

Workplace Hazardous Materials Information System (WHMIS)

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Prepared by: Department of Health & Safety	S-015

1.0 Introduction

Memorial University shall keep under constant review the use or presence of chemical substances at the workplace which may be hazardous to the health or safety of workers, and shall, wherever and so far as is reasonably practicable, substitute a safe or less hazardous substance.

2.0 Scope

The Workplace Hazardous Materials Information System or WHMIS is a nation-wide system intended to help reduce the likelihood of disease or injury in the workplace due to exposure to hazardous materials. The WHMIS legislation provides employees, employers and suppliers nation wide with specific information about hazardous materials known in the legislation as "controlled products". The three main areas of concentration for Memorial University's WHMIS program will cover Product Labeling, Material Safety Data Sheets, and Worker Training.

3.0 WHMIS - Hazard Classification

3.1 Controlled Product

WHMIS defines a hazardous material as a pure substance or mixture which meets or exceeds legislated criteria. Under WHMIS, hazardous materials are referred to as "Controlled Substances".

3.2 Exclusions

If a substance does not meet the hazard criteria set out in the Controlled Products Regulations under the Hazardous Products Act (Canada), it is not controlled under WHMIS and does not have to be included in the supplier labeling and MSDS processes.

4.0 Classes of Hazards

4.1 There are 6 basic hazard classes. Divisions are provided in some classes. Suppliers and employers are responsible for ensuring that each material and its ingredients are identified and evaluated for potential physical hazards (i.e., flammability, corrosiveness). (Note that some substances fall under more than one class of WHMIS.)

Toxic and infectious ingredients must be identified on a container label to facilitate monitoring and protect the health of workers.

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The Hazard Classes and Divisions are:

4.1.1 A. Compressed Gas

4.1.2 B. Flammable and Combustible Materials including:

1. Flammable Gases
2. Flammable Liquids
3. Combustible Liquids
4. Flammable Solids
5. Flammable Aerosols
6. Reactive Flammable Materials

4.1.3 C. Oxidizing Materials

4.1.4 D. Poisonous and Infectious Material

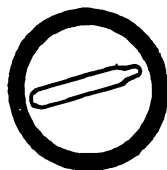
1. Materials causing immediate and serious toxic effects
2. Material causing other toxic effects
3. Bio-hazardous infectious material

4.1.5 E. Corrosive Material

4.1.6 F. Dangerously Reactive Material

5.0 Examples

- 5.1 Class A includes any product, material or substance contained under pressure including compressed gases, dissolved gases, or gases liquefied by compression or refrigeration. Class A products are recognized by the following symbol:



Examples

- 5.1.1 Non-liquefied - N_2 & Air
- 5.1.2 Liquefied under pressure - Butane
- 5.1.3 Liquefied under refrigeration - $N_2(l)$, He(l)
- 5.1.4 Dissolved gas - Acetylene in Acetone (welding)

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- 5.2 Class B. Flammable and Combustible Material. Class A products are recognized by the following symbol:



- 5.2.1 Six Divisions are prescribed in Class B.

1. Flammable Gases – flammable mixture with air
2. Flammable Liquids – flash point less than 37.8°C
3. Combustible Liquids – flash point between 37.8°C and 93.3°C
4. Flammable Solids – friction, retained heat from manufacturing or processing, ignites readily.
5. Flammable Aerosols
6. Reactive Flammable Material – spontaneously combustible, emits flare gas, or spontaneously combustible with water or water vapour

- 5.2.2 Flammable Gases - Compressed Gases which form flammable mixtures in air either at a concentration of 13% or less by volume or over a concentration range greater than 12% by volume.

Example-Butane (liquefied under pressure)

- 5.2.3 Flammable Liquids - Liquid products with a flash point less than 37.8°C (100°F) Note: The flash point of a liquid is the minimum temperature at which vapour from the liquid will ignite in the presence of an ignition source.

Examples-Benzene, Gasoline

- 5.2.4 Combustible Liquids - Liquids having a flash point of 37.8°C (100°F) or greater but less than 93.3°C (200°F)

Example - Kerosene

- 5.2.5 Flammable Solids - Solids that are liable to cause fire through friction or through heat retained from manufacturing or processing, that can be readily ignited and burn so vigorously and persistently that they create a

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hazard, or that ignite and burn with a self-sustained flame at a rate greater than 0.254 cm (0.1 inches) per second

Examples - White phosphorous, various magnesium alloys, Hexamine, Zirconium

5.2.6 Flammable Aerosols - Any product packaged in an aerosol container that produces a flame projection at full valve opening or a flashback at any valve opening when tested according to the method in schedule VI of the Controlled Products Regulations

Examples - Propane, Butane, Isobutane, Ether

5.2.7 Reactive Flammable Materials - Any product that is spontaneously combustible and liable to spontaneous heating during use or liable to heat in contact with air to the point where it begins to burn. Also, is dangerous when wet and emits dangerous quantities of flammable gas or becomes spontaneously combustible upon contact with water or water vapour.

Examples - Aluminum Alloy Compounds, Metallic Sodium, Lithium Oxide, Lithium Aluminum Hydride

5.3 Class C. Oxidizing Material – Oxidizing material is recognized by the following symbol:



A product meets the criteria for Class C. if it meets either of:

5.3.1. It causes or contributes to combustion of other material by yielding oxygen whether or not the product is combustible itself.

Examples - Nitrates, Nitrites, Bromates, Chlorates, Dichromates, Hypochlorites, Perchlorates, Permanganates, Nitric Acid

5.3.2 It is an organic peroxide

Examples – Benzoyl Peroxide, various organic Peroxy Esters, Organic Hydroperoxides

5.4 Class D. Poisonous and Infectious Material

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There are 3 Divisions prescribed in Class D and each Division has its own Symbol.

5.4.1. Materials causing immediate and serious toxic effects. There are two Subdivisions within Division 1. Poisonous and Infectious Material is recognized by the following symbol:

- 1) Very Toxic Material
- 2) Toxic Material



Example - Ammonia, Methanol

5.4.2. Materials causing other toxic effects. There are two Subdivisions within Division 2 including pure substances and tested mixtures. Materials classified as other toxic are recognized by the following symbol:

1. Very Toxic Material
2. Toxic Material



Example – Asbestos, Chromates

5.4.3 Bio-hazardous Infectious Material Division applies to organisms such as viruses, bacteria, fungi, etc.

Materials classified as biohazardous infectious material are recognized by the following symbol:



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Example - Contaminated Blood Products, Viruses

5.5 Class E. Corrosive Material

There are three basic types of Corrosive Material

5.5.1 Corrosion of Metals

5.5.2 Corrosive effects on human skin

5.5.3 Those products under the Transportation of Dangerous Goods Legislation.
(Class 2.4 and 8 TDG)

Corrosive Materials are recognized by the following symbol:



Example - Hydrochloric Acid, Sodium Hydroxide

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5.6 Class F. Dangerously Reactive Material

A product, material, or substance is included in this class if it meets one or more of the following criteria.

- 5.6.1 It undergoes vigorous polymerization, decomposition, or condensation. For example: 1, 3 Butadiene will undergo hazardous self-polymerization unless inhibitors are added to prevent the process from occurring.

Polymerization is a chemical reaction in which one or more small molecules combine to form large molecules. A hazardous polymerization is one that takes place at a rate which releases large amounts of energy.

- 5.6.2 It becomes self-reactive under conditions of shock or increase in pressure or temperature. For example: metal azides and acetylides can be explosive if subjected to physical shock.

- 5.6.3 It reacts vigorously with water to release a gas that has an LC₅₀ not exceeding 2500 parts per million (ppm) by volume of gas when tested for four hours in accordance with OECD Test Guideline No. 403, “Acute Inhalation Toxicity” dated May 12, 1981. For example: alkali metal cyanides will liberate the highly toxic gas, Hydrogen Cyanide, on contact with water.

Dangerously Reactive Material is recognized by the following symbol:



Example - picric acid, sodium metal.

6.0 Material Safety Data Sheets

- 6.1 Material Safety Data Sheets are technical bulletins that are required by law to be available in the workplace for all chemicals present in that workplace.

Memorial University Responsibilities:

- Ensure up-to-date MSDS is readily available for every controlled product on the work site
- Ensure no supplier produced MSDS is more than three years old
- Prepare workplace MSDS for controlled products produced in the workplace

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- Update workplace produced MSDS every three years or within 90 days of receipt of new information
- Ensure all relevant MSDS's are readily available to all workers who work with or in the proximity of controlled products, the OH&S committee, or safety & health representative
- Ensure the workers understand the content and significance of the information on the MSDS
- Ensure all workers know where to locate the MSDS's
- Provide all MSDS information to the medical attendant if a medical emergency occurs

6.2 Supplier Responsibilities - Suppliers shall ensure:

- An up-to-date MSDS accompanies each shipment of a controlled product to a workplace
- MSDS is updated and sent to the users as products are modified
- Update MSDS at least every three years or when products are modified

6.3 Worker Responsibilities - Workers shall:

- Ensure they handle and use the controlled product as specified in the MSDS
- Ensure they understand the contents of the MSDS and, if in doubt, contact the Supervisor or Safety Officer for advice
- Ensure they know where to locate the MSDS's available for their reference
- Report immediately any spills, leaks, or exposures to the controlled product as prescribed on the MSDS to their supervisor.

7.0 Labels

7.1 Labels shall be applied to controlled products or containers in which controlled products are packaged. The label is designed and intended to be a source of information on a controlled product that will alert employers and employees to hazards and safe work procedures associated with the product.

7.2 Two types of labels are prescribed in the legislation

- Supplier Label - For use with controlled products distributed to Canadian workplaces.
- Workplace Label - For use in cases where controlled products are removed from their original containers and used in the workplace.

7.3 Memorial University Responsibilities - Memorial will ensure:

- Workers are properly instructed/trained on labelling
- Products in the workplace are properly labelled

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- Products are not used without appropriate labels
- Labels are not defaced or removed in the workplace
- Identifiers are provided when labelling is not practical
- Suppliers are informed when products are received without proper labels (illegible, torn, or defaced)

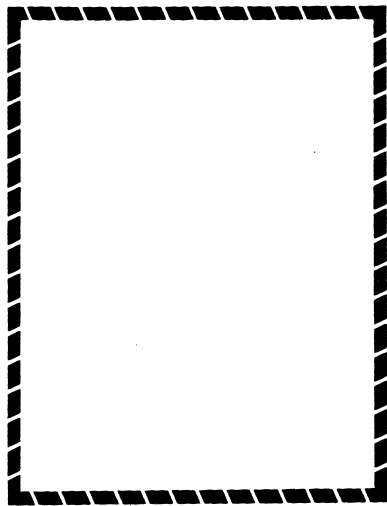
7.4 Worker Responsibilities - Workers must:

- Know and understand the label content requirements
- Understand the significance of the information on the labels
- Know the procedures for safe use
- Handle the product in accordance with the identifier alerts
- Follow instructions provided by the supervisors
- Advise immediate supervisor of any labels that are illegible or cannot be understood
- Do not deface or remove labels from containers unless it is empty and properly rinsed out

7.5 Label Design - The label on a controlled product or a controlled product container shall be applied in a border which is:

- in a colour that contrasts with the background against which it appears designed as depicted in the sketch below
- be applied on a part of the controlled product or the controlled product container which is displayed under normal storage and use conditions

Label Example:



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8.0 Worker Training

- 8.1 Memorial University managers and supervisors shall ensure that a worker who works with a controlled product or in proximity to a controlled product is educated in WHMIS and all hazard information received from a supplier concerning that controlled product. All further hazard information of which Memorial is aware of concerning the use, storage, and handling of that controlled product will be communicated to workers.
- 8.2 Where a controlled product is produced in a workplace, Memorial University managers and supervisors shall ensure that a worker who works with that controlled product or in proximity to that controlled product is informed about all hazard information about the product, its use, storage, and handling.
- 8.3 Memorial shall ensure that a worker who works with a controlled product or in proximity to a controlled product is instructed in:
- The content required on a supplier label and workplace label and the purpose and significance of the information contained on it.
 - The content required on a Material Safety Data Sheet and the purpose and significance of the information contained on the MSDS.
 - Procedures for the safe use, storage, handling, and disposal of a controlled product.
 - Procedures for the safe use, storage, handling, and disposal of a controlled product contained or transferred in a pipe, a piping system including valves, a process vessel, a reaction vessel, or (v) a tank car, tank truck, ore car, conveyor belt, or similar conveyance.
 - Procedures to be followed where fugitive emissions are present; and
 - Procedures to be followed in case of an emergency involving a controlled product.
- 8.4 Memorial shall ensure that the program of worker education is developed and implemented specifically for the University environment, related to the University's OH&S Management System, and developed in consultation with the joint Occupational Health and Safety Committees.
- 8.5 Memorial will ensure, so far as is reasonably practicable, that the program of WHMIS worker instruction results in a worker being able to apply the information as needed to protect their own health and safety and the health and safety of those with whom they work.
- 8.6 On an annual basis, the Department of Health & Safety will work in consultation with all respective departments to develop a training schedule to ensure all required WHMIS training or refresher training is conducted as required.

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Department of
Health and Safety

Legislative reference: CONSOLIDATED NEWFOUNDLAND AND LABRADOR
REGULATION 1149/96 - Workplace Hazardous Materials Information System (WHMIS)
Regulations under the Occupational Health and Safety Act (O.C. 96-478).

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