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**Esthetician – All Trades
Safety Part - 2
Hazardous Materials and Fire
Protection**

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Safety Part - 2

Hazardous Materials and Fire Protection

Rationale

Why is it important to learn this skill?

This skill is important for self-preservation. Identifying chemicals and protecting oneself against them is as critical to a long, healthy life as knowing how to extinguish a small fire.

Outcome

When you have completed this module, you will be able to:

Describe the safety practices for hazardous materials and fire protection in the Esthetician trade.

Objectives

1. Describe the roles, responsibilities, and features of the workplace hazardous materials information system (WHMIS) program.
2. Describe WHMIS labels.
3. Describe hazard groups, hazard classes, and hazard categories.
4. Describe and identify pictograms used in WHMIS.
5. Describe the characteristics of a MSDS.
6. Demonstrate usage of a MSDS or SDS.
7. Describe the characteristics of fire.
8. Describe fire hazards, classes, procedures, and equipment related to fire protection.

Introduction

WHMIS stands for the Workplace Hazardous Materials Information System. It is a system that provides information on the safe use of hazardous products in Canada.

Recently, the Canadian system was aligned with the worldwide hazard communication system known as the Globally Harmonized System (GHS) of Classification and Labelling of Chemicals. This alignment means some changes to the WHMIS system. New hazard classes have been introduced, some language has been changed, and the old Material Safety Data Sheets (MSDS) have been replaced with a new Safety Data Sheet (SDS) format. Most of the material for this module has come from the *Canadian Centre for Occupational Health and Safety*.

Objective One

When you have completed this objective, you will be able to:

Describe the roles, responsibilities, and features of a WHMIS program.

WHMIS 2015 - General

The WHMIS 1998 system in Canada has been renamed “WHMIS 2015” to indicate that it has been aligned with the GHS. On a national level, Health Canada is responsible for making the required changes to the overall federal WHMIS-related laws. It is important to note that each province and territory has its own WHMIS-related occupational health and safety regulations. WHMIS regulations and legislation are enforceable laws.

From February 2015 to June 2018, WHMIS 2015 will be phased in across the country. Suppliers may begin to use and follow the new requirements for labels and SDSs for hazardous products sold, distributed, or imported into Canada. The suppliers of chemicals must only choose one system for the duration of the change-over; they cannot use both systems simultaneously.

The Main Parts of WHMIS

The main components of WHMIS are hazard identification and product classification, labelling, safety data sheets, and worker education and training.



Products Covered Under WHMIS

All hazardous products used in the workplace are covered by the WHMIS regulations. A workplace that has hazardous products must have a WHMIS program that includes education and training. If a product is covered by the *Hazardous Products Act*, then it is a hazardous product.

WHMIS does not cover things such as explosives, cosmetics defined in the Food and Drugs Act, and nuclear substances. Even though a product is not covered under WHMIS, employers may still provide education and training on the safe use, storage, and health effects of the product.

Supplier's Duties

Suppliers are those organizations who sell or import hazardous products. Suppliers must ensure that hazardous products are correctly classified. Suppliers must label hazardous products or their container, and provide a SDS to customers. The purpose of the label is to clearly identify the hazardous product, the hazards, the supplier, and precautionary measures. The SDS also provides additional information.

Employer's Duties

When hazardous products are used in the workplace, employers are required to:

Educate and train workers on the hazards and safe use of products.

Ensure that hazardous products are properly labelled.

Prepare workplace labels, as needed.

Prepare SDSs, as necessary (e.g., if an employer manufactures a hazardous product that is used on-site).

Ensure appropriate control measures are in place to protect the health and safety of workers.

Provide workers with up-to-date SDSs to workers.

Worker's Duties

Workers must participate in WHMIS education and training programs; in addition, they must take necessary steps to protect themselves and their co-workers. Lastly, workers must participate in identifying and controlling hazards.

Consumer Products

Consumer products are those that can be purchased in a store and are usually intended for home use. They can include cleaning products and adhesives. These products are labelled according to other legislation, but workers should be made aware of their contents and the hazards involved with their use, storage, and transportation.

Enforcement

Enforcement of WHMIS legislation is the duty of the provincial, territorial, or federal government depending on the workplace. Inspectors have the authority to ensure that OHS legislation is being followed. A well-prepared employer can demonstrate that they have a WHMIS program in place. They can show where the SDSs are, that the hazardous products have appropriate labels, and that an education and training program is being used.

Confidential Business information (CBI)

Sometimes, the exact ingredients in the hazardous product are not listed on the SDS. A company can apply to Health Canada to keep an ingredient 'secret.' This is considered as confidential business information (CBI). A CBI application may be granted if declaring the ingredient on the SDS would provide to competitors financial gain and / or if significant cost was incurred to develop the product. The exact name of a secret chemical is replaced with a generic chemical identity. All physical or health hazard information, preventive measures, and first aid must be present on the label. The supplier must disclose the name of the ingredient to a safety or health professional in the case of an emergency.

Objective One Self-Test

1) When is the 'phase-in' period for WHMIS 2015?

2) Can the supplier of a hazardous product use both WHMIS systems at the same time?

3) What are the three main components of WHMIS?

4) What must a workplace create if the workplace has hazardous products?

5) Identify three supplier's duties:

6) Identify three worker's duties:

Objective One Self-Test Answers

- 1) From February 2015 to June 2018, WHMIS 2015.
- 2) No. Suppliers must only use one system during the phase-in.
- 3) The main components of WHMIS are hazard identification and product classification, labelling, safety data sheets, and worker education and training.
- 4) The workplace must create a WHMIS program that includes education and training.
- 5) Suppliers must ensure that hazardous products are correctly classified. Suppliers must label hazardous products or their container, and provide a SDS to customers.
- 6) Workers must participate in WHMIS education and training programs; in addition, they must take necessary steps to protect themselves and their co-workers. Lastly, workers must participate in identifying and controlling hazards.

Objective Two

When you have completed this objective, you will be able to:

Describe WHMIS labels.

Types of Labels

There are two main types of WHMIS labels: supplier labels, and workplace labels.

A supplier label is provided or attached by the supplier and will appear on all hazardous products received at a Canadian workplace. No other label is required if the hazardous product is always used in the container with the supplier label.

A workplace label is required when a hazardous product is produced at the workplace and used in that workplace, a hazardous product is transferred or poured into another container, or a supplier label becomes lost or unreadable.

Workplace labels are not necessary in two situations: 1) when a hazardous product is poured into a container and it is going to be used immediately, or 2) when the hazardous product is under the control of the person who transferred or poured it.

For example, if a worker pours a product from the supplied container into a second container, and then is the sole user of the product, no second label is needed. The product must be used in one shift, and the container must still be identified with the product name.

Information Required on a Supplier Label

The supplier labels must be in both French and English, and include the following six pieces of information:

1. **Product identifier** - the brand name, chemical name, common name, generic name or trade name of the hazardous product.
2. **Initial supplier identifier** – the name, address and telephone number of either the Canadian manufacturer or the Canadian importer.
3. **Pictogram(s)** – hazard symbol within a red "square set on one of its points".
4. **Signal word** – a word used to alert the reader to a potential hazard and to indicate the severity of the hazard such as "**Danger**" or "**Warning**".

5. **Hazard statement(s)** - which describe the nature of the hazard posed by a hazardous product. Some examples include: “extremely flammable gas”, “fatal if inhaled”, or “may cause cancer”.
6. **Precautionary statement(s)** – that describe measures to be taken to minimize or prevent adverse effects resulting from exposure to a hazardous product or resulting from improper handling or storage of a hazardous product.

In addition to the six pieces of information listed above, a supplier label may include supplemental information such as precautionary actions or route of exposure.

Precautionary Statements

Precautionary statements advise how to minimize or prevent adverse effects resulting from exposure to or improper storage or handling of a hazardous product. The wording of precautionary statements is standardized and harmonized.

There are five types of precautionary statements: 1) General, 2) Prevention, 3) Response (including first aid), 4) Storage, and 5) Disposal. A precautionary statement may be “Keep container tightly closed”, “Protect from sunlight”.

No set format exists for supplier labels. They may be one, bilingual label, or two separate labels (one in each language). Labels require:

The pictogram, signal word, and hazard statement grouped together.

To be clearly and prominently displayed on the container.

To be in contrast with other information on the product or container.

To be easy to read.

Product K1 / Produit K1



Danger

Fatal if swallowed.
Causes skin irritation.

Precautions:

Wear protective gloves.
Wash hands thoroughly after handling.
Do not eat, drink or smoke when using this product.

Store locked up.
Dispose of contents/containers in accordance with local regulations.

IF ON SKIN: Wash with plenty of water.
If skin irritation occurs: Get medical advice or attention.
Take off contaminated clothing and wash it before reuse.
IF SWALLOWED: Immediately call a POISON CENTRE or doctor.
Rinse mouth.

Danger

Mortel en cas d'ingestion.
Provoque une irritation cutanée.

Conseils :

Porter des gants de protection.
Se laver les mains soigneusement après manipulation.
Ne pas manger, boire ou fumer en manipulant ce produit.

Garder sous clef.
Éliminer le contenu/réceptacle conformément aux règlements locaux en vigueur.

EN CAS DE CONTACT AVEC LA PEAU : Laver abondamment à l'eau.
En cas d'irritation cutanée : Demander un avis médical/consulter un médecin.
Enlever les vêtements contaminés et les laver avant réutilisation.
EN CAS D'INGESTION : Appeler immédiatement un CENTRE ANTIPOISON ou un médecin.
Rincer la bouche.

Compagnie XYZ, 123 rue Machin St, Mytown, ON, N0N 0N0 (123) 456-7890

Sample label.

Workplace Labels

Workplace labels are predicted to require the following information:

- Product name (matching the SDS product name).
- Safe handling precautions.
- A reference to the SDS (if available).

Workplace label requirements fall under provincial, territorial, or federal jurisdiction, depending on the workplace.

In some cases, a WHMIS label can be a mark, sticker, sign, ticket, stamp, seal, tag, or wrapper. It can be attached, imprinted, stencilled or embossed on the hazardous product or its container. Workers must be trained to be able to identify these alternate systems if they are used in the workplace.

Workers should always check to see if there is a label on the product before use. The label should be read and understood. The instructions on the label and SDS should be obeyed. When a worker is unsure, they should ask supervisors for advice. Illegible labels must be replaced with legible ones. If a label cannot be read, or a product has no label, the product should not be used.

Objective Two Self-Test

1) Identify one situation when a workplace label is not necessary:

2) What is the purpose of a 'signal word' on a supplier label?

3) What is the purpose of a 'precautionary statement' on a supplier label?

4) What must be done when a workplace label is illegible?

Objective Two Self-Test Answers

- 1) Workplace labels are not necessary in two situations: 1) when a hazardous product is poured into a container and it is going to be used immediately, or 2) when the hazardous product is under the control of the person who transferred or poured it.
- 2) The signal word alerts workers to a potential hazard and its severity.
- 3) A precautionary statement describe measures to be taken to minimize or prevent adverse effects resulting from exposure to a hazardous product or resulting from improper handling or storage of a hazardous product.
- 4) The label must be replaced with a legible one.

Objective Three

When you have completed this objective, you will be able to:

Describe hazard groups, hazard classes, and hazard categories.

Hazard Groups

Two main hazard groups are identified under WHMIS 2015: physical hazards, and health hazards. The physical hazards group is based on the physical or chemical properties of the product - such as flammability or reactivity. The health hazards group is based on the ability of the product to cause a health effect such as carcinogenicity or eye irritation.

Hazard Classes

Hazard classes are clusters inside hazard groups. Products that have similar properties are classed together. The following classes are some that exist under the umbrella of **physical hazards**: *flammable liquids, self-heating substances and mixtures, corrosive metals, and simple asphyxiants*. The following classes are some that exist under the umbrella of **health hazards**: *skin corrosion/irritation, reproductive toxicity, biohazardous infectious materials, and carcinogenicity*.

Hazard Categories

Hazard categories are clusters inside hazard classes. Hazard categories are either assigned a number or a type. Types are identified by letters (e.g., A, B). A category indicates the severity of the hazard. Category 1 is the greatest level of hazard, and A is a greater hazard than B.

Suppliers evaluate products and label them according to the regulations. The SDS for the product must indicate the classification of the product. The hazard class and category will be provided in Section 2 (Hazard Identification) of the SDS. Each hazard class or category must use specific pictograms and other elements to indicate the hazard that is present, and what precautionary measures must be taken.

Objective Three Self-Test

- 1) Which category is more hazardous, category 1 or category 3?
- 2) Which category is more hazardous, category A or category B?
- 3) What are the two hazard groups?

Objective Three Self-Test Answers

- 1) Category 3.
- 2) Category A.
- 3) Physical and health.











Objective four

When you have completed this objective, you will be able to:
Describe and identify pictograms used in WHMIS.

Pictograms

Pictograms are graphic images used for quick identification. Most pictograms have a red border of a 'square set on one of its points.' Inside this border is a symbol that represents the potential hazard. The symbol and the border together are referred to as a pictogram. Pictograms are assigned to specific hazard classes or categories.

The graphic below shows hazard pictograms. The bold type is the name given to the pictogram; the words in the brackets describe the hazard.

	Exploding bomb (for explosion or reactivity hazards)		Flame (for fire hazards)		Flame over circle (for oxidizing hazards)
	Gas cylinder (for gases under pressure)		Corrosion (for corrosive damage to metals, as well as skin, eyes)		Skull and Crossbones (can cause death or toxicity with short exposure to small amounts)
	Health hazard (may cause or suspected of causing serious health effects)		Exclamation mark (may cause less serious health effects or damage the ozone layer*)		Environment* (may cause damage to the aquatic environment)
	Biohazardous Infectious Materials (for organisms or toxins that can cause diseases in people or animals)				

* The GHS system also defines an Environmental hazards group. This group (and its classes) was not adopted in WHMIS 2015. However, you may see the environmental classes listed on labels and Safety Data Sheets (SDSs). Including information about environmental hazards is allowed by WHMIS 2015.

The following pictograms are associated with these hazard classes and categories.



The **flame** pictogram is used for the following:

- Flammable gases, aerosols, liquids, and solids.
- Self-heating substances and mixtures.
- Organic peroxides.



The **flame over circle** pictogram is used for the following:

- Oxidizing gases, liquids, and solids.



The **gas cylinder** pictogram is used for the following:

- Gases under pressure (Compressed gas, Liquefied gas, Refrigerated liquefied gas, and Dissolved gas).



The **corrosion** pictogram is used for the following:

- Corrosive to metals, skin corrosion/irritation, and serious eye damage/eye irritation.



The **exploding bomb** pictogram is used for the following:

- Self-reactive substances and mixtures, and organic peroxides.



The **skull and crossbones** pictogram is used for the following:

- Acute toxicity – oral, dermal, and inhalation.



The **health hazard** pictogram is used for the following:

- Respiratory or skin sensitization - Respiratory sensitizer, and germ cell mutagenicity.
- Carcinogenicity.
- Reproductive toxicity.
- Specific Target Organ Toxicity - Single exposure and Repeated exposure
- Aspiration hazard.



The **exclamation mark** pictogram is used for the following:

- Acute toxicity - Oral, Dermal, Inhalation.
- Skin corrosion/irritation - Skin irritation.
- Serious eye damage/eye irritation - Eye irritation.
- Respiratory or skin sensitization - Skin sensitizer.
- Specific target organ toxicity - Single exposure.



The **biohazardous infectious materials** pictogram is used for the following:

- Biohazardous Infectious Materials.

Not all hazardous products that meet the criteria for a hazard class or category require a pictogram. For example, Flammable gases - Category 2 do not require a pictogram.

Pictograms are located on the product supplier labels of the hazardous products. They also appear on the SDS's.

Objective Four Self-Test

1) What two things make up the pictogram?

2) What hazards are indicated by this pictogram? _____



3) What hazards are indicated by this pictogram? _____



4) What hazards are indicated by this pictogram? _____



Objective Four Self-Test Answers

- 1) The border and the symbol inside the border.
- 2) Corrosive to metals, skin corrosion/irritation, and serious eye damage/eye irritation.
- 3) Gases under pressure (Compressed gas, Liquefied gas, Refrigerated liquefied gas, and Dissolved gas).
- 4) Flammable gases, aerosols, liquids, and solids.
Self-heating substances and mixtures.
Organic peroxides.

Objective Five

When you have completed this objective, you will be able to:

Describe the characteristics of a MSDS

Below is the information for a product frequently used in the Esthetics industry. The format is based on the WHMIS 1998 Material Safety Data Sheet (MSDS). The product name is CaviCide®, manufactured by Metrex® Research. Read the information and complete the following practical exercise.

CaviCide®

Date Prepared: 7/9/2012

MATERIAL SAFETY DATA SHEET

1. Product And Company Identification

Product Name: CaviCide®

Manufacturer: METREX® RESEARCH
28210 Wick Rd
Romulus, MI 48174
U.S.A.

Information Phone Number: 1-800-841-1428 (Customer Service)

Chemical Emergency Phone Number (Chemical Spills, Leaks, Fire, Exposure or Accident only):
CHEMTREC 1-800-424-9300 (in the US) 1-703-527-3887 (Outside the US)

MSDS Date Of Preparation/Revision: 7/9/2012

Product Use: Hard surface cleaner and disinfectant.

EPA Registration No: 46781-6

2. Hazards Identification

Clear liquid with an alcohol odor.

EMERGENCY OVERVIEW

Flammable liquid and vapor. Causes moderate eye irritation. May cause mild skin irritation. Harmful if absorbed through the skin. Inhalation of concentrated vapors may cause irritation of the eyes, nose and throat and dizziness and drowsiness. Prolonged overexposure to ethylene glycol monobutyl ether may affect liver, kidneys, blood, lymphatic system or central nervous system.

3. Composition/Information On Ingredients

Component	CAS No.	Amount
Isopropanol	67-63-0	17.2%
Ethylene Glycol Monobutyl Ether (2-Butoxyethanol)	111-76-2	1-5%
Diisobutylphenoxyethoxyethyl dimethylbenzyl ammonium chloride	121-54-0	0.28%
Water	7732-18-5	70-80%

4. First Aid Measures

Inhalation: Move to fresh air if effects occur and seek medical attention if effects persist.

Skin Contact: Remove contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for further treatment advice.

Eye Contact: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing. Call a poison control center or doctor for treatment advice.

Ingestion: If swallowed, get medical advice by calling a Poison Control Center or hospital emergency room. If advice is not available, take victim and product container to the nearest emergency treatment center or hospital. Do not attempt to give anything by mouth to an unconscious person.

5. Fire Fighting Measures

Extinguishing Media: Use water, spray, or fog, alcohol-resistant foam, carbon dioxide, or dry chemical. Cool fire exposed containers with water.

Special Fire Fighting Procedures: Firefighters should wear positive pressure self-contained breathing apparatus and full protective clothing for fires in areas where chemicals are used or stored.

Unusual Fire Hazards: Flammable liquid and vapor. May form explosive mixtures in air at temperatures at or above the flashpoint. Flammable vapors may collect in confined areas. Vapors are heavier than air and may travel along surfaces to remote ignition sources and flashback. Fire exposed containers may rupture explosively.

Hazardous Combustion Products: Burning may produce carbon monoxide, carbon dioxide, nitrogen oxides, amines, chlorine and hydrogen chloride.

6: Accidental Release Measures

Eliminate all ignition sources. Ventilate area. Use explosion-proof equipment if large amounts are released. Stop leak if it is safe to do so and move containers from the spill area. Wear appropriate protective clothing and equipment (See Section 8). Collect material with an inert absorbent material and place in appropriate, labeled container for disposal. Refer to Section 13 for disposal advice.

7. Handling and Storage

Do not get in eyes or on clothing. Wear appropriate eye protection when handling (see Section 8). Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove and wash contaminated clothing before reuse.

Flammable liquid and vapor. Keep away from heat, sparks, open flames and all other sources of ignition. Do not smoke in storage or use areas. Keep containers closed when not in use. Do not reuse empty containers.

Store in a cool, well-ventilated area away from heat, oxidizers, and all sources of ignition. Do not contaminate water, food or feed by storage.

Empty containers retain product residues and may be hazardous. Do not flame cut, drill, weld, etc. on or near empty containers, even empty.

8. Exposure Controls / Personal Protection

Exposure Limits

Chemical	Exposure Limit
Isopropanol	200 ppm TWA, 400 ppm STEL ACGIH TLV 400 ppm TWA OSHA PEL
Ethylene Glycol Monobutyl Ether (2-Butoxyethanol)	20 ppm TWA ACGIH TLV 50 ppm skin TWA OSHA PEL
Diisobutylphenoxyethoxyethyl dimethylbenzyl ammonium chloride	None Established

Ventilation: General ventilation should be adequate for normal use. For operations where the exposure limits may be exceeded, mechanical ventilation such as local exhaust may be needed to minimize exposure.

Respiratory Protection: None under normal use conditions with adequate ventilation. For operations where the occupational exposure limits are exceeded, a NIOSH/MSHA approved respirator with an organic vapor cartridges or supplied air respirator is recommended. Equipment selection depends on contaminant type and concentration. Select in accordance with 29 CFR 1910.134 and good industrial hygiene practice. For firefighting, use self-contained breathing apparatus.

Gloves: Impervious gloves such as butyl rubber or nitrile are recommended for operations which may result in prolonged or repeated skin contact.

Eye Protection: Splash proof goggles, face shield, or safety glasses are recommended to prevent eye contact.

Other Protective Equipment/Clothing: Wear protective clothing if needed to avoid prolonged / repeated skin contact. Suitable washing and eye flushing facilities should be available in the work area. Contaminated clothing should be removed and laundered before re-use.

9. Physical and Chemical Properties

Appearance And Odor: Clear liquid with an alcohol odor.

Boiling Point:	Not Determined	Specific Gravity:	0.972
Solubility in Water:	Complete	pH:	11.0 -12.49
Vapor Pressure:	43.3 mmHg @ 20°C (isopropanol)	Vapor Density:	2.1 (isopropanol)
Percent Volatile:	>95%	Melting/Freezing Point:	Not Determined
Coefficient of Water/ Oil Distribution	Not Determined		
Flash Point:	28.3°C (83°F)	Flammable Limits:	LEL: 2% UEL: 12.7%

10. Stability and Reactivity

Stability: Stable

Conditions To Avoid: Heat, sparks, flames and all other sources of ignition.

Incompatibility: Strong oxidizing agents, acids and strong reducing agents.

Hazardous Decomposition Products: Thermal decomposition will produce carbon monoxide, carbon dioxide, nitrogen oxides, amines, chlorine and hydrogen chloride.

Hazardous Polymerization: Will not occur.

11. Toxicological Information

Potential Health Effects

Acute Hazards:

Inhalation: May cause irritation of the nose, throat and upper respiratory tract. High vapor concentrations may produce nausea, vomiting, headache, dizziness, drowsiness, weakness, fatigue, narcosis and possible unconsciousness. Not acutely toxic in rats.

Skin Contact: Prolonged or repeated exposure may cause mild irritation. No signs of toxicity or irritation were observed in a dermal toxicity study in rabbits. Non-irritating in a primary irritation study with rabbits. Negative in a skin sensitization study with guinea pigs.

Eye Contact: May cause irritation with tearing, redness and pain. Moderate irritant in an eye irritation study with rabbits. Effects reversed in 7 days.

Ingestion: Ingestion may cause gastrointestinal disturbances and central nervous system effects such as headache, dizziness, drowsiness and nausea. Not acutely toxic in rats.

Chronic Hazards: Prolonged overexposure to ethylene glycol monobutyl ether may affect liver, kidneys, blood, lymphatic system, or central nervous system.

Medical Conditions Aggravated By Exposure: Due to its defatting properties, isopropyl alcohol may aggravate an existing skin condition.

Carcinogen: None of the components is listed as a carcinogen or potential carcinogen by IARC, NTP, ACGIH, or OSHA.

Acute Toxicity Values for CaviCide:

LD50 Oral Rat >5000 mg/kg

LD50 Dermal Rabbit >2000 mg/kg

LC50 inhalation LC50 rat >2.08 mg/L

12. Ecological Information

This product is not classified as aquatically toxic based on the GHS criteria for aquatic toxicity.

Toxicity

Isopropanol: LC50 fathead minnows 11,130 mg/L/48 hr; LC50 brown shrimp 1400 mg/L/48 hr
Diisobutylphenoxyethoxyethyltrimethylbenzylammonium chloride: LC50 pimephales promelas 1.6 mg/L/96 hr,
LC50 lepomis macrochirus 1.4 mg/L/96 hr.

Persistence and degradability: Isopropanol and 2-butoxyethanol are readily biodegradable in screening tests. Diisobutylphenoxyethoxyethyltrimethylbenzylammonium chloride is not readily biodegradable.

Bioaccumulative Potential: Isopropanol has an estimated BCF of 3 suggesting that the potential for bioaccumulation is low.

Mobility in Soil: Isopropanol is expected to have very high mobility in soil.

13. Disposal Considerations

Do not contaminate water, food, or feed by storage and disposal.

Pesticide Disposal: Unused product or wastes resulting from the use of this product may be disposed of according to applicable Federal, State, or local procedures.

Container Disposal: Non-refillable container. Do not reuse or refill this container. Offer for recycling, if available.

14. Transport Information

U.S. DOT Hazard Classification

Proper Shipping Name: Not Regulated per alcohol exception (49CFR 173.150(e))

Technical Name: N/A

UN Number: N/A

Hazard Class/Packing Group: N/A

Labels Required: N/A

DOT MARINE POLLUTANTS: This product does not contain Marine Pollutants as defined in 49 CFR 171.8.

IMDG Code Shipping Classification

Proper Shipping Name: Alcohols, n.o.s. (Isopropanol)

UN Number: UN1987

Hazard Class: 3

Packing Group: III

Labels Required: Flammable Liquid (Class 3)

Placards Required: Class 3

Not classified as a marine pollutant

ICAO Air Transport Classification

Proper Shipping Name: Alcohols, n.o.s. (Isopropanol)

ID Number: UN1987

Hazard Class: 3

Packing Group: III

Labels Required: Class 3

15. Regulatory Information

EPA SARA 311/312 Hazard Classification: Fire Hazard, Acute Health, Chronic Health.

EPA SARA 313: This Product Contains the Following Chemicals Subject to Annual Release Reporting Requirements Under SARA Title III, Section 313 (40 CFR 372): Ethylene Glycol Monobutyl Ether (Glycol Ether) 1-5%

Protection Of Stratospheric Ozone: This product is not known to contain or to have been manufactured with ozone depleting substances as defined in 40 CFR Part 82, Appendix A to Subpart A.

CERCLA SECTION 103: This product is not subject to CERCLA reporting requirements; however, many states have more stringent release reporting requirements. Report spills required under federal, state and local regulations.

EPA TSCA Inventory: All of the components of this material are listed on the Toxic Substances Control Act (TSCA) Chemical Substances Inventory or exempt.

16. Other Information

NFPA Rating: Fire: 3 Health: 2 Instability: 0

The information and recommendations set forth herein are taken from sources believed to be accurate as of the date of preparation, however, METREX® RESEARCH makes no warranty with respect to the accuracy or suitability of the recommendations, and assumes no liability to any use thereof.

Objective Five Self-Test

1) Who is the manufacturer of CaviCide®?

2) What is the use of this product?

3) What may be affected by prolonged exposure to glycol monobutyl ether?

4) An apprentice is working with the hazardous product, and they get it on their skin. What is done after clothing is removed and the skin has been washed for 15-20 minutes?

5) What is first done if the product is swallowed?

6) At what temperature will the product form explosive mixtures?

7) How do vapours travel?

8) If the product is accidentally released, what are the first two things that are done?

9) What are the proper hygiene procedures after handling the product?

10) List the storage conditions for this product:

11) What types of gloves are recommended?

12) What types of eye protection is recommended?

13) What may be caused by inhaling high vapour concentrations of this product?

14) How should unused product be disposed?

Objective Five Self-Test Answers

- 1) Metrex® Research.
- 2) A hard surface cleaner and disinfectant.
- 3) The liver, kidneys, blood, lymphatic system, and central nervous system.
- 4) Call a poison control centre or doctor for further treatment advice.
- 5) Seek medical advice.
- 6) At air temperatures.
- 7) They are heavier than air, and travel along surfaces.
- 8) Stop all ignition sources and ventilate the area.
- 9) Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet.
- 10) Store in a cool, well-ventilated area away from heat, oxidizers, and all sources of ignition. Do not contaminate water, food, or feed by storage.
- 11) Impervious gloves such as butyl rubber or nitrile.
- 12) Splash proof goggles, face shield, or safety glasses.
- 13) Nausea, vomiting, headache, dizziness, drowsiness, weakness, fatigue, narcosis, and possible unconsciousness.
- 14) According to federal, provincial (state), or local procedures.

Objective Six

When you have completed this objective, you will be able to:
Demonstrate using a MSDS or SDS.

Laboratory Exercise

Purpose: Demonstrate using a MSDS or SDS.

Materials: A hazardous product and its MSDS or SDS.

Procedure: Use the hazardous product and its MSDS or SDS to answer the following questions.

Product name: _____ Hazard group: _____

Manufacturer: _____ Hazard class: _____

Disposal: _____ Hazard category: _____

Respiratory: _____ Signal word: _____

Gloves: _____ Hazard statement: _____

Health effects: _____ Precautionary statement: _____

Incompatibility: _____ Pictogram: _____

Storage: _____

Ventilation: _____

Instructor verification:

Objective Seven

When you have completed this objective, you will be able to:

Describe the characteristics of fire.

Fire Factors

There are four factors involved in fires: fuel, a source of ignition / energy / heat, oxygen, and a chemical chain reaction. For a fire to begin, fuel and oxygen are needed. Next, a source of energy is added (usually heat). As both fuel and oxygen are heated, molecular activity increases. If properly heated, a self-sustaining chemical reaction is developed. The chemical reaction can escalate until the external ignition source is no longer needed for the fire to continue. A fire will burn until one of the elements is exhausted. For instance, the fuel or oxygen can be used up, or the temperature can be reduced by cooling. In order to extinguish a fire, remove one of the elements. Spraying a fire with foam will cut off the oxygen supply, adding water will remove the heat. A Halon extinguisher will create an inert gas barrier which will interrupt the chemical chain reaction.

Common Causes of Fire

Electrical devices can cause many fires. Loose connections and overloaded receptacles can overheat and / or emit sparks. Receptacles, cords, and portable devices should be checked regularly.

Flammable and combustible materials cause many fires. These materials are often stored near sources of heat such as incandescent light bulbs. They should not be allowed to accumulate, and should be properly disposed of immediately.

Human error causes many fires. People can carelessly throw out still-burning cigarettes and burn food in a kitchen.

Negligence and arson also cause fires. Negligence is different than human error, because negligence indicates a conscious choice. In the case of causing fires, a person can knowingly perform a procedure that may start a fire, or ignore safety protocols. Arson is the intentional lighting of a building on fire.

Objective Seven Self-Test

1) What four factors are involved in a fire?

2) What is required in order to extinguish a fire?

3) Identify four common causes of fire:

Objective Seven Self-Test Answers

- 1) Fuel, a source of ignition / energy / heat, oxygen, and a chemical chain reaction.
- 2) One of the elements must be removed.
- 3) Electrical devices, combustible materials stacked near sources of heat, human error, and negligence and arson.

Objective Eight

When you have completed this objective, you will be able to:

Describe fire hazards, classes, procedures, and equipment related to fire protection.

Types of Portable Fire Extinguishers

Fire extinguishers are separated into five classes based on the types of fire that they are best suited to extinguish. Extinguishers also have a number rating which identifies how much 'fire' the extinguisher can extinguish. The higher the number, the larger the fire.

Class A Extinguishers

These extinguishers are for ordinary combustible materials including cardboard, wood, and paper. They are commonly filled with water, and the numerical rating indicates the amount of water inside, and therefore, the amount of fire it can extinguish. The geometric symbol often associated with class A extinguishers is a green triangle.

Class B Extinguishers

These extinguishers are for flammable or combustible liquids such as gasoline, oil, and grease. The numerical rating for class B extinguishers indicates the approximate number of square metres of fire that can be extinguished. The geometric symbol often associated with class B extinguishers is a red square.

Class C Extinguishers

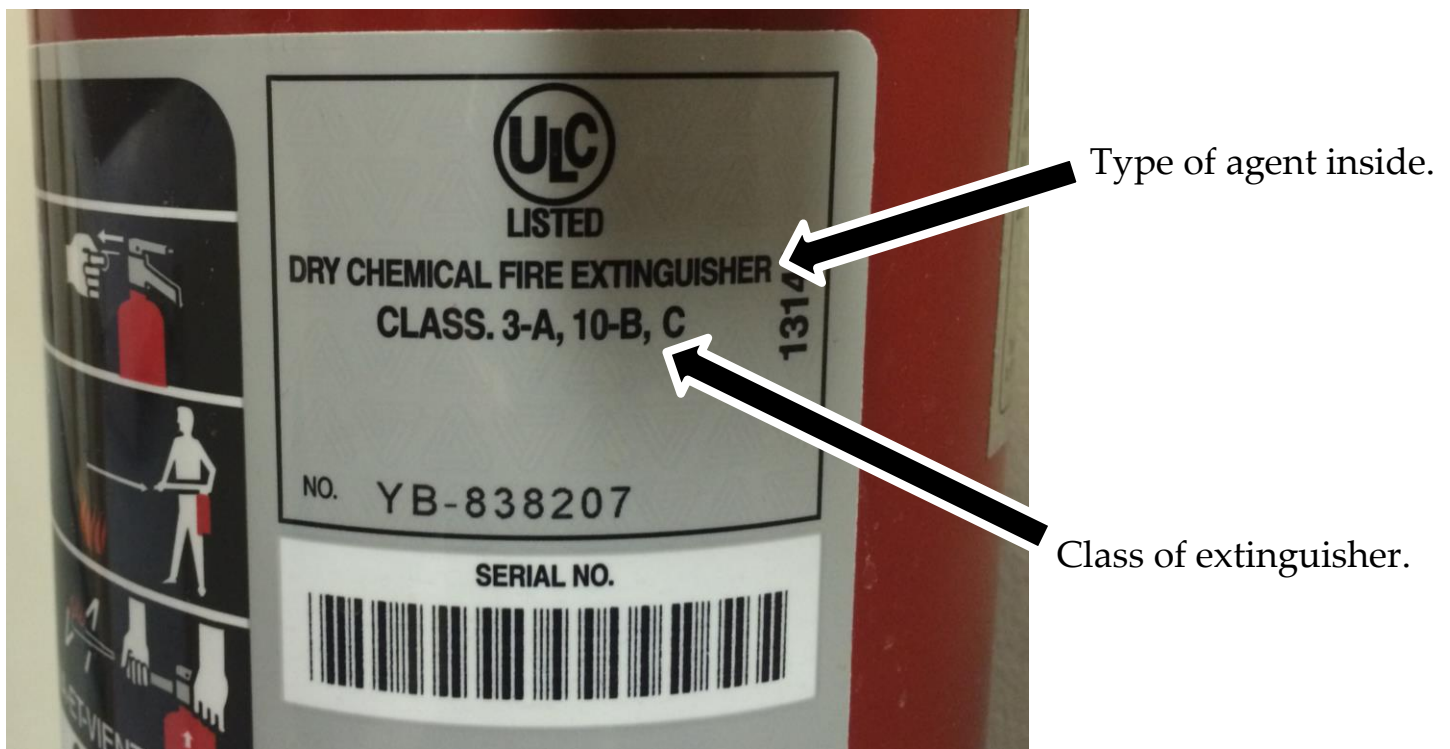
These extinguishers are for fires that involve electrical equipment. Never use a class A extinguisher on an electrical fire due to the severe chance of electrical shock. Class C extinguishers do not have a numerical rating, and their extinguishing agent is non-conductive, usually carbon dioxide. The geometric symbol often associated with class C extinguishers is a blue circle.

Class D Extinguishers

These extinguishers are for fires that involve combustible metals, such as sodium, magnesium, potassium, and titanium. Class D extinguishers have no numerical rating. The geometric symbol often associated with class D extinguishers is a yellow decagon.

Class K Extinguishers

These extinguishers are for fires that involve cooking oils or fats in cooking appliances typically found in restaurants and cafeterias. The geometric symbol often associated with class K extinguishers is a black hexagon.



Care of Fire Extinguishers

Fire extinguishers should be visually inspected once per month, and serviced one time per year. All carbon dioxide extinguishers should be weighed annually to determine any leaks. Dry chemical extinguishers should be occasionally turned upside down and shaken. A hydrostatic test should be performed every 12 years for pressure type extinguishers, and every 5 years for carbon dioxide and water extinguishers. If an extinguisher has been discharged, it should be subjected to a hydrostatic test also. Extinguishers should be tested by an independent laboratory.

Use of Fire Extinguishers

Portable fire extinguishers can be extremely effective against small fires, but they do have limitations. A rapidly growing fire may not be extinguishable. The greatest priority is to exit the area and call the fire department.

The acronym for extinguisher operation is **PASS**.

Pull the pin while holding the extinguisher with the nozzle pointing away. Pulling the pin releases the locking mechanism.

Aim low. Point the extinguisher at the base of the fire.

Squeeze the lever slowly and evenly.

Sweep the nozzle from side-to-side.

Read the instructions that come with the fire extinguisher and become familiar with its parts and operation before it is needed. Fire departments and fire equipment distributors often offer fire extinguisher training. Fire extinguishers should be installed close to an exit. Keep your back to a clear exit when using the extinguisher so an escape is easy and fast. Immediately leave if the room fills with smoke.

This extinguisher comes with directions.



Alpha and visual identification of the classes.

Objective Eight Self-Test

1) Which class of fire extinguisher is used for electrical fires?

2) Which class of fire extinguisher is used for cooking oil fires?

3) Which class of fire extinguisher is used for gasoline fires?

4) How often should a fire extinguisher be visually inspected?

5) What is the acronym for fire extinguisher operation?

6) What are the four basic steps to putting out a fire with a fire extinguisher?

Objective Eight Self-Test Answers

- 1) Class C.
- 2) Class K.
- 3) Class B.
- 4) Once per month.
- 5) PASS.
- 6) Pull the pin while holding the extinguisher with the nozzle pointing away. Pulling the pin releases the locking mechanism.
Aim low. Point the extinguisher at the base of the fire.
Squeeze the lever slowly and evenly.
Sweep the nozzle from side-to-side.

Module Summary Self-Test

1) Identify four employer duties under WHMIS:

2) What is 'confidential business information'?

3) What is the purpose of a 'precautionary statement'?

4) Examine the SDS on page 16. What are the storage requirements for this hazardous product?

5) Examine the SDS on page 16. What may happen if the hazardous product is swallowed?

6) Identify three classes that exist under the umbrella of health hazards:

7) What hazard(s) is / are associated with this pictogram? _____



8) What hazard(s) is / are associated with this pictogram? _____



9) What can be created if CaviCide® decomposes?

10) Is CaviCide® known to have ozone-depleting substances?

11) When considering the common causes of fire, what is the difference between Human error and negligence?

12) What symbol is associated with a class A fire extinguisher?

13) When extinguishing a fire, where should the nozzle be aimed?

Module Summary Self-Test Answers

- 1) Any of the following: educate and train workers, ensure proper labeling of products, prepare workplace labels if needed, prepare SDS's if needed, ensure control measures are in place, and provide workers with up-to-date SDS's.
- 2) A 'secret' ingredient that a manufacturer may keep off of a SDS.
- 3) A precautionary statement advises workers how to prevent adverse effects resulting from exposure to or improper storage or handling of a hazardous product.
- 4) Store locked up.
- 5) Death may occur.
- 6) Skin corrosion/ irritation, reproductive toxicity, biohazardous infectious materials, and carcinogenicity.
- 7) Acute toxicity.
- 8) Biohazardous infectious materials.
- 9) Carbon monoxide, carbon dioxide, nitrogen oxides, amines, chlorine, and hydrogen chloride.
- 10) No.
- 11) Human error does not assume that a person has consciously made a choice, while negligence indicates a conscious choice.
- 12) A green triangle.
- 13) The nozzle should be aimed at the base of the fire.