

# WHMIS 2015

## Information for Workers



**WHMIS.org**

## Contents

<b>Introduction</b> .....	3
<b>Identification (Classification) of Hazardous Products</b> .....	3
<b>Labels</b> .....	6
Supplier Labels .....	6
Work site labels .....	9
<b>Safety Data Sheets (SDSs)</b> .....	11
<b>Preventive Measures</b> .....	15
<b>Confidential Business Information (CBI)</b> .....	16
<b>Worker Education and Training</b> .....	17
<b>Glossary</b> .....	18

### **Acknowledgement:**

**This publication is an adaptation of**  
**CCOHS *WHMIS 2015 Fact Sheets***

All information on this site has been posted to provide Albertans with direct access to information about the programs and services offered by the Government of Alberta.

The information has been posted with the intent that it be readily available for personal and public non-commercial (educational) use and except where otherwise prohibited, may be reproduced, in part or in whole and by any means, without charge or further permission from Alberta Labour.

We only ask that:

- the materials not be modified,
- users exercise due diligence in ensuring the accuracy of the materials,
- the Government of Alberta be identified as the source of the materials, and
- the reproduction is not represented as an official version of the materials reproduced, nor as having been made in affiliation with or with the endorsement of the Government of Alberta.

## Introduction

The letters **W-H-M-I-S** stand for:

**W**orkplace  
**H**azardous  
**M**aterials  
**I**nformation  
**S**ystem.

WHMIS is Canada's national hazard communication system for hazardous products in the workplace. It applies to suppliers, importers, and distributors of hazardous products that are sold in or imported into Canada and intended for use, handling or storage in Canadian workplaces. WHMIS applies to employers and workers who use those products.

The objective of WHMIS is to ensure that workers and employers have the information they need to work safely with hazardous products.

WHMIS was originally implemented in Canada in 1988 (WHMIS 1988). In 2015, WHMIS was updated to align with the Globally Harmonized System for Classification and Labelling of Chemicals, or GHS (WHMIS 2015). GHS is an internationally agreed-upon system, which is part of a broader initiative to implement a world-wide system of classification of chemicals and provide information about their hazards.

WHMIS 2015 has four components:

1. Identification (classification) of hazardous products,
2. Labels,
3. Safety Data Sheets (SDSs), and
4. Worker Education and Training.

## Identification (Classification) of Hazardous Products

WHMIS 2015 applies to "hazardous products". A hazardous product is any product that meets the criteria to be classified in a category or subcategory of one or more of the hazard classes as described in the federal *Hazardous Products Regulations* (HPR).

WHMIS 2015 applies to two major groups of hazards:

- physical hazards, and
- health hazards.

Each hazard group includes hazard classes that address specific hazardous properties. The WHMIS 2015 hazard classes are listed in Table 1.

**Table 1: WHMIS 2015 Hazard Classes****Physical Hazard Classes**

Combustible Dusts
Corrosive to Metals
Flammable Aerosols
Flammable Gases
Flammable Liquids
Flammable Solids
Gases Under Pressure
Organic Peroxides
Oxidizing Gases
Oxidizing Liquids
Oxidizing Solids
Pyrophoric Gases
Pyrophoric Liquids
Pyrophoric Solids
Self-Heating Substances and Mixtures
Self-Reactive Substances and Mixtures
Simple Asphyxiants
Substances and Mixtures Which, in Contact with Water, Emit Flammable Gases
Physical Hazards Not Otherwise Classified

**Health Hazard Classes**

Acute Toxicity
Aspiration Hazard
Biohazardous Infectious Materials
Carcinogenicity
Germ Cell Mutagenicity
Reproductive Toxicity
Respiratory or Skin Sensitization
Serious Eye Damage/Eye Irritation
Skin Corrosion/Irritation
Specific Target Organ Toxicity - Repeated Exposure
Specific Target Organ Toxicity - Single Exposure
Health Hazards Not Otherwise Classified

(Image provided by CCOHS 2015)

Each hazard class contains at least one category. Most hazard categories are assigned a number (e.g., 1, 2). In a few hazard classes, the categories are referred to as “types”. Types are assigned an alphabetical letter (e.g., A, B, etc.). In a few cases, sub-categories are also specified. Subcategories are identified with a number and a letter (e.g., 1A, 1B).

**Hazard Group** → **Hazard Class** → **Hazard Category**

The category tells you about how hazardous the product is within a hazard class:

- Category 1 is always the greatest (most) level of hazard within a class.
  - If Category 1 is further divided, Category 1A within the same hazard class is a greater hazard than Category 1B.
- Category 2 within the same hazard class is more hazardous than Category 3, and so on.

Some hazard classes (for example, pyrophoric gases, pyrophoric liquids, pyrophoric solids, aspiration hazard) have only one category.

Most hazard classes have a pictogram assigned to them. A few hazard classes have more than one pictogram (that is, one pictogram is used for certain categories, and a different pictogram is used for other categories). Some hazard classes and some categories within a hazard class do not have a pictogram (for example, combustible dusts, simple asphyxiants, and flammable liquids – Category 4).

Table 2 provides a list of pictograms and their associated hazards. For the Physical and Health Hazards Not Otherwise Classified hazard classes, the supplier must use a WHMIS 2015 pictogram appropriate for the hazard. The Glossary for this document provides a brief description of each hazard class.

**Table 2: WHMIS 2015 Pictograms and their Associated Hazards**

WHMIS 2015	Types of Hazards
	<b>Gases under pressure</b>
	<b>Flammables</b> (gases, aerosols, liquids, solids), <b>Pyrophoric</b> (liquids, solids, gases), <b>Self-reactive substances and mixtures</b> , <b>Self-heating substances and mixtures</b> , <b>Substances and mixtures which, in contact with water, emit flammable gases</b> , <b>Organic peroxides</b>
	<b>Oxidizing</b> (liquids, solids, gases)
	<b>Acute toxicity</b> (fatal or toxic)
	<b>Carcinogenicity; Germ cell mutagenicity; Respiratory sensitization; Reproductive toxicity; Specific target organ toxicity - single exposure, Specific target organ toxicity - repeated exposure; Aspiration hazard</b>
	<b>Acute toxicity</b> (harmful); <b>Skin irritation; Eye irritation; Skin sensitization; Specific target organ toxicity - single exposure</b> (respiratory irritation or drowsiness or dizziness)
	<b>Corrosive to metals; Skin corrosion; Serious eye damage</b>
	<b>Self-reactive substances and mixtures, Organic peroxides</b>
	<b>Biohazardous infectious materials</b>

(Image provided by CCOHS 2015)

WHMIS 2015 **does not** incorporate the GHS Explosives and Environmental Hazard classes, which use the pictograms shown in Table 3. However, suppliers can choose to include these hazard classes if they wish.

**Table 3: GHS Pictograms for Explosives and Environmental Hazards**

	Explosives
	Hazardous to the aquatic environment
	Hazardous to the ozone layer

(Image provided by CCOHS 2015)

There are some types of products that are partially or completely excluded from WHMIS 2015 requirements. The following types of products are completely excluded:

- any wood or product made of wood,
- tobacco or a tobacco product as defined in section 2 of the *Tobacco Act (Canada)*,
- hazardous waste, being a hazardous product that is sold for recycling or recovery or is intended for disposal,
- a manufactured article, as defined in section 2 of the *Hazardous Products Act (Canada)*, or
- products handled or transported pursuant to the *Transportation of Dangerous Goods Act (Canada)*.

Types of products that are partially excluded (no requirement for a WHMIS label or SDS) include:

- any pest control product, as defined in subsection 2(1) of the *Pest Control Products Act (Canada)*,
- any explosive, as defined in section 2 of the *Explosives Act (Canada)*,
- any cosmetic, device, drug or food, as defined in section 2 of the *Food and Drugs Act (Canada)*,
- any consumer product, as defined in section 2 of the *Canada Consumer Product Safety Act (Canada)*, or
- Nuclear substance, within the meaning of the *Nuclear Safety and Control Act (Canada)*, that is radioactive.

## Labels

There are two types of WHMIS 2015 labels – supplier labels and work site labels. Employers must ensure that a hazardous product or its container are labeled appropriately.

### Supplier Labels

Supplier labels appear on hazardous products purchased from suppliers. The information on the label must be provided in both English and French. See Figure 1 for a sample supplier label.

Supplier labels provide information about the hazards of a product and how to handle it safely. This information is standardized and is based on the hazard classes assigned to the product. The seven label elements that must be included on a supplier label (if applicable) include:

1. Product identifier,
2. Initial supplier identifier,
3. Pictogram(s),
4. Signal word,
5. Hazard statement(s),
6. Precautionary statement(s), and
7. Supplemental label information.

Here is more information on each of the label information elements.

*Product Identifier* - the brand name, chemical name, common name, generic name or trade name of the product. The product identifier on the label must exactly match the product identifier given on the SDS.

*Initial Supplier Identifier* – the name, address and telephone number of the Canadian manufacturer, the Canadian importer, or the Canadian distributor. If the hazardous product is imported ONLY for use in the importer's own workplace, the foreign supplier identifier may be retained.

*Pictogram* - the hazard symbol within a red "square set on one of its points". The Biohazardous Infectious Materials pictogram consists of the biohazard symbol within a round black border.

*Signal Word* – the word "Danger" or "Warning" is used to alert the user to a potential hazard. "Danger" is used for the more severe hazards, while "Warning" is used for less severe hazards.

*Hazard Statement* - a phrase assigned to a hazard class and category that describes the nature of the hazard including, where appropriate, the degree of hazard. A label may have more than one hazard statement because a hazard statement is required for each hazard class and category in which a hazardous product is classified.

*Precautionary Statement* - a phrase that describes recommended measures that should be taken to minimize or prevent adverse effects resulting from exposure to a hazardous product or resulting from improper storage or handling of a hazardous product. There are five types of precautionary statements: general, prevention, response (including first aid and fire), storage and disposal.

*Supplemental label information* – Some supplemental information may be required on the label. For example, mixtures that are classified in the Acute Toxicity hazard class, and contain 1% or more of ingredients with unknown acute toxicity, must include a supplemental statement on the label indicating the percentage of the mixture that consists of the ingredient or ingredients with unknown acute toxicity. Labels may also include supplementary information about precautionary measures, hazards not yet included in WHMIS 2015, physical state, or route of exposure. However, this information must not be false, misleading or likely to create an erroneous impression, that is, it must not contradict or detract from the required information.

Note that the pictogram(s) signal word and hazard statement(s) must be grouped together on the label.

Labels must be updated by suppliers within 180 days when significant new data becomes available. However, if a sale is made within 180 days from the date upon which the significant new data became available, then the significant new data, and the date upon which it became available, must be provided in writing to the purchaser of the hazardous product. The term “significant new data” has a specific meaning and is defined in the glossary of this document.

There are some cases when the supplier label may contain less information. These situations include hazardous products in small containers (100 ml or less), samples of hazardous products sent to laboratories for analysis, bulk shipments and hazardous products sold without packaging of any sort, regardless of whether they are shipped or picked up at the supplier's location.

Employers must ensure that hazardous products received as bulk shipments or unpackaged products that do not have supplier labels attached to them are properly labelled in the workplace. When needed, employers can create a supplier label by referring to the information provided in Sections 1 and 2 of the SDS.

Figure 1: Sample WHMIS 2015 Supplier Label

## Product SHO-K1 / Produit SHO-K1




<p><b>Danger</b> Fatal if swallowed. Causes skin irritation.</p> <p><b>Precautions:</b> 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 in 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 contaminated clothing and wash it before reuse. IF SWALLOWED: Immediately call a POISON CENTRE or doctor. Rinse mouth.</p>	<p><b>Danger</b> Mortel en cas d'ingestion. Provoque une irritation cutanée.</p> <p><b>Conseils :</b> Porter des gants de protection. Se laver les mains soigneusement après manipulation. Ne pas manger, boire ou fumer en manipulant ce produit.</p> <p>Garder sous clef. Éliminer le contenu/récipient 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 un avis médical/consulter un médecin. Enlever les vêtements contaminés et les laver avant réutilisation. EN CAS D'INGESTION : Appeler immédiatement un CENTRE ANTIPOISON ou un médecin. Rincer la bouche.</p>
--	--

ABC Chemical Co., 123 rue Anywhere St., Mytown, ON NON ONO (123) 456-7890

(Image provided by CCOHS 2015)

### Work site labels

Work site labels (see Figure 2 for an example) appear on hazardous products that have been transferred from the suppliers' containers to workplace containers, on hazardous products manufactured at the workplace, and on hazardous products imported and received without a supplier label. Work site labels may also be used to replace supplier labels that have been damaged or have become unreadable and for unpackaged hazardous products.

Work site labels are less detailed than supplier labels and only require three types of information:

1. Name of the hazardous product (must match the SDS product identifier),
2. Information for the safe handling of the hazardous product (may include pictograms or other supplier label information), and
3. Reference to the SDS for further information, if available.

**Figure 2: Sample WHMIS 2015 Work site label**



(Image provided by CCOHS 2015)

Work site labels must be updated as soon as significant new data is provided to the employer from the supplier or as soon as significant new data is available to the employer. If an imported hazardous product is imported only for use in the importer's own workplace, the foreign supplier identifier may be retained.

In a few special cases, a form of clear identification such as the name of the product, colour coding or a numbering system may be used instead of a work site label. These cases include hazardous products:

- in pipes, reaction vessels, ore cars, tank trucks, tank cars,
- on conveyor belts,
- in or on other in-plant conveyance systems, or
- transferred into workplace containers for use by one worker only and used up during the shift on which the container was filled.

Employers are required to teach workers about any of the label variations they might see at their workplace.

## Safety Data Sheets (SDSs)

Safety data sheets (SDSs) provide more detailed information than the label about a hazardous product's properties, its hazards, and how to work safely with it. Always read the SDS before you use any hazardous product. Your employer is required to provide education and training that will help you understand and use the information provided on the SDS.

The WHMIS 2015 SDS has a standardized format of 16 sections, with specific information required for most sections. Table 4 shows the 16 sections and the minimum information that must be included under each heading.

An employer is required to have an SDS for every hazardous product included under WHMIS 2015 used in the workplace, and to make SDSs readily available to workers. A worker cannot use a product if there is no SDS. Employers must also prepare SDSs for any hazardous product that they produce. SDSs generated by an employer must include the information required for a supplier SDS and must state that the supplier SDS is available at the work site.

The employer must ensure that the SDS for a hazardous product is the most current version. SDSs must be updated by suppliers as soon as reasonably practicable and not more than 90 days after the significant new data becomes available.

The SDS must include the "Initial Supplier Identifier" and "Date of Latest Revision". These details allow you to get more information from the supplier about the product if you need it, and help you know that you have the most recent SDS available.

The SDSs for all hazardous products workers may be exposed to at a workplace must be kept in a place where workers, and the joint work site health committee or health and safety representative, have easy access to them. If you do not know where they are kept, ask your supervisor.

An SDS does not necessarily list all of a product's ingredients. The ingredient disclosure depends on factors such as whether the hazardous product is a substance or a mixture, the hazard class(es) assigned, and the amount of the ingredient in the mixture. Sometimes confidential business information (CBI or trade secret) rules can apply to ingredient disclosure. See the Confidential Business Information section below for more information.

Table 4: Minimum SDS Content

SDS Section and Heading		Specific Information Elements
1	Identification	<ul style="list-style-type: none"> <li>• Product identifier (name exactly as on the label)</li> <li>• Other means of identification</li> <li>• Recommended use and restrictions on use</li> <li>• Canadian supplier identifier (Name, address and telephone number)+</li> <li>• Emergency telephone number and any restrictions on the use of that number, if applicable</li> </ul>
2	Hazard identification	<ul style="list-style-type: none"> <li>• Classification (hazard class and category or subcategory) of the hazardous product, or a description of the identified hazard for Physical or Health Hazards Not Otherwise Classified.</li> <li>• Label elements: <ul style="list-style-type: none"> <li>○ symbol - symbol image or the name of the symbol (e.g., flame),</li> <li>○ signal word,</li> <li>○ hazard statement(s),</li> <li>○ precautionary statement(s),</li> <li>○ other known hazards known to the supplier which do not result in classification (e.g., molten metal hazard).</li> </ul> </li> </ul>
3	Composition/ Information on ingredients	<ul style="list-style-type: none"> <li>• When a hazardous product is a <b>material or substance</b>: <ul style="list-style-type: none"> <li>○ its chemical name,</li> <li>○ its common name and synonyms,</li> <li>○ its Chemical Abstract Service (CAS) registry number and any unique identifiers,</li> <li>○ the chemical name of impurities, stabilizing solvents and/or stabilizing additives.*</li> </ul> </li> <li>• When a hazardous product is a mixture, for each material or substance in the <b>mixture</b> that, individually, is classified in a health hazard class**: <ul style="list-style-type: none"> <li>○ its chemical name,</li> <li>○ its common name and synonyms,</li> <li>○ its CAS registry number and any unique identifiers,</li> <li>○ its concentration.</li> </ul> </li> </ul> <p>NOTE: Confidential business information rules can apply</p>
4	First-aid measures	<ul style="list-style-type: none"> <li>• First-aid measures by route of exposure: <ul style="list-style-type: none"> <li>○ inhalation,</li> <li>○ skin contact,</li> <li>○ eye contact,</li> </ul> </li> </ul>

SDS Section and Heading		Specific Information Elements
		<ul style="list-style-type: none"> <li>○ ingestion</li> <li>• Most important symptoms and effects (acute or delayed)</li> <li>• An indication of immediate medical attention and special treatment, if necessary</li> </ul>
5	Fire-fighting measures	<ul style="list-style-type: none"> <li>• Suitable and unsuitable extinguishing media</li> <li>• Specific hazards arising from the hazardous product (e.g., hazardous combustion products)</li> <li>• Special protective equipment and precautions for firefighters</li> </ul>
6	Accidental release measures	<ul style="list-style-type: none"> <li>• Personal precautions, protective equipment and emergency procedures</li> <li>• Methods and materials for containment and cleaning up</li> </ul>
7	Handling and storage	<ul style="list-style-type: none"> <li>• Precautions for safe handling</li> <li>• Conditions for safe storage (including incompatibilities)</li> </ul>
8	Exposure controls/ Personal protection	<ul style="list-style-type: none"> <li>• Control parameters, including occupational exposure limit values or biological limit values and the source of those values</li> <li>• Appropriate engineering controls</li> <li>• Individual protection measures (e.g., personal protective equipment)</li> </ul>
9	Physical and chemical properties	<ul style="list-style-type: none"> <li>• Appearance (e.g., physical state, colour)</li> <li>• Odour</li> <li>• Odour threshold</li> <li>• pH</li> <li>• Melting point and freezing point</li> <li>• Initial boiling point and boiling range</li> <li>• Flash point</li> <li>• Evaporation rate</li> <li>• Flammability (for solids and gases)</li> <li>• Upper and lower flammability or explosive limits</li> <li>• Vapour pressure</li> <li>• Vapour density</li> <li>• Relative density</li> <li>• Solubility</li> <li>• Partition coefficient - n-octanol/water</li> <li>• Auto-ignition temperature</li> <li>• Decomposition temperature</li> <li>• Viscosity</li> </ul>
10	Stability and reactivity	<ul style="list-style-type: none"> <li>• Reactivity</li> <li>• Chemical stability</li> </ul>

SDS Section and Heading		Specific Information Elements
		<ul style="list-style-type: none"> <li>• Possibility of hazardous reactions</li> <li>• Conditions to avoid (e.g., static discharge, shock, or vibration)</li> <li>• Incompatible materials</li> <li>• Hazardous decomposition products</li> </ul>
11	Toxicological information	<ul style="list-style-type: none"> <li>• Concise but complete description of the various toxic health effects and the data used to identify those effects, including:               <ul style="list-style-type: none"> <li>○ information on the likely routes of exposure (inhalation, ingestion, skin and eye contact),</li> <li>○ symptoms related to the physical, chemical and toxicological characteristics,</li> <li>○ delayed and immediate effects, and chronic effects from short-term and long-term exposure, and</li> <li>○ numerical measures of toxicity, including Acute Toxicity Estimate (ATEs).</li> </ul> </li> </ul>
12	Ecological information <i>(heading required; content optional)</i>	<ul style="list-style-type: none"> <li>• Ecotoxicity</li> <li>• Persistence and degradability</li> <li>• Bioaccumulative potential</li> <li>• Mobility in soil</li> <li>• Other adverse effects</li> </ul>
13	Disposal considerations <i>(heading required; content optional)</i>	<ul style="list-style-type: none"> <li>• Information on safe handling for disposal and methods of disposal, including any contaminated packaging</li> </ul>
14	Transport information <i>(heading required; content optional)</i>	<ul style="list-style-type: none"> <li>• United Nations (UN) number</li> <li>• UN proper shipping name</li> <li>• Transport hazard class(es)</li> <li>• Packing group</li> <li>• Environmental hazards</li> <li>• Transport in bulk, if applicable</li> <li>• Special precautions</li> </ul>
15	Regulatory information <i>(heading required; content optional)</i>	<ul style="list-style-type: none"> <li>• Safety, health and environmental regulations, made within or outside Canada, specific to the product</li> </ul>
16	Other information	<ul style="list-style-type: none"> <li>• Date of the latest revision of the SDS</li> </ul>

**Notes:**

+ The supplier that must be identified on an SDS is the initial supplier identifier (the name, address and telephone number of either the Canadian manufacturer or the Canadian importer). There are two exceptions to this requirement:

1. When an importer imports a hazardous product for use in their own workplace in Canada (the importer is not selling the hazardous product), the importer may retain the name, address and telephone number of the foreign supplier on the SDS instead of replacing it with their own contact information.
2. When a hazardous product is being sold by a Canadian distributor, the distributor may replace the name, address and telephone number of the initial supplier with their own contact information.

\* These impurities, stabilizing solvents and/or stabilizing additives are those that are individually classified in a health hazard class and that contribute to the classification of the material or substance.

\*\* The SDS must disclose each ingredient in the mixture that is classified in a health hazard class and is present above the concentration limit that is designated for that category or subcategory OR is present in the mixture at a concentration that results in the mixture being classified in any health hazard class.

## Preventive Measures

The following sections in an SDS provide information especially useful for the protection of workers.

- **Section 6, Accidental Release Measures**, includes information on the appropriate response in the event of a spill, leak, or release of the hazardous product.
- **Section 7, Handling and Storage**, describes the precautions to be followed for safe handling of the product. Conditions for safe storage include how to avoid hazards (e.g., corrosive conditions, fire hazards, incompatible materials) during storage.
- **Section 8, Exposure Controls/Personal Protection**, includes the category Individual Protection Measures which lists the clothing or equipment that a worker handling a hazardous product wears to reduce or prevent exposure to the product (e.g., coveralls, face shields, aprons, gloves or respirators). The exact type of gloves and respirator should be specified, for example, “vinyl gloves” or “organic vapour cartridge respirator”.

Also in Section 8, the category Appropriate Engineering Controls includes methods for eliminating or reducing chemical hazards, such as the enclosure of processes to prevent the release of hazardous materials, or local exhaust ventilation to remove airborne contaminants at their point(s) of generation.

Much of the information on an SDS is self-explanatory, but some terms may be unfamiliar. A number of SDS terms are explained briefly in the Glossary of this document.

## Confidential Business Information (CBI)

Certain information does not have to be disclosed on a WHMIS 2015 SDS and/or label if the supplier or employer believes that including the information could affect (hurt) their business. The supplier or employer must file a claim with Health Canada and Health Canada must approve the claim.

Subject to Health Canada approval, suppliers or employers may file a claim to withhold the identity and/or concentration of one or more ingredients of a hazardous product including the names of toxicological studies that would identify those ingredients.

Employers may also withhold the name of a hazardous product, and information that could be used to identify the supplier of a hazardous product.

If confidential business information has been withheld, it will be replaced on the SDS and/or label by the:

- *Hazardous Materials Information Review Act* (HMIRA) registry number, and
- the date when Health Canada was notified of the claim of confidential business information (Date Filed) or the date when Health Canada accepted the claim (Date Granted).

If the supplier has withheld the identity of an ingredient, the generic name of the ingredient must be disclosed on the SDS.

Hazard information, required in other sections of the SDS must still be provided on the ingredients.

As part of the claim evaluation process, the SDS and, if applicable, the label are reviewed to make sure that all the necessary hazard information is included. Hazard information can never be withheld as confidential business information.

The confidential business information, if available, must be given by the employer to a medical professional for the purposes of diagnosis or emergency treatment.

## Worker Education and Training

The fourth component of the WHMIS system, worker training, helps workers understand WHMIS 2015 information so they can work safely with hazardous products. This education and training explains the WHMIS 2015 system and gives workers specific training related to the hazardous products they work with, may be exposed to, or are involved in producing.

Employers must provide worker training for WHMIS 2015 for workers if they work with or near a hazardous product. The training and education must be tailored to the hazardous products at the work site and must be developed in conjunction with the joint work site health and safety committee or health and safety representative if there is one.

The training must include general information such as how WHMIS 2015 works and the hazards of the products. For example, workers will learn about the hazard classes (e.g., why a product is described with the words “causes severe skin burns and eye damage”, and what other information about skin corrosion - Category 1 is found on the label and SDS).

Workers must also be trained on the site- and job-specific information that covers workplace procedures for storage, handling, use, disposal, emergencies, spills, and what to do in unusual situations for the hazardous products that are used at the workplace.

Don't be surprised if you're given a test or asked questions after the education and training is over. You should be able to answer these questions for every hazardous product you work with:

- What are the hazards of the product?
- How do I protect myself from those hazards?
- What do I do in case of an emergency?
- Where can I get further information?

Your employer is just trying to find out if you understood all the things you were taught or if you need further training.

For more information see [WHMIS.org](http://WHMIS.org).

## Glossary

Note: The definitions provided in this glossary are not always identical to the regulatory definitions provided in the HPA or HPR. If you are responsible for compliance, please consult the Act and Regulations at the following links, respectively:

<http://laws-lois.justice.gc.ca/eng/acts/H-3/index.html>

<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2015-17/index.html>

**Acute** – means sudden or brief. “Acute” can describe either the duration (length) of an exposure or a health effect. An acute exposure is a short-term exposure (lasting for minutes, hours or days). An acute health effect is an effect that develops immediately or within minutes, hours or even days after an exposure. (See also “Chronic”.)

**Acute toxicity** – hazardous products classified in this hazard class cause fatal, toxic or harmful effects if swallowed, in contact with skin and/or if inhaled. Acute toxicity refers to adverse effects following:

- oral (swallowing) or dermal (skin) administration of a single dose, or multiple doses given within 24 hours, or
- an inhalation exposure of 4 hours or of a duration that is converted to four hours. Acute inhalation toxicity could result from exposure to the hazardous product itself, or to a product that, upon contact with water, releases a gaseous substance that is able to cause acute toxicity. (See also “LC<sub>50</sub>” and “LD<sub>50</sub>”.)

**Acute Toxicity Estimate (ATE)** – a numerical value that is used to evaluate acute toxicity. For an ingredient, the ATE is the LC<sub>50</sub> or the LD<sub>50</sub>, if available, or a converted acute toxicity point estimate that is based on an experimentally obtained range or the classification category. For a mixture, the ATE is calculated for oral, dermal and inhalation toxicity based on the ATE values for all relevant ingredients and the percentage concentration in the product.

**Aspiration hazards** – hazardous products classified in this hazard class may be fatal if the hazardous product is swallowed and enters the airways. Aspiration toxicity includes severe acute effects, such as chemical pneumonia, varying degrees of pulmonary injury or death, following the entry of a liquid or solid directly through the mouth or nose, or indirectly from vomiting, into the trachea and lower respiratory system.

**Biohazardous infectious materials** – hazardous products that are classified in this hazard class are microorganisms, nucleic acids or proteins that cause or are a probable cause of infection, with or without toxicity, in humans or animals.

**Canadian Centre for Occupational Health and Safety (CCOHS)** – an occupational health and safety information service with the mandate to promote workplace health and safety, and encourage attitudes and methods that will lead to improved worker physical and mental health. CCOHS provides a wide range of products and services, including free access to a large collection of factsheets on occupational health and safety topics - [www.ccohs.ca](http://www.ccohs.ca).

**Carcinogenicity** – hazardous products classified in this hazard class may cause cancer or are suspected of causing cancer. These products are liable to lead to cancer or increase the incidence of cancer.

**CAS Registry Number** – the Chemical Abstracts Service Registry Number. This identification number is assigned to a chemical by the Chemical Abstracts Service, a division of the American Chemical Society.

**Chronic** – means long-term or prolonged. “Chronic” can describe either the length (duration) of an exposure or a health effect. A chronic exposure is a long-term exposure (lasting for months or years). A chronic health effect is an adverse health effect resulting from long-term exposure or a persistent adverse health effect resulting from a short-term exposure.

**Combustible dusts** – hazardous products classified in this hazard class may form combustible dust concentrations in air. These products are in the form of finely divided solid particles that, upon ignition, are liable to catch fire or explode when dispersed in air.

**Combustible liquids** – combustible liquids are included in the Flammable Liquids hazard class. Combustible liquids will not ignite or burn as readily as Flammable Liquids.

**Confidential business information (CBI)** – also known as “trade secrets” - certain information does not have to be disclosed on a WHMIS 2015 SDS and/or label if the supplier or employer believes that providing the information could affect (hurt) their business. Health Canada must approve the claim, which must follow the rules set out under the *Hazardous Materials Information Review Act*. CBI examples include the chemical identity or concentration of an ingredient in a hazardous product.

**Control Parameters** – includes occupational exposure limits (the airborne concentration of a substance that must not be exceeded in workplace air) and biological limit values. Depending on their source, occupational exposure limit values have different names and often have different numerical values.

**Corrosive to metals** – hazardous products classified in this hazard class are liable to damage or destroy metal by chemical action.

**Engineering controls** – controls used to separate a worker from a hazard. These controls include design of or modifications to plants, equipment, or processes to reduce or eliminate hazards (e.g., process enclosure, isolation of an emission source, or ventilation).

**Eye irritation** – hazardous products classified for Eye irritation, as part of the Serious eye damage/eye irritation hazard class, produce changes in the eye which are fully reversible within 21 days. Effects could include redness, itching or swelling.

**Flammable** – able to ignite (catch fire) easily.

**Flammable aerosols** – hazardous products classified in this hazard class contain one or more flammable components in an aerosol dispenser and that, when dispensed, are liable to ignite. Products that contain flammable components in an aerosol dispenser at a

concentration less than or equal to 1.0% and that have a heat of combustion less than 20 kJ/g are excluded from this hazard class.

**Flammable gases** – hazardous products classified in this hazard class are gases that have a flammable range when mixed with air (at 20 deg C and 101.3 kPa).

**Flammable liquids** – hazardous products classified in this hazard class are liquids that have a flash point of not more than 93 deg C.

**Flammable solids** – hazardous products classified in this hazard class are readily combustible solids or solids that are liable to cause or contribute to fire through friction. A “readily combustible solid” means a powdered, granular or pasty hazardous product that can be easily ignited by brief contact with an ignition source and, when ignited, has a flame that spread rapidly.

**Gases under pressure** – hazardous products classified in this hazard class are compressed gases, liquefied gases, dissolved gases, or refrigerated liquefied gases. Compressed gases, liquefied gases and dissolved gases may explode if heated. Refrigerated liquefied gases may cause cryogenic (severe cold) burns or injury.

**Germ cell mutagenicity** – hazardous products classified in this hazard class may cause or are suspected of causing genetic defects. These products are liable lead to an increased occurrence of mutations in the germ (reproductive) cells.

**Globally Harmonized System of Classification and Labelling of Chemicals (GHS)** – an international system that defines and classifies the hazards of chemical products, and communicates health and safety information on labels and SDSs in a standardized way. The GHS is developed through consensus at the United Nations. The GHS “purple book” is a guidance document. Only the elements of GHS that have been explicitly adopted in legislation (e.g., in the HPR) are enforceable.

**Hazard** – the potential for harmful effects. The hazards of a product are evaluated by examining the properties of the product, such as toxicity, flammability and chemical reactivity.

**Hazard class** – a way of grouping products together that have similar hazards or properties.

**Hazard category** – the subdivision within a hazard class that tells you about how hazardous the product is (the severity of hazard). Category 1 is always the greatest level of hazard (it is the most hazardous within that class). If Category 1 is further divided, Category 1A within the same hazard class is a greater hazard than category 1B. Category 2 within the same hazard class is more hazardous than category 3, and so on.

**Hazardous combustion product** – hazardous substance(s) formed when the product burns. These substances may be flammable, toxic, reactive and/or have other hazards.

**Hazardous decomposition product** – hazardous substance(s) that may be released when a product reacts with other substances, as a result of aging, reaction with airborne oxygen or moisture or exposure to light.

**Hazardous ingredient** – an ingredient in a mixture that, when evaluated as an individual substance according to the HPR, is classified in a category or subcategory of a health hazard class.

**Hazardous product** – a product, mixture, material or substance that meets the criteria to be classified in one or more of the hazard classes of the HPR.

**Health hazards not otherwise classified (HHNOC)** – hazardous products classified in this hazard class have a health hazard that is different from any other health hazard addressed in the HPR. These hazards must have the characteristic of occurring following acute or repeated exposure and having an adverse effect on the health of a person exposed to it, including an injury, or resulting in the death of that person. If a product is classified in this hazard class, the hazard statement on the label and SDS will describe the nature of the hazard.

**HPA** – the *Hazardous Products Act*

**HPR** – the *Hazardous Products Regulations*

**Incompatible materials** – substances which, when combined with a hazardous product, could react to produce a hazardous situation (e.g., explosion, release of toxic or flammable materials, liberation of excessive heat).

**Individual Protection Measures (or Personal protective equipment (PPE))** – the clothing or equipment that a worker handling a hazardous product wears to reduce or prevent exposure to the product. Individual protection measures may include coveralls, face shields, aprons, gloves or respirators.

**LC<sub>50</sub> (Lethal Concentration<sub>50</sub>)** – the airborne concentration of a substance or mixture that causes the death of 50 per cent of the group of animals in tests that measure the ability of a substance or mixture to cause poisoning when it is inhaled. These tests are usually conducted over a 4-hour period. The LC<sub>50</sub> is usually expressed as parts of test substance or mixture per million parts of air (ppm) for gases, or as milligrams of test substance or mixture per litre of air (mg/l) for dusts, mists or vapours.

**LD<sub>50</sub> (Lethal Dose<sub>50</sub>)** – the single dose of a substance or mixture that causes the death of 50 per cent of the group of animals in tests that measure the ability of a substance or mixture to cause poisoning when it is swallowed (oral exposure) or absorbed through the skin (dermal exposure). The LD<sub>50</sub> can vary depending on factors such as the species of animal tested and by the route of entry. The LD<sub>50</sub> is usually expressed as milligrams of substance or mixture per kilogram of test animal body weight (mg/kg).

**Manufactured article** – an article that:

- is formed to a specific shape or design during manufacture, the intended use of which is dependent in whole or in part on the shape or design, and
- will not release or otherwise cause an individual to be exposed to a hazardous product when being installed, if the intended use of the article requires it to be installed, or under normal conditions of use.

Examples of manufactured articles include a screwdriver, a refrigerator, or an empty cylinder.

**Organic peroxides** – hazardous products classified in this hazard class are reactive and may cause a fire or explosion if heated. Organic peroxide means an organic (carbon containing) liquid or solid that contains two oxygen atoms joined together (the bivalent -O-O structure).

**Oxidizing gases, Oxidizing liquids, or Oxidizing solids** – hazardous products classified in these hazard classes may cause or intensify a fire, or cause a fire or explosion. Oxidizing gases are liable to cause or contribute to the combustion of other material more than air does. Oxidizing liquids and Oxidizing solids are liable to cause or contribute to the combustion of other material.

**Personal protective equipment (PPE)** – the clothing or equipment that a worker handling a hazardous product wears to reduce or prevent exposure to the product. Individual protection measures may include coveralls, face shields, aprons, gloves or respirators.

**Physical hazards not otherwise classified (PHNOC)** – hazardous products classified in this hazard class present a physical hazard that is different from any other physical hazard addressed in the HPR. These hazards must have the characteristic of occurring by chemical reaction and resulting in the serious injury or death of a person at the time the reaction occurs. If a product is classified in this hazard class, the hazard statement on the label and SDS will describe the nature of the hazard.

**Pyrophoric gases, Pyrophoric liquids, or Pyrophoric solids** – hazardous products classified in these hazard classes can catch fire spontaneously (very quickly) if exposed to air. Pyrophoric liquids and Pyrophoric solids are liable to ignite within five minutes after coming into contact with air. Pyrophoric gases are liable to ignite spontaneously in air at a temperature of 54 deg C or less.

**Reproductive toxicity** – hazardous products classified in this hazard class may damage or are suspected of damaging fertility and/or the unborn child (baby). This hazard class has an additional category for products that may cause harm to breast-fed children. Reproductive toxicity refers to:

- adverse effects on sexual function and fertility
- adverse effects on the development of the embryo, fetus or offspring, or
- effects on or via breast feeding

**Respiratory or skin sensitization** – see “Respiratory sensitizers” and/or “Skin sensitizers”.

**Respiratory sensitizers** – hazardous products classified as respiratory sensitizers, as part of the Respiratory or Skin sensitization hazard class, may cause allergy or asthma symptoms or breathing difficulties if inhaled. These products are liable to lead to hypersensitivity (increased sensitivity) of the airways following inhalation.

**Route of exposure** – refers to the way in which a product can enter the body. Workplace chemicals can affect the body if inhaled, following skin contact (including absorption through

the skin) or eye contact, and if ingested (swallowed).

**Self-heating substances and mixtures** – hazardous products classified in this hazard class may catch fire, or in large quantities, may catch fire. These solid or liquid products are liable to self-heat by reaction with air and without energy supply. These products differ from pyrophoric substances in that they will ignite only after a longer period of time or when in large amounts.

**Self-reactive substances and mixtures** – hazardous products classified in this hazard class may cause a fire or explosion if heated.

**Serious eye damage/eye irritation** – see “Serious eye damage” and/or “Eye irritation”.

**Serious eye damage** – hazardous products classified for Serious eye damage, as part of the Serious eye damage/eye irritation hazard class, can produce tissue damage in the eye or serious physical decay of vision that is irreversible or not fully reversed within 21 days. Effects could include permanently impaired vision or blindness.

**Significant new data** – is new data regarding the hazard presented by a hazardous product that:

- changes its classification in a category or sub-category of a hazard class, or
- results in its classification in another hazard class, or
- changes the ways to protect against the hazard presented by the hazardous product.

**Simple asphyxiants** – hazardous products classified in this hazard class may displace oxygen in air and cause rapid suffocation. These products are gases that are liable to cause asphyxiation by the displacement of air.

**Skin corrosion/irritation** – see “Skin corrosion” and/or “Skin irritation”.

**Skin corrosion** – hazardous products classified for Skin corrosion, as part of the Skin corrosion/irritation hazard class, cause severe skin burns and eye damage. Skin corrosion means the production of irreversible damage to the skin, namely, visible necrosis (tissue death) through the epidermis and into the dermis (layers of the skin), and includes ulcers, bleeding, bloody scabs and, within a 14-day observation period, discolouration due to blanching of the skin, complete areas of alopecia (loss of hair), and scars.

**Skin irritation** – hazardous products that classify for Skin irritation, as part of the Skin corrosion/irritation hazard class, are liable to cause reversible damage to the skin. Effects could include redness, itching, or swelling.

**Skin sensitizers** – hazardous products that classify as Skin sensitizers, as part of the Respiratory or skin sensitization hazard class, may cause an allergic skin reaction. These products are liable to lead to an allergic response following skin contact.

**Specific target organ toxicity (STOT) - Repeated exposure** – hazardous products classified in this hazard class cause or may cause damage to organs (e.g., liver, kidneys or blood) following prolonged or repeated exposure to the product.

This means that repeated exposure to a hazardous product that causes health effects liable to impair body function. These effects can be reversible or irreversible, immediate or delayed. This hazard class excludes health hazards addressed by the Acute toxicity, Skin corrosion/irritation, Serious eye damage/eye irritation, Respiratory or skin sensitization, Germ cell mutagenicity, Carcinogenicity, Reproductive toxicity or Aspiration hazard classes.

**Specific target organ toxicity (STOT) - Single exposure** – hazardous products classified in this hazard class cause or may cause damage to organs (e.g., liver, kidneys, or blood) following a single exposure to the product. This hazard class also includes a category for products that cause transient (temporary) respiratory irritation, or transient (temporary) drowsiness or dizziness.

This means that specific, non-lethal toxic effects arise from a single exposure to a hazardous product including impairment of function. These effects can be reversible or irreversible, immediate or delayed. This hazard class excludes health hazards addressed by the Acute toxicity, Skin corrosion/irritation, Serious eye damage/eye irritation, Respiratory or skin sensitization, Germ cell mutagenicity, Carcinogenicity, Reproductive toxicity or Aspiration hazard classes.

**Substances and mixtures which, in contact with water, emit flammable gases** – hazardous products in this hazard class react with water to release flammable gases. In some cases, the flammable gases may ignite spontaneously (very quickly). These products are liquids and solids that, by interaction with water, are liable to become spontaneously flammable or give off flammable gases in dangerous quantities.

© 2018 Government of Alberta

This material is for information only. The information provided in this material is solely for the user's information and convenience and, while thought to be accurate and functional, it is provided without warranty of any kind. The Crown, its agents, employees or contractors will not be liable to you for any damages, direct or indirect, arising out of your use of the information contained in this material. If in doubt with respect to any information contained within this material, or for confirmation of legal requirements, please refer to the current edition of the *Occupational Health and Safety Act*, Regulation and Code or other applicable legislation. Further, if there is any inconsistency or conflict between any of the information contained in this material and the applicable legislative requirement, the legislative requirement shall prevail. This material is current to June 2018. The law is constantly changing with new legislation, amendments to existing legislation, and decisions from the courts. It is important that you and keep yourself informed of the current law. This material may be used, reproduced, stored or transmitted for non-commercial purposes. The source of this material must be acknowledged when publishing or issuing it to others. This material is not to be used, reproduced, stored or transmitted for commercial purposes without written permission from the Government of Alberta.