

GUIDE

WHMIS 2015 Information for Workers



Workplace
Hazardous Materials
Information System

Système d'information sur
les matières dangereuses
utilisées au travail



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INTRODUCTION

The letters W-H-M-I-S stand for “Workplace Hazardous Materials Information System.”

WHMIS is Canada’s national hazard communication system for hazardous products in the workplace. The system addresses hazardous products that are sold in or imported into Canada, and hazardous products that are meant to be used, handled or stored in Canadian workplaces.

WHMIS applies to suppliers, importers and distributors of hazardous products, and the employers and workers who use those products. WHMIS gives workers and employers the information they need to work safely.

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

WHMIS 2015 has four parts:

1. Identification (classification) of hazardous products
2. Labels
3. Safety Data Sheets (SDS)
4. Worker education and training



IDENTIFICATION (CLASSIFICATION) OF HAZARDOUS PRODUCTS

WHMIS 2015 applies to “hazardous products.” A hazardous product is any product that falls under a category or subcategory in one or more of the hazard classes 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 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

Tables are 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). In a few cases, subcategories 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 how hazardous the product is within a hazard class:

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

Some hazard classes (e.g., Pyrophoric gases, Pyrophoric liquids, Pyrophoric solids and Aspiration hazard) have only one category.

Most hazard classes have at least one pictogram assigned to them. A class has more than one pictogram when the categories under that class have different pictograms. Some hazard classes and some categories within a hazard class do not have a pictogram (e.g., Combustible dusts, Simple asphyxiants and Flammable liquids–Category 4).

Table 2 provides a list of the 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
	Gases under pressure
	Flammables (gases, aerosols, liquids, solids); Pyrophoric (liquids, solids, gases); Self-reactive substances and mixtures; Self-heating substances and mixtures; Substances and mixtures which, in contact with water, emit flammable gases; Organic peroxides
	Oxidizing (liquids, solids, gases)
	Acute toxicity (fatal or toxic)
	Carcinogenicity; Germ cell mutagenicity; Respiratory sensitization; Reproductive toxicity; Specific target organ toxicity – single exposure; Specific target organ toxicity – repeated exposure; Aspiration hazard
	Acute toxicity (harmful); Skin irritation; Eye irritation; Skin sensitization; Specific target organ toxicity – single exposure (respiratory irritation or drowsiness or dizziness)
	Corrosive to metals; Skin corrosion; Serious eye damage
	Self-reactive substances and mixtures; Organic peroxides
	Biohazardous infectious materials

Table is provided by CCOHS 2015.

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

Table 3: GHS pictograms for explosives and environmental hazards




	Explosives
	Hazardous to the aquatic environment
	Hazardous to the ozone layer

Table is provided by CCOHS 2015.

Completely and partially excluded products

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

The following types of products are completely excluded from WHMIS 2015 requirements:

- any wood or product made of wood
- tobacco or a tobacco product as defined in section 2 of the *Tobacco Act*
- a manufactured article, as defined in section 2 of the *Hazardous Products Act*
- products handled or transported pursuant to the *Transportation of Dangerous Goods Act*.

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

- any pest control product, as defined in subsection 2(1) of the *Pest Control Products Act*
- any explosive, as defined in section 2 of the *Explosives Act*
- any cosmetic, device, drug or food, as defined in section 2 of the *Food and Drugs Act*
- any consumer product, as defined in section 2 of the *Canada Consumer Product Safety Act*
- nuclear substance, within the meaning of the *Nuclear Safety and Control Act*, that is radioactive
- hazardous waste, i.e., a hazardous product that is sold for recycling or recovery or is intended for disposal. However, it must be clearly identified in the workplace.

Assessing risk and training workers for partially excluded products

Employers must still assess the risk, create safe work procedures and train workers to safely handle a chemical substance found in partially excluded products that may create a risk to the safety and health of a worker in the workplace (*Workplace Safety and Health Regulation*, M.R. 217/2006, Part 36).

Safety Data Sheets (SDSs) are often available for partially excluded products (e.g., consumer products). When SDSs are available, your employer should refer to them to learn the product's risks, develop safe work procedures and train workers. When SDSs are not available, employers must collect the hazard information on their own or ask an outside consultant for help.



LABELS

There are two types of *WHMIS 2015* labels: supplier labels and workplace labels.

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 a product's hazards and about handling the product safely. This information is standardized and it 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)
7. Supplemental label information

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

1. *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.
2. *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 kept on the label.
3. *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.
4. *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.
5. *Hazard statement* – a phrase assigned to a hazard class and category that describes the hazard, including the degree of hazard when appropriate. 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.
6. *Precautionary statement* – a phrase that describes actions that should be taken to minimize or prevent harm because of exposure to a hazardous product or because of 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.



7. *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 that contain one per cent or more of ingredients with unknown acute toxicity, must include a supplemental statement on the label indicating the percentage of the mixture that is made up 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. It must not contradict or take away from the required information.

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

Figure 1: Sample *WHMIS 2015* supplier label



Product SHO-K1 / Produit SHO-K1	
 	
Danger Fatal if swallowed. Causes skin irritation.	Danger Mortel en cas d'ingestion. Provoque une irritation cutanée.
Precautions: Wear protective gloves. Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product. Store locked up. Dispose of contents/containers in accordance with local regulations. IF ON SKIN: Wash with plenty of water. If skin irritation occurs: Get medical advice or attention. Take off contaminated clothing and wash it before reuse. IF SWALLOWED: Immediately call a POISON CENTRE or doctor. Rinse mouth.	Conseils : Porter des gants de protection. Se laver les mains soigneusement après manipulation. Ne pas manger, boire ou fumer en manipulant ce produit. Garder sous def. Éliminer le contenu/réceptacle conformément aux règlements locaux en vigueur. EN CAS DE CONTACT AVEC LA PEAU : Laver abondamment à l'eau. En cas d'irritation cutanée : Demander un avis médical/consulter un médecin. Enlever les vêtements contaminés et les laver avant réutilisation. EN CAS D'INGESTION : Appeler immédiatement un CENTRE ANTIPOISON ou un médecin. Rincer la bouche.
ABC Chemical Co., 123 rue Anywhere St., Mytown, ON NON ONO (123) 456-7890	

Figure is provided by CCOHS 2015.



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* is new data about the hazard presented by a hazardous product that:

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

Supplier labelling exceptions

There are some cases when the supplier label may contain less information. These situations include hazardous products in small containers (100 millilitres 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.

Hazardous products received as bulk shipments or unpackaged products that do not have supplier labels attached to them must be 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.

Workplace labels

Workplace labels (see figure 2 for an example) can be used on hazardous products:

- that have been transferred from the suppliers' containers to workplace containers
- manufactured at the workplace and for use in the workplace
- to replace supplier labels that have been damaged or have become unreadable
- imported by an employer, for use in their own workplace only, that do not have WHMIS-compliant supplier labels.

Workplace labels are less detailed than supplier labels and only need three types of information:

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



Figure 2: Sample *WHMIS 2015* workplace label



Figure is provided by CCOHS 2015.

Workplace label variations

In special cases, a form of clear identification such as the name of the product, a colour code or a numbering system may be used instead of a workplace label. Some examples include:

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

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

All workplace 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.



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 must provide education that will help you understand and use the information provided on the SDS. Your employer must also provide training in safe work procedures for the hazardous chemicals you use, handle and/or store in the course of your daily work.

The *WHMIS 2015* SDS has a standardized format of 16 sections, with specific information required for most sections. Table 3 shows the 16 sections and the minimum information that must be included under each heading. SDSs must be available in both English and French.

SDSs must be updated by suppliers within 90 days when *significant new data** becomes available. However, if sales are made during this period, the significant new data, and the date when it became available, must be provided to the buyer, in writing, along with the product's SDS at the time of sale.

*The term *significant new data* is new data about the hazard presented by a hazardous product that:

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

Keeping SDSs Current

Your employer must have the most current SDS for each hazardous product used in the workplace. Each current SDS must be readily available to the worker. Therefore, your employer must check the SDS with every shipment to see if there are changes because of significant new data about the product. Significant new data will be noted on a written document included with the SDS or by a new revision date on the SDS. In these circumstances the old SDS will have to be replaced with the updated one.

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.

In addition, workers must learn to compare the SDS and label for each hazardous product they use or handle in the course of their work activities. The product identifier in section 1 of the SDS and the label information in section 2 of the SDS should match the label information.

Employers must prepare an SDS for any hazardous product that they produce. When significant new data becomes available to an employer, SDSs prepared by the employer must be updated as soon as practical but not later than 90 days after the new hazard information becomes available.

Worker Access to SDSs

The SDSs for all hazardous products at a workplace must be kept in a place where workers have easy access to them. If you do not know where they are kept, ask your supervisor.

Your employer must have an SDS for every hazardous product included under *WHMIS 2015* that is used in the workplace, and must make SDSs readily available to workers. The following examples are acceptable ways for your employer to make SDSs readily available:

- a paper copy
- a readily accessible electronic file dedicated for the SDSs used, handled and stored in your workplace.

Please note that it is not acceptable for workers to only have access to the website address or hyperlink from which to download an SDS for a product.

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 *WHMIS 2015* SDS content

SDS section and heading		Specific information elements
1	Identification	<ul style="list-style-type: none">• Product identifier (name exactly as on the label)• Other means of identification• Recommended use and restrictions on use• Initial supplier identifier (name, address and telephone number of manufacturer or importer who operates in Canada)*• Emergency telephone number and any restrictions on the use of that number, if applicable
2	Hazard identification	<ul style="list-style-type: none">• 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• Label elements:<ul style="list-style-type: none">- symbol (symbol image or the name of the symbol [e.g., flame])- signal word- hazard statement(s)- precautionary statement(s)• Other known hazards known to the supplier which do not result in classification (e.g., molten metal hazard)



SDS section and heading		Specific information elements
3	Composition/ information on ingredients	<ul style="list-style-type: none"> • When a hazardous product is a material or substance: <ul style="list-style-type: none"> - its chemical name - its common name and synonyms - its Chemical Abstracts Service (CAS) registry number and any unique identifiers - the chemical name of impurities, stabilizing solvents and/or stabilizing additives** • When a hazardous product is a mixture, for each material or substance in the mixture that, individually, is classified in a health hazard class***: <ul style="list-style-type: none"> - its chemical name - its common name and synonyms - its CAS registry number and any unique identifiers - its concentration <p>NOTE: Confidential business information rules can apply</p>
4	First aid measures	<ul style="list-style-type: none"> • First aid measures by route of exposure (inhalation, skin contact, eye contact, ingestion) • Most important symptoms and effects (acute or delayed) • An indication of immediate medical attention and special treatment, if necessary
5	Firefighting measures	<ul style="list-style-type: none"> • Suitable and unsuitable extinguishing media • Specific hazards arising from the hazardous product (e.g., hazardous combustion products) • Special protective equipment and precautions for firefighters
6	Accidental release measures	<ul style="list-style-type: none"> • Personal precautions, protective equipment and emergency procedures • Methods and materials for containment and cleaning up
7	Handling and storage	<ul style="list-style-type: none"> • Precautions for safe handling • Conditions for safe storage (including incompatibilities)
8	Exposure controls/ personal protection	<ul style="list-style-type: none"> • Control parameters, including occupational exposure limit values or biological limit values and the source of those values • Appropriate engineering controls (e.g., ventilation) • Individual protection measures (e.g., personal protective equipment)

SDS section and heading	Specific information elements
9 Physical and chemical properties	<ul style="list-style-type: none"> • Appearance (e.g., physical state and colour) • Odour • Odour threshold • pH • Melting point and freezing point • Initial boiling point and boiling range • Flashpoint • Evaporation rate • Flammability (for solids and gases) • Upper and lower flammability or explosive limits • Vapour pressure • Vapour density • Relative density • Solubility • Partition coefficient – n-octanol/water • Auto-ignition temperature • Decomposition temperature • Viscosity
10 Stability and reactivity	<ul style="list-style-type: none"> • Reactivity • Chemical stability • Possibility of hazardous reactions • Conditions to avoid (e.g., static discharge, shock or vibration) • Incompatible materials • Hazardous decomposition products
11 Toxicological information	<p>Concise but complete description of the various toxic health effects and the data used to identify those effects, including:</p> <ul style="list-style-type: none"> • Information on the likely routes of exposure (inhalation, ingestion, skin and eye contact) • Symptoms related to the physical, chemical and toxicological characteristics • Delayed and immediate effects, and chronic effects from short term and long term exposure • Numerical measures of toxicity, including Acute Toxicity Estimates (ATEs)
12 Ecological information (heading required; content optional)	<ul style="list-style-type: none"> • Ecotoxicity • Persistence and degradability • Bioaccumulative potential • Mobility in soil • Other adverse effects



SDS section and heading	Specific information elements
13 Disposal considerations (heading required; content optional)	Information on safe handling for disposal and methods of disposal, including any contaminated packaging
14 Transport information (heading required; content optional)	<ul style="list-style-type: none"> • United Nations (UN) number • UN proper shipping name • Transport hazard class(es) • Packing group • Environmental hazards • Transport in bulk, if applicable • Special precautions
15 Regulatory information (heading required; content optional)	Safety, health and environmental regulations, made within or outside Canada, specific to the product
16 Other information	Date of the latest revision of the SDS

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 (i.e., 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 that is 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 to safely handle the product. Conditions for safe storage include how to avoid hazards (e.g., corrosive conditions, fire hazards and incompatible materials) during storage.
- **Section 8, Exposure controls/personal protection**, includes individual protection measures which list 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, e.g., “vinyl gloves” or “organic vapour cartridge respirator.”
- **Section 8, Appropriate engineering controls**, also 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 included on a *WHMIS 2015* SDS and/or label if the supplier or employer believes that including the information could affect or hurt their business. Health Canada must approve all confidential business information claims.

Subject to Health Canada approval, suppliers or employers may 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
- 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.

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.



WORKER EDUCATION AND TRAINING

WHMIS 2015 requires:

- the identification (classification) of hazardous products
- that hazardous products be labelled
- that SDSs be available to provide more detailed information about those products.

The fourth part of the WHMIS system, worker education and training, explains the *WHMIS 2015* system and gives workers specific safety training about the hazardous products they work with, are exposed to or produce.

Employers are required to provide worker education and training for *WHMIS 2015*.

Education refers to general information about *WHMIS 2015* and the hazards of the products WHMIS covers. 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 product’s label and SDS).

Training refers to site- and job-specific instructions that include safe work procedures.

Instructions will cover using, handling, storing and disposing of hazardous products. You will learn how to deal with emergencies, product spills and unusual situations.

You should expect to be tested on your knowledge after your 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?

You will be tested because your employer needs to know whether you understand WHMIS guidelines or if you need further job-specific training. In addition, workers are responsible for following the safe work procedures they have been instructed to use.

Please visit **WHMIS.org** for more information.



GLOSSARY

Note: The definitions provided in this glossary are not always identical to the regulatory definitions provided in the *Hazardous Products Act* (HPA) or in the *Hazardous Products Regulations* (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 they are swallowed, if they come into contact with skin and/or if they are inhaled. Acute toxicity refers to adverse effects following:

- a single exposure (either oral [swallowing] or dermal [skin contact]), or multiple exposures within 24 hours
- an inhalation (breathing) exposure of four hours or of a length that converts to four hours.

Acute inhalation toxicity could result from exposure to the hazardous product itself, or to a product that, when it contacts water, releases a gaseous substance that causes acute toxicity. (See also “LC₅₀” and “LD₅₀.”)

Acute Toxicity Estimate (ATE) – a numerical value that is used to evaluate acute toxicity. For an ingredient, the ATE is the LC₅₀ or the LD₅₀, 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 hazard – hazardous products classified in this hazard class may be fatal if the hazardous product is swallowed and enters the airway. Aspiration toxicity includes severe acute effects, such as chemical pneumonia, varying degrees of pulmonary injury or death. It happens when a liquid or solid enters the trachea and lower respiratory system either directly through the mouth or nose, or indirectly from vomiting.

Biohazardous infectious materials – hazardous products classified in this hazard class are micro-organisms, 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 fact sheets on occupational health and safety topics. Visit www.ccohs.ca for more information.

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 included 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* (HMIRA). 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 that, when dispensed, are liable to ignite. Products that contain flammable components in an aerosol dispenser at a concentration less than or equal to one per cent 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 C and 101.3 kPa).

Flammable liquids – hazardous products classified in this hazard class are liquids that have a flashpoint of not more than 93 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 spreads rapidly.



Gases under pressure – hazardous products classified in this hazard class are compressed gases, liquefied gases, dissolved gases or refrigerated liquefied gases. They consist of gases contained in receptacles under a pressure of 200 kPa or more at 20 C, gases that are liquefied, or gases that are liquefied and refrigerated. It excludes any gas that has an absolute vapour pressure of not more than 300 kPa at 50 C or that is not completely gaseous at 20 C and 101.3 kPa. 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 to increase 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 *Hazardous Products Regulations*) 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 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, subcategory 1A within the same hazard class is a greater hazard than subcategory 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 or reacting with airborne oxygen, or because of moisture or exposure to light.

Hazardous ingredient – an ingredient in a mixture that, when evaluated as an individual substance according to the *Hazardous Products Regulations*, 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 *Hazardous Products Regulations*.

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 *Hazardous Products Regulations* (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 or 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. The exact type of gloves and respirators should be specified, e.g., “vinyl gloves” or “organic vapour cartridge respirator.”

LC₅₀ (Lethal Concentration₅₀) – 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 four-hour period. The LC₅₀ 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.

LD₅₀ (Lethal Dose₅₀) – 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 LD₅₀ can vary depending on factors such as the species of animal tested and by the route of entry. The LD₅₀ 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
- 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) – see “Individual protection measures.”

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 *Hazardous Products Regulations* (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 C or less.



Reproductive toxicity – hazardous products classified in this hazard class may damage or are suspected of damaging fertility and/or an unborn child. 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
- effects on or via lactation.

Respiratory or skin sensitization – see “Respiratory sensitizers” and “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. These products are liable to undergo a strongly exothermic (producing heat and energy) decomposition, having a heat of decomposition equal to or greater than 300 J/g, even without participation of oxygen.

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 subcategory of a hazard class
- results in its classification in another hazard class
- 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 “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.

Specific target organ toxicity arising from repeated exposure means specific toxic effects will arise on target organs from repeated exposure to a hazardous product. The toxic effects include all health effects liable to impair the function of the body or any of its parts, whether reversible or irreversible, or 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.

Specific target organ toxicity arising from a single exposure to a hazardous product means specific, non-lethal toxic effects will arise on target organs from a single exposure to a hazardous product. The toxic effects include all health effects liable to impair the function of the body or any of its parts, whether reversible or irreversible, or 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.



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NOTES:





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