

# Guidance for the Storage of Chemicals

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## **1 INTRODUCTION**

### **1.1 Purpose**

The purpose of this document is to provide detail on planning and design principles when providing consultancy for Curtin University projects involving facilities/spaces where hazardous substances are stored. Note that there is a separate management plan for the storage of chemicals.

Comprehensive details on waste management are not addressed in this document; however, some information has been provided on chemical waste and appropriate disposal.

### **1.2 Exclusions**

This guidance document applies to all areas where chemicals are stored including (but not limited to) laboratories and chemical stores. The following areas are not included under this guidance document:

- chemical management
- Class 1 Dangerous goods
- Class 2 Dangerous goods (including cryogenic liquids)
- underground bulk storage tanks
- LPG and LNG
- waste management
- nanoparticles
- Class 7 Dangerous goods – radioactive materials
- biologicals
- the built environment – asbestos, natural mineral fibres (NMF), chlorofluorocarbons (CFCs)
- concessional spirits
- emergency management.

For each of these areas, either refer to specific guidance documents or ensure an appropriate individual management plan and risk assessment are completed, appropriately reviewed and approved. Specialist input may be required for some of these areas.

## 2 ROLES, RESPONSIBILITIES AND AUTHORITIES

Table 1 provides an outline of various roles and responsibilities across campus.

**Table 1** Roles, responsibilities and authorities

<b>Role</b>	<b>Responsibility for Health and Safety (from H&amp;S Responsibilities Procedures)</b>	<b>Responsibility for Chemical Management</b>	<b>Authority</b>
Health, Safety and Emergency Management Department	<p>Provide specialist advice and support to areas in relation to hazardous substances, dangerous goods, regulated chemical waste disposal and controlled substances.</p> <p>Coordinate and administer the Curtin University ChemAlert Database.</p> <p>Provide specialist advice and support for the planning of emergency procedures.</p> <p>Coordinate any communication between Curtin and emergency authorities for the purpose of planning.</p>	<p>Maintain the chemical management system and related guidelines.</p> <p>Ensure emergency planning is undertaken.</p>	Yes – Can authorise the issue of guideline and management documents
Managers, supervisors	Undertake effective health and safety measures to ensure compliance with the Occupational Safety & Health Act 1984 and other legislative requirements.	Undertake effective chemical management measures to ensure compliance with the Occupational Safety & Health Act 1984 and other legislative requirements.	No
Individual workers/students	<p>Comply with the Occupational Safety &amp; Health Act 1984 and all reasonable directives given in relation to health and safety at work.</p> <p>Ensure compliance with University and legislative health and safety requirements.</p>	<p>Comply with the Occupational Safety &amp; Health Act 1984 and all reasonable directives given in relation to chemical management at work.</p> <p>Ensure compliance with University and legislative health and safety requirements.</p>	No
Office of Research and Development – Poisons advisor	Not listed	<p>Provide advice and guidance on the appropriate management and storage of poisons.</p> <p>Aid communication and coordinate with relevant authorities on Curtin’s management of poisons.</p> <p>Maintain the Poisons Act Compliance Management Plan and related guidelines.</p>	Advisory
University Chemical Safety Committee	Not listed	Provide advice to the University on matters relating to chemical safety.	Advisory

Role	Responsibility for Health and Safety (from H&S Responsibilities Procedures)	Responsibility for Chemical Management	Authority
Curtin Properties, Facilities and Development	Not listed	Manage current and future programs and facilities at Curtin. Provide 'fit for purpose' facilities. Ensure staff/contractors/consultants to PF&D are appropriately inducted to undertake the tasks assigned. Ensure staff/contractors/consultants act within University policies and procedures relating to chemical management	Yes
Contractors and consultants		Ensure staff are appropriately inducted to undertake the tasks assigned. Ensure staff act within University policies and procedures relating to chemical management.	No

### 3 LEGISLATION AND STANDARDS

#### 3.1 Acts and Regulations

The legislation that governs the use, storage, handling and disposal of chemicals at Curtin University can be found at the following websites.

Commonwealth law: <http://www.comlaw.gov.au/>

- National Standard for the Storage and Handling of Workplace Dangerous Goods
- Work Health and Safety Act 2011 (Harmonised)
- Work Health and Safety Regulations 2011 (Chapter 7) (Harmonised)
- WA Industrial Chemical (Notification and Assessment) Act 1989
- WA Industrial Chemical (Notification and Assessment) Regulations 1990
- Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP)
- Australian Dangerous Goods Code (<http://www.ntc.gov.au/heavy-vehicles/safety/australian-dangerous-goods-code/>)

State Law: <http://www.slp.wa.gov.au/Index.html>; WA Occupational Safety and Health Act 1984

- WA Occupational Safety and Health Regulations (1996)
- WA Dangerous Goods Safety Act (2004)
- WA Dangerous Goods Safety (Storage and Handling of Non-Explosives) Regulations 2007
- WA Dangerous Goods Safety (Security Risk Substances) Regulations 2007
- WA Medicines and Poisons Act (2014)
- WA Medicines and Poisons Regulations (2016)

#### 3.2 Standards, Codes of Practice and Guidance Material

The applicable standards that may apply to the storage of chemicals at Curtin University are listed below:

- ADG Code 7.4 Australian Code for the Transport of Dangerous Goods by Road or Rail
- AS1940 The storage and handling of flammable and combustible liquids
- AS/NZS2243.1 Safety in laboratories – Part 1: Planning and Operational Aspects
- AS/NZS2243.2 Safety in laboratories – Part 2: Chemical Aspects
- AS/NZS2243.10 Safety in laboratories – Part 10: Storage of Chemicals
- AS/NZS3833 The storage and handling of mixed classes of dangerous goods, in packages and intermediate bulk containers
- AS1894 The storage and handling of non-flammable cryogenic and refrigerated liquids
- AS4326 The storage and handling of oxidizing agents
- AS2714 The storage and handling of organic peroxides
- AS/NZS4452 The storage and handling of toxic substances
- AS3780 The storage and handling of corrosive substances
- AS/NZS4681 The storage and handling of Class 9 (miscellaneous) dangerous goods and articles
- AS1216 Class labels for dangerous goods

## 4 BASIC PRINCIPLES FOR THE STORAGE OF CHEMICALS

### 4.1 Choice of risk control measures

Any storage of chemicals shall:

- a) comply with the requirements of AS2243.10
- b) comply with the requirements of the standards applicable to the storage of each class or mixed classes of dangerous goods stored
- c) be subject to a documented and approved risk assessment and have documented control measures applied that provide a level of safety equal or higher than that achieved by items (a) or (b).

**Note:** Specific conditions apply to the storage of scheduled poisons (refer to Section 12).

#### Storage procedures

- The quantities of hazardous chemicals stored shall be kept to a minimum, commensurate with their usage and shelf life. Some chemicals degrade in storage and can become more hazardous. Such chemicals shall be identified and managed appropriately.
- Containers that have held hazardous chemicals shall be treated as full, unless the receptacle or package has been rendered free from hazardous chemicals.
- Storage of chemicals, including wastes, shall be based on the properties and mutual reactivities of the chemicals. Incompatible chemicals shall be kept segregated from one another, e.g. by fire isolation in a chemical storage cabinet or by segregation in space. A separate spill catchment shall be provided for each incompatible liquid.
- Opening of packages, transferring of contents, dispensing of chemicals or sampling shall not be conducted in or on top of a cabinet or a cupboard for storing hazardous chemicals unless it is specifically designed for this purpose and appropriate procedures and equipment are used.
- Provision shall be made for the receiving and dispatch of materials, and the inspection of packages for damage.
- Packages shall be inspected regularly to ensure their integrity. Leaking or damaged packages shall be removed to a safe area for repacking or disposal. Labels shall be reattached or replaced, as necessary, to clearly identify the contents of the package.
- Procedures shall be established to deal with clean up and safe disposal of spillages. Supplies and materials needed to control the spillages shall be readily accessible.
- Substances which are unstable at ambient temperatures shall be kept in a controlled-temperature environment set to maintain an appropriate temperature range. Reliable alternative safety measures shall be provided for situations when utilities, such as power, fail. Substances that can present additional hazards on heating shall be clearly identified.
- Containers or chemicals that may be affected by exposure to sunlight shall not be stored in an area where they can be exposed to direct sunlight (or if there is potential for the sunlight to create a safety hazard). If the stability of the chemical can be affected without creating a safety hazard, procedures shall be in place to ensure the chemical is assessed prior to use.

## 4.2 Classification for segregation

Information on compatibilities of dangerous goods should be identified within safety data sheets (SDS). Table 2 provides some guidance as to the compatibility between the classes of dangerous goods.

**Table 2 Guidance to compatibility between classes of dangerous goods (Storage and handling of dangerous goods – Code of practice)**

Class / Division	2.1	2.2	2.3	3	4.1	4.2	4.3	5.1	5.2	6.1	8	9
<b>2.1 Flammable Gas</b>	A	E	C	B	B	D	B	D	D	C	B	B
<b>2.2 Non-flammable non-toxic gas</b>	E	A	B	E	E	E	E	B	E	B	B	B
<b>2.3 Toxic gas</b>	C	B	A	C	C	C	C	C	C	B	B	B
<b>3 Flammable liquid</b>	B	E	C	A	B	D	B	D	D	C	B	B
<b>4.1 Flammable solid</b>	B	E	C	B	A	D	B	D	D	C	B	B
<b>4.2 Spontaneously combustible</b>	D	E	C	D	D	A	B	D	D	C	B	B
<b>4.3 Dangerous when wet</b>	B	E	C	B	B	B	A	D	D	C	D	B
<b>5.1 Oxidising agent</b>	D	B	C	D	D	D	D	A	D	F	D	F
<b>5.2 Organic peroxide</b>	D	E	C	D	D	D	D	D	G	F	D	F
<b>6.1 Toxic</b>	C	B	B	C	C	C	C	F	F	A	B	B
<b>8 Corrosive</b>	B	B	B	B	B	B	D	D	D	B	G	B
<b>9 Miscellaneous dangerous goods</b>	B	B	B	B	B	B	B	F	F	B	B	A

Note: In this table, combustible liquids should be included with Class 3.

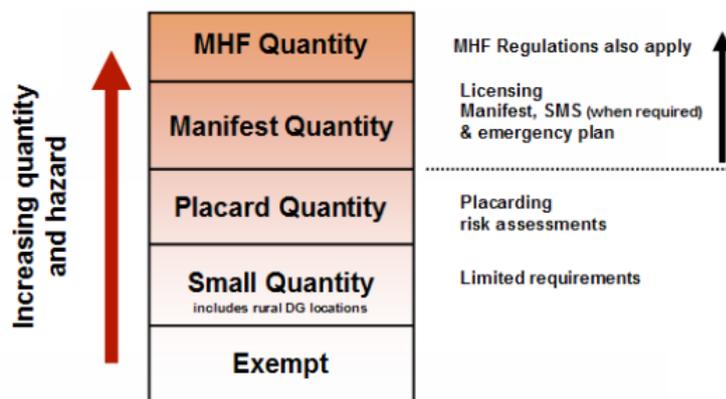
A	Most dangerous goods of the same class have similar primary hazards and are usually considered to be compatible.
B	With a few exceptions, which should be indicated on the SDS, goods of these two classes are usually non-reactive with each other. However, in an emergency such as a spill, leak or fire, the presence of the second class may lead to different hazards or increased risk such that additional control measures are required.
C	While goods of these two classes are usually non-reactive with each other, a fire involving the fire risk goods may lead to the release of large clouds of toxic gases or vapours.
D	Goods of these two classes are likely to interact with each other in such a way as to significantly increase risk. In some cases, interaction may result in fire or evolution of toxic vapours. For those that do not interact, a fire involving one may be violently accelerated by the presence of the other. These classes should not be kept in the same area unless it can be demonstrated that the risks are fully controlled.
E	If the Division 2.2 has a Subsidiary Risk 5.1, then this is D, otherwise it is B.
F	If the Division 6.1 or 9 is a fire risk substance, then this is D, otherwise it is B.
G	If one material is a concentrated, strong acid and the other is a concentrated, strong alkali, then this is D, otherwise it is A.
Unstable chemicals	Unstable at or below ambient temperature requiring storage in a cold store; unstable at or above ambient temperature and requiring some shade.

## 5 CHEMICAL STORAGE QUANTITIES

The quantities of chemicals should be restricted to the minimum levels consistent with the operations of the laboratory. Following use, chemicals should be returned to storage if they have not been contaminated. If contaminated, the chemical should be treated as a waste and appropriately disposed.

### 5.1 Dangerous goods

Figure 1 summarises the regulatory regime for the storage of dangerous goods.



**Figure 1 Schematic showing storage and handling regulatory regime (Storage and handling of dangerous goods – Code of practice)**

The licensing of dangerous goods is not required until volumes above the manifest quantities stated in the Dangerous Goods Safety (Storage and Handling of Non-Explosives) Regulations 2007, Schedule 1 — Quantities of dangerous goods being stored (refer to Table 3).

**Table 3 Placarding and Manifest Quantities (Storage and handling of dangerous goods – Code of practice)**

Item	Description of dangerous goods	Packing group	Placarding quantity	Manifest quantity
1	Division 2.1 except aerosols	N/A	500 L	5,000 L
2	Division 2.2 except aerosols	N/A	1,000 L	10,000 L
3	Division 2.3	N/A	50 L	500 L
4	Division 2.1 and 2.2 aerosols	N/A	5,000 L	10,000 L
5	Any one of Class 3, Division 4.1, 4.2 or 4.3, Division 5.1 or 5.2, Division 6.1, Class 8 or Class 9, or any combination of those classes or divisions	I	50 kg or L	500 kg or L
		II and III (aggregate)	1,000 kg or L	10,000 kg or L
		I, II and III (aggregate) where quantity of goods in packing group I does not exceed 50 kg or L	1,000 kg or L	10,000 kg or L
6	Goods too dangerous to transport	N/A	5 kg or L	50 kg or L
7	C1 combustible liquids with fire risk dangerous goods	N/A	1,000 L	10,000 L

Item	Description of dangerous goods	Packing group	Placarding quantity	Manifest quantity
8	Other C1 combustible liquids	N/A	10,000 L	100,000 L

Note: For the purposes of item 5 in the table:

- all Type B Division 4.1 Self Reactive Substances that do not have a packing group assigned to them are to be taken to be assigned to packing group I
- all Types C to F Division 4.1 Self Reactive Substances that do not have a packing group assigned to them are to be taken to be assigned to packing group II
- all Type B Division 5.2 Organic Peroxides that do not have a packing group assigned to them are to be taken to be assigned to packing group I
- all Types C to F Division 5.2 Organic Peroxides that do not have a packing group assigned to them are to be taken to be assigned to packing group II
- Class 9 dangerous goods that do not have a packing group assigned to them are to be taken to be assigned to packing group III
- all other articles and things that do not have a packing group assigned to them are to be taken to be assigned to packing group II.

Curtin's policy is to maintain chemical quantities in exempt or small quantities. Where there is a requirement to store chemicals above placard quantities, specific risk assessments and design considerations must be undertaken. Storage above placard quantities will necessitate a Dangerous Goods Licence.

## 5.2 Laboratory storage (exempt)

The quantities of hazardous chemicals stored in laboratories should not exceed those specified in Table 4. Incompatible chemicals shall not be stored together unless properly segregated. Although not a requirement at these volumes, it is recommended that chemicals stored in the laboratory are located within a chemical storage cabinet. For further information and additional table notes, refer to AS/NZS 2243.10: 2004.

**Table 4 Quantities of hazardous chemicals permitted to be stored in a laboratory other than in a chemicals storage cabinet (as per AS/NZS2243.10: 2004)**

Type of substance or class of dangerous goods	Maximum per 50 m <sup>2</sup> (kg or L)	Maximum pack size (kg or L)	Conditions for storage
Class 3 primary or sub-risk	10	5	Labelled standard laboratory cupboard or in small amounts throughout the laboratory
Combustible liquids	50	20	Labelled standard laboratory cupboard or in small amounts throughout the laboratory
Classes 4.1, 4.2, 4.3, 5.1 or 5.2	20 but less than 10 of any one Class	10	Labelled standard laboratory cupboard or, for Classes 4.1, 4.3 and 5.1, in small amounts throughout the laboratory
Class 6.1	PG I 10 Other 50	PG I 10 Other 20	Labelled standard laboratory cupboard or in small amounts throughout the laboratory
Class 8	20 for liquids 50 for solids	20	Labelled standard laboratory cupboard or in small amounts throughout the laboratory

Type of substance or class of dangerous goods	Maximum per 50 m <sup>2</sup> (kg or L)	Maximum pack size (kg or L)	Conditions for storage
Class 9 and aerosols	50 for liquids 100 for solids	5 for liquids 20 for solids	Labelled standard laboratory cupboard or in small amounts throughout the laboratory
Maximum aggregate quantity	200		
Hazardous substances		5 for liquids 20 for solids	Labelled standard laboratory cupboard or in small amounts throughout the laboratory

Where there is a specific requirement to hold greater quantities of chemicals in the laboratory, the design and management can be changed to accommodate this. Chemicals in quantities above those stated in Table 4 must be stored within a chemical storage cabinet.

The capacity of any chemical storage cabinet used in a laboratory to store chemicals of classes 4.1, 4.2, 4.3, 5.1 or 5.2 shall not exceed 50 L. For other chemicals, the capacity shall not exceed 250 L.

The aggregate cabinet storage capacity, in a radius of 10 m measured from any one cabinet shall not exceed 250 L or 250 kg.

Incompatible chemicals shall not be stored together. Separate chemical storage cabinets shall be used to maintain proper segregation.

### 5.3 Laboratory chemical store (small quantities)

This section considers separate chemical stores.

The maximum quantities of various types of chemicals shall not exceed the quantities specified in Table 5 and the aggregate maxima listed in the last row of the table. The maximum quantity of all substances in the store must not exceed 4,500 L or 4,500 kg.

**Table 5 Maximum Storage Quantities (as per AS2243.10)**

Type of goods	Kilograms for solids and aerosols, litres for liquids		Other
	PG I	PG II and PG III	
Goods too dangerous to be transported	Not applicable (Note 3)	Not Applicable (Note 3)	Risk assessment required
Class 2 aerosols (UN1950)	Not applicable (Note 3)	100	Not applicable
Class 3 primary of subsidiary risk (except UN3256)	200 but no more than 100 in any one cabinet	1,000	Not applicable
Combustible liquids C1/C2	Not applicable (Note 3)	Not applicable (Note 3)	1,000
Class 4.1 Class 4.2 Class 4.3 Class 5.1 Class 5.2	200 aggregate (includes Class 4.1 UN3221 to UN3240. Class 5.2 UN3101, UN3102 and UN3111 to UN3120)	1,000 aggregate  No more than 50 of Class 5.2 in any one cabinet	Not Applicable
Class 6.1 Class 8 Class 9 (except elevated temperature goods UN3257 and UN3258 and dry ice UN1845)	500 aggregate  No more than 100 of Class 6.1 and 8 in any one cabinet	1,000 aggregate  Class 6.1 and Class 8 liquids in breakable containers of no greater than 1 L capacity, liquids in non-breakable containers of no greater than 5 L capacity, solids in packages of no greater than 10 kg and non-combustible articles such as batteries may be stored outside cabinets.	Not applicable
UN3256 to UN3258 UN1845	Not applicable (Note 3)	See Note 4	Not applicable
Hazardous substances not otherwise classified as dangerous goods	Not applicable (Note 3)	Not applicable (Note 3)	2,000 for hazardous substances otherwise classified as dangerous goods
Aggregate maxima	500	2,000	2,000 (Note 2)

**Notes:**

1. For the purpose of risk management, some dangerous goods of Class 4.1 and 5.2 have been added to Packing Group I, varying from the groupings used for ADG Code and MSDS purposes.
2. Where other chemicals for laboratory use are stored, they shall be excluded from the total amount unless they are incompatible with other store contents.
3. No goods are assigned to this Packing Group.
4. A risk assessment is required to determine the storage conditions, storage quantities and whether the goods can be stored with other goods.

## 6 LABORATORY STORAGE REQUIREMENTS

### 6.1 Open storage

The following requirements are set out in Section 4.5.2 Open Storage of AS/NZS2243.10:

- a) For shelves over benches, chemicals shall not be stored on shelves higher than 1.5 m from the floor.
- b) Shelving and its fixtures shall be compatible with the goods stored, or shall be suitably protected from the goods.
- c) The maximum holding capacity of the shelving systems shall not be exceeded.
- d) Chemical packages should not be kept on the floor.
- e) Shelves used for chemical storage shall be restrained against lateral movement.
- f) Incompatible chemicals shall not be stored together unless properly segregated.

Liquids of any kind should not be stored above solids to reduce the risk of contamination. Liquids should be stored as low as possible to reduce the risk of breakage and spillage.

For particular groups of chemicals or items, due to their hazardous nature or regulatory requirements, additional storage requirements may be necessary. Consideration shall also be given to additional storage requirements for the following:

- scheduled drugs, poisons and controlled substances (refer to section 12)
- scheduled carcinogens
- radioactive isotopes (not considered in this document)
- illicit drug precursors (refer to section 12)
- chemical warfare agents and synthetic precursors thereof (not considered in this document)
- cyanides
- hydrofluoric acid
- nitric acid etchant blends, e.g. Nital
- perchloric acid and its etchant mixtures.

### 6.2 Storage cabinets

Chemical storage cabinets for the storage of dangerous goods are intended:

- to protect the contents against damage
- to provide segregation between incompatible substances
- to contain spillages
- in the case of fire, to allow at least 10 minutes for escape of persons or use of firefighting equipment.

Cabinet ventilation should not normally be required unless determined as an essential risk control measure. Examples of chemical types which may require ventilation include some PG 1 Flammables, chemicals with high odour, volatility and/or toxicity. Examples include diethyl ether, 37% formaldehyde solutions, and notable storage of thiols/mercaptans). See section 9.5 for further details. Cabinet ventilation is not an alternative to vapour-tight closure of all stored containers.

Cabinets shall not be located:

- one above the other
- where they can jeopardise emergency escape (a minimum of three metres is recommended between any cabinet and escape doors)

- under stairs or in corridors.

Refer to section 9 for specific details on storage cabinets.

### 6.3 Separate store

Laboratory stores shall be used for the storage of hazardous chemicals (except gases) for laboratory use. Other chemicals that are neither dangerous goods nor hazardous substances (e.g. starch or distilled water) may also be kept in the store. Other laboratory items such as glassware, apparatus or safety equipment should not be kept in the store. Waste shall only be stored if it has been classified, packaged and labelled in accordance with Curtin's Chemical Management Plan.

#### 6.3.1 Location

The location of a separate store may be:

- attached to a laboratory
- attached to any other room
- a freestanding building or structure.

Internal stores should be located on the floor directly accessible from street level or a site roadway. For stores located on any other floor, a risk assessment shall be conducted and documented. It is recommended that a chemical store be located at the delivery point of a building. Consideration will also need to be given to the new vehicle-free areas within the Bentley campus.

An external store shall be separated from on-site protected places, protected places and public places by at least:

- 3 m for a storage capacity of hazardous chemicals not exceeding 1,000 kg (or 1,000 L); or
- 5 m for a storage capacity of hazardous chemicals between 1,000 kg (or 1,000 L) and 4,500 kg (or 4,500 L).

#### 6.3.2 Requirements

A laboratory store shall meet the requirements of AS/NZS2243.10. This standard allows a high level of flexibility in the range of hazardous chemicals that may be stored but it severely limits the total storage quantity. This standard is most appropriate for stores containing a large and possibly unpredictable range of hazardous chemicals, usually in relatively small quantities.

Alternative standards may prove to be more suitable or practical and may include the following:

- The relevant standard for the class of dangerous goods may be preferable if only non-flammable dangerous goods or only one or two classes of dangerous goods are stored or if they are in dominant quantities.
- AS/NZS3833 is intended mainly for the storage of large quantities of pre-determined dangerous goods but excludes Packing Group I. It does not allow the storage flexibility often required for research and experimental laboratories. Further, the required internal segregation distances are not normally available in laboratory stores. AS/NZS3833 may be suitable for industrial applications where large quantities of raw materials or finished products are held in 'quarantine' awaiting quality assurance testing.

Once the decision has been made, the chosen approach shall be implemented fully. Different standards cannot be selectively applied to parts of the store. The following background to each option is provided:

## **7 LABORATORY STORE CONSTRUCTION**

### **7.1 General requirements**

For external and internal stores, the store construction shall comply with the requirements for flammable liquid stores in AS1940. The store shall be designed to prevent ingress of direct sunlight.

The floor of the store shall be:

- a) constructed of non-combustible materials that are compatible with the dangerous goods being kept (masonry, concrete, or a structure sheeted with non-combustible material)
- b) impervious, not liable to degradation or to incendive sparking; suitable materials are concrete and sealed masonry
- c) treated in such a manner as to render it resistant to attack by the substances being kept (some corrosive substances and some oxidising agents can attack surfaces therefore specialty painted concrete may be a suitable control)
- d) provided with a spill catchment (fixed bunding or shelf/container bunding).

The stores should remain below 30 °C; though this limit is not strict and can vary slightly (+/- 3 to 4 °C). Once temperatures get above 30 °C (especially for long periods) chemicals and some containers can start to degrade and break down. Flammable chemicals in PG I have a flash point below 35 °C, therefore the risk presented by these chemicals is significantly increased. Air conditioning may need to be considered.

Electrical wiring and lighting within the store shall comply with IP 65 in accordance with AS60529.

The store should be constructed and operated in a manner that will allow the housekeeping requirements to be carried out effectively.

### **7.2 Spillage containment**

Chemical storage should be designed with the retention of spills in mind and provide a means of diverting any spill to a containment compound within the premises. Spillage containment shall comply with the following requirements:

- For all liquid dangerous goods, the capacity of the compound shall be at least 100% of the largest container plus 25% of the storage capacity.
- The spill catchment system shall prevent incompatible chemicals from coming into contact with one another in the event of a spill.
- Surfaces of the spillage containment system shall be non-porous and chemically resistant to all stored liquids.
- Individual trays or other receptacles, of a capacity equal to 100% of the largest container stored, may be used under a shelf, rack, or single package as a catchment device in lieu of a catchment on the floor.

An approved chemical storage cabinet will provide compliance with the above criteria.

### **7.3 Fire-resistance levels for material**

#### **7.3.1 Stores containing flammable or combustible liquids (AS1940)**

A store that is inside a building, or that shares a common wall with a protected place or an on-site protected place, shall be constructed as follows:

- The separating walls shall be constructed of a material having a fire-resistance level (FRL) of at least 240/240/240. The failure of any component with an FRL of less than 240/240/240 shall not jeopardise the stability of any firewall.
- The floor of the store shall be of reinforced concrete having an FRL of at least 180/180/180.
- The roof of the store shall be of a material having an FRL of at least 180/180/180, unless the walls are taken through the main roof by at least 0.5 m, to provide fire insulation.
- Any duct that passes through a storage area shall be constructed of or protected by material having an FRL of at least –/180/180.
- Any occupancy or usage above a flammable liquids store shall be separated by a barrier having an FRL of at least 180/180/180.

### 7.3.2 Stores containing only corrosive or toxic substances (AS3780 or AS4452)

A store that shares an intervening screen wall shall meet the following requirements:

- Where the height of the store is greater than or equal to that of the protected place, the wall shall extend at least 1 m above the highest container in the store.
- Where the height of the store is less than that of the protected place, the wall shall extend at least 1 m above the protected place or extend as a roof above the store.
- The wall shall be marked to indicate the maximum permissible storage height.
- The wall and the roof, if any, shall have a FRL of not less than 120/120/120.

### 7.3.3 Doors

Any doorway through a firewall separating a store from an on-site protected place shall be provided with a door. Such a door shall:

- be a sliding or an outward-opening, automatic-closing fire door complying with AS/NZS1905.1, and fitted with a thermal-release device
- have an FRL of at least –/120/30.

## 7.4 Store ventilation

The store shall be provided with adequate mechanical ventilation. Ventilation shall be sufficient to maintain the ambient concentration of any vapours or dusts throughout the store below any recommended workplace exposure standards. The following requirements also apply:

- The ventilation system shall be sufficient to ensure that any vapours generated within the store are diluted with, and removed by, the flow of air passing through the store.
- Within 3 m of where flammable substances are stored, the atmosphere shall be maintained below 10% of the lower explosive limits during normal operation.
- Vents shall be located to ensure effective air movement to all parts of the store.

The mechanical ventilation system shall comply with the following requirements:

- The termination points within the store for both the fresh air supply and the draw-off ducts shall be:
  - immediately above the upper limit of the spillage compound
  - on opposing walls
  - of equal capacity.
- The distance between any two inlets or any two outlets shall not exceed 5 m.

- High and low level air intakes should be included as part of the extraction system to scavenge heavier-than-air vapours from the lower parts of the store as well as volatile lighter-than-air vapours from the highest points within the store. A dual redundancy system should be considered.
- The system shall be capable of exhausting 0.3 m<sup>3</sup> per square metre of floor area per minute or 5 m<sup>3</sup>/min; whichever is the greater, and the air velocity at the air entry register shall exceed 300 m/min.
- The system shall be provided with an airflow failure warning device. The warning should be able to be detected from outside the store.
- Any intake or exhaust duct shall terminate in the open air at least 2 m from any opening into a building, or 4 m from the outlet of any chimney or flue at least 3 m above the ground. The external termination of any inlet duct shall be at least 5 m from the termination of any exhaust duct.
- The system shall be designed so that it continuously operates.
- Any duct which passes through a building other than the store shall be constructed of, or protected by, material having a Fire Resistance Level / Fire Resistance Rating (FRL/FRR) of at least –/180/180. Exceptions for toxic and corrosive stores can be made; however, decisions need to be appropriately documented and risks assessed.
- Fans shall be suitable for hazardous areas. Relevant potential ignition sources, e.g. frictional sparking, static electricity and hot spots, shall be taken into account when selecting and installing fans (refer to AS60079.10.1). Fans should be constructed of non-sparking blades and shrouds and be compatible with the conveying of flammable vapours, gases, or mists.
- There shall be no recirculation of exhaust air.

#### Notes:

1. The registers should be located along the longest side of the building, in order to optimise their effect.
2. If a single-fan system is adopted, the fan should be in the exhaust duct.
3. The supply duct may be in the form of natural ventilation in an external wall at low level.

If the ventilation system incorporates fans on both the supply and exhaust ducts, the capacities of the fans shall be adjusted so that the room is under negative pressure.

## 7.5 Ignition sources

Electrical installations shall be installed in compliance with the provisions of AS/NZS3000 that relate to electrical equipment in hazardous locations. The equipment shall be of a type certified to comply with the relevant Australian standard or that has been approved for use in such locations by the relevant authority.

Where flammable dangerous goods are to be stored, and a hazardous zone could be present, the relevant requirements of the AS/NZS60079.10.1:2009 shall apply. The following provides some details on hazardous zones within the store:

- The entire floor area up to a height of 0.3 m above floor level is classed as Zone 2.
- For flammable storage cabinets, irrespective of the ventilation of the storage area:
  - Interior of a flammable cabinet – Zone 1
  - Exterior of a flammable cabinet together with any vent provided on the cabinet, from ground level to 1 m above any opening in the cabinet, including the door and 3 m laterally – Zone 2.
- For more details on chemical storage cabinets refer to section 9.

## 7.6 Clear access

The means of entry into and exit from the store shall be kept clear at all times. At all times, access shall be available to:

- firefighting equipment
- personal protective equipment
- clean-up materials and equipment
- the place where the manifest is kept.

## 7.7 Fire protection

The store should be equipped with an alarm which will sound at an attended place when the concentration of flammable or toxic vapour exceeds set limits, when there is smoke, or when heat is generated.

The selected method of fire protection shall be compatible with all hazardous chemicals stored. As a minimum, there shall be one portable fire extinguisher immediately outside the door to the store. Additional fire extinguishers may be required based on risk of the store's contents and design. The minimum size of fire extinguisher shall be equivalent to a 2A 60B(E) for powder-type extinguishers or a 2A 20B for foam extinguishers.

It is not recommended that a sprinkler system be used in the chemical store as not all chemicals being stored may be compatible with water. In addition to this, the store is used for mixed classes of chemicals and the introduction of water could provide a conduit for non-compatible chemicals to mix, generating a more complex dangerous environment.

## 8 DISPLAY OF HAZARD IDENTIFICATION INFORMATION

### 8.1 Placarding requirements

#### 8.1.1 Principles

Placards provide visual warning of the hazards associated with the storage of dangerous goods at the site. This is particularly important for Department of Fire and Emergency Services (DFES) personnel.

There are three placard types:

- an outer warning placard, known as the Hazchem placard, on the outside approaches to the site
- placards for each location of dangerous goods stored in bulk (e.g. tanks)
- placards for each location where packages are stored and handled.

Placards must be readily visible to DFES when approaching the location where the goods are stored or handled so they:

- need to be visible from all normal approaches to the storage location, the main entrance, or both
- must be kept legible and unobstructed.

#### 8.1.2 Outer warning placards

The site must be marked by a Hazchem outer warning placard.

These outer warning placards must be displayed at all road entrances to the site where DFES may gain entry. Usually, this will be at the main road entrance. However, if the site consists of buildings back from the street, such that the placard at the street entrance would not be effective, the outer warning placard should be displayed at each entrance of the building that may be used by FESA.

A Hazchem outer warning placard for dangerous goods must:

- be at least 120 mm high
- display the word 'HAZCHEM' as shown in Figure 2, that has:
  - red capital letters at least 100 mm high
  - lettering of the kind shown in Figure 2
  - white or silver background.

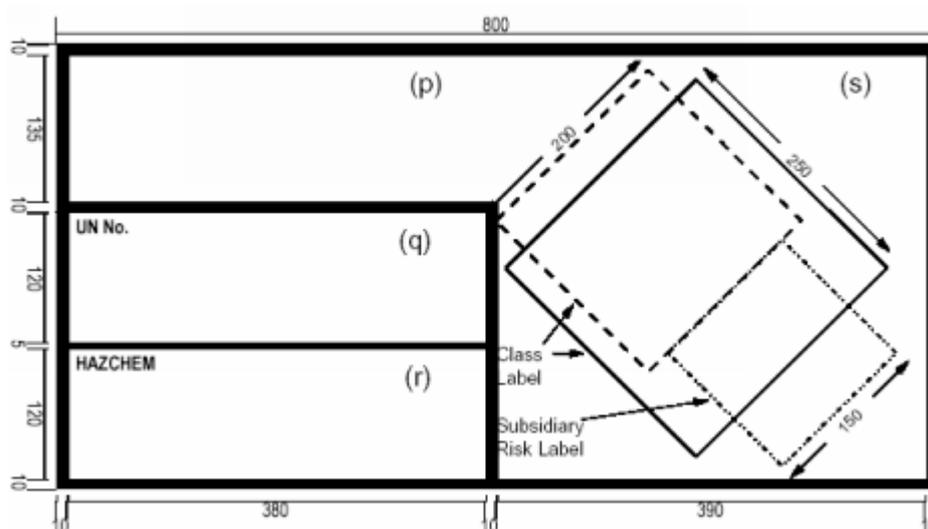


Figure 2 Hazchem sign

### 8.1.3 Packaged dangerous goods

Placards must be displayed on or near the storage location of bulk dangerous goods.

1. A placard for bulk dangerous goods must:
  - have dimensions not less than the dimensions shown in Figure 3
  - show the following details for the goods in the following positions on the placard (see Figure 3):
    - I. in position (p) – the proper shipping name
    - II. in position (q) – the UN number
    - III. in position (r) – the Hazchem code
    - IV. in position (s) – the class label and the subsidiary risk label (if any).
2. The numbers and letters used for the proper shipping name, UN number and Hazchem code must be:
  - black on a white background
  - if the proper shipping name takes no more than 1 line – at least 100 mm high
  - if the proper shipping name takes 2 lines or more – at least 50 mm high.
3. Despite paragraph (2), a letter of the Hazchem code may be white on a black background.
4. The class label must:
  - comply with the form and colouring specified in Chapter 7 of the Australian Dangerous Goods (ADG) Code
  - if there is also a subsidiary risk label – have sides of at least 200 mm
  - if there is no subsidiary risk label – have sides of at least 250 mm.
5. A subsidiary risk label must:
  - comply with the form and colouring specified in Chapter 7 of the ADG Code
  - have sides of at least 150 mm.



**Figure 3** Template of a placard for bulk dangerous goods



**Figure 4** Example a placard for bulk dangerous goods

The class label (including mixed class labels) should be grouped. Grouping need not be in a horizontal line – it can be vertical or diagonal. If there is regular variation in the type of dangerous goods, it may be convenient to use frames for slip-in-and-out labels, such as the type commonly used on vehicles. Vehicles and loads marked in accordance with the ADG Code placards are acceptable.

A placard for packaged dangerous goods must:

- display the class label for each of the dangerous goods to which the placard relates
- comply with the form and colouring specified in Chapter 7 of the ADG Code (refer to AS1216).

Each class label must have sides of at least 100 mm.

## 8.2 Signage

At the entrance to a laboratory chemical store, the following signs shall be displayed:

- restricted access with a sign “Authorised access only” (or equivalent) (refer to AS1319)
- dangerous goods (DG) diamonds.

DG diamonds shall be displayed at the entrance to the laboratory store. Refer to AS1216 for details of specific class labels for dangerous goods. Refer to AS1319 for requirements of safety signs for the occupational environment.

DG diamonds shall be in the form of a square set on an angle of approximately 45° (diamond shaped). The surface of each label shall have a line of the same colour as the symbol, inside the edge and running parallel with it. This line shall be 5 mm inside the edge for a label of dimensions of 100 mm x 100 mm. For labels of other sizes, the distance of the line from the edge shall be reduced or increased in proportion to the size of the label. The store should also have restricted access with a sign “Authorised access only” (or equivalent).

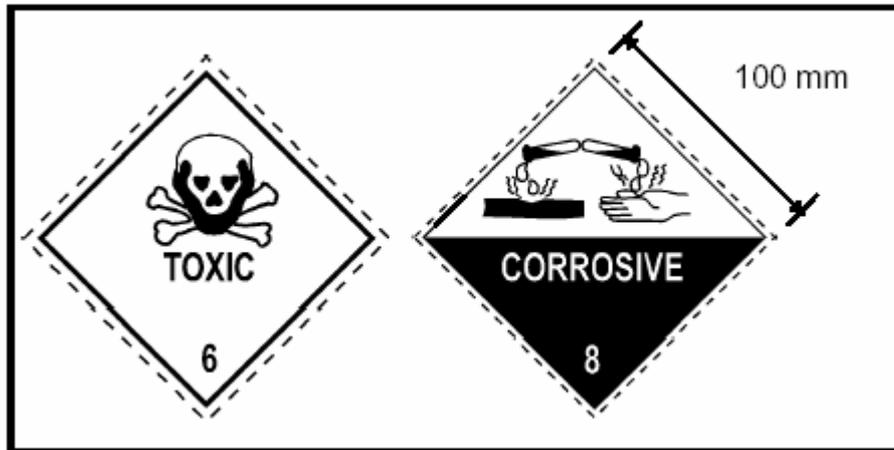


Figure 5 Example of a DG Diamond

## 9 CHEMICAL STORAGE CABINETS

### 9.1 Types of substances kept

Cabinets may be used for the storage of packaged dangerous goods of classes and divisions 3, 4.1, 4.3, 5, 6.1 and 8. Chemical storage cabinets should be used within a store to prevent contact between incompatible substances and to reduce the rate of a fire spreading.

If the compatibility of the goods being kept cannot be fully ascertained from the available technical information, each class shall be kept in a separate cabinet; except that classes 3 and 4.1 and combustible liquids may be stored in the same cabinet.

With regards to scheduled poisons numbers 4, 7, 8, and 9, these must be stored first according to the dangerous good segregation requirements. Not all scheduled poisons can be kept together due to their incompatibility or risk. It is preferable that poisons are stored in separate lockable containers (even within a storage cabinet).

The following coloured cabinets are preferred:

Yellow	flammable cabinets
White or Yellow	oxidising cabinet
Blue or grey	corrosive cabinet
Purple	Poison cabinet (must be lockable)
Purple or white	Toxic cabinet

### 9.2 Maximum quantities to be kept

Where more than one class of dangerous goods is kept in the one cabinet, the aggregate maximum quantity of dangerous goods kept in a single storage cabinet shall not exceed 250 kg or 250 L.

The quantity of particular classes of dangerous goods in one cabinet shall be further limited as specified in Table 5. If a chemical storage cabinet contains any quantity of dangerous goods of PG I, the whole contents shall be regarded as PG I.

### 9.3 Cabinet location

The following requirements apply to the location of cabinets:

- Cabinets shall not be located one above the other.
- Cabinets shall be located so that they do not impede escape in an emergency.
- A minimum of 3 m is recommended between any cabinet and escape doors (laboratories not stores).
- Cabinets shall not be located under stairs or in corridors.
- Cabinets shall not be located closer than 3 m to ignition sources other than ceiling lights unless a hazardous zone assessment has been carried out.
- Cabinets shall be separated from each other by **not less than 250 mm airspace**, which shall remain clear and accessible at all times.

## 9.4 Construction

The following requirements apply to the construction of cabinets:

- The cabinet shall be constructed from, or its surfaces sealed with, a material whose structure integrity is not compromised by long-term exposure to the substances it is intended to contain.
- The walls, floor, door and roof shall be of double-walled sheet steel construction, having a thickness of at least 0.75 mm, with a space at least 40 mm between the walls, which may be either an airspace or filled with non-combustible insulation.
- The cabinet bottom shall form a liquid-tight compound at least 150 mm deep and capable of containing at least 25% of the maximum storage capacity.
- Any shelf shall be perforated for free air movement, and shall be capable of supporting the maximum load.
- The cabinet door shall be self-closing, close-fitting, and held shut by catches at not less than two points. The door shall not open inwards, and shall be capable of being opened from inside the cabinet.
- The materials of any components that are critical to the cabinet's structural integrity shall not melt at temperatures below 850 °C; seals or gaskets excepted.

For cabinets that store corrosives, the walls, floor, doors and roof of a cabinet shall either be constructed of corrosion-resistant materials or be protected by a corrosion-resistant lining or coating.

Cabinets for the storage of toxic substances shall be lockable.

## 9.5 Venting

Highly volatile toxic substances should be stored in a continuously mechanically ventilated cupboard, away from sources of heat or ignition. The purpose of ventilation is to create and maintain a safe working atmosphere within the cabinet by means of an air flow-through system. Where mechanical ventilation of a cabinet is required the following requirements apply, in addition to the requirements of section 7.4:

- The design of any vent opening in the cabinet wall shall not compromise the structural strength of the cabinet.
- A mechanical ventilation system is preferred as this will provide a constant flow of air through the cabinet.
- A suitable mechanical fan should be constructed of non-sparking blades and shrouds and be compatible with for conveying of flammable vapours, gases, or mists.
- Ventilation shall be designed so that the vapours are prevented from escaping into any room.
- Any ventilation exhaust shall be to the outside atmosphere and in a location which allows the safe dispersal of vapours and is away from any ignition sources and where people congregate. The outlet of the ventilation should be at least 3 m above the ground and should be guarded to prevent entry by birds, insects etc.
- Ventilation ducting should provide at least the same level of fire protection as the cabinet walls and be resistant to vapours, fumes or dust in the cabinet. Steel piping is recommended whereas PVC should not be used as it cannot withstand excessive temperatures such as a fire. The ducting tubing must have an inner diameter no less than the vent bung opening.
- The total run of the exhaust ducting should not exceed 7.62 metres.
- Both bung openings should be fitted with proven flash arresters to prevent flash back into the cabinet from an external ignition source. These flash arresters must not be removed.

- Ducting should be from the bottom vent bung to draw the air and vapour from the cabinet as vapours are generally heavier than air.
- The top vent bung is a fresh air inlet to the cabinet. When the fan is operating this may create a slight negative pressure within the cabinet.
- DO NOT manifold vent piping and ducting together from multiple cabinets.
- DO NOT connect the fan to the air intake vent in order to push the air through the cabinet. This could cause an internal pressure build-up within the cabinet and also force the vapours to escape through the doors when the cabinet is opened.

Additional requirements for flammable cabinets – strictly no ignition sources are allowed within 3 m of the cabinet.

## 9.6 Cabinet marking

Cabinets shall be marked in accordance with regulatory requirements. Where there are no such requirements, each cabinet shall be marked with:

- the name and address of the manufacturer or, for imported cabinets, the distributor within Australia
- the maximum storage capacity
- a dangerous goods class label (refer to section 8.2 for details).

Signs and markings shall be clearly visible when the cabinet doors are closed.

For flammable cabinets, a sign bearing the words 'NO SMOKING, NO IGNITION SOURCES WITHIN 3 m' in lettering at least 50 mm high should also be placed on the cabinet.

## 9.7 Exclusion of ignition sources

There shall be no ignition sources within the cabinet. Where flammable liquids are stored, ignition sources shall be excluded from the area outside the cabinet to a distance of 3 m measured laterally, and from floor level to a height of 1 m above any opening in the cabinet, including the door.

Where only combustible liquids are kept in the cabinet, ignition sources should be avoided within the spaces specified above.

## **10 SAFETY EQUIPMENT**

### **10.1 General**

A permanently fixed aerated eye-wash facility which can be operated without using hands is necessary in or within 10 seconds of the laboratory store. It may be possible to install a combined eye wash and sink.

A safety shower should also be installed.

Similarly, combined eye wash/safety showers may be suitable.

Appropriate PPE should be available for use:

- protective clothing complying with AS/NZS4501.2, suitable for use with the specific dangerous goods being handled
- eye protection, selected in accordance with AS/NZS1337
- protective gloves complying with the relevant parts of the AS/NZS2161
- safety footwear complying with AS/NZS2210
- respirators having appropriate filters, complying with AS/NZS1716 and selected, used and maintained in accordance with AS/NZS1715.

Gloves and boots shall be checked for leaks.

### **10.2 First aid**

A first aid station shall be provided in a clean area. It shall comprise, as a minimum, an appropriate first aid kit and first aid instructions, e.g. SDS, for all substances being kept or handled on the premises.

It is recommended that:

- at least one person on the premises is trained in first aid
- a list of persons trained in, and designated as being responsible for the administering of, first aid should be shown on all noticeboards on the premises.

The first aid procedures set out in the relevant SDS should be adopted.

### **10.3 Corrosive substances**

After use, all personal protective equipment shall be cleaned with water or appropriate solutions, e.g. 5% sodium carbonate (soda ash) solution if contaminated with an acid or 5% sodium bisulfate solution if contaminated with an alkali. Where such other cleaning solutions have been used, the equipment shall finally be washed with water until the wash water is neutral.

### **10.4 Toxic substances**

#### **10.4.1 PPE**

Personal protective equipment shall be kept separate from normal clothing. As a minimum, gloves should be worn when handling contaminated personal protective equipment and clothing after use. Precautions should be extended depending on the degree of contamination and the toxic substance involved.

After use, all personal protective clothing and equipment shall be cleaned with water or a solution appropriate for the toxic substance. The equipment shall be dried before being put away.

Protective clothing shall be decontaminated then laundered in the normal way.

Grossly contaminated safety equipment or clothing shall be rendered unusable and disposed of in a manner approved by the local waste disposal authority.

#### **10.4.2 First aid**

Advice shall be obtained from an occupational medical practitioner as to the first aid facilities and response required. This will be dependent on the nature of the toxic substance, its quantity, and the location of the industry.

An administrative procedure shall be in place to regularly review this advice as opinions on what constitutes an appropriate response and what antidotes, if any, are appropriate, and are continually changing.

## 11 RISK MANAGEMENT APPROACH

### 11.1 Introduction

Risk management is considered an acceptable way of organising efforts to determine safe systems of handling and storage of dangerous goods. Laboratories and chemical stores are designed to address the many and varied requirements for safe operation and usage. The design process should include hazard identification, risk assessment and risk management to achieve safe and functional design.

The procedure below can be used to identify safety issues. Risk is a combination of the likelihood and severity of any harm the hazards may generate. Risk management involves the following steps:

1. Identify the hazards — Examine all activities, work processes, plant, substances, work environment, layout and condition of the site, and any other factors affecting safety. Specifically include dangerous goods classification of container contents; any dust or gas hazards that may arise from the nature of the substances and articles in use, handled or stored.
2. Assess the risks — Identify the factors contributing to the risk. With dangerous goods, the quantity stored and in use is one indicator of the level of risk. The greater the quantity the greater the risk. Prioritise the risks, tackling the most serious ones first. Evaluate the effectiveness of existing control measures.
3. Eliminate or reduce the risk(s) — Apply the ‘hierarchy of control’ measures.
  - **Eliminating the risk** — Use a non-harmful substance instead of dangerous goods.
  - Substituting the system of work, substance or plant for something less hazardous — Change the type or reduce quantities of goods kept on site.
  - **Isolating the hazard** — Introduce a restricted work area, enclosing the system, separating goods from other hazards or segregating incompatible substances.
  - **Introducing engineering controls** — Install forced ventilation to remove fumes.
  - **Administrative controls** — Modify the system of work, such as changing the times at which certain tasks are done or using hazard warning signs, specific training and work instructions.
  - **Personal protective equipment (PPE)** — Provide eye, respiratory and hand protection for the worker (and instruction on when and how to wear them).
4. Monitor and review the control measures — Ensure that safety is maintained and the risk control measures are working. Respond to changes in work practices, activities and other conditions. Supervision is essential to ensure workers and the public follow correct practices.

(For more details refer to the *Storage and handling of dangerous goods – Code of practice, 2nd edition*; DMP 2010)

### 11.2 Recording outcomes of risk assessment

If no specific measures are necessary to control risks, make a notation in the register (e.g. on the SDS). However, if specific control measures are necessary, the risk assessment must be documented, and a copy kept while the risk assessment is being reviewed. The risk assessment records should include:

- date of the assessment
- name(s) of the assessor(s)
- name(s) of people who provided specialist advice
- site, storage location, area or process to which the record relates

- dangerous goods involved in the storage or handling work activity and the particular hazards
- identified risks, including the likelihood of possible consequences
- controls necessary to reduce risks to an acceptable level and how decisions about the control were made, such as a determination of what was reasonably practicable
- existing controls in place, and if they are sufficiently effective
- other controls that need to be introduced
- methods used to make the judgement, such as the sources of information reviewed or used to make decisions (e.g. SDSs, Australian standards).

The risk assessment should include the reasons for determining controls and a determination of what was reasonably practicable in the circumstances. The record of the risk assessment will be useful when subsequently reviewing the assessment, or when changes could result in the need for a new assessment.

The record of the result of the assessment, including the consultative process, must be accessible to any person engaged to work at the site who could be exposed to the risk.

## **12 SCHEDULED POISONS**

### **12.1 Approval required for scheduled poisons**

Tertiary institutions can apply to the Department of Health for permission to purchase, hold and use restricted poisons, medicines and drugs for the purpose of teaching, analysis and research. The following information outlines the general storage requirements for these poisons; however additional conditions may apply on a case-by-case basis, as outlined in specific permissions.

### **12.2 General storage of poisons**

According to the Poisons Act, scheduled poisons shall be kept in such a manner as to “preclude contamination of any food, drink or condiment by the poison; and to preclude access to the poison by children.”

#### **12.2.1 Schedule 4 (PRESCRIPTION ONLY MEDICINE)**

In addition, Schedule 4 substances must be stored securely, with access restricted to authorised personnel. Records of purchase and use must be kept for 2 years.

#### **12.2.2 Schedule 7 (DANGEROUS POISON)**

The storage of Schedule 7 laboratory chemicals is not permitted in fume cupboards, laminar flow cupboards and/or in bio-safety cabinets. All Schedule 7 laboratory chemicals are to be used in a fume cupboard where possible.

### **12.3 Schedule 8 (CONTROLLED DRUG)**

#### **12.3.1 Storage**

Schedule 8 medicines must be stored in a safe according to the following requirements.

An authorised person who is in possession of the key to a safe in which is stored a Schedule 8 controlled drug shall ensure that the safe is kept locked at all times except when items are being placed into, or being removed from, the safe.

Where a person stores a drug of addiction in a safe in accordance with the Medicines and Poisons Regulation (2016) Schedule 3 (1) or (2) the person shall ensure that the safe is not in a part of the premises that is accessible to the public.

#### **12.3.2 Safe requirements**

Schedule 8 medicines must be stored in a safe which complies with the following requirements.

The safe must:

- weigh at least 500 kg; if it is less than 1,000 kg it must be bolted to a concrete floor by a licensed security installer
- have a key or combination lock
- have a steel plate door, which is a minimum of 12 mm thick (outer layer, does not include space for packing material)
- have at least 2 locking bolts that are at least 25 mm thick.

**Note:** Although still compliant, under-floor or in-ground safes are no longer recommended due to occupational safety and health concerns.

### 12.3.3 Exemption for small quantities

There is a provision to apply for an exemption from the requirements of Appendix M of the Medicines and Poisons Regulations (2016), under certain conditions. An exemption will be considered when only a small quantity of Schedule 8 medicines is stored at the premises (for less than 8 g, conditions apply).

When only a small quantity of Schedule 8 medicines is being stored, a safe must have:

- the cabinet and door made of solid steel at least 10 mm thick
- a flush-fit door with a maximum clearance of 1.5 mm when closed
- a dog-bolt hinge system for the door
- continuous welding on all edges
- a locking mechanism that uses a 6 lever key or 3–4 wheel combination or equivalent electronic combination lock

The safe is to be securely mounted to a brick wall or concrete floor and secured using four masonry anchors such as Loxin or Dyna Bolts, which measure at least 10 mm (width) by 50 mm (length). A licensed safe installer is recommended to ensure compliance.

### 12.3.4 Additional security requirements

The *WA Medicines and Poisons Regulations (2016)* gives clear additional requirements.

A drug or drugs of addiction in an amount greater than:

- 200 tablets or capsules
- 20 ampoules
- 500 mL liquid
- a total of no more than 7.5 g of Schedule 8 substances

shall be protected by a detection device complying with the Australian standard having the designation AS2201.3 and entitled “Intruder alarm systems Part 3: Detection devices for internal use” published by the Standards Association of Australia including any amendment thereto made before the commencement of the *Poisons Amendment Regulations (No. 2) 1993 1*.

The detection device shall be able to detect the presence of a person who interferes, or attempts to interfere, with:

- the safe in which the poison is, or poisons are, stored
- the detection device
- the device’s alarm control panel.

The detection device and its alarm control panel shall be:

- monitored by a dedicated direct line
- installed in compliance with the Australian standard having the designation AS2201.1 and entitled “Intruder alarm systems Part 1: Systems installed in client’s premises”, and by a person who is licensed under the *WA Security Agents Act 1976* as a security agent or guard to install that kind of device and alarm control panel.

### 12.3.5 Register of drugs of addiction

Records of purchase and use must be kept for 2 years. In addition a monthly inventory of Schedule 8 Poisons must be performed and recorded.

## **REFERENCES**

Storage and handling of dangerous goods – Code of practice, 2nd edition; DMP 2010

## **REVISION AND UPDATES**

### **Revision procedure**

This guidance document has been developed as a living document that reflects the changes in legislation, standards and guidelines available. This plan will therefore be subject to periodic review and new editions published. It is important that readers assure themselves that the current management plan is being referenced and that current standards including any amendments, legislation and/or guidance are being used.

As a minimum it is intended this document will be updated every three years.

Throughout this document various web links have been provided to Curtin's internal documents and other third party documents. These links are subject to change with updating information. Every effort will be made to ensure internal Curtin University links remain active. Curtin University has no control over external websites and/or documentation. If a link does not work it is recommended going to the home page of the website being referenced and search for the required document.

A revision history is provided at the front of this document.

### **Request/Recommendation log**

A log of requests / recommendations shall be maintained by the document owner (Frank Collins c/o Erin Poultney – Hazard Substances External Consultant).

Change requests / recommendations should be submitted in the format below via email to: [epoultney@slrconsulting.com](mailto:epoultney@slrconsulting.com) and [f.collins@curtin.edu.au](mailto:f.collins@curtin.edu.au)

<b>Name</b>	<b>Company &amp; Position</b>	<b>Detail of Change Request</b>	<b>Urgency of Request (High, Medium, Low)</b>