

Chemical Risk Assessment Guide

OVERVIEW

This guide aims to explain the process of completing a risk assessment for an activity involving chemicals. The process involves obtaining information for each chemical to be used from a **Safety Data Sheet (SDS)**, then considering the hazards in relation to the activity in which the chemicals will be used.

This guide recommends the use of a 'Chemical Risk Template' that will help to summarise the safety data sheet information and assist in determining the risk level and controls required for a number of chemicals simultaneously. The Chemical Risk Template should be attached to a GSafe risk assessment that addresses all aspects of the activity including the use, dispensing, storage and disposal of the associated chemicals.

Only 'hazardous' chemicals need to be assessed as defined in Chemwatch, although 'Non-hazardous' chemicals may also be included.

STEP 1: Create a copy of the Chemical Risk Template and add the name of each chemical to be assessed in the first column.

STEP 2: Access the Chemwatch Database (GOLDFFX) by navigating to the Health, Safety and Wellbeing website and clicking on the conical flask , then search for a chemical and view the associated Safety Data Sheet.



Figure 1: Chemwatch chemical search tool

STEP 3: Using the information on the Safety Data Sheet complete the 'Hazards' and 'Exposure' columns in Chemical Risk Template. The characters available for selection are indicated in Bold in the Title row. When a proper response is entered, the cell will automatically change colour relative to the risk. **Red** indicates a possible extreme risk, **Orange** a High Risk, **Yellow** a medium risk and **Green** a low risk.

Note: If the information for a particular column is not relevant or not available on the SDS simply leave that cell blank. You will need to consider your planned activity in conjunction with the SDS information to complete the last 'Risk' Columns. Refer to the example below.

BENZENE
ChemWatch Review SDS
Chemwatch: 1114
Version No: 18.1.1.1
Safety Data Sheet according to WHS and ADG requirements

Chemwatch Hazard Alert Code: 4
Issue Date: 21/11/2016
Print Date: 10/03/2017
S.GHS.AUS.EN

SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

Product Identifier

Product name	BENZENE	Substance Name
Chemical Name	Benzene	
Synonyms	C6H6, benzol, benzole, benzolene, coal naphtha, cyclohexatriene, mineral naphtha, motor benzol, nitration benzene, phene, phenyl hydride, pyrobenzol, pyrobenzole, benzine, benzene, UNILAB, benzene, nitration grade	

SECTION 2 HAZARDS IDENTIFICATION

Classification of the substance or mixture

HAZARDOUS CHEMICAL. DANGEROUS GOODS. According to the WHS Regulations and the ADG Code.

CHEMWATCH HAZARD RATINGS

	Min	Max	
Flammability	3	4	0 = Minimum
Toxicity	0	4	1 = Low
Body Contact	2	4	2 = Moderate
Reactivity	1	4	3 = High
Chronic	4	4	4 = Extreme

Poisons Schedule

Classification [1]

Flammable Liquid Category 2, Skin Corrosion/Irritation Category 2, Eye Irritation Category 2A, Germ cell mutagenicity Category 1B, Carcinogenicity Category 1A, Specific target organ toxicity - single exposure Category 3 (narcotic effects), Specific target organ toxicity - repeated exposure Category 1, Aspiration Hazard Category 1

SECTION 7 HANDLING AND STORAGE

Precautions for safe handling

The conductivity of this material may make it a static accumulator. A liquid is typically considered nonconductive if its conductivity is below 100 pS/m and is considered semi-conductive if its conductivity is below 10 000 pS/m. Whether a liquid is nonconductive or semi-conductive, the precautions are the same. A number of factors, for example liquid temperature, presence of contaminants, and anti-static additives can greatly influence the conductivity of a liquid.

Even with proper grounding and bonding, this material can still accumulate an electrostatic charge. If sufficient charge is allowed to accumulate, electrostatic discharge and ignition of flammable air-vapour mixtures can occur.

- Containers, even those that have been emptied, may contain explosive vapours.
- Do NOT cut, drill, grind, weld or perform similar operations on or near containers.
- DO NOT allow clothing wet with material to stay in contact with skin
- Electrostatic discharge may be generated during pumping - this may result in fire.
- Ensure electrical continuity by bonding and grounding (earthing) all equipment.
- Restrict line velocity during pumping in order to avoid generation of electrostatic discharge (<=1 m/sec until fill pipe submerged to twice its diameter, then <= 7 m/sec).
- Avoid splash filling.
- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.

Handling/Exposure Information

Safe handling

Figure 2: Example Safety Data Sheet excerpts

Chemical Name	Description		Hazards																			
	SDS	Form	Physical Effects								Health Effects											
NOTE: 1 is more severe than 2, etc; 1A is more severe than 1B; and A is more severe than B. Indicate selection using character(s) in BOLD.	Obtained or available (Yes or No)		Explosives (Unstable, divisions 1.1 – 1.6)	Flammable (Category 1, 2, 3, 4)	Self-reactive + Organic peroxide (Type A, B, C, D, E, F, G)	Pyrophoric (Category 1)	Self-heating substances & mixtures (Category 1, 2)	Substances and mixtures in contact with water emit flammable gases (Category 1, 2)	Oxidiser Liquids or Solids (Category 1, 2, 3)	Corrosive to metals (Category 1)	Acute toxicity (Category 1, 2, 3, 4)	Skin corrosion / Irritation (Category 1A, 1B, 1C / 2)	Serious eye damage / eye irritation (Category 1, 2A)	Sensitisers – Respiratory tract (Category 1)	Sensitisers – Skin (Category 1)	Germ cell Mutagenicity (Category 1A, 1B, 2)	Carcinogenicity (Category 1A, 1B, 2)	Reproductive Toxicity (Category 1A, 1B, 2)	Specific Target Organ Toxicity (Single Exposure) (Category 1, 2, 3)	Specific Target Organ Toxicity (Repeated Exposure) (Category 1, 2)	Aspiration toxicity/hazard (Category 1)	
	diethyl ether	Y L C		1							4								3			
	hydrofluoric acid 48%	Y L C								1	2	1A	1								1	
	hydrofluoric acid 10%	N L D								1	2	1A	1								1	
	benzene	Y L C			2							2	2A			1B	1A		3	1	1	
	carbon dioxide	Y G C																				
	lithium aluminium hydride	Y L C						1				1A	1						3			
	calcium carbide	Y S C						1														
	trimethyl aluminium	Y L C			2	1																

Figure 3: Example of completed 'Hazards' section of chemical risk template

STEP 4: Next complete the ‘Controls Available’ columns. Then based on the Hazards, Exposure and Controls identified, determine the overall level of “Risk” and the “Action from Assessment” column for each chemical. You need to refer to the GU risk matrix at the end of this document in order to determine the overall risk level.

Chemical Name	Controls Available				Risk	Action from Assessment		
	Engineering (e.g. exhaust ventilation, fumecupboard) (Yes, No, Not Required X)	Isolation (e.g. segregation, glove box) (Yes, No, Not Required X)	Personal protective equipment (consider: Lab coat, Eyewear, Gloves, Shoes) (Yes, No, Not Required X)	Administrative controls – training (Yes or No)		Risk assessed from GU Risk Matrix Extreme, High, Medium, Low	Controls (Adequate, Improve)	Air monitoring required (Yes or No)
NOTE: 1 is more severe than 2, etc; 1A is more severe than 1B; and A is more severe than B. Indicate selection using character(s) in BOLD .								
diethyl ether	X	X	Y	Y	L	A	N	N
hydrofluoric acid 48%	Y	X	Y	Y	L	A	N	N
hydrofluoric acid 10%	Y	Y	Y	Y	L	A	N	N
benzene	N	N	Y	Y	H	I	N	N
carbon dioxide	X	X	X	Y	L	I	Y	N
lithium aluminium hydride	Y	X	Y	Y	L	A	N	N
calcium carbide	X	X	Y	Y	L	A	N	N
trimethyl aluminium	X	Y	Y	Y	L	A	N	N

Figure 4: Example of completed ‘Controls Available’, ‘Risk’ & ‘Action from Assessment’ sections of the chemical risk template.

STEP 5: Access GSafe and create a new ‘Risk Assessment’ within the WHS Risk Register. Complete the GSafe risk assessment in conjunction with the information you have collated and attach the ‘Chemical Risk Assessment Form’. The GSafe assessment should address all aspects of the activity including the use, dispensing, storage and disposal of the associated chemicals.

Figure 5: GSafe Risk Assessment

GLOSSARY

If you are unfamiliar with the definition of any terms used within a chemical risk assessment, then you can refer to the glossary available within Chemwatch as shown below:

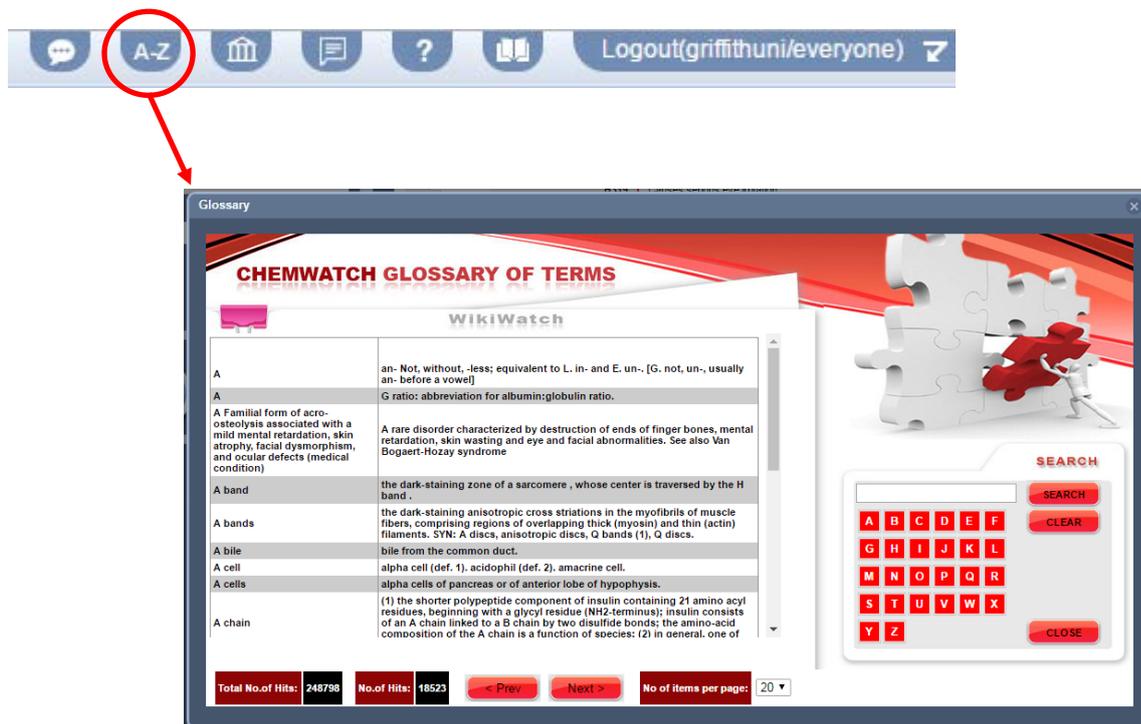


Figure 6: Chemwatch Glossary Tool

FURTHER QUESTIONS If you still have questions email safety@griffith.edu.au with your query.

Risk Matrix

Risk Rating

Consequences / Likelihood	Insignificant No injuries*	Minor First Aid treatment*	Moderate Medical treatment*	Major Serious or extensive injuries*	Catastrophic Death or large number of serious injuries*
Almost Certain	Low	Medium	High	High	Extreme
Likely	Low	Medium	Medium	High	High
Possible	Low	Low	Medium	Medium	High
Unlikely	Low	Low	Low	Medium	Medium
Rare	Low	Low	Low	Low	Medium

*These descriptors relate to health and safety risk ratings and are not part of the University Strategic Risk Table.

Likelihood Rating

The number of times within a specified period in which a risk may occur either as a consequence of business operations or through failure of operating systems, policies or procedures.

Rating	Description	Occurrence	Probability
Almost Certain	Expected to occur in most circumstances	Multiple/12 months	> 80%
Likely	Strong possibility of occurrence	Within 12 months	61% – 80%
Possible	May occur occasionally	Within 5 years	31% – 60%
Unlikely	Not expected to occur but may happen	Within 10 years	5% – 30%
Rare	May only occur in exceptional circumstances	>10 years	<0 5%

Prioritising Risks – Table of Management Action

Risk Score	What should I do?
Extreme	Immediate action required
High	Action plan required, senior management attention needed
Medium	Specific monitoring or procedures required, management responsibility must be specified
Low	Manage through routine procedures. Unlikely to need specific application of resources.