/eye irritation— category 2B aspiration hazard—category 2 flammable gas—category 2 acute hazard to the aquatic environment—category 1, 2 or 3 chronic hazard to the aquatic environment—category 1, 2, 3 or 4, or hazardous to the ozone layer. <p>Note: The Schedule 6 tables on the WHS regulation replace some tables in the GHS.</p>

Term	Definition
Hazard pictogram	A graphical composition, including a symbol plus other graphical elements that is assigned in the GHS to a hazard class or hazard category.
Hazard statement	A statement assigned in the GHS to a hazard class or hazard category describing the nature of the hazards of a hazardous chemical including, if appropriate, the degree of hazard. Hazard statements are found in Safety Data Sheets.
Label	Written, printed or graphical information elements concerning a hazardous chemical that is affixed to, printed on, or attached to the container of a hazardous chemical. Labels must use the GHS signs and pictograms.
Mixture	A combination of, or a solution composed of, two or more substances that do not react with each other.
Placard	A sign or notice displayed or intended for display in a prominent place, or next to a container or storage area for hazardous chemicals at a workplace that contains information about the hazardous chemical stored in the container or storage area. Placards must use the Dangerous Goods Signs and symbols.
Precautionary statement	A phrase prescribed by the GHS that describes measures that are recommended to be taken to prevent or minimise the adverse effects of exposure to a hazardous chemical or the improper handling of a hazardous chemical.
Signal words	Signal words are used to indicate the relative level of severity of a hazard. The GHS uses 'Danger' and 'Warning' as signal words. 'Danger' is used for a more severe or significant hazard, while 'Warning' is used for the less severe hazards. Only one signal word should be present on any one label. If the signal word 'Danger' applies, then the signal word 'Warning' should not appear on the label.
Substance	A chemical element or compound in its natural state or obtained or generated by a process: <ul style="list-style-type: none"> including any additive necessary to preserve the stability of the element or compound and any impurities deriving from the process, but excluding any solvent that may be separated without affecting the stability of the element or compound, or changing its composition.

Search Terms

Hazardous chemical/ dangerous goods/ dangerous substances.

Version Control

Version	Date	Comments
1.0	1 November 2021	First Version
2.0	14 February 2023	Second Version – minor edits and update to WHS Code of Practice references
2.1	1 August 2023	Update Australian Standard reference

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Attachment A - Specific risk controls for workplaces that have hazardous chemicals

Safety induction for laboratories

Any person entering laboratory facilities must comply with that laboratory area's processes induction requirements. A laboratory specific safety induction information/checklist will ensure that consistent information about the relevant hazards is communicated during each induction.

The level and detail of the safety induction will depend upon the risk associated with processes carried out and the materials and equipment stored within the on the laboratory. The induction topics should include:

- purchasing process
- chemical labelling
- hazardous chemical and dangerous goods storage
- waste disposal
- spill and emergency procedures
- hazardous chemical information and safety data sheet access
- safe plant and equipment operation, and
- competency based training requirements, laboratory and standard operating procedures.

The induction content should be reviewed regularly, including when the hazards in the area change or following an incident.

Gas cylinders

Compressed, liquefied or dissolved gases are categorised as Class 2 dangerous goods and subcategorised as:

- Class 2.1 - Flammable gases identified by a red dangerous goods diamond (for example, butane)
- Class 2.2 - Non-flammable and non-toxic gases identified by a green dangerous goods diamond (for example, helium), or
- Class 2.3 - Poisonous gases identified by a white dangerous goods diamond (for example, ammonia).

Where a gas presents multiple hazards, additional diamonds will indicate the subsidiary risks, for example, Chlorine Class 2.3 (toxicity) and Class 5.a (oxidising agent).

The majority of accidents involving gas cylinders occur while moving them from one location to another. The control measures reduce the potential for an accident include:

- following standard operating procedures for the movement of gas cylinders
- using purpose-built trolleys or other suitable devices for gas cylinder transportation
- securing the gas cylinder valve, disconnecting and removing associated distribution equipment, and
- ensuring that only competent personnel are permitted to move cylinders.

For information on storage of gas cylinders refer to AS/NZS 4332 The Storage and Handling of Gases in Cylinders.

Refrigeration

The safety precautions for using refrigerated storage for hazardous chemicals including:

- ensuring that that flammable liquids are not stored in refrigerators, unless the refrigerators is intrinsically safe (that is refrigerators that have spark proof wiring)
- that cold rooms must have door fittings that enable the doors to be opened from the inside
- that an emergency light or luminous sign, indicating the position of the door, is be fitted to the inside of the cold room, and
- that the risks associated with the refrigerant (a hazardous chemical) are managed.

Fume cupboards

Where fume cupboards are used:

- all fume cupboards must have regular checks of their face velocity (0.5 metre/second (Measurements should be in accordance with the AS 2243.8, Appendix B. Six monthly smoke testing is recommended for fume cupboards that do not have flow rate metre)
- workers must check that the fume cupboard is working correctly before commencing any procedure
- workers must keep the sash of the fume cupboard as low as possible when working at a fume cupboard
- workers remove all waste from the fume cupboard and decontaminate must at completion of the procedure

- workers must not store a hazardous chemical in the fume cupboard (NOTE: where empty containers are placed in a fume cupboard so that any residual evaporates prior to disposal the exhaust fan will be kept continuously running)
- any work involving the use of perchloric acid must be carried out in fume cupboards that are specifically designed for that purpose, and
- fume cupboards must be tested, inspected and certified annually.

Fire and explosion risks

If there is a possibility of fire or explosion in a hazardous area being caused by an ignition source being introduced into the area, ensure the ignition source is not introduced into the area (from outside or within the space). [Section 3.4](#) of the code of practice identifies the factors that should be considered when assessing risks from fire and explosion.

The control measures for managing these risks include:

- designing buildings and plant to relieve and redirect pressure and flame in the event that an explosion occurs
- installing systems to detect leaks of flammable gases or vapours
- using intrinsically safe equipment
- installing ventilation to avoid creation of a hazardous atmosphere
- substituting flammable materials for ones that are less flammable or combustible
- ensuring incompatible materials are separated or segregated
- reducing quantities of flammable and combustible materials, including items that contribute to the fire load but that are not hazardous chemicals themselves (for example, wooden pallets)
- eliminating ignition sources from hazardous areas (this may include establishing a hot work permit system)
- ensuring equipment used in handling hazardous chemicals is maintained in accordance with the manufacturer's instructions, and
- cleaning to minimise accumulation of combustible dusts.

Chemical oxidisers

Chemical oxidisers can react violently and unexpectedly with many chemicals such as organic material (for example, wood, paper, cellulose products), hydrocarbon solvents (for example, mineral turpentine, petrol, diesel) and other organic (carbon-based) chemicals (for example, ethanol and mineral oils).

You should assess any situation where an oxidiser could come into contact with these types of materials. This includes any containers and other equipment used in handling or

transferring the chemicals. Oxidisers should be handled in compatible containers and with compatible equipment to avoid a dangerous reaction occurring.

It is important to note that, since oxidisers provide oxygen through the chemical reaction, rather than air being the oxygen source, a risk of fire or explosion can still exist even if these materials are handled under an inert atmosphere like nitrogen.

Hot work

Hot work is any process involving grinding, welding, brazing, oxycutting, heat treatment or any other similar process that generates heat or continuous streams of sparks. Undertaking hot work in areas where flammable or combustible chemicals or other materials are present creates a significant risk of fire or explosion.

Conducting hot work on containers such as drums, tanks and pipes that have not been properly decontaminated is a common ignition scenario resulting in fatalities.

A hot work permit system is a system designed to eliminate or minimise risks from these activities, by controlling when and how hot work is undertaken in these areas.

Eliminating ignition sources

Ignition sources must be eliminated from any hazardous area. The WHS Regulation defines a hazardous area as an area in which:

- an explosible gas is present in the atmosphere in quantity that requires special precautions to be taken for the construction, installation and use of plant, or
- a combustible dust is present or could reasonably be expected to be present in the atmosphere in a quantity that requires special precautions to be taken for the construction, installation and use of plant.

Hazardous areas generally exist around flammable or combustible materials, for example, those present in tanks, drums or containers.

This may be achieved by:

- using intrinsically safe electrical equipment (which will not act as an ignition source). (Consider whether the hazardous chemicals can generate flammable or explosive atmospheres, and ensure that any equipment being used, like stirrers, is intrinsically safe)
- ensuring electrical equipment is effectively maintained. Poorly maintained electrical equipment can present a significant risk (for example, through worn brushes)
- ensuring electrical equipment is properly earthed, and
- implementing administrative controls such as hot work permits.

Static electricity can be created from a range of activities including the transfer of hazardous chemicals. Information on control of static electricity can be found in AS 1020: The control of undesirable static electricity.

The auto-ignition temperature of the hazardous chemical should be considered as some hazardous chemicals may ignite spontaneously above certain temperatures.

Further information on hazardous areas can be obtained from Australian Standards.

Reducing vapour emissions

Accumulation of vapours creates the potential for a hazardous area to exist. Vapour emissions resulting from transfer can be minimised by:

- the use of enclosed transfer systems and vapour recovery connections
- keeping lids open only for the minimum period required for transfer
- minimising exposed surface areas
- avoidance of splash filling
- minimising the temperature of liquids being transferred, and
- providing extraction ventilation for all sources of vapour.

When heated, the vapour pressure of flammable and combustible materials may increase, resulting in higher vapour emissions. Containers of hazardous chemicals should therefore be stored away from sources of heat (for example heaters or other heating appliances). Heat may also deteriorate packaging and increase the risk of failure of the container.

Chemical spills

When a spill of a chemical substance occurs, the following procedures should be followed:

Step	Action	Comments
1	Establish what material has been spilt and what personal protective measures must be followed.	This information can be obtained from a SDS (access ChemWatch if a hard copy SDS is not available). Specific information on spills clean-up method should be obtained from the SDS.
2	Ensure that you are wearing the appropriate PPE before commencing the spill clean-up.	Even small quantities of volatile materials spread over a surface in a confined space could generate significant concentrations of fumes, requiring respiratory protection to be worn.

Step	Action	Comments
3	The first step in a spill response procedure is containment.	<p>Spill control kits have been placed in a number of areas. These kits contain protective equipment, absorbents and neutralisers. Safety signs must identify the location of spill kits.</p> <p>Absorbent pillows should be placed around the spill forming a bund to control the spread of the spill. (The correct absorbent pillow must be used for the type of spill).</p>
4	Complete the spill clean-up in accordance with the standard operating procedure	<p>Examples of spill containment include:</p> <ul style="list-style-type: none"> • organics: use vermiculite as absorbent • acids or alkalis: first neutralise then absorb with paper towel, cloth or mop, and • mercury: cover with sulphur then remove with dustpan and a broom before placing in a sealed container.
5	All absorbent or contaminated material must be placed in containers, labelled and disposed of as contaminated waste.	<p>Depending on the type of hazardous chemical, it may need to be placed into a sealed container.</p> <p>Container labels must be labelled in accordance with this procedure.</p>