

This Information Sheet provides guidance on using chemicals safely in order to protect both people and the environment. It should be read in conjunction with other supporting Information Sheets eg 'First Things First', 'Identifying Chemical Hazards' and 'Safe Disposal of Hazardous (Special) Chemical Waste'.

General Information

A wide variety of chemicals are used in teaching and research. Some are extremely hazardous and unless used properly can hurt people, damage the environment and even property.

The Control of Substances Hazardous to Health (COSHH) Regulations 2002 exist to protect people from the effects of hazardous chemicals and biological agents. The Regulations require that before using any relevant hazardous substance a COSHH Assessment is undertaken which will:

- Identify the risks associated with the hazardous substance.
- Identify appropriate controls to manage any risk.

Questions and Answers

Q. Do I need to do a COSHH Assessment for **all** chemicals?

A. *No. The COSHH Regulations only apply to chemicals and biological agents that can cause damage to human health.*

Q. What substances are covered by COSHH?

A.

- **Substances classed as toxic, very toxic, harmful, corrosive or irritant.**
- **Substances with a Workplace Exposure Limit (WEL).**
- **Hazardous biological agents.**
- **Dusts present above certain concentrations.**

For guidance on identifying chemical hazards see *Information Sheet 2 – Identifying Chemical Hazards*.
For guidance on biological hazards see *Information Sheet – Biological Hazards*.

In addition, substances that can harm people as a result of fire and explosion are covered by the Dangerous Substances and Explosive Atmosphere (DSEAR) Regulations. A special risk assessment is needed when using such chemicals. Please contact your College or Departmental H&S Coordinator to discuss.



Q. I want to work with a hazardous chemical covered by COSHH what should I do?

A. If possible reduce the hazards associated with the chemical by applying:

- **ELIMINATE.** Don't use the hazardous chemical if a suitable alternative process is available eg preserve tissue samples by freezing rather than using hazardous chemicals.
- **REDUCE.** Use smaller amounts or a lower concentration eg use dilute acid rather than concentrated acid.
- **SUBSTITUTE.** Use a less hazardous chemical that performs the same function. Or use a less hazardous form of the chemical eg liquid rather than powder.

Q. I can't eliminate the chemical and there is no alternative? I have reduced the amounts used as far as possible what do I do now?

A. You need to identify the chemical's hazardous properties, find out how it may get into the body and the steps you need to take to protect yourself and other people from harm taking into account the mixture of chemicals being used, concentrations, processes involved which could affect the way the chemical behaves.

Always consider individuals who could be at greater risk when exposed to some chemicals. For example, chemicals that pose little danger to males can cause serious harm to expectant and nursing mothers. When assessing the hazards associated with the chemicals you must consider everyone who could be exposed.

Labelling and Risk and Safety Phrases will help you identify hazards and Manufacturer's Safety Data Sheets suitable controls. **ALWAYS** Refer to *specific guidance found on the H&S Website (see A – Z Index) when Handling Hydrofluoric Acid.*

REMEMBER the full introduction of the Classification, Labelling and Packing (CLP) of Substances and Mixtures Regulations on 1st June 2015 will see a change in symbols and a move from Risk and Safety Phrases to Hazard and Precautionary Statements. See *Information Sheet 7* for further information.





Q. What should I include in a COSHH Assessment?

A. Document the hazards associated with the chemicals, the controls needed to protect yourself and others and the contingency plans in the event something goes wrong.

Visit the HSS Website; under A – Z, COSHH for template Forms and a training presentation on how to complete a COSHH Assessment.

Control Measures

Once you have identified the risks you must use appropriate control measures. For example:

Control Measure	What is it suitable for?
<p>Fume Hood</p>  <p>See Info Sheet LS6 – Safe Use of Fume Hoods</p>	<p>Provides protection from chemicals or processes that produce hazardous gases / vapours / fumes / dusts that can harm if inhaled.</p> <p>Fume Hoods provide some protection if using concentrated acids.</p> <p>The following acids can be handled outside a fume hood PROVIDED:</p> <ul style="list-style-type: none">• Suitable PPE is worn.• No hazardous gases, vapours, fumes will be created during use.• Concentration is below:<ul style="list-style-type: none">- Sulphuric, Nitric, Hydrochloric and Phosphoric Acids concentration is less than 50% of the concentrated acid in aqueous solution.- Acetic Acid is less than 10%.
<p>Local Exhaust Ventilation (LEV) Systems</p> 	<p>Useful for controlling exposure to non toxic dusts etc.</p>
<p>Restricted Areas</p> 	<p>Access control systems help keep people away from areas where very hazardous chemicals such as carcinogens are used.</p> <p>Marking bench areas with suitable tape provides a good visual warning that there may be something on the worktop that someone can't see but may cause harm.</p> <p>This is also useful for protecting nursing and expectant mothers from chemicals that may impair development.</p>
<p>Automated Dispensers</p> 	<p>Useful for dispensing toxic or corrosive substances as they reduce the risk of spills.</p> <p>They can also cut down handling times.</p>

Personal Protective Equipment (PPE)

PPE is always considered the last resort to control hazards because it only protects the user and its effectiveness can vary dependent on a number of factors, for example:

- Type.
- Fit.
- Maintenance and cleaning.
- Storage.
- User training.
- Personal factors eg latex allergies, facial hair.

When choosing PPE people often refer to the MSDS. However this information is often generic and may not provide information on how to select the most suitable PPE. For example, the MSDS specifies eye protection and gloves should be worn, but different types may be needed dependent on the way the chemical is to be used and its concentration changing the types of gloves and glasses that must be selected.

- **Hand Protection** – the following chart should help.

But remember, glove thickness will differ dependent on what you are doing eg thicker gloves will be needed when handling concentrated acids or bases.

Gloves must also be replaced regularly to ensure efficacy. It is also important you know how to safely remove them too (see pictures).

GLOVE MATERIAL

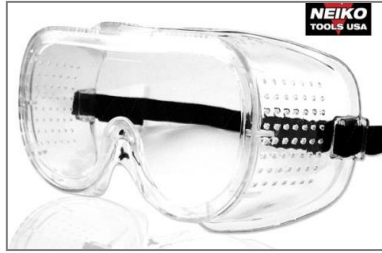
CHEMICAL GROUP	Natural Rubber	Nitrile Rubber	Neoprene™	PVC	Butyl	Viton™
Water miscible substances, weak acids / alkalis	✓	✓	✓	✓		
Oils		✓				
Chlorinated hydrocarbons						✓
Aromatic solvents						✓
Aliphatic solvents		✓				✓
Strong acids					✓	
Strong alkalis			✓			
PCBs						✓



- **Face and Eye Protection**



Safety glasses. Do not give all round protection to eyes



Safety goggles. Give all round protection to the eyes but may mist up, making vision difficult



Full face protects against chemical splashes. Care needed to stop them getting scratched. Fit important to ensure protection

- **Face Masks**



Disposal dust mask. Offers some protection against nuisance dusts



Half mask respirator. Different filters can be used to protect against specific chemicals



Full mask respirator provides eye and lung protection. Different filters can be used to protect against specific chemicals