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WHMIS: Workplace Hazardous Materials Information System



The Corporation of the City of Windsor

**Workplace Hazardous
Materials Information System
(WHMIS)**



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Slide notes

Welcome to the City of Windsor's WHMIS training.

This course will familiarize you with the WHMIS program, including its recent changes; and how to identify and safely use hazardous products in your workplace.

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WHMIS: Workplace Hazardous Materials Information System

THE CITY OF
WINDSOR
ONTARIO, CANADA

Main Menu

Click each lesson to complete this training

- WHMIS Program Overview
- WHMIS Product Classification
- Information Delivery
- Hazardous Products in the Workplace



Slide notes

You must complete all four modules of this course.

At the end of each module, you will be asked to complete a review to test your knowledge of that material.


These reviews will help prepare you for the final test.

After completing all four modules, you'll be given the final test. You must score at least 75% to pass the course.

Okay, let the learning begin!

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WHMIS: Workplace Hazardous Materials Information System




Main Menu

Click each lesson to complete this training

- ✓ WHMIS Program Overview
- ✓ WHMIS Product Classification
- ✓ Information Delivery
- ✓ Hazardous Products in the Workplace

Final Test

**Slide notes**

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Okay, let the learning begin!

Slide 4 - Program_Overview


WHMIS: Workplace Hazardous Materials Information System



WHMIS Program Overview

What To Expect

- Workplace Hazardous Materials Information System (WHMIS)
- National system implemented through federal, provincial and territorial legislation and regulations
- Gives workers the “Right to Know” through:
 - Information labels on containers
 - Safety Data Sheets (SDS)
 - Training and education




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This module provides an overview of the WHMIS 2015, or Workplace Hazardous Materials Information System 2015, the new national system implemented through both Federal and Provincial/Territorial legislation. WHMIS is designed to ensure safety, by providing workers with information on hazardous products in their workplace. Ensuring worker safety, requires active participation by government bodies, employers and workers. This is achieved by making sure workers know the hazardous products they work with. This data is provided with information on container labels, SDS - safety data sheets, and WHMIS training.

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WHMIS: Workplace Hazardous Materials Information System



WHMIS Program Overview

WHMIS and the Law

- WHMIS 2015 Legislation
- Amendments to Hazardous Products Act
- Implementation of the Hazardous Products Regulation
- Bill 85 in Ontario introducing amendments to the Occupational Health & Safety Act




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In 2015, Canada implemented new legislation, and amendments to existing legislation that relate to WHIMIS. Additionally, Ontario, and the other provinces, and territories have passed bills to amend their current legislation and regulations that relate to the WHIMIS program. This new WHIMIS program has been named WHIMIS 2015.

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WHMIS: Workplace Hazardous Materials Information System



WHMIS Program Overview

WHMIS 2015

- Aligns WHMIS with worldwide standards
- Chemical classification
- Product labeling
- Safety Data Sheets
- Address additional hazardous properties
- Easier to understand pictograms (symbols)




Try Again

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With an increase in global trade, WHMIS 2015 was designed to align our WHMIS system with that of countries around the world to ensure we're using a standardized system for classifying chemicals, labelling products and development of Safety Data Sheets, or SDS'. These changes address additional hazardous properties and incorporate symbols or pictograms, to help ensure the health and safety of workers both in Canada and abroad.

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WHMIS: Workplace Hazardous Materials Information System



WHMIS Program Overview

Globally Harmonized System (GHS)

- Globally Harmonized System of Classification and Labelling of Chemicals
- International standard endorsed by the United Nations
- Internationally recognized system for:
 - Labels
 - Pictograms (symbols)
 - Classifications of hazardous product




Try Again

Slide notes

Canada is aligning the WHMIS program with the Globally Harmonized System of Classification, better known as the GHS. GHS is a globally recognized system endorsed by the United Nations. This internationally recognized symbol outlines the requirements for product labelling, hazard symbols, data sheet configuration, and classification of hazardous products.

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WHMIS: Workplace Hazardous Materials Information System



WHMIS Program Overview

Products Covered Under WHMIS 2015

- WHMIS 2015: The Hazardous Products Regulations determined hazard classification criteria
- All hazardous products are covered under WHMIS
- Certain products are covered under other federal or provincial legislation such as the Explosives Act, the Food and Drug Act and the Pest Control Products Act.




Try Again

Slide notes

So what products are covered under WHMIS? The new Hazardous Products Regulations determined the classification criteria, for what constitutes a Hazardous Product for WHMIS 2015. Currently, any products that meet the criteria set out by WHMIS 2015, is covered under WHMIS regulations.

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Check Your Understanding


Let's stop for a moment and check your understanding of this information

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Before we continue, lets stop and make sure you understand this information. Click next when you are ready to begin the quiz.

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The Hazardous Product Regulations determines the criteria for classifying hazardous products.

A) True
 B) False


You must answer the question before continuing.

Submit

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The Hazardous Product Regulations, determines the criteria for classifying hazardous products. Choose either True. Or false.

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GHS is an acronym that stands for...

A) General Hazard Systems

B) Globally Harmonized System

C) Guided Health and Safety

D) Global Hearing Standards

You must answer the question before continuing.

Submit

Slide notes

GHS is an acronym that stands for...

General Hazard Systems


Globally Harmonized System

Guided Health and Safety

Global Hearing Standards

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The Globally Harmonized System, or GHS, is an international method used to create and consistently utilize the same...

- A) Product labels
- B) Hazard symbols
- C) Data sheets
- D) Hazard classes
- E) All of the above

You must answer the question before continuing.

Submit

Slide notes

The Globally Harmonized System, or GHS, is an international method used to create and consistently utilize the same...

Product labels

Hazard symbols


Data sheets

Hazard classes

All of the above.

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Congratulations!

You have now completed this lesson

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Congratulations!

You have now completed this lesson. Click next to continue.

Slide 14 - WHMIS_Product_Classification

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WHMIS Product Classification

Product Classification

- The term 'hazardous product' is used to describe products regulated by WHMIS 2015
- WHMIS 2015 features:
 - Legislative changes
 - Revisions to the Hazardous Products Act
 - Implementation of the Hazardous Products Regulations
 - Changes to how products are classified
 - Improved alignment with GHS

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This next module focuses on how products are classified under WHMIS 2015. All products regulated under WHMIS use a distinct reference term, 'Hazardous Products'.

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WHMIS Product Classification

WHMIS 2015 Symbols

	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.


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With the move to WHMIS 2015, some of the familiar symbols associated with WHMIS products changed, while terminology also changed. Symbols each have their own meaning.

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WHMIS Product Classification

WHMIS 2015 Symbols

- What were once referred to as 'symbols' are now called 'pictograms'
- Pictograms align with the GHS
- Certain pictograms may now represent multiple hazards



GHS 
The Global Harmonization System
of Classification and Labeling


Next

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WHMIS 2015 uses the term pictogram, rather than symbol. These pictograms, align with the GHS standards, and are internationally recognized. There have also been changes to the classifications that these symbols represent. Under WHMIS 2015, some pictograms are used to represent multiple hazard classifications. WHMIS 2015 also divides these pictograms, and their classifications, into two hazard groups: health hazards, and physical hazards. Let's take a look at the classifications and associated symbols used in WHMIS 2015.

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WHMIS 2015 Hazard Groups,
Categories and Types

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WHMIS Product Classification

WHMIS 2015 Hazard Groups

WHMIS 2015 applies two major groups of hazards:

- **Physical Hazards:** based on the physical or chemical properties of the product
- **Health Hazards:** based on the ability of the product to cause a health effect




Try Again

Slide notes

WHMIS 2015 introduced significant changes, specifically the dividing of hazards into two main groups: physical hazards, and health hazards. Each of these hazard groups, has within them hazard classes, that have specific hazard properties. The physical hazard group, contains products, and classes that are hazardous, because of their physical, or chemical properties. These include things like flammability, reactivity and corrosiveness. The health hazard group contains classes, and products, that have the ability to cause adverse health effects to humans, such as eye irritation, respiratory sensitization, and cancer. A third group exists, the Environmental group also exists under GHS but this group was not adopted into WHMIS 2015.

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WHMIS Product Classification

WHMIS 2015 Hazard Categories


- Each hazard class contains at least one category
- Categories are each assigned a number ranking
- Some classes contain are broken down into types
- Types are designated with letters (e.g. A, B, etc.)
- Subcategories are represented with a number and a letter (e.g. 1A, 1B, etc.)
- The specific hazard category of a product is identified on the SDS

Next

Slide notes

WHMIS 2015 further divides the Hazard classes into hazard categories, which are assigned number rankings. Some classes are also broken into types which are designated with letters. Subcategories may also be present, and are represented by both a number, and a letter, such as 1A. The specific category of a product will be available on the products Safety Data Sheet.


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WHMIS Product Classification

WHMIS 2015 Hazard Categories and Types

- Category 1 is considered to be most dangerous product of that class
- Type A is the most dangerous of all types
 - 1A is more hazardous than 1B





Try Again

Slide notes

Hazard categories and types, are used to rank products in each class, in terms of how dangerous they are. Products in category one of each class, are considered to be the most dangerous products in that class. Products rated type A, are considered to be the most dangerous type of all. For example, a product rated as 1A, will be more dangerous, than a product rated as 1B.

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WHMIS Product Classification

WHMIS 2015 Hazard Categories and Types

The Flammable Liquids class is broken into Categories 1, 2, 3 and 4

Category 1 Hazard:

- Greatest level of hazard

Category 2 Hazard:


- Greater than categories 3 and 4
- Less than category 1

Category 3 Hazard:

- Greater than category 4
- Lower than both 1 and 2

Category 4 Hazard:

- The lowest level of hazard in the Flammable Liquids class




Next

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Keep in mind that not all classes have the same amount of categories, or types. Let's use the flammable liquids class as an example. Flammable liquids are rated a Category 1, and will have the greatest level of hazard. A flammable liquid that is rated a Category 2, will have a greater level of hazard than Categories 3 and 4, but not more than a Category 1. A Category 3 flammable liquid, will have a greater level of hazard than a Category 4, but also has a lower level of hazard than both Categories 1 and 2. Category 4, will have the lowest level of hazards in the Flammable Liquids class.

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WHMIS 2015 Pictograms

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WHMIS Product Classification

WHMIS 2015 Pictograms

- Graphic image representing the type of hazard present
- Part of GHS recognized worldwide
- Some pictograms are used for multiple Hazard Classes

Biohazardous Infectious Materials pictogram is unique to WHMIS

No pollution pictogram in Canada



Try Again

Slide notes

One of the biggest changes with the introduction of WHMIS 2015, is the change from symbols to pictograms. Pictograms, are graphic images that visually represent the type of hazard present in a product. Some of the pictograms are similar to the symbols previously used, while others are completely new. These pictograms, are part of the Globally Harmonized System, and are recognized worldwide. Pictograms are identified by their distinctive red diamond border. Inside the border, is a symbol that corresponds to the identified hazard. It's important to restate that some pictograms represent multiple hazard classes. The bio hazard-us infectious materials pictogram, is the only one that doesn't have a distinctive red border, because it's class is unique to WHMIS, and is not recognized by GHS. Also, Canada did not adopt the Pollution symbol you see here.

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WHMIS Product Classification

Fire Hazard

- The flame pictogram represents solids, liquids and gases that ignite easily when exposed to an ignition source
- Some ignite spontaneously if exposed to air
- Some react with water to release flammable gases
- The main hazards are fire and/or explosion



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Fire Hazard pictogram represents solids, liquids, and gases that ignite easily.

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WHMIS Product Classification

Explosion or Reactivity Hazards

- The exploding bomb pictogram represents substances and mixtures that react on their own to cause fire or explosion.
- There are also products such as organic peroxides that can catch fire or explode if heated.



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The exploding bomb pictogram represents substances and mixtures that react on their own to cause fire or explosion.

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WHMIS Product Classification

Oxidizing Hazards

The flame over the circle pictogram represents solid, liquids and gases that may cause or intensify a fire or cause a fire or explosion.



Next

Slide notes

Next is the flame over circle pictogram. This is used to represent oxidizing hazards.

Oxidizers don't usually burn themselves, but they will either help the fire by providing more oxygen, or they may cause materials that normally do not burn to suddenly catch on fire.

The three hazard classes that use this pictogram are oxidizing gases, liquids and solids. Again these may cause or intensify a fire, or, cause a fire or explosion by supplying more oxygen to fuel.

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WHMIS Product Classification

Gases Under Pressure

- The gas cylinder pictogram represents products that are hazardous because they are contained under high pressure
- Certain gases may potentially explode if heated
- Certain refrigerated, liquefied gases, such as propane, are extremely cold and can cause severe frostbite if not handled properly



Next

Slide notes

The gas cylinder pictogram is used to show the gases under pressure class. These can include compressed gas, liquefied gas, refrigerated liquefied gas, and dissolved gases.

These substances are hazardous because of the high pressure inside the container or cylinder. There's also the potential for explosion if these substances are heated.

Refrigerated liquified gases can also be very cold if exposed to the skin, causing severe cold, burns or injury.

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WHMIS Product Classification

Corrosives

- The corrosive damage pictogram represents products that may damage or destroy any surface that they come in contact with, ie/ metal, plastic, skin, clothing.
- Injuries may include severe skin burns and serious eye damage



Next

Slide notes

The corrosion pictogram, identifies products that cause corrosive damage. The 3 classes that use this pictogram are:

Corrosive to metals, which are products that may chemically damage, or destroy metals.

The Skin corrosion/irritation: skin corrosion class, which contains products that have the ability to cause severe skin burns, and/or skin irritation.

And finally, the serious eye damage, eye irritation: serious eye damage class contains products that cause serious eye damage and/or irritation if exposed to the eyes.

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WHMIS Product Classification

Poisonous / Toxic

- The skull and crossbones pictogram represents products that are fatal, toxic or harmful if inhaled, absorbed or ingested.
- Injuries may occur due to exposure to the product itself or exposure to a gas released from the product.



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The pictogram for products, that can cause death, or toxicity with short exposure to small amounts, is the Skull and Crossbones pictogram.

These products are acutely toxic, meaning that exposure to these products will produce effects immediately, or in the very near future. These classes include

The Oral class, The dermal class, and finally, The Inhalation class.

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WHMIS Product Classification

Causing Serious Health Effects

- The explosion in a person pictogram represents products that may:
 - cause allergy or asthma symptoms or breathing difficulties if inhaled
 - cause genetic defects
 - cause cancer
 - damage fertility and/or an unborn child
 - damage organs either from a single exposure or repeated exposures
 - cause illness or fatality if ingested



Next

Slide notes

The health hazard pictogram, represents seven different classes, that cause, or are suspected of causing, serious health effects. Classes that are represented by this pictogram include:

The Respiratory, or skin sensitization: respiratory sensitizer class of products may cause allergic respiratory reactions, asthma symptoms, or breathing difficulties if inhaled.

The germ cell mutagenicity class, covers products that may, or are suspected, of causing genetic defects in humans.

And, the carcinogenicity class, includes products that may, or are suspected, of causing cancer in humans from exposure.

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WHMIS Product Classification

Causing Less Serious Health Effects

The exclamation mark pictogram represents products that are harmful, toxic or fatal if inhaled, ingested or absorbed and may cause:

- severe skin burns and/or skin irritation
- serious eye damage and/or irritation
- allergic skin reactions
- damage to organs after a single exposure
- damage to the ozone layer



Next

Slide notes

The exclamation mark pictogram, represents products that are harmful, toxic, or fatal if inhaled, ingested, or absorbed, and may cause:

severe skin burns, and/or skin irritation;

serious eye damage, and/or irritation;

allergic skin reactions;

damage to organs after a single exposure;

and, damage to the ozone layer

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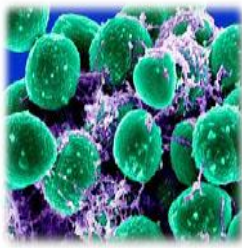


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WHMIS Product Classification

Organisms or Toxins that can Cause Disease

- The biohazardous infectious materials pictogram represents products such as microorganisms, nucleic acids or proteins that cause or may cause infection in humans or animals
- Common in individuals working in health care and/or wastewater



Next

Slide notes

The final pictogram we'll review, that's covered under WHMIS 2015, is the Bio-hazardous Infectious Material pictogram. This is the only pictogram that is not diamond-shaped, and doesn't contain the red border. Instead, it has a black circle, similar to that of the WHMIS 1988 symbol. This pictogram represents the Bio-hazardous Infectious Material class.

These are microorganisms, nucleic acids, or proteins that cause, or are a probable cause of infection, or other illness in people, or animals. These are common in both the health care, and waste treatment fields.

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WHMIS: Workplace Hazardous Materials Information System

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WHMIS Product Classification

Causing Damage to the Environment

- The environmental pictogram has not been adopted by Canada
- It will be shown on an SDS, but there will be no information to accompany it




Try Again

Slide notes

The Environment pictogram, which is used for products that cause damage to the aquatic environment, is NOT covered under WHIMIS 2015, and is not required to be displayed on products in Canada. However, you still may see this pictogram on products, and data sheets, since the supplier may choose to provide this information on a voluntary basis.

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WHMIS: Workplace Hazardous Materials Information System



Check Your Understanding


Let's stop for a moment and check your understanding of this information

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Before we continue, lets stop and make sure you understand this information. Click next when you are ready to begin the quiz.

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WHMIS: Workplace Hazardous Materials Information System 

Pictograms are symbols each representing a different type of hazard

A) True
 B) False


You must answer the question before continuing.

Submit

Slide notes

Pictograms are symbols each representing a different type of hazard. True. Or false

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WHMIS: Workplace Hazardous Materials Information System 

Physical hazard groups are based on the ability of the product to cause a health effect

A) True
 B) False


You must answer the question before continuing.

Submit

Slide notes

Physical hazard groups are based on the ability of the product to cause a health effect. True. Or False.

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WHMIS: Workplace Hazardous Materials Information System 

Almost all pictograms used in WHMIS 2015 are recognized globally under GHS

A) True
 B) False


You must answer the question before continuing.

Submit

Slide notes

Almost all pictograms used in WHMIS 2015 are recognized globally under GHS. True. Or false.

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WHMIS: Workplace Hazardous Materials Information System 

A category 3 flammable liquid is more hazardous than a category 1 flammable liquid

A) True

B) False


You must answer the question before continuing.

Submit

Slide notes

A category 3 flammable liquid is more hazardous than a category 1 flammable liquid ? True. Or false.

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WHMIS: Workplace Hazardous Materials Information System 

A type D organic peroxide is less hazardous than type B organic peroxide

A) True
 B) False


You must answer the question before continuing.

Submit

Slide notes

A type D organic peroxide is less hazardous than type B organic peroxide. True. Or false.

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WHMIS: Workplace Hazardous Materials Information System 

Which hazard group was not adopted by WHMIS 2015?

- A) Environmental
- B) Physical
- C) Health
- D) None of the above

You must answer the question before continuing.

Submit

Slide notes

Which hazard group was not adopted by WHIMIS 2015?

Environmental


Physical

Health

None of the above.

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Congratulations!

You have now completed this lesson

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Congratulations!

You have now completed this lesson. Click next to continue.

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Information Delivery

Information Delivery

There are three ways in which workers are made aware of hazardous products in the workplace

- Labels
 - supplier
 - workplace
- Safety Data Sheets
- Education and Training



Try Again

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The WHMIS program provides workers with the “Right to Know”. This module explains how information on hazardous products is provided to workers, so they are properly informed about the hazardous products they are working with. WHMIS provides information to workers in three different ways.

Supplier, or workplace labels, affixed directly to the product container, provide a quick reference when directly handling the product.

Material Safety Data Sheets for WHMIS 1988, or WHMIS 2015’s Safety Data Sheets provide more detailed information on the product.

Finally, the required education, and training, show workers how to use labels, and data sheets, and provide them with site specific training, on the hazards associated with their workplace.

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Labels

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Information Delivery

WHMIS 2015 Supplier Labels

- No cross-hatched border required
- Revised information requirements
- Different information displayed



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The supplier label is your first source of information about a product's hazards, and how you can protect yourself. Any hazardous product coming into the workplace, must be affixed with a supplier label.

WHMIS 2015 includes some new changes. The new labels will no longer be required to display the hatched border. There are changes to the label's information requirements too; and different requirements for how the information on the label must be arranged.

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WHMIS: Workplace Hazardous Materials Information System

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Information Delivery

Supplier Labels

- Suppliers are responsible for labelling hazardous products
- Employers are responsible for ensuring label is present, legible and correct
- Must be written in English and French



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So, it's the responsibility of the supplier, to ensure that all hazardous products they provide to their customers, are properly affixed with a supplier label. But it's the employer's responsibility, to ensure that the supplier label is present, legible, and correct, when the product is received.

The supplier label provides a quick reference to product information, and in Canada, must be written in both English, and in French.

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WHMIS: Workplace Hazardous Materials Information System




Information Delivery

Supplier Labels: WHMIS 1988

Required information if container contents are greater than 100 ml

1. Product identifier
2. Supplier identifier
3. A statement that the MSDS is available
4. Hazard symbols
5. Risk phrase
6. Precautionary measures
7. First aid measures

NETTOYANT XYZ CLEANER

<p>Causes Burns</p> <p>Very Toxic Material</p> <p>Avoid Contact with Skin</p> <p>In case of skin or eye contact, flush with copious amounts of water for 15 minutes and seek medical attention</p>		<p>Cause des brûlures</p> <p>Produit très toxique</p> <p>Éviter tout contact avec la peau</p> <p>En cas de contact avec la peau ou les yeux, laver à grande eau pendant 15 minutes et consulter un médecin.</p>
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See Material Safety Data Sheet
Voir la fiche signalétique

ABC Chemical Company Ltd.
Fabricant de produits chimiques ABC

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Under the WHMIS 1988 regulations, supplier labels are required to have seven pieces of information, if the contents of the container are more than 100 milliliters.

These required sections are:

- The Product identifier, which is the name of the product.
- The Supplier identifier; which is the name of the company that sold the product.
- A statement that the Material Safety Data Sheet is available.
- Hazard symbols, to quickly identify the hazards present.
- Risk phrases; which are words that describe the main hazard of the product, such as danger flammable, or poisonous.
- Precautionary measures; which clarify how to work safely with the product.
- And finally, first aid measures, which explain what to do in the event of an emergency.

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WHMIS: Workplace Hazardous Materials Information System

Information Delivery

Supplier Labels: WHMIS 2015

Required information

1. Product identifier
2. Signal word (danger or warning)
3. Hazard statements
4. Precautionary statements
5. Supplier identification
6. Pictogram
7. Supplemental label information

Product WSNB-1 / Produit WSNB-1	
<p>Danger</p> <p>Fatal if swallowed. Causes skin irritation.</p> <p>Precautions: Wear protective gloves. Wash hands thoroughly after handling. DO NOT eat, drink or smoke when using this product.</p> <p>Store locked up. Dispose of contents/containers if accordance with local regulations.</p> <p>IF ON SKIN: Wash with plenty of water. If skin irritation occurs: Get medical advice or attention. Take off worn/soiled clothing and wash it before reuse. IF SWALLOWED: Immediately call a POISON CENTRE or doctor. Rinse mouth.</p>	<p>Danger</p> <p>Mortel en cas d'ingestion. Provoque une irritation cutanée.</p> <p>Conseils : Porter des gants de protection. Se laver les mains soigneusement après manipulation. Ne pas manger, boire ou fumer en manipulant ce produit.</p> <p>Éloigner du feu. Éliminer le contenu/réceptacle conformément aux règlements locaux en vigueur.</p> <p>EN CAS DE CONTACT AVEC LA PEAU: Laver abondamment à l'eau. En cas d'irritation cutanée: Demander conseil individuel/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.</p>
ABC Chemical Co. 123 rue Anywhere St., Mytown, ON N6N 0V0 (123) 456-7890	

Try Again

Slide notes

Under the WHMIS 2015 regulations, supplier labels are also required to have 7 pieces of information, which are:

The product identifier, the name of the product.

The signal word used to alert you of a potential hazard and the severity of that hazard. WHMIS 2015 signal words are either danger or warning.

Hazard statements, which are standardized phrases that describe the nature of the hazard posed.

Precautionary statements, or phrases that describe measures to take to minimize or prevent adverse effects from exposure to a hazardous product.

The supplier identification states the name and information of the supplier.

A pictogram, this will be one of the hazard symbols within a red diamond.

Finally, the WHMIS 2015 label will contain supplemental information, which is additional information, regarding the product.

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Information Delivery

Supplier Labels: WHMIS 2015

Supplier Requirements

- The pictogram, signal word and hazard statement must be grouped together
- Clearly displayed
- Easy to read
- Written in both English and French
- Distinctive/contrasting from other container markings
- Can be printed, stencilled or embossed on the container
- No hatched border required



Next

Slide notes

The WHMIS 2015 requirements for supplier labels, include:

Ensuring that the pictogram, signal word, and hazard statement are grouped together on the label.

Similar to the WHMIS 1988 requirements; the label must be clearly displayed on the container, easy to read, and written in both English and French.

The label must be in contrast with other information on the product container. It can be printed, stenciled, or embossed on the container. However, the hatched border that was required with WHMIS 1988 supplier labels is not required in WHMIS 2015.

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WHMIS: Workplace Hazardous Materials Information System



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Information Delivery

Workplace Labels

These are required when a hazardous product:

- Is produced and used in the same workplace
- Is transferred from one container to another:
BOTH container labels required
- Has a lost or illegible (unreadable) supplier label



Next

Slide notes

Labels are still required on products that are produced, and used, in the same workplace.

When a product is transferred from one container to the other, ensure labels are on BOTH containers. And; if a supplier label is lost, or becomes illegible, you must affix a new label on that container

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WHMIS: Workplace Hazardous Materials Information System

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Information Delivery

Workplace Labels

The following information is required on workplace labels:

- product name
- safe handling precautions
- reference to the SDS

METHANOL



Flammable - Do not use near an open flame or process that makes sparks.

Avoid inhaling vapours.

SEE SAFETY DATA SHEET

Try Again

Slide notes


Workplace labels must have at least three pieces of information:

The products name, to identify the product you're working with; safe handling precautions, for using the product, which may also include pictograms, or other information found on the supplier label; and, a reference to the Safety Data Sheet, or Material Safety Data Sheet, in the event that you need further information on the product.

Check out these examples of what a workplace label may look like.

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Safety Data Sheets

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WHMIS: Workplace Hazardous Materials Information System



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Safety Data Sheets

Safety Data Sheet

Revision Date:	Prepared by:	Technical Information
Head Office:	Emergency:	

Section 1: Product Identification

MSDS Code: 4900 **Name:** Lead Free Solder
Related Part Numbers: 4900-3362, 4900-1124, 4900-2274, 4900-4346
Use: Soldering

Section 2: Hazardous Ingredients

CAUSE	Chemical Name	Percentage by weight	MSDS TWK	Index 014	Index 015
ENVIRONMENTAL	Solder	0.0 - 100.0	0.0 mg/m ³	0.0 mg/m ³	N/A
HAZ TO 2	Pb	72 - 77	0.0 mg/m ³	0.0 mg/m ³	N/A
TOXIC TO 4	Pb	72 - 77	0.1 mg/m ³	0.1 mg/m ³	N/A

Section 3: Hazards Identification

WHMIS Category:

HMIS Ratings: Health: 1 Flammability: 0 Reactivity: 0
HMIS Ratings: Health: 1 Flammability: 0 Reactivity: 0

Eye: Fumes may cause eye irritation.

Skin: Fumes may cause skin irritation.

Inhalation: The fumes from this or other soldering products may cause headache, nausea, and respiratory irritation.

Ingestion: Ingestion of the fumes from this or other soldering products may cause headache, nausea, and respiratory irritation.

Chronic: Prolonged or repeated exposure due to ingestion may cause anemia, respiratory weakness, constipation and abdominal pain.

Section 4: First Aid Measure

Eyes: **DO NOT REMOVE CONTACT LENSES** unless advised to do so. Flush eyes with plenty of water. Get medical attention. **DO NOT PRODUCE FUMES** any further unless immediately flush with water. Wash face at least 15 minutes. Do not rub or irritate. If irritation continues.

Skin: **WASH IMMEDIATELY** with plenty of water. Remove contaminated clothing for at least 15 minutes. Do not rub or irritate on the skin. Do not attempt to remove solid material unless from the skin as directed. This may result in irritation. Remove clothing and shoes. Wash thoroughly with soap and water. Do not use solvents or abrasives. Use soap to prevent irritation. Get medical attention if irritation persists.

Inhalation: If symptoms of irritation are experienced, it is advisable to fresh air. If symptoms persist, seek medical attention.

Ingestion: If taken in accidental, rinsed with 2-4 glasses of water. Do not induce vomiting. Get immediate medical attention.

PAGE 1 / 4 MSDS Code: 4900

Section 5: Fire Fighting Measures

Autoflammable: No **Flash Point:** N/A **LLP / ULV:** N/A

Extinguishing Media: Alkaline foam, carbon dioxide, or dry chemical

General Information: Do not breathe fumes. Respirator worn as required by the conditions.

Section 6: Accidental Release Measures

Spill Procedure: If the material is in its solid state, pick up and reuse. When molten, allow to solidify, and the reuse if it is not contaminated. If contaminated, refer to section 12 for disposal information.

Section 7: Handling and Storage

Handling: Wash thoroughly after handling. Avoid contact with eyes, skin, and clothing. Do not ingest or inhale. Do not breathe vapors from the use of fumes.

Storage: Keep away from sources of ignition. Store in a cool, dry, well-ventilated area. Away from incompatible materials.

Section 8: Exposure Controls

Routes of entry: Oral, Ingestion, Inhalation, Skin Contact.

Validation: Use adequate general and exhaust ventilation to keep airborne concentrations below exposure limits.

Personal: Wear appropriate control measures or personal safety devices. Other appropriate protective clothing to protect skin contact. Use a respirator approved for your use and situation.

Section 9: Physical and Chemical Properties

Physical State: Solid **Color:** Silver **Solubility:** Insoluble **Appearance:** N/A

Melting Point: 1500°C **Boiling Point:** 550°C **Vapor Density:** N/A **pH:** N/A

Section 10: Stability and Reactivity

Stability: Stable under ordinary use and storage conditions.

Reactivity: Strong oxidizing agent. Strong oxidizing agents should be avoided.

Polymerization: No polymerization under normal use and storage conditions.

Decomposition: No decomposition of carbonaceous or other carbonaceous products.

Section 11: Ecological Information

Biodegradability: (primary or secondary) No

Biodegradability: (intrinsic) No

Toxicological: (acute or subacute) in the laboratory No

Reproductive Toxicity: (in vitro or in vivo) No

Mutagenicity: (in vitro or in vivo) No

Lethal Exposure Concentrations: Ingestion (LD50): N/A Inhalation (LC50): N/A Skin (LD50): N/A

Section 12: Ecological Information

General Information: No data available on the right to be considered to be available as per the following:

Environmental Impact: (Water) (Air) (Soil) (Sediment)

CFE: 0 HFC: 0 CLM: 0 MFC: 0 HRC: 0 DRP: 0

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WHMIS: Workplace Hazardous Materials Information System



Safety Data Sheets

Section 1.1: Disposal Information

General Information: Dispose of this material, contaminated absorbent material and other contaminated material in an approved waste disposal facility, according to all applicable Federal, State / Provincial, and Local regulations. Remove and reuse, rather than dispose, should be the primary goal in handling waste.

Section 1.4: Transportation Information

Ground:
Non-regulated

Air:
Shipper must be trained and certified. Refer to IATA Dangerous Goods Regulations.

UN Number/Code:
UN 3082, Group 1, net 3000/250
UN 3082, Group 1, net 3000/250
UN 3082, Group 1, net 3000/250
Shipping Name for Hazardous:
Non-regulated

Section 1.5: Regulatory Information

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by the Controlled Products Regulations.

SDWA (SCHEDULE AMBICOMPTS AND INHIBITORS) Act of 1999, USA, 40 U.S.C. 1714 (4)
Regulated ingredients: Silver (CAS 7440-37-0), Copper (CAS 7440-48-6)

ESCA (Toxic Substances Control Act of 1976, USA)
All substances are TSCA listed or exempt from listing.

CAA (Clean Air Act, USA)
This product does not contain any class 2 ozone depleters.

This product does not contain any class 2 ozone depleters.

This product does not contain any chronic or persistent.

California Proposition 65 (Chemicals known to cause cancer or reproductive toxicity, May 1, 1987 version, USA)
When used for soldering and similar applications chemicals may be produced which are known to some states to cause birth defects or other reproductive harm.

Health Canada
Labeling and containers used in the product are listed in compliance with Consumer Chemicals and Containers Regulations 2015/2016

Environment Canada
Chemicals in this product are listed on the Toxic Substances List in the Canadian Environmental Protection Act.

This product does not contain any ozone depleting substances.

Industry and Resource Canada
Labeling, product testing, use, safety, education, information, printing, type size, height, and packaging of this product is in compliance with the Consumer Packaging and Labeling Act and Regulations. This product(s) will also meet or exceed the applicable standards.

RoHS (The restriction of the use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2002)
This product is RoHS compliant.

PAGE 3 / 4 MSDS Code: 4900

Section 1.6: Other Information

Definitions: Not applicable, not used and not defined.

Disclaimer: The material safety data sheet is provided as an information resource only. Chemicals become the user's responsibility and become responsible to themselves for their own safety. The user is responsible for the use of the user to comply with all applicable laws and regulations. The user is responsible for the use of the user to comply with all applicable laws and regulations.

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WHMIS: Workplace Hazardous Materials Information System

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Information Delivery

Safety Data Sheets

- WHMIS 2015 requirement
- Detailed product information
 - Hazards
 - Safe work procedures
 - Emergency procedures
- Contains more information than labels
- Every hazardous product under WHMIS must have a Safety Data Sheet (SDS)
- All SDS's must be available to all workers
- All SDS's must be available to all workers either



Try Again


Slide notes

Another place you can find WHMIS information regarding a hazardous, or controlled product in your workplace, is on the products Safety Data Sheet, or SDS. The data sheet for a product, contains much more information than you'll find on the supplier, or workplace label.

Additional sections have been added to the SDS so they are standardized with the GHS requirements. And finally, the SDS updated requirements for WHMIS 2015 have changed as well.

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WHMIS: Workplace Hazardous Materials Information System



Information Delivery

Safety Data Sheets

- Notify your supervisor if you cannot find an SDS
- New hazardous products must be accompanied by an SDS
- Updated SDSs required for any significant new product information such as:
 - Product classification
 - Handling/storage procedures
 - How to protect yourself from hazards
- Reference Section 16 for last revision date

Next


Slide notes

Data sheets should be referenced before working with any hazardous, or controlled products in the workplace; you should match the name of the chemical on your container, to the one on the SDS, to ensure that you have the correct corresponding data sheet. If you cannot find the SDS for the product you are working with; inform your supervisor immediately.

Safety Data Sheets, must also be updated anytime new information becomes available on the product, or every three years, if no new information has become available.

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WHMIS: Workplace Hazardous Materials Information System



Information Delivery

Safety Data Sheets

16 sections of information required for SDSs

1. Identification	9. Physical and chemical properties
2. Hazard identification	10. Stability and reactivity
3. Composition/information on ingredients	11. Toxicological information
4. First-aid measures	12. Ecological information *
5. Firefighting measures	13. Disposal considerations *
6. Accidental release measures	14. Transport information *
7. Handling and storage	15. Regulatory information *
8. Exposure controls/personal protection	16. Other information

* Sections 12 to 15 require the headings but (in Canada) information is optional

Try Again

Slide notes

The WHMIS 2016 Safety Data Sheet requires 16 categories, which brings WHMIS in line with the Globally Harmonized System for Classification, and Labelling of Chemicals. These categories are:

Identification.

Hazard identification.

Composition/ Information on ingredients.

First-aid measures.

Firefighting measures.

Accidental release measures.

Handling and storage.

Exposure controls/ personal protection.

Physical and chemical properties.

Stability and reactivity.

Toxicological information.


Ecological information.

Disposal considerations.

Transport information.
Regulatory information.
And, other information.

It's important to note that GHS requires headings in Sections 12 through 15. But under Canadian regulations, providing information in these sections is optional.

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WHMIS: Workplace Hazardous Materials Information System


Information Delivery

Safety Data Sheets

1. Identification

- Product identifier
- Other means of identification
- Recommended use
- Restrictions on use
- Manufacturer/Canadian supplier information
 - address
 - phone numbers
 - emergency numbers and any restrictions on use

SECTION: 1. Product and company identification	
1.1. Product Identifier	
Product form	: Substance
Name	: Chlorine
CAS No	: 7782-50-5
Formula	: Cl ₂
1.2. Relevant identified uses of the substance or mixture and uses advised against	
Use of the substance/mixture	: Industrial use. Use as directed.
1.3. Details of the supplier of the safety data sheet	
	Praxair, Inc. 10 Riverview Criv Danbury, CT 05810-5268 - USA T 1-800-772-9247 (1-800-PRAXAIR) - F 1-716-879-2145 www.praxair.com
1.4. Emergency telephone number	
Emergency number	: Double Emergency: 1-800-645-4333
	CHEMTREC, 24hr/day 7days/week — Within USA: 1-800-424-9330, Outside USA: 001-703-527-3887 (collected calls accepted, Contract 17729)

Next

Slide notes

The first section on an SDS, is the identification section; which contains the product identifier, and other ways to identify the product. It also includes the product's recommended use, as well as its restrictions. This is where you'll find the manufacturer, and Canadian supplier information, including; address, phone numbers, and emergency contact numbers, including any restrictions on the use of those numbers.

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WHMIS: Workplace Hazardous Materials Information System

Information Delivery

Safety Data Sheets

2. Hazard Identification

- Hazards and warning information
- Hazard classification (class, category) or a description of the identified hazard for physical or health hazards not otherwise classified
- Label elements
 - pictograms
 - signal word (danger or warning)
 - hazard statement(s)
 - precautionary statement(s)
 - other hazards which do not result in classification

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

GHS US classification	
Ox. Gas 1	-1271
Liquid/gas	-1288
Acute Tox. 2 (Inhalation: gas)	-1331
Skin Cor. 1A	-1314
Eye Dam. 1	-1311
STOT SE 3	-1333
Aquatic Acute 1	-1401

2.2 Label elements

GHS US labelling

Hazard pictograms (GHS-US)

Label Elements

Signal word (GHS-US) : DANGER

Hazard statements (GHS-US) :

- H270 - MAY CAUSE OR INTENSIFY FIRE; OXIDIZER
- H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED
- H314 - CAUSES SEVERE SKIN BURNS AND EYE DAMAGE
- H330 - FATAL IF INHALED
- H400 - VERY TOXIC TO AQUATIC LIFE
- GHA022 - CORROSIVE TO THE RESPIRATORY TRACT

Precautionary statements (GHS-US) :

- P202 - Do not handle until all safety precautions have been read and understood
- P244 - Keep reduction valves/valves and fittings free from oil and grease
- P280 - Do not breathe gas
- P284 - Wash hands thoroughly after handling
- P271+P403 - Use and store only outdoors or in a well-ventilated place
- P273 - Avoid release to the environment

Slide notes


The hazard identification section will identify the hazards of the product, and the appropriate warning information associated with those hazards.

This section will have the product’s hazard class and category, or a description of the identified hazard for physical, or health hazards not otherwise classified.

A list of the products label elements is included in this section. This list includes the pictograms associated with the products hazards. The signal word, either danger or warning. Hazard and precautionary statements and other hazards which don’t result in classification.

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WHMIS: Workplace Hazardous Materials Information System



Information Delivery

Safety Data Sheets

3. Composition/Information on ingredients

- Product ingredient(s)
 - impurities
 - stabilizing additives
- Information on substances and mixtures


SECTION 3: Composition/Information on ingredients		
3.1. Substance		
Name	Product identifier	%
Chlorine (Main constituent)	(CAS No) 7732-50-5	100
3.2. Mixture		
Not applicable		

Next

Slide notes

The composition-information on ingredients section identifies, the ingredient, or ingredients contained in the product, including impurities and stabilizing additives. This section includes information on substances and mixtures.

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WHMIS: Workplace Hazardous Materials Information System


Information Delivery

Safety Data Sheets

4. First-aid Measures

- First-aid measures by route of exposure
- Most important symptoms and effects
- When medical attention or special treatment is needed

SECTION 4: First aid measures	
4.1. Description of first aid measures	
First-aid measures after inhalation	<ul style="list-style-type: none"> Remove to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration. If breathing is difficult, trained personnel should give oxygen. Call a physician. WARNING: To avoid possible chemical burns, the rescuer should avoid breathing any exhaled air from the victim.
First-aid measures after skin contact	<ul style="list-style-type: none"> Avoid breathing vapors. In case of contact, immediately flush affected areas with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash clothing before reuse. Discard contaminated shoes.
First-aid measures after eye contact	<ul style="list-style-type: none"> Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately.
First-aid measures after ingestion	<ul style="list-style-type: none"> Ingestion is not considered a potential route of exposure.
4.2. Most important symptoms and effects, both acute and delayed	
Symptoms/injuries after inhalation	<ul style="list-style-type: none"> Overexposure to concentrations moderately above the TLV of 1 ppm irritates the eyes and respiratory tract. Very brief exposure to a concentration of 1000 ppm may be fatal. Acute or asphyxiant at high concentrations. Inhalation of high concentrations (e.g., greater than 15 ppm) causes choking, coughing, burning of the throat, and severe irritation of the upper respiratory tract. Additionally, pulmonary edema, bronchitis, and pneumonia may result.
4.3. Indicators of any immediate and/or attention and special treatment needed	
Obtain medical assistance	


Next

Slide notes

First Aid measures, and procedures, provide the steps to take, in the event of an exposure to the hazardous product. These procedures address the steps to take for each route of exposure possible.

This section also includes the symptoms, and effects of product exposure, and whether medical, or special treatment, will be required.

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Information Delivery

Safety Data Sheets

5. Firefighting Measures

- Methods/means to extinguish fire
 - suitable extinguishing media
 - unsuitable extinguishing media
- Specific hazards arising from hazardous product (e.g. hazardous combustion products)
- Special protective equipment and precautions for firefighters

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Use self-igniting media appropriate for surrounding fire.

5.2 Special hazards arising from the substance or mixture

Fire hazard : Oxidizer. May accelerate fire burning of other combustible materials.

Reactivity : No reactivity hazards other than the effects described in sub-sections below.

5.3 Advice for firefighters

Firefighting instructions : Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while containing cooling water spray. Remove spilled material if safe to do so. Remove containers from area of fire if safe to do so. Containers for liquids must comply with OSHA 29 CFR 1910.116 and applicable standards under 29 CFR 1910 Subpart L—Fire Protection.

Protection during firefighting : **DANGER!** Toxic, corrosive, high pressure gas.

Special protective equipment for firefighters : Standard protective clothing and equipment (Self Contained Breathing Apparatus, for fire fighters).

Specific methods : Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas containers to rupture. Cool undamaged containers with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems.

Other information : Stay low if product is safe to do so.
Use water spray or fog to knock down fire, unless it is possible.
Containers are equipped with a pressure relief device. (Exceptions may exist where authorized by DOT).

Next


Slide notes

The fifth section found on a Safety Data Sheet, is the Firefighting measures. This contains proper methods, and means to extinguish the product, if it catches fire. This can include suitable, and unsuitable extinguishing materials.

You'll find specific hazards that may arise from fighting a hazardous product's fire, like those hazards found in hazardous combustible products.

Finally, this section identifies special protective equipment, and precautions, for fire fighters.

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WHMIS: Workplace Hazardous Materials Information System


Information Delivery

Safety Data Sheets

6. Accidental Release Measures

- Recommended response to spills, leaks or releases
 - containment
 - cleanup
 - difference in large vs small spill response
- Recommended personal precautions
- Recommended protective equipment to prevent contamination
- Methods/materials for containment and clean-up

SECTION 6 Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures: **DANGER** Evolving gas. Corrosive. Flammable. Personnel in a safe area. Wear a self-contained breathing apparatus and appropriate personal protective equipment (PPE) (gas tight, chemical protective). Approach suspected leak area with caution. Remove all sources of ignition. Toxic, corrosive vapor can spread from spill. Contact with flammable materials may cause fire or explosion. Ventilate area or move container to a well ventilated area. Before entering the area, especially a confined area, check the atmosphere with an appropriate device. Prevent from entering sewers, basements and work pits, or any place where it accumulates can be dangerous.

6.1.1. For non-emergency personnel: No additional information available.

6.1.2. For emergency responders: No additional information available.

6.2. Environmental precautions:

Prevent waste from contaminating the surrounding environment. Prevent soil and water pollution. Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

6.3. Methods and materials for containment and clean-up:

No additional information available.


Next

Slide notes

“Accidental Release Measures”, provides recommendations on the appropriate response to spills, leaks, or release-es, including containment, and cleanup practices, to prevent, or minimize exposure to people, properties, or the environment. It may also include recommendations distinguishing large, and small spills responses, where the spill volume has a significant impact on the hazard.

The required information may consist of recommended use of personal precautions, and protective equipment, to prevent the contamination of skin, eyes, and clothing. Additionally, methods and materials used for containment, and cleanup of the product, will be found in this section.

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WHMIS: Workplace Hazardous Materials Information System


Information Delivery

Safety Data Sheets

7. Handling and Storage

- Conditions for safe storage
 - incompatible materials
 - varied temperatures
 - ventilation

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling

- Do not breathe vapour. Avoid all contact with skin, eyes, or clothing. Emergency eye wash fountains and safety showers must be available in the immediate vicinity of any potential exposures.

Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage: do not drag, roll, slide or drop. If the moving cylinder, always keep in place removable valve cover. Never attempt to fill a cylinder by the cap, the cap is intended solely to protect the valve. When moving cylinders, wear for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g. wrench, screwdriver) or a pin into cap openings, doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove one-way or ratchet caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use. Keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting if in a vertical position. For safety precautions in using this product, see section 9.

7.2. Conditions for safe storage, including any known incompatibilities

Storage conditions

- Avoid oil, grease and all other combustible materials.

Store only where temperature will not exceed 122°F (52°C). Post "No Smoking/Open Flames" signs in storage and use areas. There must be no sources of ignition. Separate packages and prevent against potential fire and/or explosion damage by using appropriate covers and requirements (e.g. NFPA 30, NFPA 54, NFPA 70, and/or NFPA 221 in the U.S.) or according to requirements determined by the Authority Having Jurisdiction (AHJ). Always ensure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand when the container is not in use. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods. For other precautions in using this product, see section 9.

OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE: When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow prevention device in the piping. Gases contain one or more asphyxiants because of oxygen deficiency; show and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/provincial, state/provincial, and local laws, then repair the leak. Never place a container under repair as a part of an electrical circuit.

7.3. Spills and leak(s)

None.

Next

Slide notes

Section seven contains the proper precautions to take for safe handling, and storage of the product, including conditions for safe storage, such as, incompatible materials, varied temperatures, and ventilation.

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Safety Data Sheets

8. Exposure Controls / Personal Protection

- Exposure limits
- Engineering controls
- Personal protective measures
- Control parameters include occupational exposure guidelines or biological exposure limits and the source of those values

SECTION 8: Exposure controls/personal protection		
8.1. Control parameters		
Chlorine (7732-50-2)		
ACGIH	ACGIH TLV-TWA (ppm)	0.5 ppm
ACGIH	ACGIH TLV-STEL (ppm)	1 ppm
USA OSHA	OSHA PEL (Ceiling) (ppm/m ³)	3 ppm ^a
USA OSHA	OSHA PEL (Ceiling) (ppm)	1 ppm
USA IDLH	US IDLH (ppm)	10 ppm

8.2. Exposure controls	
Appropriate engineering controls	Use only in a closed system. A corrosion-resistant, fume-draft fume hood is preferred. LOCAL EXHAUST: A corrosion resistant system is acceptable.
Eye protection	Wear safety glasses with side shields. Wear goggles and a face shield when transferring or breaking transfer connections. Provide readily accessible eye-wash stations and safety showers. Wear safety glasses with side shields or goggles when transferring or breaking transfer connections.
Skin and body protection	Wear metatarsal shoes and work gloves for cylinder handling, and protective clothing where needed. Wear appropriate chemical gloves during cylinder changeout or whenever contact with product is possible. Select per OSHA 29 CFR 1910.122, 1910.136, and 1910.135.
Respiratory protection	When workplace conditions warrant respirator use, follow a respiratory protection program that meets OSHA 29 CFR 1910.134, ANSI Z89.2, or NIOSH 30 CFR 72.140 (where applicable). Use an air supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure limit. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).
Thermal hazard protection	Wear cold-weathering gloves when transferring or breaking transfer connections.

Next

Slide notes

The exposure controls, and personal protection section, indicates exposure limits, engineering controls, and personal protective measures, like personal protective equipment, that can be used to minimize worker exposure.

Control parameters include occupational exposure guidelines, or the biological exposure limits, including the source of those values. This section lists appropriate engineering controls.

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WHMIS: Workplace Hazardous Materials Information System

Information Delivery

Safety Data Sheets

9. Physical and chemical properties

- Appearance
- Odor
- Odor threshold
- pH
- Melting point/Freezing point
- Initial boiling point/Boiling range
- Flash point
- Evaporation rate
- Lower explosive limit
- Upper explosive limit
- Vapour pressure
- Vapour density
- Relative density
- Solubility
- Partition coefficient
- Decomposition temperature
- Auto-ignition temperature
- Flammability
- Viscosity

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	: Gas
Appearance	: Greenish-yellow gas. Amber liquid (under pressure)
Molecular mass	: 78 g/mol
Color	: Greenish gas
Odor	: Pungent
Odor threshold	: Odor threshold is subjective and inadequate to warn for overexposure to warn for overexposure: 1.23 mg/m ³ (Down and Bell)
pH	: Not applicable
Relative evaporation rate (butyl acetate=1)	: No data available
Relative evaporation rate (ether=1)	: Not applicable
Melting point	: -101 °C (-149.8°F)
Freezing point	: No data available
Boiling point	: -34.05 °C (-29.29°F)
Flash point	: Not applicable
Critical temperature	: 144 °C
Auto-ignition temperature	: Not applicable
Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available
Vapor pressure	: 6.9 bar (101 psia) (@20°C [68°F])
Critical pressure	: 77.15 bar (1114.4 psia)
Relative vapor density at 20°C	: No data available
Relative density	: 1.6
Density	: 2.7 kg/m ³ (at 54°C)
Relative gas density	: 1.5
Solubility	: Water: 503 mg/l
LogP _{ow}	: Not applicable
LogK _{ow}	: Not applicable
Viscosity, kinematic	: Not applicable
Viscosity, dynamic	: Not applicable
Explosive properties	: Not applicable
Oxidizing properties	: Oxidizer
Explosion limits	: Non flammable

9.2 Other information

Gas group	: Liquefied gas
Additional information	: Gas/vapor heavier than air. May accumulate in confined spaces particularly at or below ground level


Next

Slide notes

Section nine, identifies physical, and chemical properties. The minimum required information consists of the items you see listed here.

A Safety Data Sheet may not contain every item on this list, because some information is not relevant, or available for some products. When this occurs, a notation must be made for that chemical property.

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WHMIS: Workplace Hazardous Materials Information System


Information Delivery

Safety Data Sheets

10. Stability and Reactivity

Reactivity

- specific test data

Chemical stability

- whether product is stable under normal temperatures / conditions
- description of any necessary stabilizers
- safety issues that may arise if the product changes physical appearance

SECTION 10: Stability and reactivity	
10.1. Reactivity	No reactivity hazard other than the effects described in sub-sections below.
10.2. Chemical stability	Stable under normal conditions.
10.3. Possibility of hazardous reactions	May set up.
10.4. Conditions to avoid	Air contact. High temperature. Moisture. Incompatible materials.
10.5. Incompatible materials	Chlorine reacts with most materials, especially flammable materials, other reducing agents, and many alloys. At temperatures below 250°F (121°C) certain common metals (e.g. iron, copper, steel, lead, nickel) react with dry chlorine, but others (e.g. aluminum, arsenic, gold, mercury, tin, titanium) react. Moist chlorine is highly corrosive except to glass, stoneware, porcelain, and certain alloys and only at low pressure. Titanium ignites spontaneously on contact with dry chlorine. Carbon steel ignites in chlorine at temperatures near 413°F (212°C).
10.6. Hazardous decomposition products	Toxic fumes. Chlorides.

“Other”

- possibilities of hazardous reactions
- conditions when hazardous reactions may occur
- conditions to avoid
- list of incompatible classes and materials
- hazardous decomposition products

Next

Slide notes


Section 10, the stability and reactivity section of the SDS, describes the reactivity hazards of the product, along with any chemical stability information. This section is split into 3 parts: reactivity, chemical stability, and “other”.

The Reactivity part, provides a description of the specific test data for the chemical. This data can be for a class, or family of the chemical, if such data adequately represents the anticipated hazard of the chemicals.

The Chemical stability, indicates whether the chemical is stable, or unstable under normal ambient temperature, and conditions while in storage, and while being handled. Description of any stabilizers that may be needed to maintain chemical stability, will also be found along with any safety issues that may arise, should the product change in physical appearance.

The “other” part, provides an indication of the possibility of hazardous reactions, including a statement of whether the chemical will react, or polymerize, which could release excess pressure, or heat, or create other hazardous conditions. You’ll also find a description of the conditions when hazardous reactions may occur, a list of all conditions that should be avoided; and a list of all classes of incompatible materials, that could react and produce a hazardous situation. Finally, this part contains a list of any known, or anticipated hazardous decomposition products that could be produced.

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WHMIS: Workplace Hazardous Materials Information System


Information Delivery

Safety Data Sheets

11. Toxicological Information

- Likely routes of exposure
- Symptoms related to physical, chemical and toxicological characteristics
- Numerical measures of toxicity
- Immediate effects and chronic effects from short-term and long-term exposure

SECTION 11: Toxicological Information	
11.1. Information on toxicological effects	
Acute toxicity	Inhalation gas: FATAL IF INHALED
Chronic (10/19/2020)	
LC50 inhalation rat (ppm)	146.5 ppm/4h
ATE US (aerosols)	146.503 ppm/4h
Skin corrosion/irritation	CAUSES SEVERE SKIN BURNS AND EYE DAMAGE.
Dermal eye damage/irritation	pH: Not applicable. CAUSES SERIOUS EYE DAMAGE.
Respiratory or skin sensitizer	pH: Not applicable.
Derm. cell estrogenicity	Not classified
Chronic toxicity	Not classified
Reproductive toxicity	Not classified
Specific target organ toxicity (single exposure)	MAY CAUSE RESPIRATORY IRRITATION
Specific target organ toxicity (repeated exposure)	Not classified
Aspiration hazard	Not classified
Symptoms/injuries after inhalation	Overexposure to concentrations moderately above the TLV of 1 ppm irritates the eyes and respiratory tract. Very brief exposure to a concentration of 1000 ppm may be lethal. Acts as an asphyxiant at high concentrations. Inhalation of high concentrations (e.g. greater than 10 ppm) causes choking, coughing, burning of the throat, and severe irritation of the upper respiratory tract; additionally, pulmonary edema, bronchitis, and pneumonia may result.

Next

Slide notes

Section 11, contains concise, but complete descriptions of the various toxic health effects, and the data used to identify those effects. This includes information on the product’s likely routes of exposure, symptoms related to the physical, chemical, and toxicological characteristics of the product, and numerical measures of toxicity. This is also where you’ll find information on immediate effects, and chronic effects from short-term, and long-term exposure.

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WHMIS: Workplace Hazardous Materials Information System

Information Delivery

Safety Data Sheets

12. Ecological Information

- Ecotoxicity
- Persistence and degradability
- Bioaccumulative potential
- Mobility in soil
- Other adverse effects

SECTION 12: Ecological Information	
12.1. Toxicity	
Ecology - general	VERY TOXIC TO AQUATIC LIFE
Chubiusa (712-50-5)	
...C01 fish 1	0.44 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus (low-through))
...C01 Daphnia 1	0.017 mg/l (Exposure time: 48 h - Species: Daphnia magna)
Chubiusa (712-50-5)	
...C01 fish 2	0.014 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss (low-through))
12.2. Persistence and degradability	
Chubiusa (712-50-5)	
Persistence and degradability	Not applicable for inorganic gases
12.3. Bioaccumulative potential	
Chubiusa (712-50-5)	
...C01 fish 1	(see Bioaccumulation expected)
...eq Flow	Not applicable
...eq Kow	Not applicable
Bioaccumulative potential	No data available
12.4. Mobility in soil	
Chubiusa (712-50-5)	
Mobility in soil	No data available
...C01 soil	Because of its high volatility, the product is unlikely to cause ground or water pollution
12.5. Other adverse effects	
Other adverse effects	May cause pH changes in aqueous ecological systems.
Effect on ozone layer	None

Next


Slide notes

As we mentioned earlier, WHMIS 2015 manufacturers and suppliers, are not required to complete sections 12 to 15 in Canada. However, these sections may be filled out voluntarily.

Section 12, contains information of the ecological effects of the product, including Eco-toxicity, persistence and degradability, bioaccumulative potential, and mobility in soil, as well as other adverse effects.

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WHMIS: Workplace Hazardous Materials Information System



Information Delivery

Safety Data Sheets

13. Disposal Considerations

- Safe handling procedures for product disposal, including any contaminated packaging

SECTION 13: Disposal considerations

13.1. Waste treatment methods


Waste disposal recommendations : Do not attempt to dispose of residue or unused quantities. Return container to supplier.

Next

Slide notes

If Section 13 is completed, it will explain safe handling procedures for product disposal, including the disposal method for any contaminated packaging

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WHMIS: Workplace Hazardous Materials Information System


Information Delivery

Safety Data Sheets


14. Transport Information

- UN number
- UN proper shipping name
- Transport hazard class(es)
- Packing group
- Environmental hazards
- Special precautions

SECTION 14: Transport information

In accordance with ECT

<p>Transport document description</p> <p>UN No. (DOT)</p> <p>Proper shipping name (8.3)</p> <p>Class (DOT)</p> <p>Hazard labels (DOT)</p> <p>DOT Special Provisions (49 CFR 172.102)</p> <p>Marine pollutant</p>	<p>UN117 CHLORINE, 2.3</p> <p>UN1177</p> <p>Chlorine</p> <p>2.3 - Class 2.3 - Poisonous gas 49 CFR 173.115</p> <p>Poison Gas</p> <p>2.3 - Poison gas</p>
--	--



2 This material is poisonous by inhalation (see 17.2.8 of this subchapter) in Hazard Zone B (see 17.1.1(b)(ii) or 17.1.3(a) of this subchapter) and must be described as an inhalation hazard under the provisions of 18 in such chapter.

02 - Oxygen indices are not authorized.

011 - Each bulk packaging, except a tank car or a multi-unit tank car tank, must be insulated with an insulating material so that the overall thermal conductance at 15.5 C (60 F) is no more than 1.032 kilojoules per hour per square meter per degree Celsius (0.175 Btu per hour per square foot per degree Fahrenheit) temperature differential. Insulating materials must not promote corrosion to metal when used.

105 - UN pressure receptacles made of aluminum alloy are not authorized.

T50 - When portable tank insulator T50 is referenced in Column (7) of the 172.101 Table, the applicable liquid compressed gases are authorized to be transported in portable tanks in accordance with the requirements of 173.31 of this subchapter.

1715 - The calculated wall thickness must be increased by 5 mm at the time of construction. Wall thickness must be verified ultrasonically at intervals midway between periodic hydrostatic tests (every 2.5 years). The portable tank may not be used if the wall thickness is less than that permitted by the applicable T code in Column (7) of the Table for this material.

Additional information

Environmental Precaution (EPA) Number: 4144-111

Next


Slide notes

Section 14, contains information on shipping, and transport of the hazardous product, and will include the information listed below.

- UN number;
- UN proper shipping name;
- Transport hazard class or classes;
- Packing group;
- Environmental hazards; and
- Special precautions.

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WHMIS: Workplace Hazardous Materials Information System


Information Delivery

Safety Data Sheets

15. Regulatory Information

- Specific product safety, health and environmental regulations

SECTION 15: Regulatory information	
15.1. US Federal regulations	
Chlorine (7822-50-5)	
Listed on the United States TSCA (Toxic Substances Control Act) Inventory	
Listed on the United States SARA Section 302	
Subject to reporting requirements of United States SARA Section 313	
CERCLA RC	100 lb
SARA Section 302 Threshold Planning Quantity (TPQ)	100 lb
SARA Section 311/312 Hazard Classes	Extremely flammable (acute) health hazard Delayed (chronic) health hazard Sudden release of pressure hazard Fire hazard
SARA Section 311 - Pictogram Reporting	100%
15.2. International regulations	
CANADA	
Chlorine (7822-50-5)	
Listed on the Canadian DSL (Domestic Substances List)	
EU Regulations	
Chlorine (7822-50-5)	
Listed on the EEC Inventory EINECS (European Inventory of Existing Commercial Chemical Substances)	
15.2.3. National regulations	
Chlorine (7822-50-5)	
Listed on the AICG (Australian Inventory of Chemical Substances)	
Listed on ECSC (Inventory of Existing Chemical Substances Produced or Imported in China)	
Listed on the Korean ECL (Existing Chemicals List)	


Next

Slide notes

The final voluntary section on the Safety Data Sheet, is the regulatory information section, where you may see safety, health, and environmental regulations specific to the product.

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WHMIS: Workplace Hazardous Materials Information System


Information Delivery

Safety Data Sheets

16. Other Information

- Date SDS was prepared or latest revision
- Other pertinent information provided by the supplier

SECTION 16: Other Information

Other information

When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product.

Please read each of the sections in this SDS and become aware of the product hazards and safety information. To maximize safe use of this product, a user should (1) notify employees, agents, and customers of the information in this SDS and of any other known product hazards and safety information; (2) furnish this information to each purchaser of the product; and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Praxair, Inc. it is the user's obligation to determine the conditions of safe use of the product.

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NFPA health hazard

NFPA fire hazard

NFPA reactivity

NFPA specific hazard

- 4 - Very short exposure could cause death or serious residual injury, even though prompt medical attention was given.
- 3 - Materials that will not burn.
- 2 - Normally stable, even under fire exposure conditions, and are not reactive with water.
- 0x - This denotes an oxidizer, a chemical which can greatly increase the rate of combustion fire.



Next

Slide notes

The final section of the Safety Data Sheet is titled, "Other Information". This section indicates when the SDS was prepared, or when the last known revision was made. It also specifies other pertinent information provided by the manufacturer or supplier.

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WHMIS: Workplace Hazardous Materials Information System


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Information Delivery

Safety Data Sheets

Review prior to working with any hazardous product to know:

- Hazards
- Proper use
- Ways to protect yourself and fellow workers




Next

Slide notes

Before working with any product, it's important to review the material contained within the Safety Data Sheet, to ensure that you're familiar with the hazards associated with the product, how to use it correctly, and how to protect yourself ,and your fellow coworkers. If you are unsure of any information about the product, ask your supervisor.

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WHMIS: Workplace Hazardous Materials Information System



Responsibilities

Slide notes

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WHMIS: Workplace Hazardous Materials Information System


THE CITY OF WINDSOR
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Information Delivery

Education / Training

Employer responsibility to train/educate workers in WHMIS

- general WHMIS training
- site-specific hazardous product training
- Train workers on any new hazardous product in the workplace
 - handling
 - storage
 - safe use



Try Again

Slide notes

In addition to supplier, or workplace labels and Data Sheets, education and training is the third way workers are made aware of hazards in the workplace. It is the employer's responsibility to ensure that their workers are trained in WHMIS.

Workers must receive general WHMIS training which is the course you are currently completing. You must also receive site specific training on the hazards present at your work site.

All workers should be educated on any new hazardous product that enter the workplace, including the product's hazards, proper handling, storage, and safe use procedures.

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WHMIS: Workplace Hazardous Materials Information System


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Information Delivery

Supplier Responsibilities

Ensure appropriate classification of hazardous/controlled products

- proper labelling
- SDS
- accurate and up-to-date information



Next


Slide notes

Under WHMIS regulations, the supplier of the hazardous product is responsible for ensuring the appropriate classification of hazardous, and controlled products.

This responsibility includes; labelling the product or container with a supplier label, to make it easily identified by the purchaser; providing Data Sheets for their customer for all hazardous, and controlled products; and ensuring that this information is accurate, and up to date.

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WHMIS: Workplace Hazardous Materials Information System



Information Delivery

Employer Responsibilities

Must ensure/provide:

- Education and training
- Proper product labelling
- SDSs
 - available for all hazardous products
 - available to all staff
 - remain accurate / up-to-date
- Appropriate control measures
 - PPE
 - proper exhausts in place
 - adequate / safe storage
 - proper disposal of hazardous products


Next

Slide notes

Employers have a number of responsibilities required under WHMIS regulations in Canada. They are responsible for ensuring workers are trained on WHMIS and the hazardous products that are present in their workplaces locations. They're responsible for ensuring that products are properly labelled, which includes providing workplace labels as needed to properly identify hazardous or controlled products. Employers must also make sure data sheets are available for all hazardous products within their workplaces and that these data sheets are available to all staff, and remain accurate and up to date. Employers must ensure all proper control measures for working with a hazardous product are observed. This may include providing PPE to workers, confirming proper exhaust is in place, providing adequate, and safe storage or products, and or, ensuring proper disposal of hazardous products.

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WHMIS: Workplace Hazardous Materials Information System



Information Delivery

Worker Responsibilities

- Participate in WHMIS education/training
- Protect themselves and co-workers from hazards
- Identify/control workplace hazards

Next


Slide notes

As a City of Windsor worker, you, too, have responsibilities. The WHMIS program requires that you participate in WHMIS education, and training programs. The program requires all workers take steps to protect themselves, and their co-workers, from the hazards present in their workplace.

Finally, you, the worker, are required to actively participate in identifying, and controlling hazards within your workplace. Any identified hazards in the workplace should be brought to the attention of your supervisor as soon as possible.

Slide 79 - Slide 79

WHMIS: Workplace Hazardous Materials Information System



Check Your Understanding


Let's stop for a moment and check your understanding of this information

Next

Slide notes

Before we continue, lets stop and make sure you understand this information. Click next when you are ready to begin the quiz.

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WHMIS: Workplace Hazardous Materials Information System 

The three ways that workers are made aware of hazardous products are:

- A) Training, commercials and supplier labels
- B) Training, supplier/workplace labels and SDS
- C) Supplier labels, workplace labels and testing
- D) SDS, training and commercials

You must answer the question before continuing.

Submit

Slide notes

The three ways that workers are made aware of hazardous products are:


Training, commercials and supplier labels

Training, supplier/workplace labels and SDS

Supplier labels, workplace labels and testing

SDS, training and commercials

Slide 81 - Slide 81

WHMIS: Workplace Hazardous Materials Information System 

How many separate pieces of information are required on a supplier label?

A) 5

B) 7

C) 9

D) 11

You must answer the question before continuing.

Submit


Slide notes

How many separate pieces of information are required on a supplier label?

5. 7. 9. 11.

Slide 82 - Slide 82

WHMIS: Workplace Hazardous Materials Information System



Workplace labels must have a product name, safe handling procedures and a reference to the SDS

A) True
 B) False

You must answer the question before continuing.


Submit

Slide notes

Workplace labels must have a product name, safe handling procedures and a reference to the SDS

True. Or false.

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WHMIS: Workplace Hazardous Materials Information System 

It is the responsibility of the Supplier to train workers on the hazardous products in their workplace

A) True
 B) False

You must answer the question before continuing.


Submit

Slide notes

It is the responsibility of the Supplier to train workers on the hazardous products in their workplace.

True. Or false.

Slide 84 - Slide 84

WHMIS: Workplace Hazardous Materials Information System 

How many categories must be present on the WHMIS 2015 SDS sheet?

- A) 7
- B) 10
- C) 13
- D) 16

You must answer the question before continuing.


Submit

Slide notes

How many categories must be present on the WHIMIS 2015 safety data sheet?

7. 10. 13. 16.

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WHMIS: Workplace Hazardous Materials Information System 

Which has more detailed information about a hazardous product?

A) Supplier or workplace labels

B) Safety Data Sheets (SDS's)

C) Safety Data Sheets and product labels contain the same information

You must answer the question before continuing.

Submit

Slide notes

Which has more detailed information about a hazardous product?


Supplier or workplace labels

Safety Data Sheets (SDS's)

Safety Data Sheets and product labels contain the same information

Slide 86 - Slide 86

WHMIS: Workplace Hazardous Materials Information System



Congratulations!

You have now completed this lesson

Next

Slide notes

Congratulations!

You have now completed this lesson. Click next to continue.

Slide 87 - Hazardous_Products_in_the_Workplace

WHMIS: Workplace Hazardous Materials Information System

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Hazardous Products in the Workplace

Hazardous Products in the Workplace

- States of hazardous products
- Routes of entry
- Controlling hazards



Next


The image shows five bottles of hazardous products. From left to right: a red spray bottle with a biohazard symbol, a black bottle with a biohazard symbol, a white bottle with a flame symbol, a blue bottle with an exclamation mark symbol, and a yellow bottle with a biohazard symbol.

Slide notes

The final module of this course will review some additional information that relates to WHMIS and hazardous products in the workplace, including; states of hazardous products (solids, liquids and gases), routes of entry, and controlling hazards.




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WHMIS: Workplace Hazardous Materials Information System



Hazardous Products in the Workplace

Hazard States

SOLIDS	LIQUIDS	GASES
		
<ul style="list-style-type: none">• defined shape• structurally rigid• dust/fine particles pose the greatest risk <p>Examples: asbestos, silica</p>	<ul style="list-style-type: none">• nearly incompressible fluid• conforms to the shape of its container• can be mists or fine liquid droplets suspended in air <p>Examples: gasoline, liquid chlorine, turpentine, acetone</p>	<ul style="list-style-type: none">• no fixed shape• capable of expansion and contraction with changes in pressure and temperature• able to diffuse readily• have spontaneous tendency to become distributed uniformly throughout any container <p>Examples: carbon monoxide, methane, propane, oxygen</p>

Try Again

Slide notes

Hazardous products can be present in many different states, and some could potentially be present in more than one state within the workplace. Solids, liquids and gases are your three basic states in which hazards may be present.

Solids have a definite shape and structural rigidity, unlike liquids, and gases. Dusts, and other fine particles created when solids are ground, generally pose the greatest risk to workers. Examples of these include, asbestos, and silica.

A liquid is a nearly incompressible fluid that conforms to the shape of its container, but, retains a nearly constant volume, independent of the pressure it's under. Liquids can be present in containers, and other forms of containment, or may be in the form of mists, and fine liquid droplets suspended within the air. Examples of hazardous liquids include, gasoline, liquid chlorine, turpentine and acetone.

Gases are substances that, like air, have no fixed shape, and are capable of expanding, and contracting, with changes in pressure, and temperature. They have the ability to diffuse readily, and have the spontaneous tendency to become distributed uniformly throughout any container. Examples of hazardous gases include, carbon monoxide, methane, and compressed gases, like propane, or oxygen.

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WHMIS: Workplace Hazardous Materials Information System

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Hazardous Products in the Workplace

Routes of Entry

Four main routes of exposure by which hazardous products can enter our bodies

Inhalation

Ingestion

Injection

Absorption

Try Again

Slide notes

There are four main routes that hazardous products can enter our bodies. These are, inhalation. absorption. ingestion.

And: injection, which we will review in more detail next.

Slide 90 - Slide 90

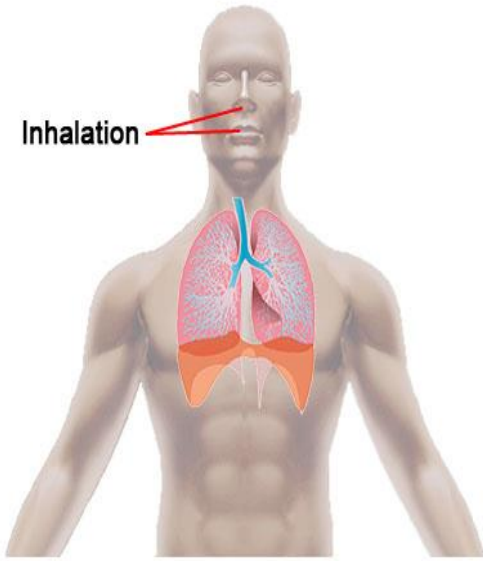
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Hazardous Products in the Workplace

Routes of Entry: Inhalation

- Most common route of entry
- Flow of air into the body through the mouth or nose
- Usual results
 - sore throat
 - respiratory problems
 - headaches
 - nausea
 - disease
- Generally affects the lungs, nose and skin



Next

Slide notes

The most common route of entry to the body for hazardous substances is through inhalation.

Inhalation, is the flow of air into the body through the mouth, or the nose. When chemicals are present in the air, they too can be inhaled into the body.

Inhalation of hazardous products, usually results in sore throats, respiratory problems, headaches, nausea, and disease; and generally affects the lungs, nose, and skin.

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Hazardous Products in the Workplace

Routes of Entry: Absorption

- Entry through the skin or eyes
- Direct effects at point of contact
 - rashes
 - hives
 - burns
- Penetration of the skin can produce other effects
- Skin penetration is most often from liquid chemicals
- Cuts and scrapes create an easier route of entry



Next

Slide notes

Absorption, is another common route of entry, where hazardous substances enter the body through the skin, or eyes. The skin is the largest organ in the body, and provides a large area where hazardous products could potentially be absorbed.

Hazardous products coming into contact with the skin, or eyes, can cause direct effects at the point of contact; such as rashes, hives, and burns; or may penetrate the skin, and produce other effects on the body. Chemicals vary in their ability to penetrate the skin, and are most often in the form of liquids. Keep in mind that cuts, and scrapes, create an easier route of entry for these chemicals!

Slide 92 - Slide 92

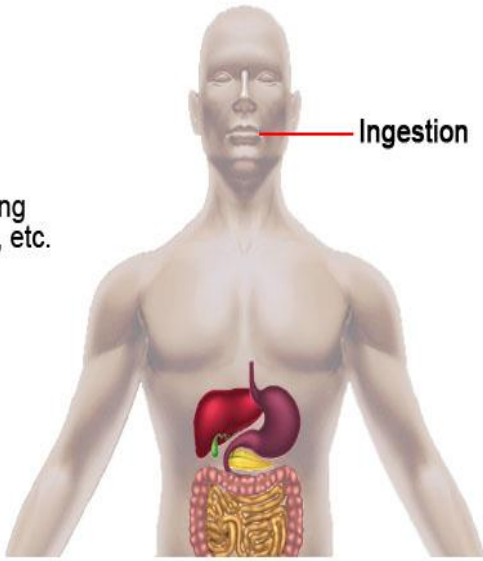
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Hazardous Products in the Workplace

Routes of Entry: Ingestion

- Swallowing product by eating or drinking
- Can be directly ingested
- Can be indirectly ingested by eating or drinking contaminated food or beverages, biting nails, etc.
- Varying effects
 - burning mouth, esophagus and stomach
 - toxic effects through the blood stream



Next

Slide notes

Hazardous products can also enter our bodies through ingestion, which mean swallowing the product by either eating, or drinking it. These products can be directly ingested, or more commonly, can be indirectly ingested by eating contaminated food, drinking contaminated beverages, or biting your nails.

Ingested products will have varying effects on the body, such as, burning of the mouth, esophagus, and stomach; or can enter the blood stream, and produce toxic effects.

Slide 93 - Slide 93


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Hazardous Products in the Workplace

Routes of Entry: Injection

- Puts fluid into the body
- Penetrates the skin to introduce hazardous chemical or biological substance
- Most common in health care settings



Next

Slide notes

An injection puts fluid into the body, usually with the use of a needle, but can also be done with any object, that can penetrate the skin, and introduces a hazardous product, either chemical, or biological, into the body.

Those working in health care settings, are generally at the highest risk for injection incidents.

Slide 94 - Slide 94


WHMIS: Workplace Hazardous Materials Information System

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Hazardous Products in the Workplace

Effects of Exposure

- Different products have different effects
- Effects can depend on
 - direct or indirect exposure
 - length of exposure
 - amount of product
 - route of entry
 - genetic factors
 - age
 - sex
 - underlying health conditions
 - sensitivity



Next

Slide notes


There are a number of factors, that determine the effects, that exposure to a hazardous product will have on the body.

Different products will have varying effects on the body, and will vary in their toxicity. These effects will depend on whether the exposure is direct, or indirect; the length of time the individual is exposed, and the amount of the product that they are exposed to.

The same product may produce different effects on the body, depending on its route of entry.

Each worker may experience differing effects, or differing levels of severity, when exposed to the same hazardous product. These effects may be dependent on an individual's genetic makeup, their age, sex, underlying health conditions, and sensitivity.

Slide 95 - Slide 95


WHMIS: Workplace Hazardous Materials Information System 

Hazardous Products in the Workplace

Effects of Exposure: Acute vs. Chronic


Acute

- Immediately or short time after exposure
- Mostly treatable
 - rashes/skin irritations
 - burns
 - allergic reactions
 - headaches
 - nausea



Chronic

- Effects over a long period of time
- Generally caused by repeated exposure
- Forms of chronic effects
 - cancer
 - silicosis
 - mesothelioma



Try Again

Slide notes

There are two ways the effects of exposure to a hazardous product can take place.

An acute effect takes place immediately, or shortly after, an exposure to a hazardous product. Most cases of acute exposure are treatable. Examples of acute effects include; rashes and other skin irritations, burns, allergic reactions, headaches and nausea.

Chronic effects happen over a longer period of time, and are generally caused by repeated exposure to a hazard. For example, if you breathe small amounts of asbestos fibres, you'll have no immediate symptoms, since there are generally no acute effects of asbestos exposure. But if you inhale asbestos fibres month after month, year after year; you greatly increase your chances of contracting an asbestos-related disease, such as lung cancer.

Cancer, silicosis and mesothelioma are just a few forms of chronic effects of exposure.

Slide 96 - Slide 96


WHMIS: Workplace Hazardous Materials Information System

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Hazardous Products in the Workplace

Using Hazardous Products

- Ensure product is labeled
- If no label or unreadable label follow up with your supervisor to label the product
- Consult the SDS for more detailed information
- Ask supervisor for storage instructions



Never use a product you haven't been properly trained to use or that doesn't have an accompanying data sheet for you to consult

Next

Slide notes

Before using any potentially hazardous product in the workplace, you should always check to see if there's a label on the product. If there's no label, or if you can't read the label, follow up with your supervisor to ensure a label is put on the product.

Make sure you read the label and follow the instructions on it. Then consult the Material Safety Data Sheet or Safety Data Sheet for more detailed information. If you're unsure how to use or store the product, ask your supervisor for instructions. Never use a product you haven't been properly trained or instructed to use. And never use a hazardous product that doesn't have an accompanying data sheet present.

Slide 97 - Slide 97

WHMIS: Workplace Hazardous Materials Information System 

Hazardous Products in the Workplace

Controlling Hazards



At the source



Along the path



At the worker

Next

Slide notes

There are three methods to control hazards in the workplace.

At the source.

Along the path.

And, at the worker.

Slide 98 - Slide 98


WHMIS: Workplace Hazardous Materials Information System

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Hazardous Products in the Workplace

Controlling Hazards: At the Source

- Most effective control method
- Should be used whenever possible
- Control at the point of origin before it comes in contact with the worker
 - eliminate hazardous products/machines
 - substitute with a safer product
 - isolate the product, process or equipment



Try Again

Slide notes

Controlling hazards at the source, whenever possible, is the most effective control method, and should be the first method considered, when a hazard exists in the workplace.

Controlling hazards at the source, refers to controlling that hazard at its point of origin, before it even comes into contact with the worker. Some examples of control measures include: eliminating the hazardous product, or machine, from the workplace, if it's not essential to operations; substituting the product for a safer one; or isolating the hazardous product, process, or equipment so the worker does not have to be exposed to the hazard .

Slide 99 - Slide 99


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Hazardous Products in the Workplace

Controlling Hazards: Along the Path

- Prevent hazard from reaching the worker
 - ventilation
 - portable barriers
 - good housekeeping



Next

Slide notes

If the hazard cannot be controlled at the source, the next step is to try and control it along the path to the worker. The goal here is to prevent, or eliminate the hazard, before it reaches the worker in the worksite.

Some common forms of controlling hazards along the path include:

Ventilation, so the worker doesn't have to breathe in hazardous gases or fumes;

Portable barriers, to protect the worker from sparks, embers, noise, or arc flash; and

Good housekeeping, which helps ensure that chemicals are properly stored, and cleaned up, so workers aren't accidentally, and needlessly exposed to a product in the workplace.

Slide 100 - Slide 100

WHMIS: Workplace Hazardous Materials Information System

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Hazardous Products in the Workplace

Controlling Hazards: At the Worker


PPE

- proper fit
- tested
- worker trained

Administrative controls

- limit time spent on a job task
- pre-screening
- pre-placement medical exams
- job rotations

Controlling hazards at the worker should be a last resort when controlling hazards in the workplace



Next

Slide notes

When all other methods have been exhausted, the last option to control hazards, is at the worker. There are two methods for controlling hazards at the worker, personal protective equipment, and administrative controls.


Personal Protective Equipment, or PPE, is equipment worn by workers to protect them from identified or potential hazards. It's important to ensure that proper PPE is selected to protect the worker from the hazard. Proper PPE must then be properly fitted, and tested; and workers must be trained on its use, and maintenance.

Administrative controls are rules and procedures designed to control the worker, rather than to control the hazard. Administrative controls include, limiting time spent on a job task, pre-screening workers for the job, pre-placement medical exams, and job rotations.

Again, controlling hazards at the worker should be a last resort, when controlling hazards in the workplace.

Slide 101 - Slide 101

WHMIS: Workplace Hazardous Materials Information System



Check Your Understanding


Let's stop for a moment and check your understanding of this information

Next

Slide notes

Before we continue, lets stop and make sure you understand this information. Click next when you are ready to begin the quiz.

Slide 102 - Slide 102

WHMIS: Workplace Hazardous Materials Information System 

The four main routes hazardous products can enter the body are...

A) injection, inhalation, insertion, indigestion

B) injection, inhalation, absorption, ingestion

C) infection, indigestion, perspiration, absorption

D) absorption, radiation, infection, ingestion

You must answer the question before continuing.

Submit

Slide notes

The four main routes hazardous products can enter the body are...


injection, inhalation, insertion, indigestion

injection, inhalation, absorption, ingestion

infection, indigestion, perspiration, absorption

absorption, radiation, infection, ingestion

Slide 103 - Slide 103

WHMIS: Workplace Hazardous Materials Information System 

Which of the following is not a hazard state?

A) Solid

B) Gas

C) Liquid

D) Crystal

You must answer the question before continuing.

Submit

Slide notes

Which of the following is not a hazard state?


Solid.

Gas.

Liquid.

Crystal.

Slide 104 - Slide 104

WHMIS: Workplace Hazardous Materials Information System 

Effects that happen over an extended period of time and generally caused by repeated exposure to a hazard are considered...

A) Acute
 B) Chronic

You must answer the question before continuing.

Submit


Slide notes

Effects that happen over an extended period of time and generally caused by repeated exposure to a hazard are considered...

Acute

Chronic

Slide 105 - Slide 105

WHMIS: Workplace Hazardous Materials Information System 

The most effective way to control workplace hazards is by controlling hazards ...

- A) at the worker
- B) along the hazard's path
- C) at the source of the hazard

You must answer the question before continuing.

Submit

Slide notes

The most effective way to control workplace hazards is by controlling hazards ...


at the worker

along the hazard's path

at the source of the hazard

Slide 106 - Slide 106

WHMIS: Workplace Hazardous Materials Information System



Congratulations!

You have now completed this lesson

Next

Slide notes

Congratulations!

You have now completed this lesson. Click next to continue.

Slide 107 - Final_Test

The slide features a blue border. At the top left, the text reads "WHMIS: Workplace Hazardous Materials Information System". At the top right is the logo for "THE CITY OF WINDSOR ONTARIO, CANADA". In the center, the text says "Final Test" and "75% accuracy required for course completion". A "Next" button is located in the bottom right corner.


Slide notes

Now that you have completed all the lessons of this course, it's time to make sure you have a good understanding of this material.

Course completion will require a score of 75 percent or greater.

Click next, when you're ready to begin.

Slide 108 - Slide 108

WHMIS: Workplace Hazardous Materials Information System 

Question 20 of 38

How many categories must be present on the WHMIS 2015 SDS sheet?

- A) 7
- B) 10
- C) 13
- D) 16

Correct!

OK

You must answer the question before continuing.

Incorrect

The WHMIS 2015 Safety Data Sheet requires 16 categories which brings WHMIS in line with the Globally Harmonized System for Classification and Labelling of Chemicals.

OK


Submit

Slide notes

How many categories must be present on the WHIMIS 2015 SDS sheet?

7. 10. 13. 16.

Slide 109 - Slide 109

WHMIS: Workplace Hazardous Materials Information System 

Question 21 of 38

Effects that happen over an extended period of time and generally caused by repeated exposure to a hazard are considered...

A) Acute

B) Chronic

Correct!

OK

You must answer the question before continuing.

Incorrect

Effects that happen over an extended period of time and are generally caused by repeated exposure to a hazard are considered chronic.

OK


Submit

Slide notes

Effects that happen over an extended period of time and are generally caused by repeated exposure to a hazard are considered...

Acute. Chronic.

Slide 110 - Slide 110

WHMIS: Workplace Hazardous Materials Information System 

Question 22 of 38

The three ways that workers are made aware of hazardous products are:

- A) Training, commercials and supplier labels
- B) Training, supplier/workplace labels and SDS
- C) Supplier labels, workplace labels and testing
- D) SDS, training and commercials

Correct!

OK

You must answer the question before continuing.

Incorrect

The three ways that workers are made aware of hazardous products are through training, supplier/workplace labels and the safety data sheets (SDS).

OK

Submit

Slide notes

The three ways that workers are made aware of hazardous products are:


Training, commercials and supplier labels

Training, supplier/workplace labels and SDS

Supplier labels, workplace labels and testing

SDS, training and commercials

Slide 111 - Slide 111

WHMIS: Workplace Hazardous Materials Information System 

Question 23 of 38

Which of the following is not a hazard state?

- A) Solid
- B) Gas
- C) Liquid
- D) Crystal

Correct!

OK

You must answer the question before continuing.

Hazardous products can be present in many different states, and some could potentially be present in more than one state within the workplace. Solids, liquids and gases are your three basic states in which hazards may be present.

OK

Submit

Slide notes

Which of the following is not a hazard state?


Solid.

Gas.

Liquid.

Crystal.

Slide 112 - Slide 112

WHMIS: Workplace Hazardous Materials Information System 

Question 24 of 38

Which hazard group was not adopted by WHMIS 2015?

- A) Environmental
- B) Physical
- C) Health
- D) None of the above

Correct!

OK

You must answer the question before continuing.

The Environment pictogram which is used for products that cause damage to the aquatic environment is not covered under WHMIS 2015 and is not required to be displayed on products in Canada. However, you still may see this pictogram on products and data sheets since the supplier may choose to provide this information on a voluntary basis.

OK

Submit

Slide notes

Which hazard group was not adopted by WHIMIS 2015?


Environmental

Physical.

Health.

None of the above.

Slide 113 - Slide 113

WHMIS: Workplace Hazardous Materials Information System 

Question 25 of 38

The four main routes hazardous products can enter the body are...

- A) injection, inhalation, insertion, indigestion
- B) injection, inhalation, absorption, ingestion
- C) infection, indigestion, perspiration, absorption
- D) absorption, radiation, infection, ingestion

Correct!

OK

You must answer the question before continuing.

Incorrect

The four main routes hazardous products can enter the body are injection, inhalation, absorption and ingestion.

OK

Submit

Slide notes

The four main routes hazardous products can enter the body are...


injection, inhalation, insertion, indigestion

injection, inhalation, absorption, ingestion

infection, indigestion, perspiration, absorption

absorption, radiation, infection, ingestion

Slide 114 - Slide 114

WHMIS: Workplace Hazardous Materials Information System 

Question 26 of 38

A category 3 flammable liquid is more hazardous than a category 1 flammable liquid

A) True

B) False

Correct!

OK

You must answer the question before continuing.

Hazard categories and types are used to rank products in each class in terms of how dangerous they are. Products in category 1 of each class are considered to be the most dangerous products in that class. So a category 3 flammable liquid is LESS hazardous than a category 1 flammable liquid.


OK

Submit

Slide notes

A category 3 flammable liquid is more hazardous than a category 1 flammable liquid ? is this statement true. Or false.

Slide 115 - Slide 115

WHMIS: Workplace Hazardous Materials Information System 

Question 27 of 38

GHS is an acronym that stands for...

- A) General Hazard Systems
- B) Globally Harmonized System
- C) Guided Health and Safety
- D) Global Hearing Standards

Correct!

OK

You must answer the question before continuing.

Canada is aligning the WHMIS program with the Globally Harmonized System of Classification and Labelling of Chemicals, better known as GHS. GHS is a globally recognized system endorsed by the United Nations.

OK

Submit

Slide notes

GHS is an acronym that stands for...

General Hazard Systems

Globally Harmonized System

Guided Health and Safety

Global Hearing Standards

Slide 116 - Slide 116

WHMIS: Workplace Hazardous Materials Information System

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Question 28 of 38

The most effective way to control workplace hazards is by controlling hazards ...

A) at the worker

B) along the hazard's path

C) at the source of the hazard

Correct!

OK

You must answer the question before continuing.

Incorrect

Controlling hazards at the source, whenever possible, is the most effective control method and should be the first method considered when a hazard exists in the workplace.

OK

Submit

Slide notes


The most effective way to control workplace hazards is by controlling hazards ...

at the worker

along the hazard's path

at the source of the hazard

Slide 117 - Slide 117

WHMIS: Workplace Hazardous Materials Information System 

Question 29 of 38

Almost all pictograms used in WHMIS 2015 are recognized globally under GHS

A) True
 B) False

Correct!

OK

You must answer the question before continuing.

Almost all pictograms used in WHMIS 2015 are recognized globally under GHS, with the exception of the Environment pictograms which is used for products that cause damage to the aquatic environment is not covered under WHMIS 2015 and is not required to be displayed on products in Canada.


OK

Submit

Slide notes

Almost all pictograms used in WHMIS 2015 are recognized globally under GHS. True. Or false.

Slide 118 - Slide 118

WHMIS: Workplace Hazardous Materials Information System 

Question 30 of 38

Workplace labels must have a product name, safe handling procedures and a reference to the SDS

A) True
 B) False

Correct!
OK

You must answer the question before continuing.


Incorrect
Workplace labels must have a product name, safe handling procedures and a reference to the SDS.
OK

Submit

Slide notes

Workplace labels must have a product name, safe handling procedures and a reference to the SDS. True. Or false.

Slide 119 - Slide 119

WHMIS: Workplace Hazardous Materials Information System 

Question 31 of 38

The Hazardous Product Regulations determines the criteria for classifying hazardous products.

A) True
 B) False

Correct!
OK

You must answer the question before continuing.


The new Hazardous Products Regulations determined the classification criteria for what constitutes a Hazardous Product for WHMIS 2015. Currently, any products that meet the criteria set out by WHMIS 2015 and considered to be covered under WHMIS regulations.
OK

Submit

Slide notes

The Hazardous Product Regulations determines the criteria for classifying hazardous products. True. Or false.

Slide 120 - Slide 120

WHMIS: Workplace Hazardous Materials Information System 

Question 32 of 38

A type D organic peroxide is less hazardous than type B organic peroxide

A) True
 B) False

Correct!

OK

You must answer the question before continuing.

Products rated type A are considered to be the most dangerous of all the types. For example a product rates as 1A will be more dangerous than a product rated as 1B. So a Type D organic peroxide is LESS hazardous than a Type B organic peroxide.


OK

Submit

Slide notes

True. Or False. A type D organic peroxide is less hazardous than type B organic peroxide.

Slide 121 - Slide 121

WHMIS: Workplace Hazardous Materials Information System 

Question 33 of 38

It is the responsibility of the Supplier to train workers on the hazardous products in their workplace

A) True
 B) False

Correct!
OK

You must answer the question before continuing.


Incorrect
Employers are responsible for ensuring workers are trained on WHMIS and the Hazardous products that are present in their workplace locations.
OK

Submit

Slide notes

True. Or False. It is the responsibility of the Supplier to train workers on the hazardous products in their workplace.

Slide 122 - Slide 122

WHMIS: Workplace Hazardous Materials Information System 

Question 34 of 38

Which has more detailed information about a hazardous product?

- A) Supplier or workplace labels
- B) Safety Data Sheets (SDS's)
- C) Safety Data Sheets and product labels contain the same information

Correct!

OK

You must answer the question before continuing.

Incorrect

WHMIS 2015 Safety Data Sheets provide more detailed information on the product than a supplier or workplace label.

OK

Submit

Slide notes


Which has more detailed information about a hazardous product?

Supplier or workplace labels

Safety Data Sheets (SDS's)

Safety Data Sheets and product labels contain the same information

Slide 123 - Slide 123

WHMIS: Workplace Hazardous Materials Information System 

Question 35 of 38

How many separate pieces of information are required on a supplier label?

- A) 5
- B) 7
- C) 9
- D) 11

Correct!

OK

You must answer the question before continuing.

Incorrect

Under WHMIS 2015 regulations, supplier labels are required to have seven pieces of information.


OK

Submit

Slide notes

How many separate pieces of information are required on a supplier label?

Slide 124 - Slide 124

WHMIS: Workplace Hazardous Materials Information System 

Question 36 of 38

Physical hazard groups are based on the ability of the product to cause a health effect

A) True
 B) False

Correct!
OK

You must answer the question before continuing.


The physical hazard group contains products and classes that are hazardous because of their physical or chemical properties.
OK

Submit

Slide notes

Physical hazard groups are based on the ability of the product to cause a health effect. True. Or False.

Slide 125 - Slide 125

WHMIS: Workplace Hazardous Materials Information System 

Question 37 of 38

The Globally Harmonized System, or GHS, is an international method used to create and consistently utilize the same...

- A) Product labels
- B) Hazard symbols
- C) Data sheets
- D) Hazard classes
- E) All of the above

Correct!

OK

You must answer the question before continuing.

world to ensure we're using a standardized system for classifying chemicals, labelling products and development of Safety Data Sheets, or SDS'. These changes address additional hazardous properties and incorporate symbols or pictograms, to help ensure the health and safety of workers both in Canada and abroad.

OK

Submit

Slide notes

The Globally Harmonized System, or GHS, is an international method used to create and consistently utilize the same.

Product labels


Hazard symbols

Data sheets

Hazard classes

All of the above.

Slide 126 - Slide 126

WHMIS: Workplace Hazardous Materials Information System 

Question 38 of 38

Pictograms are symbols each representing a different type of hazard

A) True
 B) False

Correct!

OK

You must answer the question before continuing.

One of the biggest changes with the introduction of WHMIS 2015, is the change from symbols to pictograms. Pictograms are graphic images that visually represent the type of hazard present in a product.

OK


Submit

Slide notes

Pictograms are symbols each representing a different type of hazard. True. Or false

Slide 127 - Slide 127

WHMIS: Workplace Hazardous Materials Information System



Test Results

Correct Questions: {correct-questions}

Total Questions: {total-questions}

Accuracy: {percent}

Attempts: {total-attempts}

Review Area


Retake Quiz

Exit

Slide notes

Slide 128 - Slide 128

WHMIS: Workplace Hazardous Materials Information System



Congratulations!

You have successfully completed this course on
Workplace Hazardous Materials Information System
(WHMIS)!

Exit

Slide notes

Congratulations!

You have successfully completed this course on WHMIS training!

Click exit to end the course.