WHMIS

Stands for

Workplace

Hazardous

Materials

Information

System

Under **WHMIS**, you receive information in three ways:

- **Material Safety Data Sheets (MSDS)**
  - A MSDS is available to you for every controlled product.

- **Label**
  - A label is displayed on each package or container of controlled product in the workplace.

- **Training Program**
  - That teaches you to understand and use the information on labels and **MSDS** to protect yourself.

The main intent of **WHMIS** is to ensure that workers understand the following:

1. What controlled product they are using.
2. What hazards to their safety and health care are involved.
3. Proper handling and use of the controlled product.
4. How to protect themselves.
5. What to do if they are exposed to a controlled product (i.e. first aid).

WHMIS is an information system that ensures that you know about the hazardous materials that are in your workplace.

WHMIS helps you know more about the chemical products that you use every day. This is especially important if the product can injure you when you get it on your skin, in your eyes, or if you inhale the fumes. Under **WHMIS**, these products are called "**Controlled Products**". If you are dealing with controlled products, it is very important that you get the information that tells you how they can harm you and how you can work with them safely.

WHMIS does not apply to consumer products. They are covered under other laws and have a consumer label.

EXEMPTIONS

- Wood & Tobacco Products
- Manufactured articles that shouldn't be harmful during normal use.
- When Chemicals are being transported under the *Transportation of Dangerous Goods Regulations*, **WHMIS** doesn't apply. It only takes effect after the goods enter your workplace.
- Some chemicals substances are partially exempt from **WHMIS** because they are already covered under other laws including:
    - Explosives
    - Cosmetics, food & Drugs
    - Pesticides
    - Radioactive substances

Consumer goods that you buy in a store also partially exempt because they are intended for home use. If you use a consumer product at work, you are expected to follow instructions for safety that are written on the label.

RESPONSIBILITIES OF:

A. Supplier:

- Classify the product according to the type of hazard.
- Label the product with warning information.
- Provide **MSDS** for more detailed hazard information.

B. **Employer**:

- Ensure that the labels or other types of identification are on place.
- Ensure that **MSDS** are complete and up to date.
- Train employees to understand and use this information.

C. Employee:

- Follow safe work procedures.
- Use recommended control measures.
- Take part in **WHMIS** training that your employer provides.

WHMIS makes it possible for you to get health and safety information about hazardous products, but it is up the **EMPLOYEE** to apply this information in your day to day work.

For Example:

The **supplier label** on a container of chlorine says inhaling the gas is dangerous.

The **employer** will make sure that you know the hazards of working with chlorine and that you are trained to use the correct respirator.

You are required to learn the hazards and wear the respirator that your employer provides.

LABELS:

There are two types of labels under **WHMIS** regulations:

Supplier Labels:

- Has a distinctive **D** border
- Has very visible hazard symbols and are always written in English & French.

The label can be any size and can be Black & White, or Color, as long as it stands out from the container or other markings. In special cases, I.E.: where containers are very small or intended for laboratory use, different kinds of supplier labels may be used.

Workplace labels:

Can be used on a container of a controlled product when:

- The supplier label is missing or damaged.
- The product is produced or used in the workplace.
- The product is transferred from the supplier's container to another container, (unless it is going to be used right away by the person who transferred it and then only the name of the product is needed).

The workplace label **must** contain the following three pieces of information:

- Name of the product.
- Safe handling information.
- A reference to **MSDS.**

How chemical products can enter your body

The way a chemical product affects you depends on how you come into contact with it. This is called the chemical's **"route of entry":**

- **Skin Contact (absorption)**
- **Eyes, nose and mouth**
- **Inhalation**
- **Ingestion**
- **Injection**

It is important to know that some hazardous products can cause immediate harm, (acute effect), while others take hours, days, years or even decades, (chronic effects), before you become aware of the damage that has been done.

Often people underestimate the dangers of using a chemical product incorrectly because they do not feel any immediate pain or discomfort.

In the past, workers weren't often aware of the hazards: In some cases, people who worked around coal dust or asbestos only learned of the harmful effects after they began to show signs of illness.

Now we know more about the chemical products that we use, including their acute and chronic effects. Even if the product is suspected of being harmful, you can find out what to do to protect yourself when working with it.

Material Safety Data Sheets (MSDS):

A **MSDS** provides you with detailed information on how hazardous a product is and how to handle it safely. It is your responsibility to ensure that you are aware of the location of the **MSDS** binders in the facility or program in which you are working.

Inactive **MSDS** are kept on file for 30 years. Inactive **MSDS** are those products that have been deleted from the inventory.

The following pages are examples of Labels, Hazard Symbols, and Material Safety Data Sheets. Please review thoroughly and then complete the quiz. Return the completed quiz to your supervisor.

Classes and Their Hazard Symbols

Class A Compressed Gas…….....

Class B Flammable and Combustible Materials.

Class C Oxidizing Materials……

Class D Poisonous & Infectious Materials

- **Division 1, Immediate & Serious Toxic Effec**

- **Division 2, Other Toxic Effects……**

- **Division 3, Biohazardous Infectious Materia**

Class E Corrosive Material……

Class F Dangerously Reactive Material……

Class A: Compressed Gas
This class includes compressed gases, dissolved gases and gases liquefied by compression or refrigeration.

Class A materials:

- Pose an explosion danger because the gas is being held in a container under pressure;
- May cause its container to explode if heated (such as what would happen in a fire);
- May also cause its container to explode if dropped.

When handling Class A materials you should:

- Handle with care, do not drop container;
- Keep container away from potential sources of ignition;
- Store the container in designated areas.

Examples of Class A materials: gas cylinders for oxyacetylene welding or water disinfection.

Class B: Flammable and Combustible Materials
This class includes solids, liquids and gases capable of catching fire or exploding in the presence of a source of ignition.

Class B materials:

- Will burn and are therefore potential fire hazards.
- May burn at relatively low temperatures; flammable materials catch fire at lower temperatures than combustible materials.
- May burst into flame spontaneously in air or may release a flammable gas on contact with water;
- May cause a fire when exposed to heat, sparks, or flames or as a result of friction.

When handling Class B materials you should:

- Keep the materials away from heat sources and other combustible materials;
- Never smoke when working with or near the material;

- Store the containers in designated areas.

Examples: White phosphorus, acetone and butane. Flammable liquids such as acetone are more easily ignited than combustible liquids such as kerosene.

Class C: Oxidizing Materials
This class includes materials which provide oxygen or similar substances and which increase the risk of fire if they come into contact with flammable or combustible materials.

Class C materials:

- Pose a fire and/or explosion risk in the presence of flammable or combustible material;
- May cause fire when they come in contact with combustible materials such as wood;
- May react violently or cause an explosion when they come in contact with combustible materials such as fuels;
- May burn skin and eyes upon contact.

When handling Class C materials you should:

- Wear proper protective equipment, including eye, face and hand protection and protective clothing;
- Keep the material away from combustible materials;
- Keep the material away from sources of ignition;
- Never smoke when working with or near the material;
- Store the containers in designated areas.

Examples: Sodium hypochlorite, perchloric acid, inorganic peroxides.

Class D: Poisonous & Infectious Materials
Division 1: Immediate and Serious Toxic Effects
This division includes materials causing immediate and serious toxic effects. These materials can cause the death of a person exposed to small amounts.

Class D, Division 1 materials:

- Are potentially fatal poisonous substance;
- May cause permanent damage if inhaled or swallowed or if they enter the body through skin contact;
- May burn eyes or skin upon contact.

When handling Class D, Division 1 materials you should:

- Handle the material with extreme caution;
- Avoid contact with the skin or eyes by wearing the proper protective equipment, including eye, face, and hand protection and protective clothing;
- Avoid inhaling by working in well-ventilated areas and/or wearing respiratory equipment;
- Wash and shower thoroughly after using;
- Store containers in designated areas.

Examples: Sodium cyanide, hydrogen sulphide.

Class D: Poisonous & Infectious Materials
Division 2: Other Toxic Effects
This division includes materials causing immediate eye and/or skin irritation as well as those which can cause long-term effects in a person repeatedly exposed to small amounts.

Class D, Division 2 materials:

- Are poisonous substances that are not immediately dangerous to health;
- May cause death or permanent damage as a result of repeated exposures over time;
- May be a skin or eye irritant;
- May be a sensitizer, which produces a chemical allergy;
- May cause cancer;
- May cause birth defects or sterility.

When handling Class D, Division 2 materials you should:

- Avoid contact with the skin or eyes by wearing the proper protective equipment, including eye, face and hand protection and protective clothing;
- Avoid inhaling by working in well-ventilated areas and/or wearing respiratory equipment;
- Store the containers in designated areas.

Examples: acetone (irritant), asbestos (carcinogen), toluene diisocyanate (sensitizer).

Class D: Poisonous & Infectious Materials
Division 3: Biohazardous Infectious Material
This division includes materials which contain harmful microorganisms.

Class D, Division 3 materials:

- May cause a serious disease resulting in illness or death.

When handling Class D, Division 3 materials you should:

- Take every measure to avoid contamination;
- Handle the material only when fully protected by the proper, designated equipment;
- Handle the material in designated areas where engineering controls are in place to prevent exposure.

Examples: Cultures or diagnostic specimens containing salmonella bacteria or the hepatitis B virus.

Class E: Corrosive Material
Class E materials are acid or caustic materials which can destroy the skin and/or eat through metals.

Class E materials:

- Cause severe eye and skin irritation upon contact;
- Cause severe tissue damage with prolonged contact;
- May be harmful if inhaled.

When handling Class E materials you should:

- Keep container lids tightly closed;
- Avoid contact with the skin or eyes by wearing the proper protective equipment, including eye, face and hand protection and protective clothing;

- Avoid all inhaling by working in well-ventilated areas and/or wearing respiratory equipment.

Examples: Muriatic acid, lye.

Class F: Dangerously Reactive Material
Class F materials can undergo dangerous reaction if subjected to heat, pressure, shock or allowed to contact water.

Class F materials:

- Are very unstable;
- May react with water to release a toxic or flammable gas;
- May explode as a result of shock, friction or increase in temperature;
- May explode if heated when in a closed container;
- May undergo vigorous polymerization.

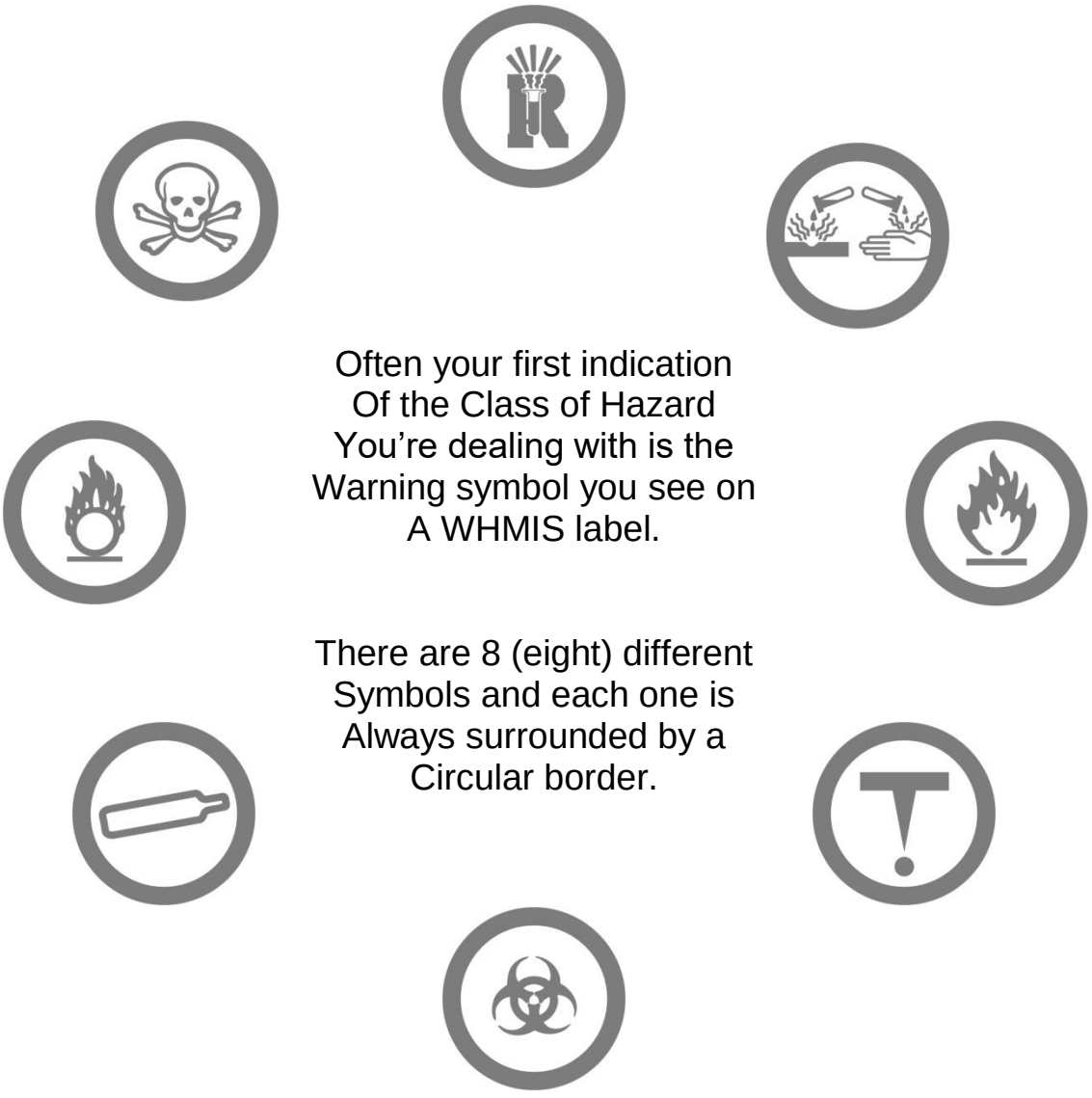
When handling Class F materials you should:

- Keep material away from heat;
- Open containers carefully, do not drop them;
- Store the material in a cool, flame –proof designated area.

Example: Plastic monomers such as butadiene and some cyanides.

How WHMIS Identifies Hazards

Under WHMIS, the hazards of controlled products are identified by distinctive symbols representing different Classes.



Often your first indication
Of the Class of Hazard
You're dealing with is the
Warning symbol you see on
A WHMIS label.

There are 8 (eight) different
Symbols and each one is
Always surrounded by a
Circular border.

Sample Supplier Label

There are 7 types of information to look for on a Supplier Label:

1. **Product Identifier:** Identification of the material by chemical name, common name, generic name, trade name, brand name, code name or number.

2. **Risk Phrase:** Phases that explain the nature of the hazard and the risks involved in misusing the product, beyond the risks conveyed by the symbols.

3. **Precautionary Statement:** The essential measures to be taken when using, handling, or working in the presence of a controlled product.

4. **Hazard Symbols:** Symbols that correspond to the classes and, where applicable, divisions under which the controlled product falls: the symbols immediately alert label readers to the product hazards.

5. **Reference that MSDS is Available:** A statement to the effect that a **MSDS** is available, reminding label readers of the more comprehensive source of information.

An example of a supplier label.

6. **First Aid Measures:** Phrases explaining the measures to be taken in case of an acute exposure.

7. **Supplier Identifier:** Name of the supplier of the controlled product.

Material Safety Data Sheets (M.S.D.S.)

What is a Material Safety Data Sheet?

A MSDS is the next part of the WHMIS system. It provides additional information for every specifically controlled product at the workplace.

Like the supplier label, it must be provided as a condition of sale. The label is important for every controlled product supplied to a Canadian work site.

The MSDS must provide information in nine specific areas;

1) Product information
2) Hazardous ingredients
3) Physical data
4) Fire and explosion data
5) Reactivity data
6) Toxicological properties
7) Preventative measures
8) First aid measures
9) Preparation data

Product Information

- How to contact the manufacturer
- How to contact the supplier
- Name of the product
- How the manufactures intended the product to be used.

Material Safety Data Sheet
2,2,2- Trifluoroethanol MSDS

Section 1: Chemical Product and Company Identification	
Product Name: 2,2,2- Trifluoroethanol	**Contact Information:**
Catalog Codes: SLT3697	**ScienceLab.com, Inc.** 14025 Smith Rd. Houston, Texas 77396
CAS#: 75-89-8	US Sales: **1-800-901-7247** International Sales: **1-281-441-4400**
RTECS: KM5250000	Order Online: ScienceLab.com
TSCA: TSCA 8(b) inventory: 2,2,2- Trifluoroethanol	**CHEMTREC (24HR Emergency Telephone), call:** 1-800-424-9300
CI#: Not available.	**International CHEMTREC, call:** 1-703-527-3887
Synonym: 2,2,2-Trifluoroethyl Alcohol	**For non-emergency assistance, call:** 1-281-441-4400
Chemical Name: 2,2,2- Trifluoroethanol	
Chemical Formula: C2-H3-F3-O	

Hazardous Information

- Ingredients that are capable of being harmed or might have unknown effects
- How much ingredient is in the whole product
- A code required by the transportation of Dangerous Goods Regulations
- A code number which identifies this particular chemical
- How toxic is it if swallowed, absorbed through the skin, or injected (lethal dose)
- How toxic is it by inhaling (lethal concentration)

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
{2,2,2-} Trifluoroethanol	75-89-8	100

Toxicological Data on Ingredients: 2,2,2- Trifluoroethanol: ORAL (LD50): Acute: 366 mg/kg [Mouse]. 240 mg/kg [Rat]. DERMAL (LD50): Acute: 1680 mg/kg [Rat]. GAS (LC50): Acute: 499.4 ppm 4 hour(s) [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Hazardous in case of skin contact (irritant, sensitizer), of eye contact (irritant), of ingestion, of inhalation (lung irritant).

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified None. by NTP, None. by OSHA, None. by NIOSH.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/male [POSSIBLE].
The substance is toxic to blood, the reproductive system, bladder, brain, upper respiratory tract, eyes.
Repeated or prolonged exposure to the substance can produce target organs damage.

This section provides information on the identity, concentration and estimators of acute toxicity for ingredients in a controlled product.

Physical Data

- Whether it is a solid, liquid or gas at room temperature
- How to recognize the product by sight and smell
- The smallest amount (in the air) that you can smell
- How quickly it will evaporate
- The temperature at which it changed from a liquid to a gas
- The temperature at which it freezes
- Whether its heavier or lighter than air

- The amount of pressure caused when it evaporated in a closed container
- A number that shows how corrosive it is
- How well it dissolves in water
- Whether it is heavier or light than water

Section 9: Physical and Chemical Properties
Physical State: Liquid
Appearance: colorless
Odor: Not available.
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: 50 - 52 deg C @6mmHg
Freezing/Melting Point: Not available.
Decomposition Temperature: Not available.
Solubility: Not available.
Specific Gravity/Density: 0.813
Molecular Formula: C11H22SI
Molecular Weight: 182.38

This section provides a physical description of the product which is used for recognition of presence, an understanding of its response to change in the physical environment and has specific applications for ventilation system design and emergency procedures.

Fire & Explosion Data

- The lowest temperature at which the vapors will ignite from a spark or flame
- The amount of gas or vapor from the product (in the air) that can explode or catch fire from a spark or flame
- How easily it will ignite or burn
- The temperature at which vapor or gas will ignite without a spark or flame
- The chances of it exploding from sudden impact
- What kind of extinguisher to use
- The chances of it exploding from an electrical spark or static discharge
- Hazardous material that could be released if the product burns

Section 5: Fire and Explosion Data
Flammability of the Product: Flammable.
Auto-Ignition Temperature: 480°C (896°F)
Flash Points: CLOSED CUP: 29°C (84.2°F).
Flammable Limits: LOWER: 5.5% UPPER: 42%
Products of Combustion: These products are carbon oxides (CO, CO2), halogenated compounds.
Fire Hazards in Presence of Various Substances: Not available.
Explosion Hazards in Presence of Various Substances: Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.
Fire Fighting Media and Instructions: Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.
Special Remarks on Fire Hazards: Not available.
Special Remarks on Explosion Hazards: Not available.

Reactivity Data

- Chances of it reacting dangerously from physical shock or from a change in pressure or temperature.
- Other products that could react with it to produce heat, an explosion or something that is toxic or corrosive.
- Other conditions that could cause a normally stable product to react dangerously.
- Hazardous material that could be released if the product gets old, is heated or reacts with another product

Stability And Reactivity	
Stability:	The product is stable
Polymerization:	Hazardous polymerization does not occur
Hazardous decomposition products:	None reasonably foreseeable.
Materials to avoid:	Strong bases. Reducing agents. Do not mix with chlorinated products.

The intent of this section is to provide information on the stability of the product and its likelihood of dangerous reaction with other chemicals. Information here has implications for handling procedures, storage arrangements and may be useful along with Section 4 data for the prevention and control of fires or explosions.

Toxicological Properties

- Immediate health effects of a harmful exposure
- The ways it can enter or affect parts of the body
- Ability to cause effects like burns, swelling or irritation
- Ability to cause a reaction like a rash or asthma after more than one exposure
- Health effects of many exposures over a long period of time
- The limits allowed for exposures to the product during your work
- Ability to cause permanent damage to the cells of the body
- Products which can combine with it to cause toxic effects

TOXICOLOGICAL INFORMATION	
Acute toxicity:	LD50 estimated to be greater than 5000 mg/kg
Component Information:	See Section 3
Chronic toxicity:	None known

Specific effects

Carcinogenic effects: None known
Mutagenic effects: None known
Reproductive toxicity: None known
Target organ effects: None known

Hazardous ingredients

Ingredient(s)	CAS #	NTP	IARC	OSHA
Hydrogen Peroxide	7722-84-1		3	

This section provides information on how a material is likely to enter the body and what short and long term health effects it is likely to have on an exposed worker, including signs and symptoms of exposure and pre-existing medical conditions which may be aggravated. Information in this section is an important determinant of preventative and first aid measures in Sections 7 and 8. *NOTE:* Where data on the toxicological properties of a controlled product provided on one part of the MSDS may be interpreted to qualify or contradict other toxicological data on the sheet, the MSDS must include sufficient particulars of toxicological studies so as to not mislead a person about the nature and extent of the hazard posed by the controlled product.

Preventative Measures

- The specific protective equipment or clothing needed to keep you from being directly exposed to the product.
- How to safely store the product
- Particular precautions needed for special hazards
- Special procedures and protective equipment to be used in case of a leak or spill
- Permanent control measures to help reduce exposures
- Instruction for products which require special handling during transport
- How to safely dispose of the product

EXPOSURE CONTROLS/ PERSONAL PROTECTION

Engineering measures to reduce exposure:
No special ventilation requirements. General room ventilation is adequate.

Personal Protective Equipment

Eye protection: No special requirements under normal use conditions.
Hand protection: No special requirements under normal use conditions
Skin and body protection: No special requirements under normal use conditions.
Respiratory protection: No special requirements under normal use conditions.

Hygiene measures: Handle in accordance with good industrial hygiene and safety practice.

Ingredient(s)	CAS #	ACGIH	OSHA	Mexico
Hydrogen peroxide	7722-84-1	1 ppm (TWA)	1 ppm (TWA) 1.4 mg/m3 (TWA)	2 ppm (STEL) 3 mg/m3 (STEL) 1.5 mg/m3 (TWA) 1 ppm (TWA)

First Aid Measures

- What type of emergency care to give someone who has been over exposed to the product

FIRST AID MEASURES	
Eye contact:	Flush immediately with plenty of water. If irritation develops, get medical attention.
Skin contact:	Flush immediately with plenty of water. If irritation develops, get medical attention.
Inhalation:	No specific first aid measures are required.
Ingestion:	No specific first aid measures are required.
Aggravated Medical Conditions:	None known.

The intent of this section is primarily to provide information necessary for the safe evacuation and immediate treatment of a person experiencing acute effects of overexposure to the controlled product. Information is meant for use by workers on site, including first aid personnel and will normally expand on and must always be consistent with first aid measure on the label.

Preparation Data

- How to contact the person who prepared the MSDS (If the organization is the original producer of the product, this information may be found with the Product Identification.)
- The date the MSDS was prepared (it shouldn't be more than 3 years old)

SECTION 9	EMERGENCY CONTACT	PREPARATION DATE OF MSDS
Prepared by (group, department, ETC)	Emergency contact Phone number	Date of preparation (no older than 3 years)

WHMIS legislation requires that material safety data sheets be kept current and that they be prepared no earlier than three years prior to the receipt of the product in the workplace. Information in this section is designed to help ensure compliance with this requirement.