



3.19 Chemical Safety Management

IMPLEMENTATION

Aim

To prescribe the responsibilities and actions required for the possession, use, storage and disposal of chemicals on University premises and/or during University-related activities to ensure the University meets the requirements of the [Health, Safety and Wellbeing \(HSW\) Policy](#) principles and the relevant sections of the [Work Health and Safety \(WHS\) Act 2012 \(SA\)](#) and [WHS Regulations 2012 \(SA\)](#).

3.19.1 Objectives

- 3.19.1.1 To ensure that the risks of all chemical activities are identified, assessed and the appropriate control measures are in place to prevent an injury and minimise exposure.
- 3.19.1.2 To ensure that all chemical related incidents/injuries have been:
 - investigated;
 - control measures reviewed before the activity is conducted again; and
 - corrective action(s) implemented where required to prevent a recurrence.

3.19.2 Scope

3.19.2.1 Inclusions

This process is applicable to all workers who undertake University of Adelaide related activities, and/or are employed or engaged by the University or affiliated with the University in any capacity as a worker as defined under the [Work Health and Safety \(WHS\) Act 2012 \(SA\)](#). This includes but is not limited to employees, title holders, volunteers, students, visitors or contractors where applicable.

Note that:

- Radioactive chemicals are included under chemical management however for the complete requirements; please refer to HSW Handbook Chapter [Radiation Safety Management](#).
- Nanochemicals are included under chemical management requirements.

3.19.2.2 Exclusions

- This process does not include asbestos management. Please refer to the HSW Handbook Chapter [Asbestos Management](#).
- [Controlled Substances \(therapeutic goods and other matters\) Amendment Bill \(SA\) 2011](#) which affects those areas which are dispensing substances (e.g. hospital and clinical veterinary situations). If applicable refer and apply the Act.
- Veterinary chemical products within the meaning of the [Agricultural and Veterinary Chemicals Code Act](#). "Chemicals at the point of intentional administration to animals". If applicable refer and apply the Act.

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3.19.2.2 Exclusions (Continued)

- There are extra duties (which are not included in this chapter) if you are manufacturing or importing hazardous chemicals. If applicable refer and apply the [WHS Regulations 2012 \(SA\)](#) Reg. 329 - 335.
- There are extra duties (which are not included in this chapter) if you are manufacturing and exporting therapeutic goods. If applicable refer and apply the [Therapeutic Goods Act \(Cth\) 1989](#).
- There are extra duties (which are not included in this chapter) around stock withholding periods found in the [Agricultural and Veterinary Products \(Control of use\) Act \(SA\) 2002](#) and [Regulations \(SA\) 2004](#). If applicable refer and apply the Act.

3.19.3 Process: Purchasing and Receiving of chemicals

| Person Responsible | | Actions |
|--------------------|---|--|
| 3.19.3.1 | All workers identified in the scope of this process | <ul style="list-style-type: none"> □ Review the Safety Data Sheet (SDS) from the manufacturer/ supplier (or refer to Chemwatch) before purchasing, and check the hazards, health effects, precautions for use, safe handling information, storage requirements and exposure standards outlined, to determine if further action is required prior to purchase. This may include: <ul style="list-style-type: none"> • considering if there is a safer alternative if the chemical has been defined as a "Hazardous Chemical" (see definitions); • ensuring that all safety provisions outlined on the SDS have been considered and appropriate control measures implemented; • providing Personal Protective Equipment (PPE); • ensuring appropriate spill kits/emergency contingency arrangements are in place; • storage facilities are in accordance with specifications; and • checking quantities purchased meet fuel load requirements as per Appendix A. □ Ensure the SDS is readily available to all who use the substance or have reasonable need for requesting the information (e.g. first aid officer, goods receiving). |
| 3.19.3.2 | Manager of goods receiving workers | <ul style="list-style-type: none"> □ Ensure that all goods receiving workers understand chemical hazards and are able to readily access information on chemicals (SDS). □ Ensure that all workers are informed and trained on handling and emergency responses for the chemicals they are receiving. |

3.19.4 Process: Storage and Use of Chemicals

| Person Responsible | | Actions |
|--------------------|---|---|
| 3.19.4.1 | Managers and Supervisors of Laboratories, Workshops and Chemical Stores | <ul style="list-style-type: none"> □ Ensure the chemicals are stored and used in accordance with the SDS, Globally Harmonised System of Classification and Labelling of Chemicals (GHS); and the University's Research Instruction or Training Permit (controlled substances). See Appendix A for general storage requirements and Appendix B for controlled substances, plants and equipment. <p style="text-align: right;">Continued</p> |

3.19.4 Process: Storage and Use of Chemicals (Continued)

| Person Responsible | Actions |
|---|--|
| <p>3.19.4.1 Managers and Supervisors of Laboratories, Workshops and Chemical Stores</p> | <ul style="list-style-type: none"> <input type="checkbox"/> Ensure that any chemical used, handled or stored does not become unstable, decompose or change to create another hazard or increase the risk unless it is a part of a deliberate process or activity which has been risk assessed and had controls implemented. <input type="checkbox"/> Ensure that you refer the following information sheets if you require extra information regarding storage and use of specific substances: <ul style="list-style-type: none"> • Hydrofluoric acid Information Sheet, • Cryogenic substances Information Sheet, • Cyanides Information Sheet, • Gas cylinders and Compressed gases Information Sheet, • Peroxidisable and Explosives Information Sheet, and • Nanomaterials Information Sheet. <input type="checkbox"/> Ensure that the holdings of security sensitive chemicals are monitored and these items are secured in accordance with Appendix D Security Sensitive Ammonium Nitrate, Chemicals of Security Concern and Chemical Weapons. <input type="checkbox"/> Ensure that if you are undertaking abrasive blasting or spray painting that it is not undertaken in conjunction with restricted hazardous chemicals (see tables in Appendix C). <input type="checkbox"/> Ensure that if you are undertaking lead processes (as defined by Work Health and Safety Regulations 2012 (SA) Reg. 392 consult with Health, Safety and Wellbeing (HSW) Team for guidance before commencing. <p>Labelling and Placarding</p> <ul style="list-style-type: none"> <input type="checkbox"/> Ensure that all stored chemicals are labelled and placarded in accordance with Appendix F Labelling, Placarding, Registers and Manifests. |
| <p>3.19.4.2 Head of School/Branch</p> <p>(Any or all of these tasks can be delegated to School/Branch staff, however the Head of School/Branch must monitor the tasks on a regular basis to ensure they take place.)</p> | <p>Chemical Register</p> <ul style="list-style-type: none"> <input type="checkbox"/> Maintain a School/Branch hazardous chemical and controlled substances register refer to Appendix F which is updated at least once a year. Note: if your School/Branch wishes to use Chemwatch for chemical registers please contact HSW Team for assistance. <input type="checkbox"/> Ensure that the register is in a format which can be viewed by the emergency services in the event of an emergency <input type="checkbox"/> Ensure that the register is in a format which can be viewed by University or external organisations. <p>Manifest and emergency plan for specific hazardous chemicals</p> <ul style="list-style-type: none"> <input type="checkbox"/> In consultation with the HSW Team prepare and amend a School/Branch chemical manifest and emergency plan if quantities used, handled or stored in a building <u>exceed regulated quantities</u> (see Appendix F). <p style="text-align: right;">Continued</p> |

3.19.4 Process: Storage and Use of Chemicals (Continued)

| Person Responsible | | Actions |
|--------------------|--|---|
| 3.19.4.2 | Head of School/Branch (Continued) | <p>Permits and Licensing</p> <ul style="list-style-type: none"> <input type="checkbox"/> Ensure workers using controlled substances S8 or S9 hold the relevant permit and required records are kept in accordance with Appendix B Controlled Substances. <input type="checkbox"/> Ensure a permit is held and required records kept if using or storing prohibited or restricted carcinogens (see Appendix C). |
| 3.19.4.3 | Associate Director HR Policy, Safety and Compliance (or HSW Team delegate) | <ul style="list-style-type: none"> <input type="checkbox"/> Manage the Controlled substances permit (S2- S7) and the Dangerous Substances licence on behalf of the University. <input type="checkbox"/> Assist Schools with the requirements (including submitting to the emergency services) for chemical manifest and emergency plans if quantities used, handled or stored in a building exceed regulated quantities (see Appendix E). |
| 3.19.4.4 | All workers identified in the scope of this process | <ul style="list-style-type: none"> <input type="checkbox"/> Ensure all chemicals are stored and used in accordance with this chapter of the HSW Handbook and SDS where applicable. |
| 3.19.4.5 | All workers identified in the scope who are pregnant or are considering conception | <ul style="list-style-type: none"> <input type="checkbox"/> If you want extra information please refer to Workers and Reproductive toxicity (female and male), pregnancy and breast feeding Information Sheet |

3.19.5 Process: Chemical Hazard Management

| Person Responsible | | Actions |
|--------------------|--|---|
| 3.19.5.1 | Head of School/Branch (refer to 3.19.4.2 for delegations) | <ul style="list-style-type: none"> <input type="checkbox"/> Ensure that all areas which contain hazardous chemicals have a supervisor/manager responsible for the activities under 3.19.5.2 and 3.19.6.1 (this is normally the overarching academic or lab/workshop manager – Note: it is not appropriate that this person is a student). <input type="checkbox"/> Ensure that there is a risk assessment in place prior to workers conducting activities involving hazardous chemicals (see Appendix E and HSW Handbook Chapter Hazard Management). <input type="checkbox"/> Ensure hazards for specific substances are managed in accordance with the HSW Handbook Chapter Hazard Management. For more information regarding these chemicals refer to the following information sheets: <ul style="list-style-type: none"> • Hydrofluoric Acid, • Cryogenic Substances, • Cyanides, • Gas Cylinders and Compressed Gasses, • Cytotoxic; • Peroxidisable and Explosives, and • Nanomaterials. |

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3.19.5 Process: Chemical Hazard Management (Continued)

| Person Responsible | | Actions |
|--------------------|---|---|
| 3.19.5.1 | <p>Head of School/Branch</p> <p>(refer to 3.19.4.2 for delegations)</p> | <ul style="list-style-type: none"> <input type="checkbox"/> Ensure exposure to a chemical is kept to as low as is reasonably practicable and always below the exposure standards by using the highest level of control where possible. (Note: The aim is to minimise the risk to health as some people may be more sensitive to chemicals than other people. Additionally, the combined effects (synergism) of chemicals in mixtures can be more hazardous to health than the individual substances). <input type="checkbox"/> Ensure that controls are implemented as identified by the risk assessment outcomes. <input type="checkbox"/> Ensure air and health monitoring is conducted where required. See Air & Health Monitoring information sheet. <input type="checkbox"/> Ensure that risk assessments and control measures are reviewed in accordance with the HSW Handbook Chapter Hazard Management. |
| 3.19.5.2 | <p>Managers and Supervisors of Laboratories, Workshops and Chemical Stores</p> | <ul style="list-style-type: none"> <input type="checkbox"/> Ensure that risk assessments are conducted in accordance with the HSW Handbook Chapter Hazard Management. |
| 3.19.5.3 | <p>All workers identified in the scope of this process</p> | <ul style="list-style-type: none"> <input type="checkbox"/> Ensure all activities involving hazardous chemicals are risk assessed and controls are implemented prior to commencement (refer to HSW Handbook Chapter Hazard Management). <input type="checkbox"/> Ensure that control measures are reviewed. |

3.19.6 Process: Training

| Person Responsible | | Actions |
|--------------------|---|---|
| 3.19.6.1 | <p>Managers and Supervisors of Laboratories, Workshops and Chemical Stores</p> | <ul style="list-style-type: none"> <input type="checkbox"/> Ensure that all workers using or handling hazardous chemicals have been appropriately trained on handling, storing and disposing of chemicals. <input type="checkbox"/> Ensure that appropriate supervision is provided where hazardous chemicals are being used (see HSW Handbook Chapter TNA and Training Plan). <input type="checkbox"/> Ensure all mandatory training is recorded on the Training Needs Analysis (or equivalent) in accordance with HSW Handbook Chapter HSW Training. |
| 3.19.6.2 | <p>All workers identified in the scope of this process</p> | <ul style="list-style-type: none"> <input type="checkbox"/> Participate in training on tasks involving hazardous chemicals as required by your Manager/Supervisor. |

3.19.7 Process: Chemical Emergency contingencies and incidents

| Person Responsible | Actions |
|--|---|
| <p>3.19.7.1 Head of School/Branch (refer to 3.19.4.2 for delegations)</p> | <ul style="list-style-type: none"> <input type="checkbox"/> Ensure areas storing and using hazardous chemicals develop, implement and test contingency plans in accordance with Chemical Emergencies and Contingency Arrangements (see Appendix H). <input type="checkbox"/> Ensure a hazardous chemicals manifest is written; where the building is holding above the legislated quantities (see Appendix E). <input type="checkbox"/> Ensure spill kits appropriate to the hazards in the area are made available and workers are trained in their use. <input type="checkbox"/> Ensure emergencies (including spills and exposures) for specific chemicals are managed in accordance with Chemical Emergencies and Contingency Arrangements (see Appendix H and also refer to the following information sheets for extra information): <ul style="list-style-type: none"> • Hydrofluoric Acid, • Cryogenic Substances, • Cyanides, • Gas Cylinders and Compressed Gasses, • Cytotoxic; • Peroxidisables and Explosives, and • Nanomaterials. <input type="checkbox"/> Ensure that there are compliant safety showers and eyewash stations where applicable. <input type="checkbox"/> Ensure that all chemical incidents are reported and investigated in accordance with the HSW Handbook Chapter Incident, Near miss Reporting and Investigation. |

3.19.7 Process: Chemical Emergency contingencies and incidents (Continued)

| Person Responsible | Actions |
|--|--|
| <p>3.19.7.2 All workers identified in the scope of this process</p> | <ul style="list-style-type: none"> <input type="checkbox"/> Ensure you are aware of the relevant emergency contingency arrangements, including the location and use of spill kits, emergency showers/eyewash stations and first aid provisions in your area. <input type="checkbox"/> Participate in any testing of emergency contingency arrangements where required. |

3.19.8 Process: Transportation of Chemicals

| Person Responsible | Actions |
|--|--|
| <p>3.19.8.1 Head of School/Branch (refer to 3.19.4.2 for delegations)</p> | <ul style="list-style-type: none"> <input type="checkbox"/> Ensure workers who transport chemicals do so in accordance with Transportation of Chemicals (see Appendix G). |

3.19.8 Process: Transportation of Chemicals (Continued)

| Person Responsible | | Actions |
|--------------------|---|--|
| 3.19.8.2 | All workers identified in the scope of this process | <input type="checkbox"/> Transport chemicals in accordance with Transportation of Chemicals (see Appendix G). |

3.19.9 Process: Disposal of Chemicals

| Person Responsible | | Actions |
|--------------------|--|--|
| 3.19.9.1 | Head of School/Branch (refer to 3.19.4.2 for delegations) | <input type="checkbox"/> Ensure workers dispose of chemicals in accordance with Chemical Disposal Requirements (see Appendix I) |
| 3.19.9.2 | All workers identified in the scope of this process | <input type="checkbox"/> Dispose of chemicals in accordance with Chemical Disposal Requirements (see Appendix I). <input type="checkbox"/> Ensure that if you are leaving the University permanently that all chemicals are either disposed of or the chemicals are transferred to another worker. |

3.20 Definitions

Airborne contaminants: are defined as a contaminant in the form of a fume, mist, gas, vapour or dust, and includes micro-organisms.

Bunding: A container that can contain the entire contents of a bottle in the event of breakage or spill.

Chronic effects: are defined as effects that usually occur following repeated low dose exposures over an extended period of time, possibly years. Chronic toxicity can affect any organ system.

Controlled substances (or scheduled drugs & poisons): are pharmaceuticals and poisons that require licensing. Under the licence conditions there are restrictions on access, labelling and use. The purpose of the classification is to restrict the accessibility by non-authorised people to particular groups of pharmaceuticals and poisons.

Correct classification: means the set of hazard classes and hazard categories assigned to a hazardous chemical when correctly classified.

Dangerous Goods: are solids, liquids or gases that have been classified as dangerous under the *Australian Code for the Transport of Dangerous Goods by Road or Rail* (the ADG code). Substances in this classification must adhere to legislative requirements when being **transported** by road or rail.

- Packing Group I (PGI) indicates dangerous goods that are highly dangerous.
- Packing Group II (PGII) indicates dangerous goods that are moderately dangerous.
- Packing Group III (PGIII) indicates dangerous goods that are mildly dangerous.

Note the storage of dangerous goods is now included in the term hazardous chemicals. Dangerous goods requirements only are applicable to the transportation.

GHS: means the Globally Harmonised System of classification and Labelling of chemicals (3rd edition).

Hazardous chemical: is a substance, mixture or article that satisfies the criteria for a hazard class in the GHS. This term replaces hazardous substances and the storage of dangerous goods.

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3.19.10 Definitions (Continued)

Hazardous substance (note will be phased out by 31 Dec 2016 the replacement term is hazardous chemical): is defined as a substance that has the potential to cause harm to a person's health, and are defined by the National Occupational Health & Safety Commission (NOHSC). They can be defined as: very toxic, toxic, harmful, irritant, carcinogenic, mutagenic, teratogenic, corrosive, and sensitising.

Hazard Statement means a statement assigned in the GHS to a hazard class of hazard category describing the nature of the hazards of a hazardous chemical including, if appropriate, the degree of hazard (see [Appendix F](#)).

Hazchem Code means a hazchem code under the ADG Code, also known as an emergency action code.

Lead means lead metal, lead alloys, inorganic lead compounds and lead salts of organic acids. For the definition of Lead processes please refer to [WHS Regulations 2012 \(SA\)](#) Reg. 392.

Manifests: are a written summary of the hazardous chemicals used, handled or stored at a workplace which is used by the Emergency Services in the event of an emergency. Its principal purpose is to inform Emergency Services about the chemical hazards that may exist in a building so that appropriate action can be selected to prevent loss of life, minimise property damage and to prevent inappropriate action being taken.

Placarding: means a sign or notice containing information about hazardous chemicals which is displayed in a prominent place, or next to a container or storage area for the chemicals.

Precautionary Statements: is a phrase on the label describing measures recommended to prevent or minimise:

- the adverse effects of exposure to a hazardous chemical; or
- improper handling of a hazardous chemical.

Prohibited and Restricted carcinogens: are substances which require a permit from SafeWorkSA. Note the substances are listed in [Appendix C](#) of this Handbook ([WHS Regulations 2012 \(SA\)](#) Schedule 10 (Table 10.1)). Exemptions apply for substances that are 0.1% or less in concentration.

Research chemical: means a substance or a mixture that is manufactured in a laboratory for genuine research and is not for use or supply for a purpose other than analysis or genuine research.

Safety Data Sheet (an SDS): is a document prepared by the manufacturer or importer of all chemicals that describes uses, chemical and physical properties, health hazard information, precautions for use, safe handling information and emergency information (Note: formerly known as MSDS).

Signal Words: is a one word indicator indicating the level of severity of the hazard. It is required to be on the label under GHS and details can be obtained by referring to the SDS.

Threshold quantity: the quantity at which there is a requirement to implement legislative requirements (below the quantity is exempt).

Worker means according to the [WHS Act 2012 \(SA\)](#) a person who carries out work in any capacity for a person conducting a business or undertaking, including work as -

- | | |
|---|--|
| a) an employee; or | e) an outworker; or |
| b) a contractor or subcontractor; or | f) an apprentice or trainee; or |
| c) an employee of a contractor or subcontractor; or | g) a student gaining work experience; or |
| d) an employee of a labour hire company who has been assigned to work in the person's business or undertaking; or | h) a volunteer; or |
| | i) a person of a prescribed class. |

The person conducting the business or undertaking is also a worker if the person is an individual who carries out work in that business or undertaking. Note -Higher Degree Research students and Academic Visitors are likely to be workers under the [WHS Act 2012 \(SA\)](#).

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3.19.11 Performance Measures

The [HSW Team](#) will use the performance measures listed below to assist in identifying areas of success and/or where corrective action is required to meet the objectives and targets of this process.

The level of compliance with the chapter and effectiveness will be determined during the internal audit process.

| References | Measure | Objective Evidence | Frequency | Indicator of success |
|------------------------|--|---|--------------------------------|--|
| See objective 3.19.1.1 | % of risk assessments held for hazardous chemical activities | <ul style="list-style-type: none"> Risk Assessments Hazardous Chemical Register | As per the Internal audit plan | Success = 100% Less than 100% = Corrective action |
| See objective 3.19.1.2 | % of chemical related incidents which have been investigated and corrective actions implemented (where required) before the activity is conducted again. | <ul style="list-style-type: none"> RMSS Incident/Injury and investigation reports. Where applicable: <ul style="list-style-type: none"> Evidence of review of control measures. Evidence that the Risk Assessment and/or Safe Operating Procedure have been reviewed where applicable. | As per the Internal audit plan | Success = 100% Less than 100% = Corrective action |

3.19.12 Useful information and resources

3.19.12.1 University related documents and resources

- HSW Handbook Chapter [Asbestos Management](#)
- HSW Handbook Chapter [Hazard Management](#)
- HSW Handbook Chapter [HSW Training](#)
- HSW Handbook Chapter [Incident, Near miss Reporting and Investigation](#)
- HSW Handbook Chapter [Radiation Safety Management](#)
- HSW Handbook Chapter [Training Needs Analysis and Training Plan](#)
- [Air & Health Monitoring](#) Information Sheet
- [Cryogenic substances](#) Information Sheet
- [Cyanides](#) Information Sheet
- [Emergency safety showers and eye wash Maintenance](#) Information Sheet
- [Fume Cupboards](#) Information Sheet
- [Gas cylinders and Compressed gases](#) Information Sheet
- [Hydrofluoric acid](#) Information Sheet
- [Nanomaterials](#) Information Sheet
- [Peroxidisable and Explosives](#) Information Sheet
- [Understanding of Safety Data Sheets](#) Information Sheet
- [Workers and Reproductive toxicity \(female and male fertility, pregnancy and breastfeeding\)](#) Information Sheet
- [Chemwatch](#)

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3.19.12.2 Related Legislation

- [Agricultural and Veterinary Chemicals Code Act 1994.](#)
- [Controlled Substances \(SA\) Act 1984.](#)
- [Controlled Substances \(Controlled Drugs, Precursors and Plants\) \(SA\) Regulations 2000.](#)
- [Controlled Substances \(Poisons\) \(SA\) Regulations 2011.](#)
- [Dangerous Substances \(SA\) Act 1979.](#)
- [Dangerous Substances Regulations \(SA\) 2002.](#)
- [Dangerous Substances Transport Regulations \(SA\) 2008.](#)
- [Excise Act \(Cth\) 1901.](#)
- [Explosives Act \(SA\)1936.](#)
- [Explosives Regulation\(SA\) 2011](#)
- [Explosives \(Security Sensitive Substances\) Regulations \(SA\) 2006 \(and exemption gazetted 5 October 2006\).](#)
- [Globally Harmonized System of Classification and Labelling of Chemicals third edition 2009](#)
- [Work Health and Safety Act 2012 \(SA\).](#)
- [Work Health and Safety Regulations 2012 \(SA\).](#)
- [Code of Practice Managing Risks of Hazardous Chemicals in the Workplace 2012.](#)
- [Code of Practice Labelling of Workplace Hazardous Chemicals 2012.](#)
- [Code of Practice for the Storage and Transport of Drugs of Dependence \(December 2012\).](#)
- [National Code of Practice for Chemicals of Security Concern 2013.](#)
- [The Australian Code for the Transport of Dangerous Goods by Road or Rail seventh edition \(2011\).](#)
- [Workplace Exposure Standards for Airborne Contaminants 2013.](#)

3.19.12.3 Other Resources

- [Australia Post Dangerous and Prohibited Goods Packaging and Post Guide \(2009\)](#)
- [Australian Standard, AS 2243 \(series\) \(2006\) Safety in Laboratories.](#)
- [Australian Standard AS 1319 \(1994\) Safety Signs for the Occupational Environment.](#)
- [Australian Standard, AS 1596 \(2008\) The Storage and Handling of LP Gas.](#)
- [Australian Standard, AS 1940 \(2004\) The Storage and Handling of Flammable and Combustible Liquids.](#)
- [Australian Standard, AS 1894 \(1997\) The Storage and Handling of Non-flammable Cryogenic and Refrigerated Liquids.](#)
- [Bretherick's Handbook of Reactive Chemical Hazards 6th ed. Vol 2 1999.](#)
- [Classification and labelling for workplace hazardous chemicals poster.](#)
- [CASA Guidance Sending Dangerous Goods by Air.](#)
- [Guide for Preventing and Responding to Cyanide Poisoning in the Workplace 2013.](#)
- [Human Health Hazard Assessment and Classification of Carbon Nanotubes by the National Industrial Chemicals Notification and Assessment Scheme \(NICNAS\).](#)
- [Hydrogen Fluoride \[NOHSC:5001\(1989\)\].](#)
- [Hazardous Substances Information System.](#)
- [Health Monitoring for Exposure to Hazardous Chemicals Guide for Persons Conducting a Business or Undertaking.](#)
- [Safe and Effective Pesticide Use Handbook \(EPA\).](#)
- [Safe Handling and Use of Carbon Nanotubes.](#)
- [Safe Work Australia poster: classification & labelling for workplace hazardous chemicals.](#)

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STORAGE (GENERAL REQUIREMENTS)

General

- Chemicals and laboratory equipment are not to be stored in offices.
- Chemicals stored on the floor must be a bunding tray.
- If keeping chemicals on shelves they should be below 1.8 metres high where possible.
- Ideally, shelves should have a lip on the forward edge to prevent bottles from slipping off.
- Shelving units should be securely fastened to the wall or floors. Shelves should not be overloaded e.g. shelving is bowed.
- Containers of all types must be in a sound condition, free from rust, deformity and be inspected for any signs of leakage.
- Containers must be made of material which is compatible with, and will not be adversely affected by the chemical.
- Do not reuse food or beverage containers for storage of chemicals excluding food/beverages that are used for research purposes (see [Appendix E](#)).
- Ensure chemicals are appropriately segregated not stored alphabetically (see below).
- Liquids must not be stored above solids unless the liquids are bunded.
- When storing chemicals consider the weight of the chemicals as collapse of the shelves and breakage of bottles could occur.

Segregation

Segregation refers to physical separation of containers and isolation of potential spills and releases with the goal of preventing chemical reactions. The following classes must be segregated from each other and all other classes

- GHS Flammable liquids (DGC 3).
- GHS Flammable solids/Self-reactive/Pyrophoric liquids/Self heating substances/Substances and mixtures which in contact with water emit flammable gases (DGC 4).
- GHS Oxidising solids/Oxidising liquids/Organic peroxides type A-F (DGC 5).
- GHS Acute toxicity (DGC 6.1).
- GHS Corrosion (DGC 8) and within this class prevent reactions between acids and alkalis.

Cabinets

- Bunded, vented chemical cabinets (which are designed to contain spills) are available for minor storage of flammables, corrosive, oxidising and toxic chemicals within buildings (venting may only be required if storing volatile, extremely toxic or corrosive substances).
- Shelving should be appropriate to the substances being stored. For example wooden shelves may burn on contact with some oxidising agents or metal shelves could cause static discharge.

Flammable liquids

- Flammable liquids must not be used or stored near exits to minimise endangering people in the event of a fire.
- Do not store flammables in close proximity to ignition sources.
- Flammable liquids should never be stored in (or alongside) domestic refrigerators as a spark from the motor or internal light can cause an explosion. Where a refrigerator is required to store flammable liquids, it should be intrinsically safe (either from manufacture or by modification).
- Flammable liquid cabinets must not be used for storage of any other substance.
- Flammable liquids should not exceed 2.5L in a fume cupboard.

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Storage Levels of Chemicals AS 2243.10)

WHS Regulations 2012 (SA) Reg. 53 states that flammable and combustible substances must be kept at lowest practicable quantity (includes waste and empty containers and gas cylinders). Below are the Australian Standard ([AS2243.10 \(2004\) Safety in laboratories - Storage of chemicals](#)) quantities, if you need to hold more than these quantities you must conduct a risk assessment specifically for storage on your holdings.

| GHS Class (DG Class) | Storage Location | Maximum amount |
|--|--|--|
| Flammable Liquids (DGC 3) | Outside the flammables cabinet or in other types of storage cabinets | 10L per 50m ² of floor space |
| | Flammable liquids cabinet | No more than 250L |
| Flammable solids (DGC 4.1) | Outside the chemical cabinet or in other types of storage cabinets | 20 Kg per 50m ² |
| | Chemical cabinet | 50 Kg per laboratory |
| Pyrophoric liquids/ Pyrophoric solids/Self heating substances and mixtures (DGC 4.2) | Outside the chemical cabinet or in other types of storage cabinets | 20 Kg or L per 50m ² |
| | Chemical cabinet | 50 Kg or L per laboratory |
| Substances which in contact with water emit flammable gas (DCG 4.3) | Outside the chemical cabinet or in other types of storage cabinets | 20 Kg or L per 50m ² |
| | Chemical cabinet | 50 Kg or L per laboratory |
| Oxidising liquids/ Oxidising solids (DGC 5.1) | Outside the chemical cabinet or in other types of storage cabinets | 20 Kg or L per 50m ² |
| | Chemical cabinet | 50 Kg or L per laboratory |
| Organic peroxides (DGC 5.2) | Outside the chemical cabinet or in other types of storage cabinets | 20 Kg or L per 50m ² |
| | Chemical cabinet | 50 Kg or L per laboratory |
| Acute Toxicity (DGC 6.1) | Outside the chemical cabinet or in other types of storage cabinets | Category 1 (PG1) 10 Kg or L per 50m ² Other categories 50 Kg or L per 50m ² |
| | Chemical cabinet | 250 Kg or L per laboratory |
| Note DGC 7 is not a part of GHS please refer to the HSW Handbook Chapter Radiation Safety Management | | |
| Corrosives (DGC 8) | Outside the chemical cabinet or in other types of storage cabinets | 20 L for liquids per 50m ² 50Kg for solids per 50m ² |
| | Chemical cabinet | 250 Kg or L per laboratory |
| Maximum aggregate quantities | Outside the chemical cabinet or in other types of storage cabinets | 200 Kg or L per 50m ² |

CONTROLLED SUBSTANCES, PLANTS AND EQUIPMENT

Controlled Substances (SA) Regulations are designed to prevent unauthorised access and use of pharmaceuticals, poisons and prohibited substances as well as precursors to these substances. The National Health and Medical Research Council has scheduled all drugs and poisons taking into account toxicity, purpose of use, potential for abuse, safety in use and the requirement for the substance.

A controlled substances permit also includes laboratory equipment for the purposes of analysis, research, instruction and training. Equipment includes common laboratory equipment e.g. reaction vessels, heater-stirrers, etc. which could be used for illegal activities (listed in [table 2](#)). For the items listed in [table 2](#) (page16) please ensure that they are kept in a secure location which is only accessible to authorised workers, and theft or loss is reported to the [HSW team](#).

For controlled plants (listed in [table 2](#) (page16) please contact the [HSW team](#) for permit requirements.

How to identify if a substance is controlled

To identify which Schedule a substance belongs to see Section 2 of the SDS under 'Poisons schedule'.

Permits

a. University Controlled Substances Permit

The University of Adelaide has "Research Instruction or Training Permits" for each of the four campuses (Adelaide, Waite, Roseworthy and Thebarton) which allows the University to manufacture, supply, possess and use Schedule 2, 3, 4, and 7 substances (Note: a permit is not required for S5 and S6 substances).

The permit requires the University to abide by the following conditions:

- The poisons must not be re-sold or supplied to any other person.
- The permit holder shall store scheduled poisons in suitable containers, appropriately labelled and shall store schedule 2, 3, 4 & 7 poisons, when not in use in a locked receptacle or enclosure.
- The poisons shall not be kept elsewhere than at the premises specified, except when in accordance with written guidelines or protocols prepared by or on behalf of the permit holder.
- Access to the poisons shall be restricted to persons under the direction of the permit holder, or in accordance with written guidelines or protocols prepared by or on behalf of the permit holder.
- A record indicating the quantity of each schedule 2, 3, 4 and 7 poison manufactured, produced, received, used or destroyed during the currency of this permit must be kept by the permit holder.
- The permit holder must comply with the requirements of the SA Health Suspected Theft of Loss of Drugs or Substances from licence or permit holder policy dated March 2011

To breach the conditions of the University's permit is an **unlawful act**, which could result in a loss of the University's permit and hence ability to purchase and hold these types of substances. Any breach of these conditions must be reported to the [HSW Team](#).

Please refer to section c for guidelines on how to comply with the conditions.

b. Individual Permits for Schedule 8 & 9 Substances.

Any person intending to obtain and use substances classified as Schedule 8 or 9 is required to obtain an individual permit from SA Health.

The permits will outline the storage, disposal and records requirements.

The University is not immediately responsible for the items; the primary responsibility is retained by the permit holder.

Contact the University's HSW Team for further details on obtaining an S8 or S9 permit.

To breach the conditions of an individual's permit is an **unlawful act**. Any breach (including loss) of these conditions must be reported to the [HSW Team](#).

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CONTROLLED SUBSTANCES, PLANTS AND EQUIPMENT

c. Guidelines for complying with the conditions of the University controlled substances permit

(This guidance does not apply to personal permits for S8 Controlled Drug or S9 Prohibited Substances)

1. The poisons must not be re-sold or supplied to any other person.
 - Within the University it is acceptable to transfer controlled substances between Schools/Branches as each School/Branch is part of the organisation, please ensure that your chemical register is updated if transferred.
 - Where a researcher is moving to another research organisation and is intending to transfer chemicals to that organisation there are a number of issues regarding permits held by the other organisation, transport and security arrangements. Please contact the [HSW team](#) if you wish to transfer any controlled substances with you when moving organisations.
 - Disposal: Poisons/chemicals (not controlled drugs or prohibited substances S8 & S9) can be collected by waste disposal companies as they are doing so for the purpose of destruction/disposal and they hold the appropriate permits to undertake this type of activity.
2. The permit holder shall store scheduled poisons in suitable containers, appropriately labelled, and shall store schedule 2, 3, 4 and 7 poisons, when not in use, in a locked receptacle or enclosure.
 - Requirements for labelling of chemicals are detailed in this Handbook chapter under [Appendix F](#)
 - Schedule 2, 3, 4 and 7 poisons must be stored in a locked cabinet when the chemicals are not in use, or the laboratory/workshop/building must be locked or access restricted by some means when not in use.
3. The poisons shall not be kept elsewhere than the premises specified, except when in accordance with written guidelines or protocols prepared by or on behalf of the permit holder.
 - The four permits the University holds covers each of the four main campuses of the University: Adelaide, Waite, Roseworthy and Thebarton campus. The Adelaide campus permit covers North Terrace and additionally covers staff and students working in the hospitals and field/offsite locations (including permanent locations such as the farms and non-permanent locations such as sites visited on School field trips). When transporting controlled substances to a field trip location a Risk Assessment and Safe Operating Procedure must be written detailing the safe transport and security of the substances (please contact [HSW Team](#) for assistance with this requirement).
4. Access to the poisons shall be restricted to persons under the direction of the permit holder, or in accordance with written guidelines or protocols prepared by or on behalf of the permit holder.
 - Only staff and students given permission to access individual laboratories and workshops are allowed access to the controlled substances in those individual laboratories and workshops. Any person who is not authorised to use chemicals in a laboratory or workshop must be supervised (or not permitted to enter) where controlled substances are not in locked receptacles.
5. A record indicating the quantity of each schedule 2, 3, 4 and 7 poison manufactured, produced, received, used or destroyed during the currency of this permit must be kept by the permit holder.
 - By ensuring the local chemical register is kept up to date a comparison between current and previous years can be made to determine substances used, destroyed or disposed of. Information on chemicals received should be obtainable through purchasing staff.
6. The permit holder shall comply with the requirements of the Department of Health "Suspected Theft or Loss of Drugs or Substances from Licence or Permit Holders" policy dated March 2011
The [HSW Team](#) must be contacted where there are reasonable grounds to suspect the occurrence of:
 - a theft or loss of a drug, prohibited substance, Schedule 7 poison, laboratory equipment or controlled plants, or
 - a quantity of drugs or prohibited substances that cannot be reasonably accounted for; or
 - staff member and/or contractor who has access to such drugs or prohibited substances exhibits such behaviour that you or others may reasonably suspect that they have a drug problem or are diverting drugs or substances.

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CONTROLLED SUBSTANCES, PLANTS AND EQUIPMENT

Schedule of Drugs and Poisons

Drugs and poisons are classified according to the Schedules in which they are included.

Table 1

| Schedule | Signal Words | Access and use requirements |
|------------|---|---|
| Schedule 1 | | [This Schedule is intentionally blank.] |
| Schedule 2 | Pharmacy Medicine | Substances, the safe use of which may require advice from a pharmacist and which should be available from a pharmacy or, where a pharmacy service is not available, from a licensed person. Covered by University Permit |
| Schedule 3 | Pharmacist Only Medicine | Substances, the safe use of which requires professional advice but which should be available to the public from a pharmacist without a prescription. Covered by University Permit |
| Schedule 4 | Prescription Only Medicine, or Prescription Animal Remedy | Substances, the use or supply of which should be by or on the order of persons permitted by State or Territory legislation to prescribe and should be available from a pharmacist on prescription. Covered by University Permit |
| Schedule 5 | Caution | Substances with a low potential for causing harm, the extent of which can be reduced through the use of appropriate packaging with simple warnings and safety directions on the label. Permit is not required |
| Schedule 6 | Poison | Substances with a moderate potential for causing harm, the extent of which can be reduced through the use of distinctive packaging with strong warnings and safety directions on the label. Permit is not required |
| Schedule 7 | Dangerous Poison | Substances with a high potential for causing harm at low exposure and which require special precautions during manufacture, handling or use. These poisons should be available only to specialised or authorised users who have the skills necessary to handle them safely. Special regulations restricting their availability, possession, storage or use may apply. Covered by University Permit |
| Schedule 8 | Controlled Drug | Substances which should be available for use but require restriction of manufacture, supply, distribution, possession and use to reduce abuse, misuse and physical or psychological dependence. Individual Permits are required |
| Schedule 9 | Prohibited Substance | Substances which may be abused or misused, the manufacture, possession, sale or use of which should be prohibited by law except when required for medical or scientific research, or for analytical, teaching or training purposes with approval of Commonwealth and/or State or Territory Health Authorities. Individual Permits are required |

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CONTROLLED SUBSTANCES, PLANTS AND EQUIPMENT

Prescribed Equipment and Controlled Plants

Table 2

| | |
|----------------------|---|
| Prescribed equipment | <ul style="list-style-type: none"> • Condensers • Distillation heads • Heating mantles • Rotary evaporators • Heater-stirrers • Mechanical-stirrers • Pressure reaction vessels • Separatory funnels • Buchner flasks • In-line membrane filters • Reaction vessels • Splash heads • Tube furnaces • Manual or mechanical tablet presses, including parts for such an item • Manual or mechanical encapsulators, including parts for such an item • An item modified to perform the function of a condenser, distillation head, splash head, pressure reaction vessel or tube furnace • A device comprising a hydraulic compression system and a die that is, or may at some stage have been, capable of being used to compress a powdered substance into blocks |
| Controlled Plants | <ul style="list-style-type: none"> • Any plant of the genus <i>Erythroxylum P. Browne</i> including <i>Erythroxylum coca Lam</i> and <i>Erythroxylum nova-granatense</i>. • <i>Papaver bracteatum</i> Lindley. • <i>Papaver somniferum</i> L. • All fungi that contain <i>PSILOCIN</i>. • All fungi that contain <i>PSILOCYBIN</i>. • Any plant containing <i>MESCALINE</i> including any plant of the genus <i>Lophophora</i>. • <i>Salvia divinorum</i> EPL. & <i>Jativa</i> (Diviners Sage). • <i>Mitragyna speciosa</i> Korth (<i>Kratom</i>). • <i>Catha edulis</i> Forsk (<i>Khat</i>). • Any species of the genus <i>Ephedra</i> which contains ephedrine. |

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PROHIBITED/RESTRICTED CARCINOGENS AND RESTRICTED HAZARDOUS CHEMICALS

From 1st January 2014 if your School is conducting genuine research using prohibited or restricted carcinogens (or is intending to hold these substances) they **must** obtain government authorisation. Exemptions apply for substances that are 0.1% or less in concentration. (WHS Regulations 2012 (SA) Schedule 10 (Table 10.1)).

If you have any of the following chemicals and have not obtained a permit or a supplier has requested a permit before supply of a compound, please contact the [HSW team](#) for assistance.

The [SafeWork SA permit process](#) requires an application to be completed which includes a risk management plan and a competent person sign off.

Permits do not have an expiry date and do not have an application fee, however there are fines attached to incorrect data in applications and the onus is on the School to ensure that all the information is up to date.

The School is to review at least once a year (e.g. reminders can be added to the Schedule of Programmable Events) and any changes must be submitted by the School to SafeWorkSA using the amendment form.

Once you have your permit you will be required adhere to any condition for the prohibited/restricted carcinogen.

Your risk management plan and details sent to SafeWorkSA will be subjected to internal and external audits.

| Prohibited Carcinogens | |
|--|---|
| Name [CAS Number] | |
| 2-Acetylaminofluorene [53-96-3] | |
| Aflatoxins | |
| 4-Aminodiphenyl [92-67-1] | |
| Benzidine [92-87-5] and its salts (including benzidine dihydrochloride [531-85-1]) | |
| bis(Chloromethyl) ether [542-88-1] | |
| Chloromethyl methyl ether [107-30-2] (technical grade which contains bis(chloromethyl) ether) | |
| 4-Dimethylaminoazobenzene [60-11-7] (Dimethyl Yellow) | |
| 2-Naphthylamine [91-59-8] and its salts | |
| 4-Nitrodiphenyl [92-93-3] | |
| Restricted Carcinogens | |
| Restricted Use | |
| Acrylonitrile [107-13-1] | All |
| Benzene [71-43-2] | All uses involving benzene as a feedstock (additions into a manufacturing processes) containing more than 50% of benzene by volume and/or genuine research or analysis . |
| Cyclophosphamide [50-18-0] | When used in preparation for therapeutic use in hospitals and oncological treatment facilities, and in manufacturing operations and/or genuine research or analysis . |
| 3,3'-Dichlorobenzidine [91-94-1] and its salts (including 3,3'-Dichlorobenzidine dihydrochloride [612-83-9]) | All |
| Diethyl sulfate [64-67-5] | All |
| Dimethyl sulfate [77-78-1] | All |
| Ethylene dibromide [106-93-4] | When used as a fumigant and/or genuine research or analysis |
| 4,4'-Methylene bis(2-chloroaniline) [101-14-4] MOCA | All |
| 3-Propiolactone [57-57-8] (Beta-propiolactone) | All |
| o-Toluidine [95-53-4] and o-Toluidine hydrochloride [636-21-5] | All |
| Vinyl chloride monomer [75-01-4] | All |

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PROHIBITED/RESTRICTED CARCINOGENS AND RESTRICTED HAZARDOUS CHEMICALS

Restricted Hazardous Chemicals

Ensure that if the School is undertaking activities listed in the "restricted use" column that it is not undertaken in conjunction with the associated restricted hazardous chemical. Please contact [HSW team](#) for more information.

| Restricted hazardous chemicals | Restricted Use |
|---|---|
| Antimony and its compounds | For abrasive blasting at a concentration of greater than 0.1% as antimony |
| Arsenic and its compounds | For abrasive blasting at a concentration of greater than 0.1% as arsenic For spray painting |
| Benzene (benzol), if the substance contains more than 1% by volume | For spray painting |
| Beryllium and its compounds | For abrasive blasting at a concentration of greater than 0.1% as beryllium |
| Cadmium and its compounds | For abrasive blasting at a concentration of greater than 0.1% as cadmium |
| Carbon disulphide (carbon bisulphide) | For spray painting |
| Chromate | For wet abrasive blasting |
| Chromium and its compounds | For abrasive blasting at a concentration of greater than 0.5% (except as specified for wet blasting) as chromium |
| Cobalt and its compounds | For abrasive blasting at a concentration of greater than 0.1% as cobalt |
| Free silica (crystalline silicon dioxide) | For abrasive blasting at a concentration of greater than 0.1% For spray painting |
| Lead and compounds | For abrasive blasting at a concentration of greater than 0.1% as lead or which would expose the operator to levels in excess of those set in the <u>WHS Regulations 2012 (SA)</u> covering lead |
| Lead carbonate | For spray painting |
| Methanol (methyl alcohol), if the substance contains more than 1% by volume | For spray painting |
| Nickel and its compounds | For abrasive blasting at a concentration of greater than 0.1% as nickel |
| Nitrates | For wet abrasive blasting |
| Nitrites | For wet abrasive blasting |
| Radioactive substance of any kind where the level of radiation exceeds 1 Bq/g | For abrasive blasting, so far as is reasonably practicable |
| Tetrachloroethane | For spray painting |
| Tetrachloromethane (carbon tetrachloride) | For spray painting |
| Tin and its compounds | For abrasive blasting at a concentration of greater than 0.1% as tin |
| Tributyl tin | For spray painting |

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SECURITY SENSITIVE AMMONIUM NITRATE, CHEMICALS OF SECURITY CONCERN AND CHEMICAL WEAPONS

Security Sensitive Ammonium Nitrate (SSAN)

The potential for use of ammonium nitrate as a component of explosives has led the Australian Government to impose strict controls on the purchase, storage and use of this substance through the [Explosives \(Security Sensitive Ammonium Nitrate\) Regulations 2006](#). The University has obtained an exemption from the full range, but not all, of these controls. The exemption (Gazette 5 October 2006) is subject to the following conditions:

- All purchases must be recorded in an auditable format.
- All use and disposal must be recorded in an auditable format listing quantity and date.
- Records must be kept for 5 years.
- All records must be made available to an Inspector of Explosives on request within 14 days.
- Loss or theft is to be reported to SafeWork SA Dangerous Substances Department and the SA Police.
- Procedures for security are written and SSAN is secured.
- No more than 3kg is allowed to be kept in a laboratory or other area of use at any time.

Solid (powder) at a concentration of greater than 45% has been classified as Security Sensitive Ammonium Nitrate (SSAN). Solutions of ammonium nitrate are not subject to the legislation.

Chemicals of Security Concern

This national code is concerned with specific chemicals which can be diverted from legitimate research/agricultural/veterinary uses into unlawful purposes.

The University of Adelaide is adopting the intent of this code by restricting the quantity and applying security restrictions to the 96 chemicals of security concern (see [Table 1](#) below)

If your laboratory exceeds the University prescribed quantities (see [Table 1](#) below) then the chemical is subject to the following conditions:

- All purchases must be recorded in an auditable format.
- All use and disposal must be recorded in an auditable format listing quantity and date.
- Records (of purchase, use and disposal) must be kept for 5 years.
- Loss or theft is to be reported to the [HSW team](#) who will notify National Security (1800 124900).
- Procedures for security are written and implemented.

Please note that some of the following chemicals (see [Table 1](#) (** indicates a chemical weapon) and [Table 2](#)) are also under the control of the [Chemical Weapons \(prohibition\) Act \(Cth\)](#), if you have any of the indicated chemicals please contact the [HSW team](#) for assistance with permit and notification requirements

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SECURITY SENSITIVE AMMONIUM NITRATE, CHEMICALS OF SECURITY CONCERN AND CHEMICAL WEAPONS

Table 1: Chemicals of Security Concern

| Chemical | Cas number | Concentrations | University Prescribed Quantities per Laboratory |
|---------------------------|------------|--|---|
| Aldicarb | 116-06-3 | All concentrations | 100g or mL |
| Aluminium phosphide | 20859-73-8 | All concentrations | 100g or mL |
| Ammonium nitrate * | NA | Powders at 45% or greater | All holdings |
| Ammonium perchlorate | 7790-98-9 | Water-based solutions 10% or greater All other forms 65% or greater | 2Kg or L |
| Arsenic pentoxide | 1303-28-2 | All concentrations | 1Kg or L |
| Arsenic trioxide | 1327-53-3 | All concentrations | 1Kg or L |
| Arsine | 7784-42-1 | All concentrations | 100g or mL |
| Azinphos methyl | 86-50-0 | All concentrations | 100g or mL |
| Bendiocarb | 22781-23-3 | All concentrations | 100g or mL |
| Beryllium sulfate | 13510-49-1 | All forms 65% or greater | 500g or mL |
| Bromine | 7726-95-6 | All concentrations | 2Kg or L |
| Cadusafos | 95465-99-9 | All concentrations | 100g or mL |
| Calcium cyanide | 592-01-8 | All concentrations | 100g or mL |
| Carbofuran | 1563-66-2 | All concentrations | 100g or mL |
| Carbon disulphide | 75-15-0 | All concentrations | 2Kg or L |
| Carbon monoxide | 630-08-0 | All concentrations | 50L |
| Chloropicrin** | 76-06-2 | All concentrations | 15Kg or L |
| Chlorfenvinphos | 2701-86-2 | All concentrations | 200mL |
| Chlorine | 7782-50-5 | All concentrations | 50L |
| Cyanogen bromide | 506-68-3 | All concentrations | 1Kg or L |
| Cyanogen chloride** | 506-77-4 | All concentrations | 15Kg |
| Diazinon | 333-41-5 | All concentrations | 1Kg or L |
| Dichlorvos | 62-73-7 | All concentrations | 5Kg or L |
| Diethyl phosphite** | 762-04-9 | All concentrations | 20Kg |
| Dimethyl phosphite** | 868-85-9 | All concentrations | 20Kg |
| Dimethyl mercury | 593-74-8 | All concentrations | 100g or mL |
| Dimethyl sulfate | 77-78-1 | All concentrations | 1Kg or L |
| Disulfoton | 298-04-4 | All concentrations | 100g or mL |
| Endosulfan | 115-29-7 | All concentrations | 40Kg or L |
| Ethion | 563-12-2 | All concentrations | 100g or mL |
| Ethyl mercury chloride | 107-27-7 | All concentrations | 100g or mL |
| Ethylthioethanolamine** | 139-87-7 | All concentrations | 20Kg or L |
| Fenamiphos | 22224-92-6 | All concentrations | 100g or mL |
| Fluorine gas | 7782-41-4 | All concentrations | 2 x D sized cylinder = 20L |
| Fluoroacetic acid | 144-49-0 | All concentrations | 50g or mL |
| Fluoroethyl alcohol | 371-62-0 | All concentrations | 100g or mL |
| Fluoroethyl fluoroacetate | 459-99-4 | All concentrations | 100g or mL |
| Hydrochloric acid | 7647-01-0 | 30% or greater | 100Kg or L |
| Hydrogen chloride | 7647-01-0 | All concentrations | 1Kg or L |
| Hydrogen cyanide** | 74-90-8 | All concentrations | 15Kg or L |

* See SSAN section above for restrictions on ammonium nitrate.

** Also controlled under the [Chemical Weapons \(prohibition\) Act \(Cth\) 1994](#) see [chemical weapons](#) (page 22).

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SECURITY SENSITIVE AMMONIUM NITRATE, CHEMICALS OF SECURITY CONCERN AND CHEMICAL WEAPONS

Table 1: Chemicals of Security Concern (Continued)

| Chemical | Cas number | Concentrations | University Prescribed Quantities per Laboratory |
|----------------------------|------------|---|---|
| Hydrogen peroxide | 7722-84-1 | Water-based solutions any concentration All other forms 15% or greater | 10Kg or L |
| Hydrogen sulphide | 7783-06-4 | All concentrations | 2 x D sized cylinder = 20L |
| Magnesium phosphide | 12057-74-8 | All concentrations | 100g or mL |
| Mercuric chloride | 7487-94-7 | 5% or greater | 1Kg or L |
| Mercuric nitrate | 10045-94-0 | All concentrations | 500g or mL |
| Mercury cyanide | 592-04-1 | All concentrations | 100g or mL |
| Methamidophos | 10265-92-6 | All concentrations | 100g or mL |
| Methidathion | 950-37-8 | All concentrations | 100g or mL |
| Methiocarb | 2032-65-7 | All concentrations | 100g or mL |
| Methomyl | 16752-77-5 | All concentrations | 100g or mL |
| Methyl Fluoroacetate | 453-18-9 | All concentrations | 100g or mL |
| Methyldiethanolamine** | 105-59-9 | All concentrations | 20Kg or L |
| Mevinphos | 7786-34-7 | All concentrations | 100g or mL |
| Nitric acid | 7697-37-2 | At a concentration of 30% or higher | 50L |
| Nitric oxide | 10102-43-9 | All concentrations | 2 x G sized cylinder = 96L |
| Nitromethane | 75-52-5 | At a concentration of 10% or higher | 5L |
| Omethoate | 1113-02-6 | All concentrations | 2Kg or L |
| Osmium tetroxide | 20816-12-0 | At a concentration of 10% or higher | 200g or mL |
| Oxamyl | 23135-22-0 | All concentrations | 100g or mL |
| Paraquat | 4685-14-7 | At a concentration of 30% or higher | 1Kg or L |
| Parathion methyl | 298-00-0 | All concentrations | 100g or mL |
| Perchloric acid | 7601-90-3 | All concentrations | 100Kg or L |
| Phorate | 298-02-2 | All concentrations | 100g or mL |
| Phosgene** | 75-44-5 | All concentrations | 15 Kg or L |
| Phosphine | 7803-51-2 | All concentrations | 2 x D sized cylinder = 20L |
| Phosphorus | 7723-14-0 | All concentrations | 200g or mL |
| Phosphorus oxychloride** | 10025-87-3 | All concentrations | 20Kg or L |
| Phosphorus pentachloride** | 10026-13-8 | All concentrations | 20Kg or L |
| Phosphorus trichloride** | 7719-12-2 | All concentrations | 2 Kg |
| Potassium chlorate | 3811-04-9 | Water-based solutions 10% or greater All other forms 65% or greater | 2Kg or L |
| Potassium cyanide | 151-50-8 | All concentrations | 1Kg or L |
| Potassium nitrate | 7757-79-1 | Water-based solutions 10% or greater All other forms 65% or greater | 10Kg or L |
| Potassium perchlorate | 7778-74-7 | Water-based solutions 10% or greater All other forms 65% or greater | 2Kg or L |
| Propoxur | 114-26-1 | All concentrations | 100g or mL |
| Sodium azide | 26628-22-8 | At a concentration of 95% or higher | 5Kg |

* See SSAN section above for restrictions on ammonium nitrate.

** Also controlled under the [Chemical Weapons \(prohibition\) Act \(Cth\) 1994](#) see [chemical weapons](#) (page 22).

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SECURITY SENSITIVE AMMONIUM NITRATE, CHEMICALS OF SECURITY CONCERN AND CHEMICAL WEAPONS

Table 1: Chemicals of Security Concern (Continued)

| Chemical | Cas number | Concentrations | University Prescribed Quantities per Laboratory |
|-------------------------|------------|--|---|
| Sodium chlorate | 7775-09-9 | Water-based solutions 10% or greater All other forms 65% or greater | 5Kg |
| Sodium cyanide | 143-33-9 | All concentrations | 1Kg or L |
| Sodium fluoroacetate | 62-74-8 | All concentrations | 500g or mL |
| Sodium perchlorate | 7601-89-0 | Water-based solutions 10% or greater All other forms 65% or greater | 10Kg |
| Sodium nitrate | 7631-99-4 | Water-based solutions 10% or greater All other forms 65% or greater | 2Kg |
| Strychnine | 57-24-9 | All concentrations | 100g or mL |
| Sulfur dichloride** | 10545-99-0 | All concentrations | 20Kg or L |
| Sulfur monochloride** | 10025-67-9 | All concentrations | 20Kg or L |
| Sulphuric acid | 7664-93-9 | At a concentration of 30% or higher | 50L |
| Terbufos | 13071-79-9 | All concentrations | 100g or mL |
| Thallium sulphate | 10031-59-1 | All concentrations | 100g or mL |
| Thionyl chloride** | 7719-09-7 | All concentrations | 20Kg or L |
| Thiophosphoryl chloride | 3982-91-0 | All concentrations | 200g or mL |
| Triethanolamine** | 102-71-6 | All concentrations | 20Kg or L |
| Triethyl phosphite** | 122-52-1 | All concentrations | 20Kg or L |
| Trimethyl phosphite** | 121-45-9 | All concentrations | 20Kg or L |
| Zinc cyanide | 557-21-1 | All concentrations | 1Kg or L |
| Zinc phosphide | 1314-84-7 | All concentrations | 30Kg or L |

Table 2 Chemical Weapons

The production, use, transfer or holding of certain substances are controlled under the [Chemical Weapons \(prohibition\) Act \(Cth\) 1994](#). If you have any of the below chemicals please contact the [HSW team](#) for assistance with permit and notification requirements.

| Chemical Weapons | |
|--|-----------------------|
| Schedule 1 | CAS (Registry number) |
| O-Alkyl (<=C10, incl. cycloalkyl) alkyl (Me, Et, n-Pr or i-Pr)-phosphonofluoridates | |
| O-Isopropyl methylphosphonofluoridate | (107-44-8) |
| O-Pinacolyl methylphosphonofluoridate | (96-64-0) |
| O-Alkyl (<=C10, incl. cycloalkyl) N,N-dialkyl (Me, Et, n-Pr or i-Pr) phosphoramidocyanidates | |
| O-Ethyl N,N-dimethyl phosphoramidocyanidate | (77-81-6) |
| O-Alkyl (H or <=C10, incl. cycloalkyl) S-2-dialkyl (Me, Et, n-Pr or i-Pr)-aminoethyl alkyl (Me, Et, n-Pr or i-Pr) phosphonothiolates and corresponding alkylated or protonated salts | |
| O-Ethyl S-2-diisopropylaminoethyl methyl phosphonothiolate | (50782-69-9) |
| Sulfur mustards: | |
| 2-Chloroethylchloromethylsulfide | (2625-76-5) |
| Mustard gas: Bis(2-chloroethyl)sulfide | (505-60-2) |

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SECURITY SENSITIVE AMMONIUM NITRATE, CHEMICALS OF SECURITY CONCERN AND CHEMICAL WEAPONS

Table 2 Chemical Weapons (Continued)

| Chemical Weapons | |
|---|-----------------------|
| Schedule 1 | CAS (Registry number) |
| Bis(2-chloroethylthio)methane | (63869-13-6) |
| Sesquimustard: 1,2-Bis(2-chloroethylthio)ethane | (3563-36-8) |
| 1,3-Bis(2-chloroethylthio)-n-propane | (63905-10-2) |
| 1,4-Bis(2-chloroethylthio)-n-butane | (142868-93-7) |
| 1,5-Bis(2-chloroethylthio)-n-pentane | (142868-94-8) |
| Bis(2-chloroethylthiomethyl)ether | (63918-90-1) |
| O-Mustard: Bis(2-chloroethylthioethyl)ether | (63918-89-8) |
| Lewisites: | |
| Lewisite 1: 2-Chlorovinylchloroarsine | (541-25-3) |
| Lewisite 2: Bis(2-chlorovinyl)chloroarsine | (40334-69-8) |
| Lewisite 3: Tris(2-chlorovinyl)arsine | (40334-70-1) |
| Nitrogen mustards: | |
| HN1: Bis(2-chloroethyl)ethylamine | (538-07-8) |
| HN2: Bis(2-chloroethyl)methylamine | (51-75-2) |
| HN3: Tris(2-chloroethyl)amine | (555-77-1) |
| Saxitoxin | (35523-89-8) |
| Ricin | (9009-86-3) |
| Schedule 1 Precursors | (CAS Registry number) |
| Alkyl (Me, Et, n-Pr or i-Pr) phosphonyldifluorides | |
| Methylphosphonyldifluoride | (676-99-3) |
| O-Alkyl (H or <=C10, incl. cycloalkyl) O-2-dalkyl (Me, Et, n-Pr or i-Pr)-aminoethyl alkyl (Me, Et, n-Pr or i-Pr) phosphonites and corresponding alkylated or protonated salts | |
| O-Ethyl O-2-diisopropylaminoethyl methylphosphonite | (57856-11-8) |
| Chlorosarin: O-Isopropyl methylphosphonochloridate | (1445-76-7) |
| Schedule 2 | (CAS Registry number) |
| Amiton: O,O-Diethyl S-[2-(diethylamino)ethyl] phosphorothiolate and corresponding alkylated or protonated salts | (78-53-5) |
| PFIB: 1,1,3,3,3-Pentafluoro-2-(trifluoromethyl)-1-propene | (382-21-8) |
| BZ: 3-Quinuclidinyl benzilate (*) | (6581-06-2) |

Continued

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SECURITY SENSITIVE AMMONIUM NITRATE, CHEMICALS OF SECURITY CONCERN AND CHEMICAL WEAPONS

Table 2 Chemical Weapons (Continued)

| Schedule 2 Precursors | (CAS Registry number) |
|--|-----------------------|
| Methylphosphonyl dichloride | (676-97-1) |
| Dimethyl methylphosphonate | (756-79-6) |
| O-Ethyl S-phenyl ethylphosphonothiothionate | (944-22-9) |
| N,N-Dialkyl (Me, Et, n-Pr or i-Pr) phosphoramidic dihalides | |
| Dialkyl (Me, Et, n-Pr or i-Pr) N,N-dialkyl (Me, Et, n-Pr or i-Pr)-phosphoramidates | |
| Arsenic trichloride | (7784-34-1) |
| 2,2-Diphenyl-2-hydroxyacetic acid | (76-93-7) |
| Quinuclidin-3-ol | (1619-34-7) |
| N,N-Dialkyl (Me, Et, n-Pr or i-Pr) aminoethyl-2-chlorides and corresponding protonated salts | |
| N,N-Dialkyl (Me, Et, n-Pr or i-Pr) aminoethane-2-ols and corresponding protonated salts | |
| N,N-Dimethylaminoethanol | (108-01-0) |
| and corresponding protonated salts | |
| N,N-Diethylaminoethanol | (100-37-8) |
| and corresponding protonated salts | |
| N,N-Dialkyl (Me, Et, n-Pr or i-Pr) aminoethane-2-thiols and corresponding protonated salts | |
| Thiodiglycol: Bis(2-hydroxyethyl)sulfide | (111-48-8) |
| Pinacolyl alcohol: 3,3-Dimethylbutan-2-ol | (464-07-3) |

| Schedule 3 | CAS Registry number) |
|-------------------------------------|-----------------------|
| Phosgene: Carbonyl dichloride | (75-44-5) |
| Cyanogen chloride | (506-77-4) |
| Hydrogen cyanide | (74-90-8) |
| Chloropicrin: Trichloronitromethane | (76-06-2) |
| Schedule 3 Precursors | (CAS Registry number) |
| Phosphorus oxychloride | (10025-87-3) |
| Phosphorus trichloride | (7719-12-2) |
| Phosphorus pentachloride | (10026-13-8) |
| Trimethyl phosphite | (121-45-9) |
| Triethyl phosphite | (122-52-1) |
| Dimethyl phosphite | (868-85-9) |
| Diethyl phosphite | (762-04-9) |
| Sulfur monochloride | (10025-67-9) |
| Sulfur dichloride | (10545-99-0) |
| Thionyl chloride | (7719-09-7) |
| Ethyl-diethanolamine | (139-87-7) |
| Methyl-diethanolamine | (105-59-9) |
| Triethanolamine | (102-71-6) |

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HAZARD MANAGEMENT

RISK ASSESSMENTS GENERAL INFORMATION

Exclusions

The chemical is **not required** to be separately risk assessed as the Safety Data Sheet (SDS) [formerly known as MSDS] lists the chemical hazards and controls.

The storage of a chemical is **not required** to be risk assessed **unless**:

- determined by the regulator (for example prohibited carcinogens); or
- the storage could pose a significant risk to health (e.g. amount exceeds the maximum quantity set by AS 2243.10 see [Appendix A](#)); or
- the chemical is an explosive/peroxidisable.

Task Chemical Risk Assessments

The tasks involving hazardous chemicals **are required** to be risk assessed. This risk assessment may take the form of individual task risk assessments through to one assessment for the laboratory/workshop where the controls are common, for more details please refer to the HSW Handbook Chapter [Hazard Management](#).

[The Code of Practice \(Managing Risks of Hazardous Chemicals in the Workplace\)](#) allows for three different types of risk assessments:

A basic risk assessment – allows the review of the label or the SDS and a decision that the chemical is controlled within existing laboratory controls (rules). If you are using a basic assessment model then your School (laboratory or workshop etc.) must have an overall risk assessment and controls (lab rules). The basic assessment can then determine whether the process or chemical fits into the general controls (lab rules).

A generic risk assessment – where similar/related activities or a defined area (e.g. laboratory/workshop etc.) can be included in one overarching risk assessment.

A detailed risk assessment must be conducted when–

- The use of chemicals which pose a significant risk to health or high risk chemicals have not been included/controlled in an appropriate generic risk assessment (e.g. carcinogens, mutagens, reproductive toxins, sensitisation agents, explosives, highly reactive, highly toxic, chemicals requiring health surveillance, or mixing of incompatible chemicals); or
- conducting a unique, or introducing a new process (one which does not fit the existing basic risk assessment and controls); or
- there are susceptible workers (e.g. pregnant, pre-existing medical conditions etc.).

Refer to the SDS for hazard associated with chemicals. The SDSs are available from the supplier, manufacturer of the chemical or via the [Chemwatch](#) SDS database. To assist with reading and understanding SDS refer to [Understanding a Safety Data Sheet Information Sheet](#).

Please note that hazard management templates must use the University matrix and meet the intent of the HSW Handbook Chapter [Hazard Management](#).

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HAZARD MANAGEMENT

FACTORS TO CONSIDER

The health hazards from handling any particular hazardous chemical will vary with each chemical and the way in which the chemical is used. Factors such as route of exposure, type of disease or injury, the relative toxicity and concentration of the hazardous chemical are required to be considered in any assessment. When novel chemicals are involved in the process then the risk assessment shall take into account known similar chemicals and parallel chemical structures.

To determine the level of risk, it is necessary to draw together the information gathered about the hazardous chemical/s used and the way it is used in the workplace. This will involve considering:

- a. the nature and severity of the hazard for each hazardous chemical. This information should be available from the label and the safety data sheet (SDS) in most cases.
- b. the degree of exposure of workers, taking account of:
 - o actual processes and practices in the workplace where the chemicals are used
 - o the quantities of chemicals being handled
 - o work practices and procedures and the way individual workers carry out their daily tasks
 - o whether existing control measures adequately control exposure.
- c. routes of entry; the physical form and concentration; who could be exposed and when this could occur; how often is exposure likely to occur and for how long; what the estimated exposure to hazardous chemicals is.

If you require assistance/further information please contact your [School/Branch Health and Safety Officer](#) or the [HSW Team](#)

Table 1 An example of typical chemical task hazards

| Chemical attributes | | Asphyxiant Gas | |
|---------------------------------------|---|--------------------------|---|
| <input type="checkbox"/> | Inherent hazardous properties for the chemicals e.g. flammable, explosive, dust, corrosive, compressed and toxic gas. | <input type="checkbox"/> | Gaseous hazard e.g. toxic or asphyxiant gases such as nitrogen, dry ice, carbon dioxide. |
| Exposure to hazardous chemical | | <input type="checkbox"/> | Gaseous hazard being transported e.g. transporting liquid nitrogen, dry ice inside a vehicle or lift. |
| <input type="checkbox"/> | Easily airborne or be can be breathed in? e.g. fine powder; aerosol; toxic or corrosive fumes or chemicals are being sprayed, nanomaterials. | General hazards | |
| <input type="checkbox"/> | Eye or skin contact | <input type="checkbox"/> | Fatigue |
| <input type="checkbox"/> | Health surveillance list (see Air and health monitoring Information Sheet). | <input type="checkbox"/> | Cold object (cryogenic) or hot objects (ovens, water baths, autoclave, boiler). |
| <input type="checkbox"/> | Controls unavailable (no fume cupboard, etc.). | <input type="checkbox"/> | Radiation e.g. x-ray, sealed/unsealed, or artificial UV Sources. |
| <input type="checkbox"/> | Exposure exceeding exposure standards. | <input type="checkbox"/> | Biological hazard e.g. diagnostic human or animal body fluids, infectious material. |
| <input type="checkbox"/> | Violent physical or chemical reaction (produces/emits toxic substances). | <input type="checkbox"/> | Sharp object e.g. needles, scalpel, razor blades. |
| Explosive/Flammable | | <input type="checkbox"/> | Manual handling/ergonomics hazards e.g. poor lighting, insufficient space, poor seating design, reaching, bending twisting, lifting, pulling, pushing, repetitive motions (pipetting), microscope work. |
| <input type="checkbox"/> | Explosive or flammable due to the process undertaken? e.g. mixing of incompatible chemicals, incorrect storage, ignition of material (including naked flame), gas, vapour, pressure build up. | | |
| <input type="checkbox"/> | Environment will increase fire or explosion if an ignition source is introduced? e.g. explosive atmosphere, combustible dust. | | |
| <input type="checkbox"/> | Incorrect fire extinguishers or it is not easily accessible. | | |

HAZARD MANAGEMENT

FOR HIGHLY TOXIC, CARCINOGENIC OR CHEMICALS REQUIRING HEALTH SURVEILLANCE

For highly toxic, carcinogenic or chemicals requiring health surveillance (for list refer to [Air and Health Monitoring Information Sheet](#) or SDS) you will need to determine if there is a **significant risk to health**.

The level of risk to workers from exposure to these chemicals depends on the hazards as well as the frequency, duration and amount of exposure (the dose). E.g. if a worker is frequently using a chemical the likelihood of exposure could increase and if the chemical is highly toxic then the consequences will be increased from that exposure, therefore the controls will need to be higher.

- the nature and severity of the hazard for each hazardous chemical. This information should be available from the label and the safety data sheet (SDS) in most cases.
- the degree of exposure of workers, taking account of:
 - actual processes and practices in the workplace where the chemicals are used.
 - the quantities of chemicals being handled.
 - work practices and procedures and the way individual workers carry out their daily tasks.
 - whether existing control measures adequately control exposure.

The outcome from this assessment is either **a significant risk to health** or not a significant risk to health. If there is a significant risk (this means that workers are likely to be exposed at a level that could adversely affect their health) then health monitoring **IS REQUIRED** in line with the requirements of [WHS Regulations 2012 \(SA\)](#) (contact the [HSW team](#) if you requires assistance with this process).

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LABELLING, PLACARDING, REGISTERS AND MANIFESTS

The labelling requirements do **not** apply to:

- hazardous chemicals which are used in household quantities and consistent with domestic use,
- hazardous chemicals which are placed into a container and used immediately.

General Labelling requirements:

Please also refer to [Labelling transition arrangements](#) Information Sheet

- The manufacturer's labels must not be defaced, including writing on them. It is, however, acceptable to write the date and tare weight on a manufacturer's label in an appropriate place such that none of the original information is obscured.
- The lids of containers of decanted substances or mixtures must not be the sole label as the lid will become separated from the container.
- Chemicals in unlabelled containers must not be left unattended.
- Containers must not be labelled using handwriting directly onto the container. Except where labels are printed directly onto the container by the manufacturer.
- The label must be a separate item composed of a suitable material (usually paper), and appropriately fixed.
- To facilitate identification of chemicals and their relevant hazards, it is highly recommended that all labels be printed in colour and best practice is the use of [Chemwatch](#) labels.
- Food and drink used for research purposes must be labelled "**for research purposes only**" and "**not for human consumption**".
- If the chemical is unknown then it is to be marked with '**caution do not use: unknown substance**', stored in isolation until contents are established (then labelled) and if contents cannot be identified then it should go to waste disposal.
- If the chemical container size is too small for the details below, then a label can be attached to the rack, box, shelf or other container in which the chemical is stored.

Labels

Until 31 December 2016 all containers (this includes original, decanted or mixtures) must be labelled in accordance with the relevant requirements of *NOHSC:2012 (1994) National Code of Practice for Labelling of Workplace Substances* (refer to Appendix G of the NOHSC document) or with the [GHS](#) and [WHS Regulations 2012 \(SA\)](#) Part 2 Schedule 9. After this date then labelling must comply with GHS and [WHS Regulations 2012 \(SA\)](#) (Note: You will **not be required to relabel all existing chemicals** as at 31 Dec 2016 however all solutions made after this date will need to be labelled correctly).

NOHSC:2012(1994) guideline

The label shall, at a minimum, contain the following information (which is legible and in English):

- Name of chemical - common name, formal name, or both. If the substance contains more than one chemical, all chemicals must be listed (not abbreviations unless there is a posted list of all abbreviations within your laboratory).
- Concentration: percentage or molarity of the chemical.
- Risk phrases- a general description of the physicochemical, environmental & health hazards of a substance, e.g. causes burns, irritating to the skin, toxic by inhalation.
- Safety phrases- information on safe storage, handling, disposal, PPE & first aid, e.g. keep container dry, wear suitable gloves, avoid contact with eyes.
- If hazardous substances are also classified as Dangerous Goods (DG) they must meet the requirements of DG legislation (i.e. the label must indicate which DG class the chemical belongs to).
- The full name (or staff/student number) of the worker who made or decanted the chemical.
- The date that the chemical was opened (if the chemical is peroxidisable).

[GHS](#) and [WHS Regulations 2012 \(SA\)](#) Part 2 Schedule 9.

Whilst the manufacturer or supplier of chemicals are required to have extensive labelling the label for a **decanted chemical**, or **research chemical**, or **sample for analysis** shall at a minimum:

- be legible and in English,
- have the product identifier (name or number found on the suppliers label or in the SDS),
- have a pictogram or hazard statement consistent with the chemical,
- the full name (or staff/student number) of the worker who made or decanted the chemical, and
- the date that the chemical was opened (if the chemical is peroxidisable).

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LABELLING, PLACARDING, REGISTERS AND MANIFESTS

Labels (continued)

A label for **waste chemicals** shall at a minimum:

- be legible and in English,
- have the product identifier (name or number found on the suppliers label or in the SDS), and
- have a pictogram or hazard statement consistent with the chemical.

A label for **explosive chemicals** shall at a minimum:

- be legible and in English,
- have the proper shipping name,.
- have a pictogram consistent with the chemical,
- have the hazard statement consistent with the chemical, and
- have the precautionary statements consistent with the chemical, and
- the full name (or staff/student number) of the worker who has responsibility for the chemical.

A label for **nanomaterials** (when the hazards are known) shall at a minimum:

- be legible and in English,
- contain the product identifier (name or number found on the suppliers label or in the SDS),
- have a pictogram or hazard statement consistent with the chemical, and
- the full name (or staff/student number) of the worker who made, collected or decanted the nanomaterial.

A label for **nanomaterials** (when the hazards are not fully characterised) shall at a minimum:




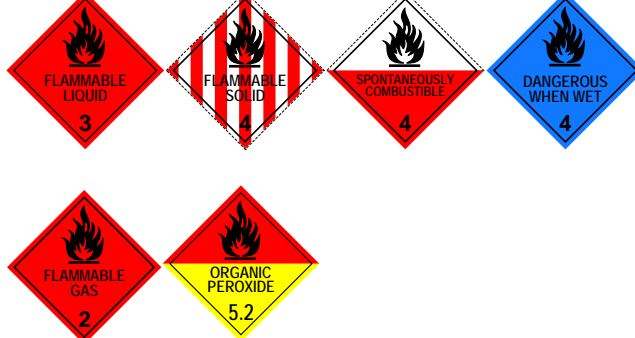



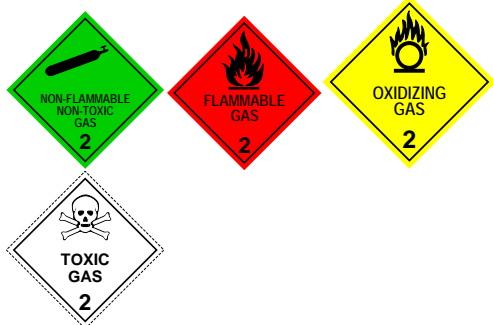




- be legible and in English,
- A statement of hazard "contains engineered/manufactured nanomaterials. Caution Hazard unknown", and
- the full name (or staff/student number) of the worker who made, collected or decanted the nanomaterial.

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LABELLING, PLACARDING, REGISTERS AND MANIFESTS








Conversion of DGC to GHS Classes

The table below compares hazard pictograms from the GHS with the corresponding ADG Code class labels (Labelling of Workplace Hazardous Chemicals Code of Practice).

| Hazard Pictograms | GHS Hazard | Dangerous Goods class labels (pictograms) | Dangerous goods classes |
|---|---|--|---|
|  | Explosives Self-reactives Organic peroxides |  | Explosive |
|  | Flammables Self-reactives Pyrophorics Self-heating Emits flammable gas in contact with water Organic peroxides |  | Flammability (Liquid, Solid or Gas) Pyrophoric, Emits Flammable Gas Organic Peroxide |
|  | Oxidisers |  | Oxidiser Oxidising gas |
|  | Gases under pressure |  | Non-toxic non-flammable gas, flammable gas, oxidising gas, toxic gas |
|  | Acute toxicity |  | Acute toxicity Acute Toxic gas |
|  | Acute toxicity Skin irritants Eye irritants Skin sensitisers | No equivalent | |
|  | Carcinogens Respiratory sensitisers Reproductive toxicants Target organ toxicants Germ cell mutagens | No equivalent | |

LABELLING, PLACARDING, REGISTERS AND MANIFESTS

Conversion of DGC to GHS Classes (continued)

| Hazard Pictograms | GHS Hazard | Dangerous Goods class labels (pictograms) | Dangerous goods classes |
|---|---|---|---------------------------------|
|  | Eye corrosion Skin corrosion Corrosive to metal |  | Corrosive to metals |
|  | Aquatic toxicity. Not covered within the scope of workplace hazardous chemicals requirements |  | Environmental hazard |
| No equivalent hazard pictogram | |  | Miscellaneous dangerous goods |
| Not covered within the scope of workplace hazardous chemicals requirements | |   | Infectious or Radioactive |

LABELLING, PLACARDING, REGISTERS AND MANIFESTS

Transportation Labelling and Vehicle Placarding

For transportation of hazardous chemicals the outer label must comply with ADG Code. The GHS label is still suitable for the inner label of the chemical but for the external labelling the package must have the correct dangerous good diamond.

To identify the dangerous goods code of the chemical you are transporting refer to the Safety Data Sheet (SDS).

Vehicles must display a placard when the load meets any of the following levels:

- Any hazardous chemical in a receptacle of individual capacity of > 500 kg or L*; or
- ≥ 1000 kg or L aggregate hazardous chemical; or
- ≥ 250 kg or L aggregate hazardous chemical where the load includes any quantity of:
 - DGC Division 2.1/ GHS Flammable gas (other than aerosols)



- DGC Division 2.3/GHS Acute toxicity and skin corrosion; or



- DGC Packing Group I/ GHS Explosives, self-reactives, organic peroxides of any class.



- Any quantity of DGC Division 6.2 Category A;
- ≥ 10 kg/L of Division 6.2 other than Category A



* Includes tank vehicles, portable tanks, pressure drums, and bulk containers.

≥ means greater than or equal to

> means greater than

| | | | | |
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LABELLING, PLACARDING, REGISTERS AND MANIFESTS

Chemical register

The chemical register is required for all chemicals (including gas cylinders and radioactive materials [unsealed isotopes]) held in the workplace ([WHS Regulations 2012 \(SA\)](#)). The register is used for emergency services, Dangerous Goods licences and Controlled Substances licences. This register must be held in a format in which the emergency services can gain access to the information (on a shared server or on [Chemwatch](#))

This register must also be available if requested by the University or external organisation.

Please note there is no longer a requirement to keep a manifest at the EWIS board/fire panel unless buildings exceed the manifest levels and there is no need to submit your register to the HSW team in December, the review date can be decided by the School/Branch.

The Chemical Register must at a minimum contain the following (Note: the register can contain extra information if required for other purposes and there is no defined format).

| |
|--|
| Chemical Name - Use the common name if it exists, and please put the name of the chemical before the concentration if applicable |
| Dangerous Goods/GHS information – You must record one or both of the below classifications on the register: |
| (1) GHS Class and Category (This is the Class and the Category under the Globally Harmonized system of classification and labelling of chemicals third edition 2009 e.g. Flammable Liquid Category 2); and/or |
| (2) Primary DGC- DGC Class (These are solids, liquids or gases that have been classified as dangerous under the <i>Australian Code for the Transport of Dangerous Goods by Road or Rail</i> (the ADG code)). |
| Building - |
| Room |
| Maximum Volume |
| Controlled Substance - Use the appropriate S number such as S4, S8 etc. If it is not controlled, insert "-" |
| Container Unit |

- a) The register must contain all hazardous chemicals, controlled substances and unsealed radiation sources (including mine tailings) and nanomaterials.
- b) There is no need to record chemicals which are cleaning agents unless they are in Industrial quantities of (ie 20L and above).
- c) There is no need to record chemicals which are normal office supplies e.g. liquid paper, white board cleaner, printer cartridges etc.
- d) There is no need to record chemicals which are under 10g or 10mL; unless it is:
 - a controlled substance class S8 or S9; or
 - extremely hazardous i.e. are category 1 (GHS); or
 - a restricted or prohibited carcinogen (see [Appendix C](#)); or
 - a chemical of security concern or chemical weapon (see [Appendix D](#)); or
 - nanomaterial; or
 - radioactive material.
- e) When updating registers there is a requirement to
 - record all new chemicals and remove any chemicals which you no longer have;
 - change amounts only if they have changed more than 1L or Kg.

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LABELLING, PLACARDING, REGISTERS AND MANIFESTS

Building Manifest and Placarding

Manifests under [WHS Regulations 2012 \(SA\)](#) are only required if the building exceeds the regulated quantities. Below outlines the placard and manifest threshold quantities.

If you think you may be exceeding the regulated quantities in any building and you are required to prepare a chemical manifest and emergency plan please contact the [HSW team](#) for assistance.

As per the notification from SafeWorkSA (dated 20 June 2014) the requirement for the University to notify the regulator regarding holdings exceeding manifest quantities below (due to come into effect 1 Jan 2016) has been delayed and the Dangerous Substances licensing will continue to operate. This however will not affect the University's requirement to placard or manifest if the building exceeds the levels below.

| Item Column 1 | Description of hazardous chemical | | Placard quantity Column 4 | Manifest quantity Column 5 | ADG Code Classification |
|------------------|---|--|---|-------------------------------|----------------------------|
| | Column 2 | Column 3 | | | |
| 1 | Flammable gases | Category 1 | 200L <small>(note 1G sized cylinder is approx. 48 L)</small> | 5000L | 2.1 |
| 2 | Gases under pressure | with acute toxicity, categories 1, 2, 3 or 4 Note—Category 4 only up to LC50 of 5000 ppmV | 50L | 500L | 2.3 |
| 3 | | with skin corrosion categories 1A, 1B or 1C | 50L | 500L | 2.3 |
| 4 | | aerosols | 5000L | 10 000L | 2.1 or 2.2 |
| 5 | | not specified elsewhere in this Table | 1000L | 10 000L | 2.2 |
| 6 | | Flammable liquids | Category 1 | 50L | 500L |
| 7 | Category 2 | | 250L | 2500L | 3 (PG II) |
| 8 | Category 3 | | 1000L | 10 000L | 3 (PG III) |
| 9 | Any mix of chemicals from Items 6 – 8 where none of the items exceeds the quantities in columns 4 or 5 on their own | | 1000L | 10 000L | All 3 |
| 10 | Category 4 | | 10 000L | 100 000L | <i>Note 3</i> |
| 11 | Self-reactive substances | Type A | 5kg or 5L | 50kg or 50L | GTDTBT – <i>Note 4</i> |
| 12 | | Type B | 50kg or 50L | 500kg or 500L | 4.1 (Type B) |
| 13 | | Type C-F | 250kg or 250L | 2500kg or 2500L | 4.1 (Type C-F) |
| 14 | Flammable solids | Category 1 | 250kg | 2500kg | 4.1 (PG II) |
| 15 | | Category 2 | 1000kg | 10 000kg | 4.1 (PG III) |

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LABELLING, PLACARDING, REGISTERS AND MANIFESTS

Building Manifest and Placarding (continued)

| Item Column 1 | Description of hazardous chemical | | Placard quantity Column 4 | Manifest quantity Column 5 | ADG Code Classification |
|------------------|---|--|------------------------------|-------------------------------|----------------------------|
| | Column 2 | Column 3 | | | |
| 16 | | Any mix of chemicals from Items 12 - 15 where none of the items exceeds the quantities in columns 4 or 5 on their own | 1000kg or 1000L | 10 000kg or 10 000L | All 4.1 |
| 17 | Pyrophoric liquids and pyrophoric solids | Category 1 | 50kg or 50L | 500kg or 500L | 4.2 (PG I) |
| 18 | Self-heating substances and mixtures | Category 1 | 250kg or 250L | 2500kg or 2500L | 4.2 (PG II) |
| 19 | | Category 2 | 1000kg or 1000L | 10 000kg or 10 000L | 4.2 (PG III) |
| 20 | | Any combination of chemicals from Items 17 to 19 where none of the items exceeds the quantities in columns 4 or 5 on their own | 1000kg or 1000L | 10 000kg or 10 000L | All 4.2 |
| 21 | Substances which in contact with water emit flammable gas | Category 1 | 50kg or 50L | 500kg or 500L | 4.3 (PG I) |
| 22 | | Category 2 | 250kg or 250L | 2500kg or 2500L | 4.3 (PG II) |
| 23 | | Category 3 | 1000kg or 1000L | 10 000kg or 10 000L | 4.3 (PG III) |
| 24 | | Any combination of chemicals from Items 21 to 23 where none of the items exceeds the quantities in columns 4 or 5 on their own | 1000kg or 1000L | 10 000kg or 10 000L | All 4.3 |

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LABELLING, PLACARDING, REGISTERS AND MANIFESTS

Building Manifest and Placarding (continued)

| Item Column 1 | Description of hazardous chemical | | Placard quantity Column 4 | Manifest quantity Column 5 | ADG Code Classification |
|------------------|--|---|------------------------------|-------------------------------|----------------------------|
| | Column 2 | Column 3 | | | |
| 25 | Oxidising liquids and oxidising solids | Category 1 | 50kg or 50L | 500kg or 500L | 5.1 (PG I) |
| 26 | | Category 2 | 250kg or 250L | 2500kg or 2500L | 5.1 (PG II) |
| 27 | | Category 3 | 1000kg or 1000L | 10 000kg or 10 000L | 5.1 (PG III) |
| 28 | | Any combination of chemicals from Items 25 to 27 where none of the items exceeds the quantities in columns 4 or 5 on their own | 1000kg or 1000L | 10 000kg or 10 000L | All 5.1 |
| 29 | Organic peroxides | Type A | 5kg or 5L | 50kg or 50L | GTDTBT – Note 4 |
| 30 | | Type B | 50kg or 50L | 500kg or 500L | 5.2 (Type B) |
| 31 | | Type C to F | 250kg or 250L | 2500kg or 2500L | 5.2 (Type C-F) |
| 32 | | Any combination of chemicals from Items 30 and 31 where none of the items exceeds the quantities in columns 4 or 5 on their own | 1000kg or 1000L | 10 000kg or 10 000L | All 5.2 |
| 33 | Acute toxicity | Category 1 | 50kg or 50L | 500kg or 500L | 6.1 (PG I) – Note 5 |
| 34 | | Category 2 | 250kg or 250L | 2500kg or 2500L | 6.1 (PG II) |
| 35 | | Category 3 | 1000kg or 1000L | 10 000kg or 10 000L | 6.1 (PG III) |
| 36 | | Any combination of chemicals from Items 33 to 35 where none of the items exceeds the quantities in columns 4 or 5 on their own | 1000kg or 1000L | 10 000kg or 10 000L | All 6.1 |
| 37 | Skin corrosion | Category 1A | 50kg or 50L | 500kg or 500L | 8 (PG I) |
| 38 | | Category 1B | 250kg or 250L | 2500kg or 2500L | 8 (PG II) |
| 39 | | Category 1C | 1000kg or 1000L | 10 000kg or 10 000L | 8 (PG III) |

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Building Manifest and Placarding (continued)

| Item Column 1 | Description of hazardous chemical | | Placard quantity Column 4 | Manifest quantity Column 5 | ADG Code Classification |
|------------------|---|--|------------------------------|-------------------------------|--|
| | Column 2 | Column 3 | | | |
| 40 | Corrosive to metals | Category 1 | 1000kg or 1000L | 10 000kg or 10 000L | 8 (PG III) |
| 41 | | Any combination of chemicals from Items 37 to 40 where none of the items exceeds the quantities in columns 4 or 5 on their own | 1000kg or 1000L | 10 000kg or 10 000L | All 8 |
| 42 | Unstable explosives | | 5kg or 5L | 50kg or 50L | goods too dangerous to be transported GTDTBT – Note 4 |
| 43 | Self-reactive substances Organic peroxides Unstable explosives goods too dangerous to be transported | Any mix of chemicals from Items 11, 29 and 42 where none of the items exceeds the quantities in columns 4 or 5 on their own | 5kg or 5L | 50kg or 50L | goods too dangerous to be transported GTDTBT – Note 4 |

Notes

- For the purposes of this table, if a flammable liquid category 4 is used, handled or stored in the same spill compound as one or more flammable liquids of categories 1, 2 or 3, the total quantity of flammable liquids categories 1, 2 or 3 must be determined as if the flammable liquid category 4 had the same classification as the flammable liquid in the spill compound with the lowest flash point.
- For the item 2 in the table, Gases under pressure with acute toxicity category 4 only applies up to a LC₅₀ of 5000 ppmV. This is equivalent to Division 2.3 dangerous goods under the ADG Code.
- Only flammable liquids with a flash point of up to 93°C are classified as hazardous chemicals under the [WHS Regulations 2012 \(SA\)](#) and the [GHS](#). C1 combustible liquids with flashpoints between 93°C and 150°C are not classified as hazardous workplace chemicals.
- GTDTBT means goods too dangerous to be transported.
- Division 2.3 under the ADG Code includes gases and vapours classified as acutely toxic (categories 1, 2 and 3) and gases which are corrosive to skin (category 1).

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TRANSPORTATION OF CHEMICALS

Outside the University

- Read the SDS before leaving and take the SDS and absorbent spill kit.
- The load is to be banded and segregated. The banding is to be enough to contain the total amount in the container(s) being transported and the packaging is in a way that discourages breakage of containers.
- All loads are to be secured (large amounts must also be transported behind a cargo barrier).
- Transportation of large quantities of chemicals may require placarding (refer to [Appendix F](#) Labelling, Placarding, Manifests and Registers).
- If chemicals or biological samples are to be transported by air refer to [CASA* guidelines](#).
- If chemicals are being transported by post, refer to [Australia Post guidelines](#).
- There are specific requirements for the transportation by road of liquid nitrogen and dry ice. Refer to [Cryogenic Substances Information Sheet](#).

* CASA's primary function is to conduct the safety regulation of civil air operations in Australia.

Within the University

Transportation by hand

Use carriers, baskets or trolleys to carry chemicals, where possible.

If you are picking up chemicals from the chemical store ensure you have suitable clothes, PPE and footwear in accordance with the local rules.

When large bottles of corrosive liquids, solvents, or other hazardous liquids are transported without a trolley or carrier/basket

- One bottle should be carried at a time;
- The bottle should be carried with both hands, one on the neck of the bottle and the other underneath;
- Do not hook a finger through the glass ring on top of the bottle, allowing it to dangle while being transported;
- Never carry or attempt to pick up a bottle by the cap.

Transportation by trolley

- Trolleys should be stable under load and have wheels large enough to negotiate uneven surfaces (such as expansion joints and floor drain depressions) without tipping or stopping suddenly;
- Bottles should not be placed near the edge of the trolley;
- Bottles should not be touching each other or other glassware during transport;
- Caution must be observed when rolling the trolley over door sills or other possible obstructions; and
- Incompatible chemicals should not be transported on the same trolley.

Lifts and Stairs

- Freight-only lifts should be used if possible when transporting chemicals to avoid exposure to persons in passenger lifts.
- Lifts which can be locked out are to be used where possible.
- If using stairs ensure that you are not rushing, you can see your feet and that you have one free hand.

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EMERGENCIES AND CONTINGENCY ARRANGEMENTS

General

Basic prevention strategies can reduce the severity of an emergency situation.

This can be achieved by:

- Reducing the holding of chemicals (especially flammable liquids and gases);
- Ensuring that incompatible chemicals do not mix;
- Reducing the fuel load from other sources.
- Areas holding hazardous chemicals must develop local emergency procedures in the event of a spill or leak of a chemical, fire, explosion or other emergency situation.
- Workers are to be trained on how to respond to an emergency. This training might include first response actions or how to raise an alarm and evacuation procedures, for example:
 - What to do in a minor and major spill
 - How to use a spill kit and safety shower/eye wash;
 - How to trigger alarm/duress system;
 - The role of security (they will coordinate the Emergency Services you will need to give them the building, room, nature and exact location within the room of the spill)
 - Reporting process for an incident.

Emergency Equipment

Each area using hazardous chemicals shall have the following (according to the level of hazard):

- Accessible safety shower and eye wash conforming to AS 4775 Emergency eyewash and shower equipment;
- Fire extinguisher (suitable for the chemicals);
- Respiratory protection (see note below); and
- Alarm or duress system and/or telephone for emergency use.

Note: Respiratory protection is required for some chemicals in the event of a spill. The University recommends that areas use Emergency Services for large or highly hazardous chemical spill cleanup, rather than risking the health of workers. Respiratory protection requires training from the supplier and regular maintenance and must not be used by untrained workers. Respirators should not be used by workers who have facial hair.

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EMERGENCIES AND CONTINGENCY ARRANGEMENTS

CHEMICAL EMERGENCIES AND CONTINGENCY ARRANGEMENTS (continued)

In the Event of Exposure

First aid

A first aider should be available during working hours and University Security is available 24 hours a day. Below are general first aid treatments, however for specific treatments consult the SDS.

Please note that if the first aider or security assesses the situation to be beyond their capability or it is foreseeable that they will become contaminated then an ambulance should be called.

a. Eye Contact

Promptly flush eyes with water for a prolonged period (15 minutes) and seek medical attention (take SDS with you).

b. Ingestion

The treatment for ingestion of a chemical will depend on what chemical has been ingested. Consult the SDS for the appropriate action, seek medical attention (take SDS with you). Note that it is against University policy to eat and drink in the laboratory and to pipette chemicals by mouth.

c. Skin Contact

Promptly flush the affected area with water and remove any contaminated clothing. If symptoms persist after washing, seek medical attention (take the SDS with you).

Note-for some chemicals (e.g. hydrofluoric acid) medical attention must be sought even if symptoms are not apparent, due to a possible delay in effects.

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CHEMICAL DISPOSAL REQUIREMENTS

Permissible Chemical Disposal into the Environment (i.e. down the sink)

In the interest of environmental responsibility, disposal of any chemicals either down the sink or through evaporation in a fume cupboard is not recommended.

If, however, you do dispose of chemicals down the sink, the Environmental Protection Authority (EPA) requires that they are only:

- Non-hazardous chemicals which are in aqueous solutions within the pH range of 6 to 10.
- Do not discharge to the sewer:
 - any concentrated acids or bases;
 - highly toxic, malodorous (bad odour), or lachrymatory (produces tears) substances;
 - any substances which might interfere with the biological activity of waste water treatment plants,
 - any chemical which could create fire or explosion hazards,
 - any chemical which could cause structural damage or obstruct flow

Other Disposal Methods

- All out-of-date chemicals shall be disposed of on a periodic basis via the [Cleaning and Waste Collection Request Form](#) to reduce the overall hazard potential and minimise inventory tracking and updating.
- Peroxide formers and others that degrade over time must be dated when they are opened (or purchased) and must be disposed of 12 months after opening or 18 months after date of purchase (refer to the [Peroxidisable and Explosives](#) information sheet).
- Controlled substances can be disposed of through the [Cleaning and Waste Collection Request Form](#). However it is a breach of the University's Controlled Substances Licences to leave controlled substances unattended in loading bays. If you are requested to do this please contact the HSW Team for advice.
- Explosives (Dangerous Goods Class 1/GHS Explosives) are not collected by the current chemical waste service provider, for companies who dispose of this type of waste please refer to [HSW contacts](#).
- Radioactive substances (Dangerous Goods Class 7) are not collected by the current chemical waste service provider for disposal methods please refer to HSW Handbook Chapter [Radiation Safety Management](#).
- Gas cylinders are not collected by the current chemical waste service provider for disposal methods please refer to the [Gas Cylinders and Compressed Gases](#) Information Sheet.
- Nanomaterials for disposal please refer to the [Nanomaterials](#) Information Sheet.

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CHEMICAL DISPOSAL REQUIREMENTS

Chemical Waste Collection Procedure

In University buildings

All requests for waste disposal should be submitted on the [Cleaning and Waste Collection Request Form](#) on the Campus Services website. (When this form is completed and submitted it is sent to the Campus Services at the relevant campus where a record of the request is maintained and a copy sent to the relevant chemical waste service provider.)

The chemical waste service provider receives the request and will contact the person nominated on the form to obtain a copy of the waste manifest. If the requester does not have a manifest the chemical waste service provider will provide a blank for them to complete.

If delays occur contact [Campus Services](#) to resolve the issue.

Commercial buildings

The first point of contact for requests is the Building Facilities Manager.

The Building Facilities Manager will submit the request to the chemical waste service provider. The chemical waste service provider receives the request and they will contact the person requesting waste collection to obtain a copy of the waste manifest. If the requester does not have a manifest the chemical waste service provider will provide a blank manifest for them to complete.

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