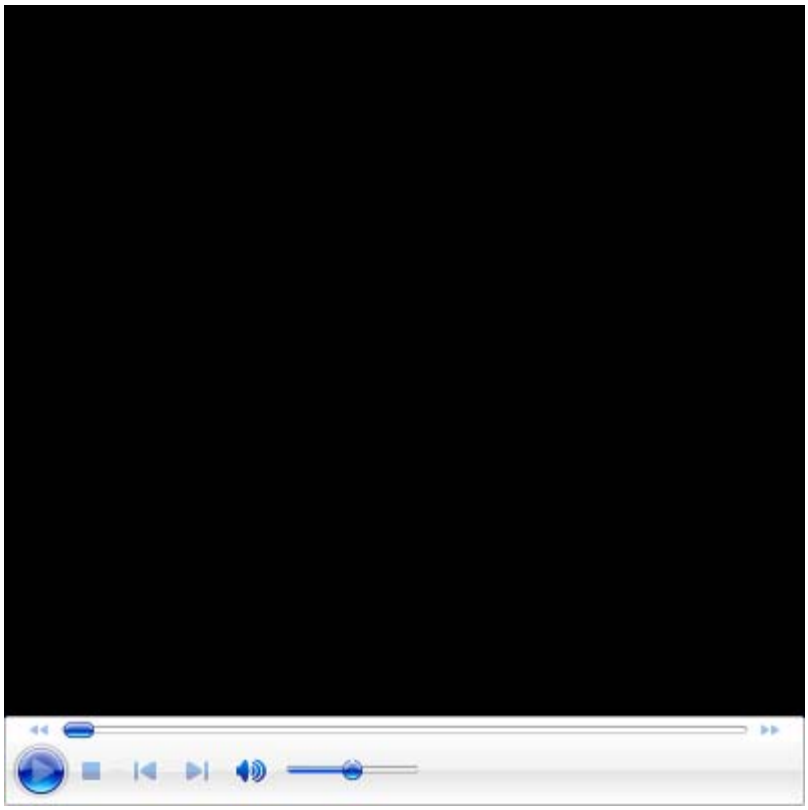
MIE - H&S - 07 - WHMIS



Please watch this video first.

WHMIS

WHMIS: What Does It Mean?

The Workplace Hazardous Materials Information System – WHMIS – is part of your right to know about the hazards of the chemicals you work with. It is a system that will also provide you with information on how to safely use and handle the chemicals, and how to respond should an emergency involving the chemical arise.

WHMIS legislation provides employees, employers and suppliers nationwide with specific vital information about hazardous materials (called **controlled products** in the legislation).

Under the Occupational Health and Safety Act, if you work with chemicals, you must receive training on the Workplace Hazardous Materials Information System. Your supervisor will ensure that you are provided with WHMIS training before you start working with the chemicals.

WHMIS provides this information by means of 3 main components

(a) Labeling of chemical containers.

(b) Material Safety Data Sheets(MSDS) which contain comprehensive health and safety information on the chemicals.

(c) WHMIS education and training.

WHMIS: Background

Exposure to hazardous materials can contribute to many serious health effects such as dermatitis, burns, kidney or lung damage, sterility, and cancer. Some materials can cause fires or explosions.

A federal impact analysis on the use of hazardous materials in the workplace estimated the social cost due to exposure to those materials in 1984 was about $600 million. In British Columbia, from 1982 to 1986, workplace exposure to hazardous chemicals resulted in approximately 4,300 wage-loss disease claims, at an estimated compensation cost of $26 million.

The purpose of WHMIS is to help reduce the likelihood of disease or injury in the workplace. It was developed through the collective efforts of labour, industry and federal, provincial and territorial regulatory agencies. From the beginning, the Worker's Compensation Board of BC has been active in formulating the system and producing the written materials for its implementation.

In the early 1980's, a recommendation for a uniform national information system was made to the Canadian Association of Administrators of Labour Legislation (CAALL) by Canadian regulatory agencies in occupational safety and health.

In 1983, a federal/provincial task force completed its report on the feasibility of labeling hazardous substances in the workplace. It recommended that a comprehensive national information delivery system on hazardous materials be established.

In 1983, government, industry and labour established a tripartite approach to WHMIS which has seen the development of WHMIS legislation and regulations and their implementation.

WHMIS: The Legislation

Legislation to implement WHMIS has been enacted on both the federal and

provincial/territorial levels. **Federal** requirements deal with the importation and sale of controlled products; **provincial** legislation covers the storage, handling and use of controlled products in the workplace.

More specifically, the federal **Hazardous Products Act** and the **Controlled Products Regulations** establish the criteria for including products in WHMIS and require suppliers to provide appropriate labels and material safety data sheets as a condition of sale and importation of those products.

Federal legislation balances a worker's right-to-know about hazardous products with industry's need to protect confidential business information. A self-financing Commission established by the **Hazardous Materials Information Review Act** oversees that aspect.

Provincial legislation, through amendments to occupational safety and health regulations, covers the responsibility of the employer to provide:

- Worker education on controlled products;
- Workplace labeling and identification; and
- A material safety data sheet where the employer produces a controlled product.

The same requirements have been adopted for federally regulated workplaces through amendments to the **Canada Labour Code.**

Designated Substances

There are 11 Designated Substances that the Ontario *Occupational Health and Safety Act* has determined to be toxic? The Act has 11 separate Regulations that have been passed, each describing the amount of the substance that workers can be exposed to and different ways to control and measure the substance in the workplace. It is the responsibility of building owners and employers to properly identify the Designated Substances that are present at their site. The following is a list of the 11 Designated Substances and their corresponding regulations:

Acrylonitrile O. Reg. 835

Arsenic O. Reg. 836

Asbestos O. Reg. 278

Benzene O. Reg. 839

Coke Oven Emissions O. Reg. 840

Ethylene Oxide O. Reg. 841

Isocyanates O. Reg. 842

Lead O. Reg. 843

Mercury O. Reg. 844

Silica O. Reg. 845

Vinyl Chloride O. Reg. 846

Exemptions of Products from WHMIS

Partially Exempted

Some products already covered by other labeling legislation have been exempted from federal WHMIS requirements for labels and MSDS's. They include:

Some consumer products;

- Cosmetics and drugs;
- Explosives;
- Pesticides;
- Radioactive substances.

However, provincial WHMIS regulations require employers to educate workers in the safe handling of these products and to use workplace labeling when the contents are transferred to new containers.

Completely Exempted

Some products are exempted from both federal and provincial WHMIS requirements; for example:

- Wood and products made of wood;
- Manufactured articles;
- Tobacco and products made of tobacco;
- Goods handled, offered for transport or transported under the ***Transportation of Dangerous Goods Act.***

To protect workers from any hazards resulting from the use of products which are completely exempt from WHMIS, general occupational safety and health information and training requirements apply.

In addition, hazardous wastes are exempted from WHMIS except that wastes must be identified at the workplaces where they are produced and workers must be trained to safely dispose the waste. General environmental regulations cover information requirements for

wastes.

Parliament is reviewing the status of products exempt from WHMIS.

WHMIS – The Three Key Elements of Information Delivery

WHMIS is a communication system on the hazards of controlled products in the workplace – from the suppliers of controlled products to purchasers, from employers to workers through the three key elements of: **labeling, material safety data sheets** and **workers education.**

1. Labeling

All containers containing controlled products used in workplace must be properly labeled. Labeling requirements start with the sale or import of a controlled product.

When supplier produces or imports a product for distribution and sale in Canada, that supplier must prepare a **supplier label**.

Suppliers generally transport products in single containers, multi-containers or in bulk shipments.

- For shipments of ***single containers***, the supplier must apply the applicable WHMIS label.
- For ***multi-container shipments***, the supplier must apply labels to the inner as well as outer containers, unless there is a written agreement with the purchaser to apply the supplier's labels to inner containers.
- For ***bulk shipments***, the supplier must send either a supplier label or alternative labeling instructions to the employer for use when the product is received.

NOTE: During transportation, additional labels may be required under the *Transportation of Dangerous Goods Act and Regulations.* With a multi-container shipment, the supplier need not provide a WHMIS label to the outer container if a TDG label is provided on that container and all inner containers bear WHMIS labels.

Employers are responsible for checking that supplier labels have been applied to controlled products received at the workplace. Improperly labeled products must not be used or handled for any purpose other than temporary storage.

- For **multiple container shipments**, where the employer has agreed in writing, supplier labels are applied by the employer.
- For **bulk shipments**, the employer must post or apply the supplier label. Where the supplier sends labeling instructions, the employer must apply, at a minimum, a workplace label.

Workplace labels are required on containers of controlled products in cases where the product is produced on site or transferred from the original supplier's containers. Workplace labels must contain 3 categories of information:

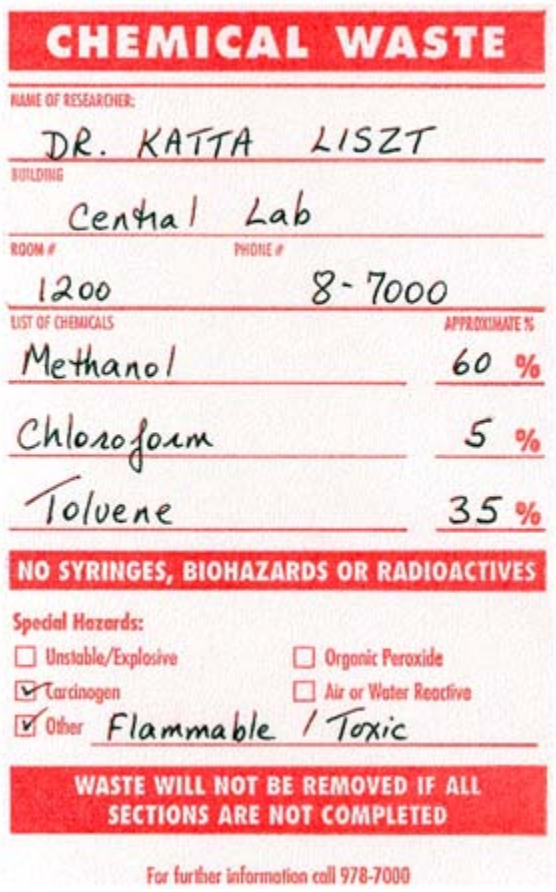
- The product name
- Safe handling information
- Reference to MSDS

The use of Hazard symbols and warning hatch-marks are optional.

A simple means of identifying the product is all that is required for use in a laboratory, or if an employee transfers the product to a container and uses it for only one shift.

If a controlled product is transferred to a system (piping, reaction vessel), the contents of the system must be properly identified.

When hazardous wastes which contain a controlled product are produced their location must be identified with clearly marked signage. This waste must also have a chemical waste label for disposal.



Chemical Waste Label

Workers must be instructed on how to read and understand the labels and identifiers.

No one in the workplace can remove or deface the identification label of a hazardous material.

WHMIS Symbols

Symbol	Risk	Precautions
Compressed Gas  **Class A**	**MATERIALS WHICH ARE NORMALLY GASEOUS KEPT IN A PRESSURIZED CONTAINER** • Could explode due to pressure • Could explode if heated • Possible hazard from both the force of explosion and the release of contents	**ENSURE CONTAINER IS ALW** • Store in appropriate areas • Do not drop or allow to fa
Flammable and Combustible  **Class B**	**MATERIALS WHICH WILL CONTINUE TO BURN AFTER BEING EXPOSED TO A FLAME OR OTHER IGNITION SOURCE** • May ignite spontaneously • May be a material which will release flammable products if allowed to degrade or when exposed to water	**STORE IN PROPERLY DESIG** **WORK IN WELL VENTILATE** • Avoid heating • Avoid sources of sparks / • Ensure electrical sources a
Oxidizing Material  **Class C**	**MATERIALS WHICH CAN CAUSE OTHER MATERIALS TO BURN OR SUPPORT COMBUSTION** • Can cause skin or eye burns • Increase fire and explosion hazard • May cause combustibles to explode or react violently	**STORE IN AREAS AWAY FRO COMBUSTIBLES** **WEAR BODY, HAND, FACE A PROTECTION** • Store in proper containers or oxidize
Toxic	**POISONS / POTENTIALLY FATAL MATERIALS WHICH CAUSE IMMEDIATE AND SEVERE**	**AVOID BREATHING DUST OI AVOID CONTACT WITH SKI**

Immediate And Severe  **Class D1**	**HARM** • May be fatal if ingested or inhaled • May be absorbed through the skin • Small volumes have a toxic effect	• Wear protective clothing which is effective against fumes and vapours • Wear face and eye protection • Work in well ventilated areas and wear breathing protection
Toxic Long Term Concealed  **Class D2**	**MATERIALS WHICH HAVE HARMFUL EFFECTS AFTER REPEATED EXPOSURES OR OVER LONG PERIODS OF TIME** • May cause death or permanent injury • May cause birth defects or sterility • May cause cancer • May be sensitizer causing allergies	**WEAR APPROPRIATE PERSONAL PROTECTION WORK IN A WELL VENTILATED AREA** • Store in appropriate designated areas • Avoid direct contact • Use hand, body, face and eye protection • Ensure respiratory and body protection is appropriate for the specific hazard
Biohazardous Infectious  **Class D3**	**INFECTIOUS AGENTS OR A BIOLOGICAL TOXIN CAUSING A SERIOUS DISEASE OR DEATH** • May cause anaphylactic shock • Includes Viruses, Yeasts, Moulds, Bacteria and Parasites which affect humans • Includes fluids containing toxic products • Includes cellular components	**SPECIAL TRAINING REQUIRED** **WORK IN DESIGNATED BIOLOGICAL AREA WITH APPROPRIATE ENGINEERING CONTROLS** • Avoid forming aerosols • Avoid breathing vapours • Avoid contamination of people / area • Store only in special designated areas
Corrosive Materials  **Class E**	**MATERIALS WHICH REACT WITH METALS AND LIVING TISSUE** • Eye and skin irritation on exposure • Severe burns/tissue damage on longer exposure • Lung damage if inhaled • May cause blindness if eyes contacted • Environmental damage from fumes	**WEAR BODY, FACE AND EYE PROTECTION** **USE BREATHING APPARATUS** • Ensure protective equipment is appropriate • Work in well ventilated area • Avoid all direct body contact • Use appropriate storage containers and ensu proper non-venting closures
Dangerously Reactive	**MATERIALS WHICH MAY HAVE UNEXPECTED REACTIONS** • May react with water • May be chemically unstable	**HANDLE WITH CARE AVOIDING VIBRATIO SHOCKS AND SUDDEN TEMPERATURE CHANGES** • Store in appropriate containers

 **Class F**	• May explode if exposed to shock or heat • May release toxic or flammable vapours • May vigorously polymerize • May burn unexpectedly	• Ensure storage containers • Store and work in designa

2. Material Safety Data Sheets (MSDS)

The second element of WHMIS is Material Safety Data Sheets, usually written as MSDS. An MSDS is a technical document which provides information on potential hazards, precautions and emergency information about a controlled product. MSDS's supplement the alert information provided on labels.

The ***minimum requirements*** for a MSDS are:

- **Nine** content sections as shown on the MSDS Sample.

MSDS Sample

MATERIAL SAFETY DATA SHEET

SECTION 1 - PRODUCT IDENTIFICATION AND USE

PRODUCT IDENTIFIER → Sodium hydroxide. Caustic soda		**PRODUCT IDENTIFICATION NUMBER (PIN)** S-318	
PRODUCT USE →			
MANUFACTURER'S NAME La Bell Industries		**SUPPLIER'S NAME** Omega Chemicals	
STREET ADDRESS 18 Rue LeJour		**STREET ADDRESS** P.O. Box 1989	
CITY Montreal	**PROVINCE** Quebec	**CITY** Sumaro	**PROVINCE** Ont.
POSTAL CODE H3N 0C0	**EMERGENCY TELEPHONE NO.** (522) 555-4833	**POSTAL CODE** C1H 2O1	**EMERGENCY TELEPHONE NO.** (416) 555-4321

SECTION 2 - HAZARDOUS INGREDIENTS

HAZARDOUS INGREDIENTS	%	CAS NUMBER	LD_{50} OF INGREDIENT (Specify species & route)	LD_{50} OF INGREDIENT (Specify species)
Sodium Hydroxide	96	1310-73-2		
Sodium Carbonate (Na_2CO_3)	0.5-2.5			
Sodium Chloride (NaCl)	0.0-2.1			
Sodium Sulphate (Na_2CO_3)	0.02-0.1			
Potassium, Calcium, and Magnesium	0.1			
Sodium Dioxide (SiO_2)	0.03			
Other Metals (total)	0.01			

SECTION 3 - PHYSICAL DATA

PHYSICAL STATE Other	**ODOUR AND APPEARANCE** White/off-white odourless, hygroscopic			**ODOUR THRESHOLD (ppm)** odourless
VAPOUR PRESSURE (mm Hg) Not appl.	**VAPOUR DENSITY (AIR = 1)** Not appl.	**EVAPORATION RATE** Not appl.	**BOILING POINT (°C)** 1388°C	**MELTING POINT (°C)** 318°C
pH Not appl.	**SPECIFIC GRAVITY** 2.13	**COEFF. WATER/OIL DIST.** Not appl.		

SECTION 4 - FIRE AND EXPLOSION DATA

FLAMMABILITY YES ☐ NO ☒ IF YES, UNDER WHICH CONDITIONS? →

MEANS OF EXTINCTION Although it is non-combustible, it can be hazardous in a fire area. The following should be known for fire fighting: 1) it can melt and flow when heated (mp 318°) 2) Acid or acidic material can react violently with water (splattering). 3) Can react with certain metals, such as Aluminum to generate flammable hydrogen gas.

FLASHPOINT (°C) AND METHOD Not flammable	**UPPER FLAMMABLE LIMIT (% BY VOLUME)** Not flammable	**LOWER FLAMMABLE LIMIT (% BY VOLUME)** Not flammable	
AUTOIGNITION TEMPERATURE (°C) Not flammable	**HAZARDOUS COMBUSTION PRODUCTS** Not flammable		
EXPLOSION DATA — SENSITIVITY TO IMPACT Not appl.	**SENSITIVITY TO STATIC DISCHARGE** Not appl.		

SECTION 5 - REACTIVITY DATA

CHEMICAL STABILITY

YES ☒ NO ☐ IF NO, UNDER WHICH CONDITIONS? →

INCOMPATIBILITY WITH OTHER SUBSTANCES Strong acids, many organic compounds, leather, wool, aluminum, zinc, and tin.

YES ☒ NO ☐ IF SO, WHICH ONES →

REACTIVITY, AND UNDER WHAT CONDITIONS Slowly picks up moisture and CO_2 from the air to form Sodium carbonate

HAZARDOUS DECOMPOSITION PRODUCTS None

PRODUCT IDENTIFIER

SECTION 6 - TOXOLOGICAL PROPERTIES

ROUTE OF ENTRY SKIN CONTACT ☒ SKIN ABSORPTION ☒ EYE CONTACT ☒ INHALATION ☒ INGESTION ☒

EFFECTS OF ACUTE EXPOSURE TO PRODUCT Damage to any human tissue particularly skin, eyes, and respiratory tract.

EFFECTS OF CHRONIC EXPOSURE TO PRODUCT Dust and mist can cause damage particularly to the respiratory tract.

EXPOSURE LIMITS 2 mg/m³ Ceiling limit.	**IRRITANCY OF PRODUCT** Causes burning sensation	**SENSITIZATION TO PRODUCT** Not known	**CARCINOGENICITY** Not listed
TERATOGENICITY Not known	**REPRODUCTIVE TOXICITY** Not known	**MUTAGENICITY** Not listed	**SYNERGISTIC PRODUCTS** Reacts violently when molten

SECTION 7 - PREVENTATIVE MEASURES

PERSONAL PROTECTIVE EQUIPMENT

GLOVES (SPECIFY) rubber, polyethylene	**RESPIRATOR (SPECIFY)** filter type	**EYE (SPECIFY)** goggles, face shield
FOOTWEAR (SPECIFY) rubber boots where needed to prevent contact	**CLOTHING (SPECIFY)** rubber apron where needed to prevent contact	**OTHER (SPECIFY)** Lab coat, overalls

ENGINEERING CONTROL (SPECIFY E.G., VENTILATION, ENCLOSED PROCESS) local exhaust

LEAK AND SPILL PROCEDURE When spilled in a dry condition, it can be promptly shovelled up for recovery or disposal. Flush surfaces with water, neutralize with diluted acid (vinegar).

WASTE DISPOSAL Disposal must meet with local requirements. Waste must never be discharged directly into sewers or surface waters. Neutralize and dilute with much water.

HANDLING PROCEDURES AND EQUIPMENT

STORAGE REQUIREMENTS Store in well-sealed containers, have abundant water (running preferred) at hand.

SPECIAL SHIPPING INFORMATION This material is classified as **Corrosive**

SECTION 8 - FIRST AID MEASURES

SPECIFIC MEASURES

Eye Contact: Wash eyes immediately with plenty of running water for no less than 15 min. (including under the eyelids). Speed is important to avoid permanent injury. If one eye is injured, keep the injured eye at a lower level to avoid contaminating the uninjured eye.

Skin Contact: Wash contact area promptly with much water. (Dilute acetic acid, vinegar, can be used to neutralize). Remove contaminated clothing under the shower. Prolong washing until medical help arrives.

Inhalation: Remove from exposure to mist or dust and get prompt medical help.

Ingestion: Immediately phone 911 and ask for poison treatment. Describe the chemical that has been swallowed, and follow the advise of emergency personnel.

SECTION 9 - PREPARATION DATE OF MSDS

PREPARED BY (GROUP, DEPARTMENT, ETC.)	PHONE NUMBER	DATE

- No section may be left blank.

- Data Sheets cannot be more than 3 years old.
- All Hazardous ingredients must be disclosed. In the case of proprietary ingredients, access to information, for medical personnel in an emergency, must be made available.

Suppliers must have MSDS's available in both languages for the controlled products they sell or import. Information must be current and prepared no more than 3 years from date of sale.

A copy of the current MSDS must be sent to the purchaser on or before the date of sale of the first purchase of a controlled product.

Employers must ensure that MSDS's are received for all controlled products purchased. The employer must contact the supplier for an updated MSDS when the preparation date on workplace data sheet is 3 years old.

If the employer produces a controlled product for use at the workplace, the employer must develop an MSDS for that product, and make it available to workers.

Copies of supplier and employer MSDS's must be readily accessible to employees during each work shift. Workers must be trained to understand the basic requirements of an MSDS as well as the applicable information in it.

Employers **may computerize the MSDS information** as long as all employees have access to and are trained on how to use the computer, the computers are kept in working order, and that the employer makes a hard copy of the MSDS available to the employee or safety and health committee/representative upon request.

3. Worker Education

The third element of WHMIS is worker education. Employers must establish education and training programs for workers. Training must include:

- How WHMIS works
- The hazards of controlled products
- Procedures for safe storage, use and disposal
- Emergency procedures

Workers require training if they use or work near controlled products. **Contact Osmond Sargeant at osmond@mie.utoronto.ca if you require WHMIS training.**

Please proceed to take the Test for this section. Answering 4 out of 6 questions correctly is a pass and you may re-take the test if necessary (up to 3 times).