

# LABORATORY SAFETY



# GENERAL LAB SAFETY RULES

The following is a small list of the rules that **MUST** be followed in the lab!



# General Lab Safety Rules:



## 1. Wear Goggles and Gloves when instructed.

- Safety goggles must be worn whenever you are working with chemicals, glassware or heat.
- Gloves (preferably nitrile) should be worn whenever working with acids or bases

## 2. Be Responsible!

- Horseplay or practical jokes will not be tolerated.
- If you are playing around, you are putting everyone's safety at risk.

# General Lab Safety Rules:



3. Never Work Alone!

4. Don't Touch!

- When you enter the lab, do not touch any materials or equipment unless instructed to do so.

5. Bring only what you need.

- All other items should be placed somewhere safe and out of the way.

# General Lab Safety Rules:



6. **Never perform your own experiments!**
  - Instructions from the lab handout or teacher must be followed.
  
7. **Proper attire must be worn.**
  - Hair should be tied back, avoid wearing loose clothing, no sandals or flip-flops, etc.
  - Contact lenses should not be worn.
  
8. **No food or drink in the lab.**

# General Lab Safety Rules:



9. Never touch or ingest chemicals!
  - Never drink/eat from lab glassware, never touch chemicals unless instructed to do so.
  
10. Be sure to read and understand the lab before beginning.
  - If you are not sure what to do, ask your teacher.
  
11. Report any spills, accidents or injuries to the teacher regardless of how small.

# General Lab Safety Rules:



## 12. Be smart with chemicals

- Only take as much as you need.
- Transport them in proper containers.
- Never return unused chemicals to the original container  
→ dispose of them as directed.

## 13. Clean up after yourself!

- Your lab station should be left the way you found it

## 14. Wash your Hands!!!!

# GENERAL LAB SAFETY EQUIPMENT

You must know the location and how to use the various safety equipment in the lab!





# Safety Equipment:



## Eyewash Fountain:

- If a chemical gets in your eye, go to the eyewash station and flush for 15 minutes.
- Contact lenses should be removed immediately
- Hold your eyes open and rotate your eyes as much as possible.
- Seek medical attention.



# Safety Equipment:



## Emergency Shower:

- Used if you catch fire, or if a chemical gets splashed onto your clothing or your skin.
- Get to the shower immediately and rinse for 15 min.
- Seek medical attention.








# Safety Equipment:

## Fire Extinguishers:

### In case of a fire

- Get the proper extinguisher
- Pull the pin
- Aim the nozzle at the base of the flames
- Squeeze the handle.



CLASSES OF FIRES	TYPES OF FIRES	PICTURE SYMBOL
<b>A</b>	Wood, paper, cloth, trash & other ordinary materials.	
<b>B</b>	Gasoline, oil, paint and other flammable liquids.	
<b>C</b>	May be used on fires involving live electrical equipment without danger to the operator.	
<b>D</b>	Combustible metals and combustible metal alloys.	
<b>K</b>	Cooking media (Vegetable or Animal Oils and Fats)	

# Safety Equipment:



## Fire Blankets:

### Uses:

- If someone catches fire
- To smother a small fire
- To help escape the building if its on fire.



# WHMIS

It is important that you can read and understand the WHMIS labelling on all controlled products



# WHMIS:



## What does WHMIS stand for ?

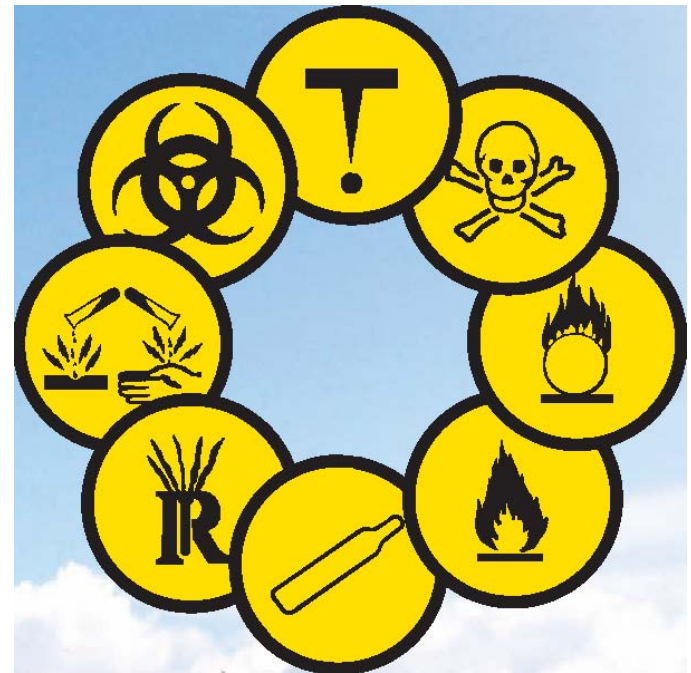
Workplace

Hazardous

Material

Information

System



# WHMIS:



## What is WHMIS?

- A standard system to inform employers and employees about the hazards of products they may be working with.

## Why is WHMIS so important ?

- If you know about the hazards of a material you can handle it safely and prevent any illness and injury.
- If something does go wrong, you can be prepared to respond quickly, correctly, and effectively in case of an emergency.



# WHMIS:



## What does WHMIS consist of ?

WHMIS consists of three key elements:

### **1. Product labels and symbols**

- Alerts you to the identity of the product you are working with or exposed to
- Alerts you to the danger of the product you are working with or exposed to
- Alerts you to the very basic safety precautions when working with or around the product

### **2. Material Safety Data Sheets (MSDS)**

- Details on the hazards associated with the product you are using
- Details on the precautionary information in using the product

### **3. Worker education and training**



# WHMIS Classes and Symbols:



## Class A: Compressed Gas



- Includes such things such as Propane and Acetylene bottles, as well as Oxygen tanks

## Class B Flammable/Combustible Materials



- Flammable or combustible materials will ignite and continue to burn if exposed to a flame or source of ignition.
- Oil and Gasoline are examples of flammable materials.

# WHMIS Classes and Symbols:



## Class C: Oxidizing Material



- Releases oxygen or another oxidizing substance and causes/contributes to the combustion of another material.
- Examples are Ozone, Chlorine, and Nitrogen Dioxide

## Class D: Poisonous and Infectious Materials



### **Division 1:**

- Materials that cause immediate and serious toxic effects
- Examples are potassium cyanide, carbon monoxide, hydrogen sulphide.

# WHMIS Classes and Symbols:



## Class D: Poisonous and Infectious Materials Con't



### **Division 2:**

- Materials that cause serious effects that take a long time to show up
- Examples are asbestos, arsenic, nicotine, etc.



### **Division 3:**

- Biohazardous materials that cause disease in living organisms
- Examples are contaminated blood samples, Ebola, flesh eating disease, etc.

# WHMIS Classes and Symbols:



## Class E: Corrosive Material



- Products that corrode (eat away) metals, or damage human tissues (ex. Skin).
- Usually acids or bases.

## Class F: Dangerously Reactive Material



- Materials that, when mixed, undergo serious and vigorous reactions.
- Alkali metals (Sodium/Potassium) are examples.

# WHMIS Labels:



## There are 2 types of WHMIS Labels:

### 1. Supplier Labels

- Labels that are found on the original container. They look like this:

**TOLUENE SULPHONIC ACID 70%, LIQUID**

**RISK PHRASE(S)**  
Highly irritating to skin, eyes, and nose



**HEALTH HAZARD DATA:**  
Strong Acid: Treat as per sulphuric acid  
EFFECTS OF OVEREXPOSURE, ACUTE OVEREXPOSURE: Skin and eye

**PRECAUTIONARY MEASURES**  
SPECIFIC PERSONAL PROTECTIVE EQUIPMENT  
EYE: Face shield and goggles  
GLOVES: Rubber  
OTHER CLOTHING AND EQUIPMENT: Rubber apron, rubber boots

**FIRST AID MEASURES:**  
EYES: Flush with copious quantities of water for 15 minutes. Consult physician  
SKIN: Flush with water as per sulphuric acid  
Ingestion: Treat as per sulphuric acid. Consult physician.

**REFER TO MATERIAL SAFETY DATA SHEET FOR FURTHER INFORMATION**

Henkel Canada Ltd.  
162 Ward Ave. Hamilton, Ontario L8N 3M8  
(416) 525-4860



# WHMIS Labels:



## There are 2 types of WHMIS Labels:

### 2. Workplace Labels

- Labels that are used when the material is transferred into another container.
- They usually look like this:

Acetone
Keep away from heat, sparks, and flames. Wear safety goggles and butyl rubber gloves. Use with local exhaust ventilation.
MSDS available.

# MSDS:



## What does MSDS stand for ?

Material

Safety

Data

Sheet


An MSDS is a safety bulletin that gives detailed information on the product you are using. They must be readily available to all workers.

**MATERIAL SAFETY DATA SHEET**

5100 W. Henrietta Rd.  
West Henrietta, NY 14586  
TEL: (866) 260-0501

MSDS No. 9797400  
DD3025-KIT  
Effective Date: February 5, 2007

**SECTION I NAME 24 HOUR EMERGENCY ASSISTANCE**

Product	Hydrochloric Acid, 32-36%	416-984-3000		Health	3
Chemical Synonyms	Hydrochloric Acid Water Solution			Flammability	0
Formula	HCl	<b>HAZARD RATING</b> Minimal 0 Slight 1 Moderate 2 Serious 3 Severe 4	<b>WHMIS</b> Serious 3 Severe 4	Reactivity	2
CAS No.	7647-01-0				

**SECTION II DANGEROUS INGREDIENTS**

Name	%	TLV Units
Hydrochloric acid	32-36%	TWA: 5 ppm (HCl)
Water: (CAS No. 7732-18-5)	64-68%	None established.

**DANGER! CORROSIVE! POISON!**

**SECTION III PHYSICAL DATA**

Melting Point (°C)	-74°C	Specific Gravity (H <sub>2</sub> O = 1)	1.18
Boiling Point (°C)	53°C	Percent Volatile by Volume (%)	100%
Vapor Pressure (mm Hg)	190 @ 25°C	Evaporation Rate (Water = 1)	N/A
Vapor Density (Air=1)	N/A		
Solubility in Water	Complete.		
Appearance & Odor	Clear liquid; pungent odor.		

**SECTION IV FIRE AND EXPLOSION HAZARD DATA**

Flash point	Non-flammable.	Flammable Limits in Air % by Volume	N/A	Lower	Upper
Firefighting Procedures	Use dry chemical, CO <sub>2</sub> , alcohol foam or dry sand. In fire conditions, firefighters should wear an appropriate mask or a self-containing breathing apparatus.				

**Flammability and Explosion Hazards**

In fire conditions, water may evaporate from this solution which may cause hazardous decomposition products to be formed as dust or fume.

**TDG Class 8 Corrosive liquid. UN1789**

**SECTION V REACTIVITY DATA** HH0071

Chemical Stability	Yes	X	If no, under what conditions?
	No		
Incompatible with Other Products	Yes	X	Incompatible with alkalis, strong bases, metals, amines, carbonates, metal oxides, cyanides, sulfides, sulfites and formaldehyde.
	No		
Hazardous Decomposition Products	Hydrogen chloride fumes.		
Reactive under what conditions	Reactive with water or steam to produce heat and toxic and corrosive fumes.		

**SECTION VI TOXICOLOGICAL PROPERTIES**

Route of Entry	Skin contact. Ingestion.
TLV	TWA: 5 (ppm)
Toxicity for animals	Acute oral toxicity (LD50): 900 mg/kg (rabbit).
Chronic effects on humans	Repeated or prolonged exposure to the substance can produce target organ damage. Target organs: Respiratory system, skin, eyes, lungs.
Acute effects on humans	Dangerous in case of skin contact (irritant, permeator), of eye contact (irritant), of ingestion.

**SECTION VII PREVENTIVE MEASURES**

Waste Disposal	Discharge, treatment, or disposal may be subject to local laws. Consult your local or regional authorities.
Storage	Keep container tightly closed. Keep in a cool well ventilated place. Corrosive materials should be stored in a separate safety cabinet or room.
Precautions	Keep container dry. Keep away from heat. Keep away from sources of ignition. Keep away from combustible materials. DO NOT ingest. Do not breathe gas, fumes, vapor or spray. Avoid contact with skin. Never add water to this product. Keep away from incompatibles as reducing agents, organic materials, alkalis, moisture.
Spill or leak	Dilute with water and mop up, or absorb with an inert DRY material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.
Protective Clothing	Splash goggles. Lab coat.

**SECTION VIII FIRST AID MEASURES**

Specific first aid measures	Ingestion: Call physician or Poison Control Center immediately. Induce vomiting only if advised by the appropriate medical personnel. Eye contact: Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Seek medical attention. Skin contact: Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Inhalation: Move victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Allow victim to rest in a well ventilated area. Seek immediate medical attention.
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**SECTION IX PREPARATION OF THE MSDS**

Rev. No.	1	Date	February 5, 2007	Approved	James A. Bertsch
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