

Understanding Safety Data Sheets

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1.0 Purpose

These guidelines offer guidance on interpreting and comprehending a safety data sheet (SDS). The process involves obtaining information for each chemical to be used from a SDS, then considering the hazards in relation to the activity in which the chemicals will be used. The guidelines aim to minimise risks to personnel and property and ensure continuing legislative compliance.

These guidelines must be read in conjunction with the Managing Chemical Standard and chemical safety management procedures.

2.0 Scope

These guidelines apply to all staff, students, contractors and other relevant persons engaged by Griffith University that procure, use, store and dispose of chemicals as part of their work, research or study.

3.0 Guidelines

Griffith University maintains its Chemical Inventory using the ChemWatch platform, which provides all staff and students with access to information on chemical safety i.e. safety data sheets.

Note: The terms Hazardous Chemicals Register, Chemical Register, Chemical Inventory and Manifest are used interchangeably at Griffith and refer to the 'Inventory' recorded in ChemWatch. This document uses Chemical Inventory unless referencing a specific legislative requirement.

3.1 Reading and Understanding a Safety Data Sheet (SDS)

A SDS is an important information source for managing the risks associated with chemicals. All importers, manufacturers, and suppliers are required to supply an Australian SDS to all users of a chemical. The SDS provides information on the risk, hazards, emergency procedures, handling, storage, PPE selection, and incompatibilities. Insert Text>

3.2 Importation or Manufacture of Chemicals

In some instances, chemical custodians will be required to create an Australian SDS for the importation or manufacture of a chemical. To have an SDS converted to Australian format or have a new SDS created within ChemWatch, you will need to contact crs@griffith.edu.au.

The SDS must:

- Be in English
- Contain unit measures expressed in Australian legal units of measurement

- State the date it was last reviewed (must be at least once every five years), or if it has not been reviewed, the date it was prepared
- State the name, Australian address and business telephone number of the manufacturer or importer
- State and Australian business telephone number from which information about the chemical can be obtained in an emergency

3.3 Assessing the Hazards of a Chemical

One of the first steps in a risk assessment is to identify the hazards. The SDS assists you by providing a section on Hazard Identification (section 2). This section starts with a classification of a substance or mixture as a hazardous or non-hazardous chemical (under Workplace Health and Safety (WHS) Regulations and as a dangerous or non-dangerous good (under Australian Dangerous Goods (ADG) Code). The WHS Regulation defines the hazard to the individual, while the ADG code defines the transportation hazards.

There are 2 different examples in Figure 1 below.

SECTION 2 Hazards identification
Classification of the substance or mixture
 HAZARDOUS CHEMICAL. DANGEROUS GOODS. According to the WHS Regulations and the ADG Code.

SECTION 2 Hazards identification
Classification of the substance or mixture
 NON-HAZARDOUS CHEMICAL. NON-DANGEROUS GOODS. According to the WHS Regulations and the ADG Code.

Figure 1 Examples SDS Section 2 Hazards identification

Section 2 of the SDS is the information that helps you understand the risks of that chemical (see Figure 2). In Figure 2, each sub section has a list of codes and phrases that provide information to you on the hazards present, some of the possible controls, and storage considerations. These assist you in determining the hazards presented by the chemical that you will need to address in your risk assessment through controls.


SECTION 2 Hazards identification	
Classification of the substance or mixture	
Poisons Schedule	S6
Classification ⁽¹⁾	Skin Corrosion/Irritation Category 1B, Serious Eye Damage/Eye Irritation Category 1, Acute Toxicity (Inhalation) Category 4, Carcinogenicity Category 1A
Legend:	1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI
Label elements	
Hazard pictogram(s)	
Signal word	Danger
Hazard statement(s)	
H314	Causes severe skin burns and eye damage.
H332	Harmful if inhaled.
H350	May cause cancer.
Precautionary statement(s) Prevention	
P201	Obtain special instructions before use.
P260	Do not breathe mist/vapours/spray.
P264	Wash all exposed external body areas thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves, protective clothing, eye protection and face protection.
Precautionary statement(s) Response	
P301+P330+P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313	IF exposed or concerned: Get medical advice/ attention.
P310	Immediately call a POISON CENTER/doctor/physician/first aider.
P363	Wash contaminated clothing before reuse.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Precautionary statement(s) Storage	
P405	Store locked up.
Precautionary statement(s) Disposal	
P501	Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.

Figure 2 Sample SDS Section 2 with explanatory callouts

While all chemicals have hazards, there are some that have significant hazards and you will need to minimise the associated risks by identifying, documenting, and implementing controls.

The best way to identify these significant hazards is to look at the hazard codes and phrases in the SDS under each of the Precautionary Statement subheadings in Section 2. The below table has examples of significant hazard codes, phrases, and classes. (Table 1).

Table 1. List of high hazard codes, phrases, and classes

GHS Classification	Hazard Code	Hazard phrase	Suggested controls
Flammable gases	H220	Extremely flammable gas	<ul style="list-style-type: none"> Remove ignition and/or heat sources from the work area. Use heating elements appropriate for the flammable hazardous area if heat sources are required.
Flammable liquids	H224	Extremely flammable liquid and vapor	
Flammable gases	H230	May react explosively even in the absence of air	
Flammable gases	H232	May ignite spontaneously if exposed to air	<ul style="list-style-type: none"> Use of inert gas to remove oxygen, e.g. glove box or gas head space. Training from others who have experience with the chemical.
Pyrophoric liquids; Pyrophoric solids	H250	Catches fire spontaneously if exposed to air	
Substances and mixtures which in contact with water, emit flammable gases	H260	In contact with water releases flammable gases which may ignite spontaneously	<ul style="list-style-type: none"> Ensure the work area and equipment is dry
Specific target organ toxicity, single exposure	H370	Causes damage to organs	<ul style="list-style-type: none"> Ensure good hygiene practices and separation from people e.g. fume cupboard and suitable gloves.
Specific target organ toxicity, repeated exposure	H372	Causes damage to organs through prolonged or repeated exposure	
Acute toxicity, oral	H300	Fatal if swallowed	
Acute toxicity, dermal	H310	Fatal in contact with skin	
Acute toxicity, inhalation	H330	Fatal if inhaled	
Germ cell mutagenicity	H340	May cause genetic defects	<ul style="list-style-type: none"> All chemicals that have a significant risk of genetic defects or cancer are described in the precautionary statements as “may cause...” as cancer and genetic defects are difficult to definitively associate to a chemical. Ensure good hygiene practices and separation from people e.g. fume cupboard and suitable gloves.
Carcinogenicity	H350	May cause cancer	
Carcinogenicity	H350i	May cause cancer by inhalation	
Self-reactive substances and mixtures; Organic peroxides	H240	Heating may cause an explosion	<ul style="list-style-type: none"> Self-reactive substances and mixtures; Organic peroxides are known to create heat and self-decompose. This may lead to unwanted reactions.
Self-reactive substances and mixtures; Organic peroxides	H241	Heating may cause a fire or explosion	
Self-reactive substances and mixtures; Organic peroxides	H242	Heating may cause a fire	
Sensitization, Skin	H317	May cause an allergic skin reaction	

GHS Classification	Hazard Code	Hazard phrase	Suggested controls
Sensitization, respiratory	H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled	<ul style="list-style-type: none"> ○ All chemicals that have a significant risk of causing allergic reactions are described in the precautionary statements as “may cause...” as there is a complex interaction with individuals. ○ Ensure good hygiene practices and separation from people e.g. fume cupboard and suitable gloves

3.4 Controlling the Hazards

3.4.1 Prevention and Storage

As noted above, the SDS will offer some insights into how to prevent the hazards from affecting the user or the area in the Precautionary Statement(s) Prevention, Precautionary Statement(s) Response, Precautionary Statement(s) Storage, Precautionary Statement(s) Disposal. These present basic controls for the pure substance.

Further controls for handling and storage of chemicals can be found in Section 7 handling and storage. While these are usually general in nature there is often important information on storage incompatibilities and specific requirements for safe storage.

Examples:

Picric acid becomes unstable when dry. Section 7 will state, 'when dry is a highly unstable and heat, friction-, and impact- sensitive explosive (explodes at approximately 300 C)' (or similar).

Nitric and sulphuric acids should not be stored together. Section 7 for nitric acid will state 'is incompatible with many substances including acrylates, aldehydes, alkanolamines, alkylene oxides, aromatic amines, amides, cresols, cyclic ketones, epichlorohydrin, glycols, hydrocarbons, isocyanates, ketones, oleum, organic anhydrides, paraldehyde, phenols, silanes, strong oxidisers, substituted allyls, sulfuric acid, terpenes, vinyl acetate, vinylidene chloride.'

3.4.2 Exposure Controls



Section 8 Exposure controls / personal protection provide advice on the exposure limits and appropriate controls. The SDS is usually written for the handling of large quantities, e.g. industrial use, and is therefore used as a guide in the assessment of hazards and risks, and the selection of controls for laboratory scale.

Additional information on exposure controls is available in the Health Monitoring Standard and Procedure.

3.4.3 Personal Protection Controls

Personal Protection Equipment (PPE) is the last line of defence and should not be relied upon as the primary hazard control. You should implement higher controls to minimise the risk. The exposure controls (Section 8 of the SDS), hazard statements, and precautionary statements provide guidance to determine the equivalent laboratory controls and PPE.

The below table has some examples to assist you with the selection of controls.

SDS section 8 PPE symbol	Equivalent laboratory control
 (use respirator)	The requirement for a respirator could be replaced by use of local extraction or a fume hood.
 (wear overalls)	Overalls can be replaced by lab coat/gown.

Similarly, the selection of gloves should be informed by the recommendations on the SDS, however the gloves listed are for full immersion in the chemical. A glove type that offers splash protection may be suitable within a laboratory setting, however you will need to confirm suitability with the glove manufacturer.

For example: Figure 3 SDS excerpt states that butyl, Hypalon, neoprene, or neoprene natural rubber blend are the best choice for dimethyl sulfoxide. However, in a situation where small quantities are used, nitrile gloves could provide sufficient protection.

Recommended material(s)

GLOVE SELECTION INDEX

Glove selection is based on a modified presentation of the:
"Forsberg Clothing Performance Index".
 The effect(s) of the following substance(s) are taken into account in the **computer-generated** selection:
 DIMETHYL SULFOXIDE

Material	CPI
BUTYL	A
HYPALON	A
NEOPRENE	A
NEOPRENE/NATURAL	A
PE/EVAL/PE	A
NITRILE+PVC	B
NATURAL RUBBER	C
NATURAL+NEOPRENE	C
NITRILE	C
PVC	C

* CPI - Chemwatch Performance Index
 A: Best Selection
 B: Satisfactory; may degrade after 4 hours continuous immersion
 C: Poor to Dangerous Choice for other than short term immersion
NOTE: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -
 * Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

Figure 3 Excerpt from dimethyl sulfoxide SDS Section 8

Note: once you mix chemicals the hazards change. If you are mixing chemicals you will need to assess the hazards present as intermediaries in the process in addition to the original chemical (raw product). Many mixes may already have an SDS in ChemWatch to access them always search the full ChemWatch database (from the 'Simple' tab, ensure 'Full' is selected (see Figure 4)).

If you create an SDS for a mixture it must be approved by the CRS team.

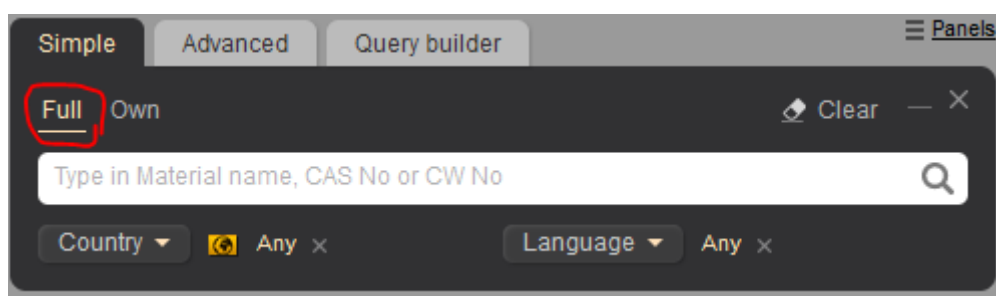


Figure 4 The ChemWatch full search

If you require further information on controlling chemical risks and hazards please discuss with your supervisor or HSW Partner.

4.0 Definitions

ADG Code is the Australian Code for the Transport of Dangerous Goods by Road and Rail, in its current form, approved by the Australian Transport Council. The ADG Code is accessible at the National Transport Commission website.

Chemicals are any substance that has a defined composition.

Hazardous Chemical means a substance, mixture or article that satisfies the criteria for a hazard class in the GHS (including a classification referred to in Schedule 6 of the WHS Regulation).

Chemical Custodians are personnel with operational control over chemicals at Griffith. This includes users of the chemicals, chief investigators and their supervisor.

Chemical Inventory is a 'hazardous chemical register' as defined by the WHS Regulation, and at Griffith is using the 'manifest' function in ChemWatch.

GHS refers to the 'Globally Harmonised System of Classification and Labelling of Chemicals,' in its current form and published by the United Nations.

Label means written, printed or graphical information elements concerning a chemical that is affixed to, printed on, or attached to the container of a hazardous chemical.

SDS refers to a safety data sheet prepared under Section 330 or 331 of the WHS Regulation.

WHS Regulation refers to the Work Health and Safety Regulation 2011 (QLD)

5.0 Information

Title	Understanding Safety Data Sheets Guidelines
Document number	2024/0001114
Purpose	<p>These guidelines offer guidance on interpreting and comprehending a safety data sheet (SDS). The process involves obtaining information for each chemical to be used from a SDS, then considering the hazards in relation to the activity in which the chemicals will be used. The guidelines aim to minimise risks to personnel and property and ensure continuing legislative compliance.</p> <p>These guidelines must be read in conjunction with the Managing Chemical Standard and chemical safety management procedures.</p>
Audience	Staff
Category	Operational
Subcategory	Safety
UN Sustainable Development Goals (SDGs)	This document aligns with Sustainable Development Goal: 3: Good Health and Well-Being
Approval date	1 October 2024
Effective date	1 October 2024
Review date	2029
Policy advisor	Senior Manager Chemical Safety
Approving authority	Director Health and Wellbeing

6.0 Related Policy Documents and Supporting Documents

Legislation	<i>Work Health and Safety Act 2011 (Qld)</i>
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Work Health and Safety Regulation 2011 (Qld)

Policy

Health, Safety and Wellbeing Policy

Procedures and Standards

Managing Chemicals Standard
Health Monitoring Standard
Health Monitoring Procedure

Local Protocol

Managing Chemical Incidents and Emergencies Protocols

Forms

N/A
