ALGONQUIN COLLEGE | Risk Management

WHMIS Program

OCCUPATIONAL HEALTH & SAFETY

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Accidental release measures – the steps to be taken in response to spills, leaks, or releases of a hazardous product to prevent or minimize adverse effects on people and property.

ACGIH® – see American Conference of Governmental Industrial Hygienists.

Acid, Acidic – See pH.

Acute – 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 “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.

Administrative controls – controls that alter the way the work is done, including timing of work, policies and other rules, and work practices such as standards and operating procedures (including training, housekeeping and equipment maintenance).

AIHA® – AIHA® stands for American Industrial Hygiene Association.

Alkali, Alkaline – see pH.

American Conference of Governmental Industrial Hygienists (ACGIH®) – an international association of occupational hygienists that develops guidelines for the practice of occupational hygiene, including Threshold Limit Values (TLVs®) and Biological Exposure Indices (BEIs®). This publication serves as the basis for occupational exposure limits in many jurisdictions around the world.

ANSI – ANSI stands for the American National Standards Institute.

Asphyxiant – see Simple asphyxiants.

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.

Auto-ignition temperature – the lowest temperature at which a product ignites when no spark or flame is present.

Base, Basic – See pH.

Bailment – the transfer of possession without transferring ownership. (See also “Sell”.)

Bioaccumulative potential - describes the potential for the substance or certain components of a mixture to accumulate in animal or plant life, and possibly pass through the food chain.

Biological Exposure Indices (BEIs®) - guidance values developed by ACGIH to assess biological monitoring results. Biological monitoring involves the measurement of the concentration of a chemical indicator (such as the substance itself or a chemical formed from the substance by the body) in body components (e.g., blood, urine) of people who have been exposed to the substance. Biological monitoring is used to indicate how much of the substance has been absorbed into the body. The BEI generally identifies a concentration below which nearly all workers should not experience adverse health effects.

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.

Boiling point – see Initial boiling point.

Bulk shipment - a shipment of a hazardous product that is contained in any of the following, without intermediate containment or intermediate packaging,

- a vessel that has a water capacity equal to or greater than 450 l,
- a freight container, road vehicle, railway vehicle or portable tank,
- the hold of a ship, or
- a pipeline.

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.

CANUTEC - CANUTEC stands for Canadian Transport Emergency Centre, which is operated by the Transportation of Dangerous Goods (TDG) Directorate of Transport Canada. CANUTEC provides information and communications assistance in case of transportation emergencies involving dangerous goods. It is accessible in Canada by telephone, 24 hours a day, year round at (613) 996-6666 (collect) or *666 on a cell phone.

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.

Ceiling (C) – See Occupational exposure limit values.

Chemical name – a scientific designation of a material or substance:

- that is made according to the naming rules of either the Chemical Abstracts Service, a division of the American Chemical Society, or the International Union of Pure and Applied Chemistry, or
- that is internationally recognized and that clearly identifies the material or substance.

Chemical stability – the ability of a product to remain unchanged under normal ambient and anticipated storage and handling conditions of temperature and pressure. An unstable product may decompose, burn or explode under normal environmental conditions. Any indication that the product is unstable gives warning that special handling and storage precautions may be necessary.

Chronic– 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.

Closed cup – a test procedure used to measure the flash point of a product, using a closed cup, which prevents the vapour from escaping. A closed cup flash point is generally lower than a flash point measured using an open cup method.

CNS – CNS stands for central nervous system.

Coefficient of water/oil distribution – the ratio of a product’s distribution between the water and oil portions of a mixture of water and oil. A value of less than 1 indicates that the product is more soluble in oils. A value of greater than 1 indicates that the product is more soluble in water.

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.

Complex mixture – a mixture that has a commonly known generic name and that is:

- naturally occurring,

- a fraction of a naturally occurring mixture that results from a separation process, or
- a modification of a naturally occurring mixture or a modification of a fraction of a naturally occurring mixture that results from a chemical modification process.

Petroleum distillates and turpentine are examples of complex mixtures. A complex mixture can be comprised of many individual ingredients whose concentrations may vary from batch to batch.

Conditions to avoid – conditions such as heat, pressure, shock, static discharge, vibrations or other physical stresses that might result in a hazardous situation involving the product.

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.

Container – includes a bag, barrel, bottle, box, can, cylinder, drum or similar package or receptacle but does not include a storage tank. (See also "Outer container".)

Control parameters – includes occupational exposure limits and biological limit values. Depending on their source, occupational exposure limit values have different names and often have different numerical values. (See also "Occupational exposure limit values".)

Controls – measures used to protect workers from exposure to a hazardous product. Control measures include engineering controls (e.g., ventilation), administrative controls (e.g., scheduling, training) or personal protective equipment.

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

Critical temperature – the temperature above which a pure gas cannot be liquefied, regardless of the degree of compression.

Decomposition temperature – the temperature at which the product chemically decomposes.

Density – the weight of a product for a given volume. Density is usually given in units of grams per milliliter (g/mL) or grams per cubic centimeter (g/cc). The volume of a product in a container can be calculated from its density and weight.

Dilution ventilation – See Ventilation.

Disposal considerations – information for safe handling for disposal, and recommended methods for disposal of the hazardous product, including any contaminated packaging.

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).

Evaporation rate – a term that indicates how quickly a product evaporates compared to n-butyl acetate. The evaporation rate of butyl acetate is 1. A value greater than 1 means the product has a high evaporation rate and will mix with air very quickly.

Explosive limits – see Lower explosive limit (LEL) or Lower flammability limit (LFL) and Upper explosive limit (UEL) or Upper flammability limit (UFL).

Exposure limit values – see Occupational exposure limit values.

Extinguishing media – agents which can put out fires involving the product. Common extinguishing agents are water, carbon dioxide, dry chemical, and "alcohol" foam. It is important to know which extinguishers can be used (suitable extinguishing media) so they can be made available at the worksite. It is also important to know which agents cannot be used (unsuitable extinguishing media) since an incorrect extinguisher may not work or may create a more hazardous situation. If several products are involved in a fire, an extinguisher effective for all of the products should be used.

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.

First-aid measures – the initial care that can be given by an untrained responder to a person who is experiencing symptoms of exposure to the product.

Flammable (or flammability) limits – see Lower explosive limit (LEL) or Lower flammability limit (LFL) and Upper explosive limit (UEL) or Upper flammability limit (UFL).

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.

Flash back – occurs when a trail of flammable gas, vapour or aerosol is ignited by a distant spark, flame or other source of ignition. The flame then travels back along the trail of gas, vapour or aerosol to its source. A serious fire or explosion could result.

Flash point – the lowest temperature at which the application of an ignition source causes the vapours of a liquid to ignite (catch fire). The lower the flash point, the more easily the product will ignite and burn.

Fugitive emission – a gas, liquid or solid, vapour, fume, mist, fog or dust that escapes from process equipment or from emission control equipment or form a product where workers may be readily exposed to it.

Freezing point – the temperature below which a liquid product becomes solid. (See also "Melting point".)

Fumes – very small, airborne, solid particles formed by the cooling of a hot vapour. For example, a hot zinc vapour may form when zinc-coated steel is welded. The vapour then condenses to form fine zinc fume as soon as it contacts the cool surrounding air. Fumes are smaller than dusts and are more easily breathed into the lungs.

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.

These products consist of a gas contained in a receptacle under a pressure of 200 kPa or more at 20 deg C, or that is liquefied, or liquefied and refrigerated, but excludes any gas that has an absolute vapour pressure of not more than 300 kPa at 50 deg C or that is not completely gaseous at 20 deg C and 101.3 kPa.

General ventilation – see Ventilation.

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.

Handling and storage – the basic precautions to be followed when handling and for storing a hazardous product, or the basic equipment to be used during handling and storing.

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.

Hazard classification – the hazard class and category assigned to a hazardous product based on the comparison of the properties of the hazardous product with the criteria for each hazard class in the HPR.

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

Hazard statement – a required phrase assigned to a category or subcategory of a hazard class that describes the nature of the hazard presented by a hazardous product.

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.

Hazardous Products Act / Hazardous Products Regulations – The *Hazardous Products Regulations* (HPR) are Canadian federal regulations enabled by the *Hazardous Products Act* (HPA). They are part of the national Workplace Hazardous Materials Information System (WHMIS 2015), and replace the Controlled Products Regulations (CPR). The HPR applies to all suppliers (importers or sellers) in Canada of hazardous products intended for use, handling or storage in Canadian work places. The regulations specify the criteria for classification of hazardous products. They also specify what information must be included on labels and Safety Data Sheets (SDSs).

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.

Health professional – as defined by the *Hazardous Products Regulations*, are

a. physicians who are registered and entitled under the laws of a province to practice medicine and who are practicing medicine under those laws in that province; and

b. nurses who are registered or licensed under the laws of a province to practice nursing and who are practicing nursing under those laws in that province.

HPA – the *Hazardous Products Act*. See "*Hazardous Products Act / Hazardous Products Regulations*".

HPR – the *Hazardous Products Regulations.* See "*Hazardous Products Act / Hazardous Products Regulations*".

IARC – IARC stands for the International Agency for Research on Cancer. IARC is an agency of the World Health Organization. IARC evaluates information to identify environmental factors that can increase the risk of human cancer. These factors include chemicals, complex mixtures, occupational exposures, physical agents, biological agents and lifestyle factors. IARC publishes lists of agents which are classified as carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), possibly carcinogenic to humans (Group 2B), or not classifiable as to its carcinogenicity to humans (Group 3).

IDLH – IDLH stands for Immediately Dangerous to Life or Health. For the purposes of respirator selection, the U.S. NIOSH defines the IDLH concentration as the airborne concentration that poses a threat of exposure to airborne contaminants when that exposure is likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from such an environment. The purpose of establishing an IDLH exposure concentration is:

- to ensure that the worker can escape from a given contaminated environment in the event of failure of the respiratory protection equipment, and
- is considered a maximum level above which only a highly reliable breathing apparatus providing maximum worker protection is permitted.

In the event of failure of respiratory protective equipment, every effort should be made to exit immediately.

Impervious – is a term used to describe protective gloves and other protective clothing. If a protective material is impervious to a substance, then that substance cannot readily penetrate through the material or damage the material. Different materials are impervious (resistant) to different substances. No single material is impervious to all substances. If a SDS recommends wearing impervious gloves, you need to know the specific type of material from which the gloves should be made.

Importer – is a person or company that brings a hazardous product into Canada for sale to, or use at, a work place. Importers have the same WHMIS responsibilities as suppliers. An employer can be an importer.

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

Initial boiling point – the temperature of a liquid at which its vapour pressure is equal to the standard pressure of 101.3 kPa, (i.e., the temperature at which the first gas bubble appears).

Initial supplier identifier – the name, address and telephone number of the manufacturer or the importer of the hazardous product who operates in Canada.

Interactive effects – the potential effects from exposure to more than one substance at the same time. The effects of the individual substances may be increased or decreased due to the combined exposure.

Label – a group of written, printed or graphic information elements that relate to a hazardous product. The label is to be affixed to, printed on or attached to the hazardous product or the container in which the hazardous product is packaged.

Laboratory sample – a sample of a hazardous product that is packaged in a container that contains less than 10 kg of the hazardous product and that is intended solely to be tested in a laboratory. The definition of laboratory sample does NOT include a sample that is to be used:

- by the laboratory for testing other products, mixtures, materials or substances; or
- for educational or demonstration purposes.

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 4-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).

Local exhaust ventilation – see Ventilation.

Lower explosive limit (LEL) or Lower flammability limit (LFL) – the lowest concentration of a substance in air that will burn or explode when it is exposed to a source of ignition. At concentrations below the LEL, the mixture is “too lean” to burn or explode. The LEL is the same as the LFL. (See also “Upper explosive limit (UEL) or Upper flammability limit (UFL)”.)

Manufacturer – a supplier who, in the course of business in Canada, manufactures, produces, processes, packages or labels a hazardous product and sells it.

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 us 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.

Mechanical ventilation – see Ventilation.

Melting point – the temperature at which a solid product becomes a liquid. It is important to know the freezing or melting point for storage and handling purposes. For example, a frozen or melted product may burst a container. As well, a change of physical state could alter the hazards of the product. (See also “Freezing point”.)

Mixture – a combination of, or a solution that is composed of, two or more ingredients that, when they are combined, do not react with each other. (This definition does not include any such combination or solution that is a substance. (See also “Substance”.)

Mutagenicity – see Germ cell mutagenicity.

Natural ventilation – see Ventilation.

NIOSH – NIOSH stands for National Institute for Occupational Safety and Health. NIOSH is a branch of the United States government. It is the mission of NIOSH to develop new knowledge in the field of occupational safety and health, and to transfer that knowledge into practice.

NOEL – NOEL stands for No Observable Effect Level.

NOS – NOS stands for Not Otherwise Specified.

NTP – NTP stands for National Toxicology Program. This program is part of the United States Department of Health and Human Services. The NTP has a program for testing the potential short-term and long-term health effects, including the carcinogenicity, of chemicals.

Occupational exposure limit values or exposure limits – the airborne concentration of a substance that must not be exceeded in workplace air. Exposure limits have various names and often have different numerical values in different jurisdictions. In most Canadian provinces and territories, the exposure limits are called Occupational Exposure Limits (OELs). (See also “Control parameters” and “Threshold limit values (TLV®s)”.)

There are three different types of exposure limits in common use:

- **Time-weighted average (TWA)** exposure limit is the time-weighted average concentration of a chemical in air for up to 10 hours a day, 40 hours a week, to which nearly all workers may be exposed day after day without harmful effects. “Time-weighted average” means that the average concentration has been calculated using the duration of exposure to different concentrations of the chemical during a specific time period

(usually 8 hours). In this way, higher and lower exposures are averaged over the day or week.

- **Short-term exposure limit (STEL)** is the average concentration to which workers can be exposed for a short period (usually 15 minutes) without harmful effects. ACGIH specifically defines the harmful effects as irritation, long-term or irreversible tissue damage, reduced alertness or other toxic effects. The number of times the concentration reaches the STEL and the amount of time between these occurrences can also be restricted.
- **Ceiling (C)** is the concentration which should not be exceeded at any time.

Other OEL-related terms:

"SKIN" notation (SKIN) means that contact with the skin, eyes and mucous membranes (e.g., the mouth) can contribute to the overall exposure. This notation indicates that measures should be used to prevent absorption by these routes, e.g., the use of protective gloves.

Permissible Exposure Limit (PELs) are the legal occupational exposure limits in the United States set by the U.S. OSHA.

Recommended Exposure Limits (RELs) are the occupational exposure limits set by the U.S. NIOSH.

Odour threshold – the lowest concentration of a product that most people can smell.

OECD – OECD stands for Organization for Economic Cooperation and Development. The OECD has published "Guidelines for Testing of Chemicals." These guidelines contain recommended procedures for testing chemicals for toxic and environmental effects, and for determining physical and chemical properties.

OSHA – OSHA stands for Occupational Safety and Health Administration. It is the branch of the United States government which sets and enforces occupational health and safety legislation.

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).

Outer container – the most outward container of a hazardous product that is visible under normal conditions of handling, but does not include the most outward container if it is the only container of the hazardous product. See also "Container".

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.

Particles Not Otherwise Specified (PNOS) - a term defined by ACGIH® to describe particles for which there is no evidence of specific toxic effects such as fibrosis or systemic effects. (This term was previously called "particulates not otherwise classified (PNOC) and/or nuisance dust/nuisance particulate). These substances are not to be considered inert, however, and can

produce general toxic effects depending on the airborne concentration. High levels of particles in the air may reduce visibility and can get into the eyes, ears, and nose. Removal of these substances by washing or rubbing may cause irritation.

PEL – See Occupational exposure limit values.

Personal protective equipment (PPE) – see “Individual protection measures”.

pH – a measure of a product’s acidity or alkalinity. A pH of 7 is neutral. Products with a pH of greater than 7 are alkaline. Alkalinity increases as the number increases. Products with a pH of less than 7 are acidic. Acidity increases as the number decreases.

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.

Physical state – indicates whether a product is a solid, liquid or gas.

Pictogram – a graphical composition that includes a symbol along with other graphical elements, such as a border or background colour.

Precautionary statement – a phrase that describes the recommended measures to take in order to minimize or prevent adverse effects resulting from exposure to a hazardous product or resulting from improper storage or handling of a hazardous product.

Process enclosure – the operation in which the product is used is completely enclosed. A physical barrier separates the worker from the potential health or fire hazard. Process enclosure is usually recommended if the product is very toxic or flammable.

Product identifier – the brand name, chemical name, common name, generic name or trade name of a hazardous product.

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.

Polymerization – a chemical reaction that involves the combination of simple molecules to form large chain-like macro-molecules. This reaction can sometimes be observed as the “hardening” of a “non-inhibited” liquid product.

Reactivity - Describes the intrinsic ability of a product to undergo a hazardous chemical change (e.g., organic peroxide, oxidizer, self-reactive, pyrophoric, self-heating).

Relative density – the weight of a product compared to the weight of an equal volume of water. Products with a relative density greater than 1 are heavier than water. Products with a relative density less than 1 are lighter than water.

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 lactation

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).

RTECS® - RTECS® stands for Registry of Toxic Effects of Chemical Substances.

Safety Data Sheet (SDS) - a document that contains specified, required information about a hazardous product, including information related to the hazards associated with any use, handling or storage of the hazardous product in a work place.

Sell (a hazardous product) – offer for sale or distribution, expose for sale or distribution (e.g., advertising), have in possession for sale or distribution or distribute – whether for consideration or not - to one or more recipients. The definition also includes the transfer of possession of a hazardous product that creates a bailment. **Bailment** means the transfer of possession without transferring ownership.

Self-heating substances and mixtures – hazardous products classified in this hazard class are products that may catch fire, or that may catch fire when in large quantities. 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.

Signal word - in respect of a hazardous product, the word “Danger” or “Warning” that is used to alert the reader of the product label or SDS to a potential hazard and to indicate its severity.

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” Notation - See Occupational exposure limit values.

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.

Solubility – the ability of a product to dissolve in water or another liquid. Solubility may be expressed as a ratio or may be described using words such as insoluble, very soluble or miscible. Often, on a SDS, "Solubility" describes solubility in water. Solubility information is useful for planning spill clean-up, and fire-fighting procedures.

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 on target organs that arise from repeated exposure to a hazardous product, including all health

effects liable to impair function of the body or any of its parts, whether 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.

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

STEL - STEL stands for Short-Term Exposure Limit. (See Occupational exposure limit values.)

Storage requirements – specific instructions to safely store the hazardous product and prevent hazardous conditions from developing during storage.

Substance - any chemical element or chemical compound - that is in its natural state or that is obtained by a production process - whether alone or together with:

a. any additive that is necessary to preserve the stability of the chemical element or chemical compound,
b. any solvent that is necessary to preserve the stability or composition of the chemical element or chemical compound, or
c. any impurity that is derived from the production process.

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.

Suitable extinguishing media – see Extinguishing media.

Supplier – a person who, in the course of business, sells or imports a hazardous product.

Synonyms - alternative names for the same substance. For example, methanol and methyl hydrate are synonyms for methyl alcohol. Synonyms may help in locating additional information on a substance.

Threshold limit values (TLV®s) – airborne concentrations of substances to which it is believed that nearly all workers may be exposed day after day without experiencing adverse effects. ACGIH® develops these values.

Toxicity – a product's ability to cause adverse health effects in people exposed to it.

Trade Name – the name under which a product is commercially known. Some products are sold under common names, such as Stoddard solvent or degreaser, or internationally recognized trade names, like Varsol. Trade names are sometimes identified by symbols such as (R) or (TM).

Trade secret – see Confidential Business Information.

Transportation of Dangerous Goods **(TDG)** – federal legislation that controls the conditions under which dangerous goods may be transported on public roads, in the air, by rail or by ship. Its purpose is to protect the health and safety of persons in the vicinity of transport accidents involving those goods.

Transport information – basic classification information for the transporting/shipment of a product by road, rail, sea or air.

TWA – TWA stands for Time-Weighted Average. (See "Occupational exposure limit values".)

UN number – the four-digit identification number issued in accordance with the United Nations Model Regulations.

Unsuitable extinguishing media – see Extinguishing media.

Upper explosive limit (UEL) or Upper flammability limit (UFL) – the maximum concentration of a product in air that will burn or explode when it is exposed to a source of ignition. At concentrations greater than the UEL, the mixture is "too rich" to burn or explode. The UEL is the same as the UFL. (See also "Lower explosive limit (LEL) or Lower flammability limit (LFL)".)

Vapour – the gaseous form of a mixture or substance released from its liquid or solid state.

Vapour density – the weight of a vapour or gas compared to the weight of an equal volume of air. Products with a vapour density greater than one are heavier than air and can accumulate in low areas.

Vapour pressure – the pressure exerted by the vapour formed over a liquid in a closed container under standard test conditions and reported as an absolute pressure.

Ventilation – the movement of air, which is intended to remove contaminated air from the work place. There are several different kinds of ventilation.

- **Mechanical ventilation –** the movement of air by mechanical means (e.g., a wall fan). There are two kinds of mechanical ventilation: general ventilation and local exhaust ventilation.

    - **General ventilation** – also known as **dilution ventilation** - is the removal of contaminated air from the general area and the bringing in of clean air. This movement of air dilutes the amount of contaminant in the work environment. General ventilation is usually suggested for non-hazardous products.
    - **Local exhaust ventilation** – is the removal of contaminated air directly at its source. This type of ventilation can help reduce worker exposure to airborne substances more effectively than general ventilation, because it does not allow the substance to enter the work environment. It is usually recommended for hazardous airborne substances.
- **Natural ventilation** – is a type of general ventilation which depends on natural instead of mechanical means for air movement. Natural ventilation can depend on the wind or the difference in temperature from one area to another to move air through a building. Therefore, it is unpredictable and unreliable.

Viscosity – a measure of a fluid's resistance to flow. There are two types of viscosity values:

- dynamic viscosity which measures internal resistance to flow of a fluid under an applied force, and
- kinematic viscosity which is the ratio of dynamic viscosity to density.

VOC – VOC stands for Volatile Organic Compound.

WHMIS – WHMIS stands for Workplace Hazardous Materials Information System. WHMIS is Canada's national hazard communication system for hazardous products in the work place. 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 work places, as well as to the employers and workers who use those products.

WHMIS 1988 – The original WHMIS system enacted in 1988 through the *Hazardous Products* Act and the *Controlled Products Regulations* is now referred to as "WHMIS 1988".

WHMIS 2015 – On February 11, 2015, the Government of Canada published the *Hazardous Products Regulations* (HPR), which, in addition to the amendments made to the *Hazardous Products Act* (HPA), modified WHMIS 1988 to incorporate the GHS for workplace chemicals. This modified WHMIS is referred to as WHMIS 2015.

Program Overview

WHMIS (1988)

The Workplace Hazardous Materials Information System (WHMIS), which first came into effect in 1988, provides workers with information regarding hazardous products used in the workplace. WHMIS is the national hazardous materials classification system intended to provide workplace standards for the control, handling, storage, and disposal of controlled products which can impact the health and safety of the workplace and its employees.

A product that is classified as hazardous under WHMIS is called a **controlled product**. WHMIS classification of controlled products is based on properties such as flammability, reactivity and toxicity of the material.

WHMIS consists of 3 essential elements to convey hazard information to workers handling chemicals: labels, material safety data sheets and worker education. These elements convey to workers the following:

- how to recognize hazardous materials;
- how to identify the hazards associated with these materials and;
- how to safely use, handle, store and dispose of hazardous materials.

Global Harmonized System (GHS) and WHMIS 2015

Canada has aligned the WHMIS (1988) with the Global Harmonized System of Classification and Labelling of chemicals (GHS), an internationally agreed-upon system by the United Nations in 1992. Currently many countries have different systems for classifying hazardous products. This has caused confusion as each country has different requirements in terms of the information that is made available about the product in terms of the hazardous, precautions, exposure limits, first aid measure, and concentrations.
In 2015, Canada amended the Hazardous Products Act and the Hazardous Products Regulations in order to incorporate the GHS into WHMIS. The new WHMIS is identified as WHMIS 2015 (replacing WHMIS 1988).

Some of the key changes from WHMIS 1988 to WHMIS 2015 include:

- adaptation of new international standards for classifying hazardous workplace chemicals and giving information and safety data sheets
- update the information on labels to include pictograms, instead of symbols, to match hazard classes and make them easier to understand
- update the format of safety data sheets
- classify hazardous products into two broad hazard groups, physical hazards and health hazards
- update the term “controlled products” to “hazardous products” to be consistent with federal WHMIS legislation
- present information in a consistent manner in all safety data sheets, regardless of supplier
- ensure that the information that workers and emergency responders need most appears first on labels and safety data sheets

Scope

This program, and all related legislation, is applicable to all schools, departments, and workers, of Algonquin College.

Applicable Legislation

- The Hazardous Product Act (HPA)
- The Occupational Health and Safety Act
- Reg. 860 WHMIS

Roles and Responsibilities

Suppliers

Suppliers of hazardous materials are responsible for:

a) Classifying hazardous materials into the WHMIS 2015 classes. A supplier must consider the technical criteria of each of the six classes and determine the applicability to its products.
b) Providing supplier labels on the hazardous materials going to the workplace.
c) Providing MSDSs with the hazardous materials going to the workplace.
d) Providing any information available including trade secrets (confidential business information) to a doctor or nurse in the case of a medical emergency.

Supervisors

Supervisors are responsible for:

a) Advising workers of hazards in their workplace (OHSA, sec. 25, 27 and WHMIS (860) sec. 6). Supervisors have a legal duty to be familiar with the WHMIS 2015 requirements as outlined in this program and all other hazards associated with the job.
b) Identifying equipment, protective devices and measures to be taken to enable the employee to work safely.
c) Ensuring that employees work as required, using the required equipment and protective measures identified by the supervisor or by the Occupational Health and Safety Act or regulations.
d) Ensuring that all hazardous materials in the workplace are properly labelled.
e) Maintaining a current file of SDSs for all controlled products used in a work area. All SDSs must be current to within three years. New or updated SDSs should be obtained from the supplier.
f) Providing worker education. Employee positions must be rated in terms of the potential risk of exposure to hazardous materials on the job. Supervisors must ensure that adequate and appropriate training is attained by employees who work with or in close proximity to hazardous chemicals.
g) Updating hazardous materials inventories on an annual basis, as requested by the Occupational Health and Safety Department.

Workers

All Algonquin College employees are workers as defined by the Occupational Health and Safety Act and are responsible for:

a) Working in compliance with OH&S legislation and the WHMIS regulation (860) and following safe work procedures.
b) Reporting any hazards or personal chemical exposure incidents to their supervisor.
c) Not using any machine, equipment, etc., in such a way, or working in a manner, that places them or others in danger.
d) Applying their WHMIS 2015 training to work safely on the job.

The Joint Occupational Health and Safety Committee
The Joint Occupational Health and Safety Committees (JOHSC) are responsible for:

a) Identifying hazards related to hazardous materials and processes.
b) Consulting in the development and review of the Algonquin College WHMIS 2015 program.

Occupational Health and Safety
Occupational Health and Safety is responsible for:

a) Developing, reviewing and revising the WHMIS 2015 program at Algonquin College in consultation with the Joint Health and Safety Committees. This program complies with the WHMIS regulation and assists employees of Algonquin College to work safely.
b) Providing advice, consultation and training to Senior Management, Deans, Directors, Department Managers, Coordinators, employees, unions, and Joint Health and Safety Committees related to the WHMIS program.
c) Maintaining records of WHMIS 2015 training for employees at Algonquin College.
d) Soliciting inventories of hazardous materials annually from departments and updating the centralized records as required.
e) Responding to or providing advice with respect to chemical emergencies where the user is unable to deal with the problem.
f) Developing procedures to enable the employees to work safely.
g) Providing consultation with supervisors regarding the development of written procedures for employees, where necessary.

Physical Resources

Physical Resources Department is responsible for:

a) The disposal of hazardous waste material, (please see the Hazardous Waste and Disposal Program);
b) Will coordinate the clean-up of spills and accidental releases of hazardous chemicals.

Pictograms

Pictograms are **graphic images** that immediately show the user of a hazardous product what type of hazard is present. With a quick glance, you can see, for example, that the product is flammable, or if it might be a health hazard.

Most pictograms have a distinctive red "square set on one of its points" border. Inside this border is a symbol that represents the potential hazard (e.g., fire, health hazard, corrosive, etc.). Together, the symbol and the border are referred to as a pictogram. Pictograms are assigned to specific hazard classes or categories.

Hazard Class
Hazard classes are a way of grouping together products that have similar properties. Most of the hazard classes are common to GHS and will be used worldwide by all countries that have adopted GHS. Some hazard classes are specific to WHMIS 2015.

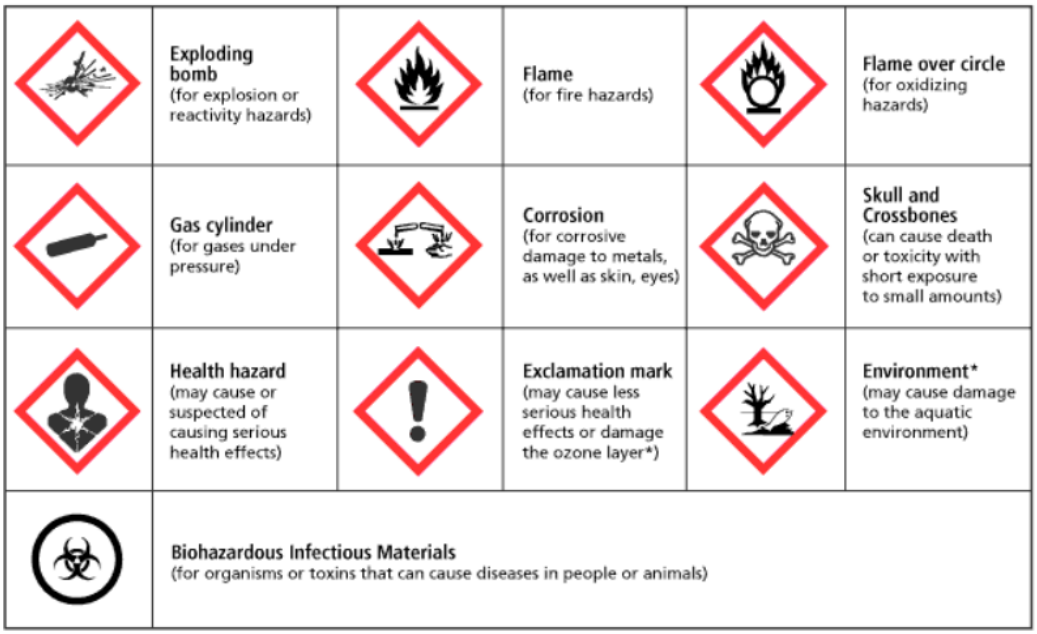
Hazard Category
Each hazard class contains at least one category. The hazard categories are assigned a number (e.g., 1, 2, etc.) Categories may also be called "types". Types are assigned an alphabetical letter (e.g., A, B, etc.). In a few cases, sub-categories are also specified. Subcategories are identified with a number and a letter (e.g., 1A and 1B).

Some hazard classes have only one category (e.g., corrosive to metals), others may have two categories (e.g., carcinogenicity (cancer)) or three categories (e.g., oxidizing liquids). There are a few hazard classes with five or more categories (e.g., organic peroxides).

The category tells you about how hazardous the product is (that is, the severity of hazard).
• **Category 1 is always the greatest level of hazard** (that is, 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.**

There are a few exceptions to this rule. For example, for the Gases under pressure hazard class, the hazard categories are "Compressed gas", "Liquefied gas", "Refrigerated liquefied gas" and "Dissolved gas". These classes relate to the physical state of the gas when packaged and do not describe the degree of hazard.

WHMIS 2015/ GHS Pictograms



NOTE: *The Environment pictogram, although not adopted by WHMIS 2015, but adopted in the GHS system, may still appear on labels and SDSs, including additional information pertaining to environmental hazards. The displaying of this pictogram is allowed by WHMIS 2015*

WHMIS 2015 Pictograms with Hazard and Safe Work Practices

Pictogram	**Associated Hazard(s)**	**Hazard Description(s)**	**General Safe Work Practices**
	The flame pictogram is used for the following classes and categories: Flammable gases ○ (Category 1) Flammable aerosols ○ (Category 1 and 2) Flammable liquids	**Flammables**: These four classes cover products that have the ability to **ignite (catch fire) easily** and the main hazards are **fire or explosion**. **Self-Reactive**: These products may react on their own to **cause a fire or explosion,** or **may cause a fire or explosion if heated.**	• Obtain and read the Material Safety Data Sheets for all materials you work with. • Wear appropriate PPE. • Keep away from ignition sources (heat, sparks, and open flames.

	○ (Category 1, 2 and 3) Flammable solids o (Category 1 and 2) Pyrophoric liquids ○ (Category 1) Pyrophoric solids ○ (Category 1) Pyrophoric gases ○ (Category 1) Self-heating substances and mixtures ○ (Category 1 and 2) Substances and mixtures which, in contact with water, emit flammable gases ○ (Category 1, 2 and 3) Self-reactive substances and mixtures ○ (Types B*, C, D, E and F) Organic peroxides ○ (Types B*, C, D, E and F)	**Pyrophoric:** These products **can catch fire** very quickly (spontaneously) if exposed to air.	• Keep only the minimum quantity required in work areas. • Store away from oxidizers. • Store materials in fire-resistant cabinets or other specified storage areas. • Work with flammable materials should be performed in a fume hood or well-ventilated area. • Keep storage areas cool and dry. • Use labelled and approved safety containers. • Keep containers closed when not in use. • Bond and ground containers when transferring flammable and combustible liquids.
	The **flame over circle** pictogram is used for the following classes and categories: Oxidizing gases ○ (Category 1) Oxidizing liquids	These three classes cover oxidizers, which may **cause or intensify a fire** or **cause a fire or explosion**.	• Obtain and read the Material Safety Data Sheets for all materials you work with. • Wear appropriate PPE.

	○ (Category 1, 2 and 3) Oxidizing solids ○ (Category 1, 2 and 3)		• If the reaction can be violent, use barriers to isolate it. • Keep only the minimum quantity required in work areas. • Keep the work areas clear of unneeded materials that could react with oxidizers. • Store away from flammable materials, organic materials, and reducing agents. • **Do not open peroxide containers where crystals have formed around the lid.** • Any spills of oxidizing materials need to be cleaned up immediately and thoroughly.
	The **gas cylinder** pictogram is used for the following classes and categories: • Gases under pressure ○ Compressed gas ○ Liquefied gas ○ Refrigerated liquefied gas ○ Dissolved gas	This class includes compressed gases, liquefied gases, dissolved gases and refrigerated liquefied gases. Compressed gases, liquefied gases and dissolved gases are hazardous because of the high pressure inside the cylinder or container. The cylinder or container **may explode** if heated. Refrigerated liquefied gases are very cold	• Obtain and read the Material Safety Data Sheets for all materials you work with. • Cylinders should be secured to the wall or structure using a chain or strap. • Protect cylinders from heat and physical damage • Keep valve caps on all

		and can cause **severe cold (cryogenic) burns or injury**.	cylinders not in use or when storing or moving them. • Before using cylinders, check all fittings and regulators for defects, leaks, oil and grease. • Use the smallest cylinder required for the work. • Wear goggle for safety glasses. • Do not empty a cylinder completely. A slight pressure will keep contaminant out. • Use proper storage and transportation procedures. • Use a cart designed for moving cylinders • Wear steel-toed footwear when handling large cylinders.
	The **corrosion** pictogram is used for the following classes and categories: • Corrosive to metals ○ (Category 1) • Skin corrosion/irritation - Skin corrosion ○ (Category 1, 1A, 1B and 1C) • Serious eye damage / eye irritation - Serious eye damage ○ (Category 1)	These products may be **corrosive** (chemically damage or destroy) to metals. This class covers products that cause **severe skin burns** (i.e., corrosion) and products that cause skin irritation. This class also covers products that cause **serious eye damage** (i.e., corrosion) and	• Obtain and read the Material Safety Data Sheets for all materials you work with. • Wear appropriate PPE. • Use corrosion-resistant equipment and materials. • Work in a fume hood or well-ventilated area.

		products that eye irritation.	• Add acid slowly to water; never add water to acid. • Never return unused material to the original container. It may contain traces of contamination which may cause a chemical reaction. • Keep containers closed when not in use. • Store acids and bases separately from each other and in a well-ventilated area. • In case of eye/skin contact flush areas with emergency eyewash/shower for 15 minutes and seek medical attention.
	The **exploding bomb** pictogram is used for the following classes and categories: • Self-reactive substances and mixtures ○ (Types A and B*) • Organic peroxides ○ (Types A and B*)	**Self-Reactive -** These products may react on their own to cause a fire or explosion, or may cause a fire or explosion if heated. **Organic Peroxides** - These products may cause a fire or explosion if heated.	• Obtain and read the Material Safety Data Sheets for all materials you work with. • Work in a fume hood. • Wear appropriate PPE. • Establish standard operating procedures when working with materials.

			• If the reaction can be violent, use barriers. • Use only the minimum amount of the material necessary. • Discard of unopened materials within 12 months, and opened
	The **skull and crossbones** pictogram is used for the following classes and categories: • Acute toxicity - o Oral (Category 1, 2 and 3) o Dermal (Category 1, 2 and 3) o Inhalation (Category 1, 2 and 3)	These products are **fatal, toxic** or **harmful** if inhaled, following skin contact, or if swallowed. Acute toxicity refers to effects occurring following skin contact or ingestion exposure to a single dose, or multiple doses given within 24 hours, or an inhalation exposure of 4 hours. Acute toxicity could result from exposure to the product itself, or to a product that, upon contact with water, releases a gaseous substance that is able to cause acute toxicity.	• Obtain and read the Material Safety Data Sheets for all materials you work with. • Use engineered controls such as a fume hood or snorkel when working with the material. • Wear appropriate PPE. • Establish standard operating procedures when working with materials. • Keep only the minimum quantity required in work areas. • Know the signs and symptoms of exposure to materials being used. • Establish cleaning and decontamination procedures.

	The **health hazard** pictogram is used for the following classes and categories: Respiratory or skin sensitization - Respiratory sensitizer o (Category 1, 1A and 1B) Germ cell mutagenicity o (Category 1, 1A, 1B and 2) Carcinogenicity o (Category 1, 1A, 1B, and 2) Reproductive toxicity o (Category 1, 1A, 1B and 2) Specific Target Organ Toxicity - Single exposure o (Category 1 and 2) • Specific Target Organ Toxicity - Repeated exposure o (Category 1 and 2) • Aspiration hazard o (Category 1)	**Respiratory or skin sensitization** - A respiratory sensitizer is a product that may cause allergy or asthma symptoms or breathing difficulties if inhaled. Skin sensitizer is a product that may cause an allergic skin reaction. **Germ cell mutagenicity** - This hazard class includes products that may cause or are suspected of causing genetic defects (permanent changes (mutations) to body cells that can be passed on to future generations). **Carcinogenicity** - This hazard class includes products that may cause or are suspected of causing cancer. **Reproductive toxicity** - This hazard class includes products that may damage or are suspected of damaging fertility or the unborn child (baby). Note: There is an additional category which includes products that may cause harm to breast-fed children. **Specific Target Organ Toxicity - Single exposure** -	• Obtain and read the Material Safety Data Sheets for all materials you work with. • Use engineered controls such as a fume hood or snorkel when working with the material. • Wear appropriate PPE. • Establish standard operating procedures when working with materials. • Keep only the minimum quantity required in work areas. • Know the signs and symptoms of exposure to materials being used. • Establish cleaning and decontamination procedures.

		This hazard class covers products that cause or may cause damage to organs (e.g., liver, kidneys, or blood) following a single exposure. This class also includes a category for products that cause respiratory irritation or drowsiness or dizziness. **Specific Target Organ Toxicity - Repeated exposure** - This hazard class covers products that cause or may cause damage to organs (e.g., liver, kidneys, or blood) following prolonged or repeated exposure. **Aspiration hazard** - This hazard class is for products that may be fatal if they are swallowed and enter the airways.	
	The **exclamation mark** pictogram is used for the following classes and categories: Acute toxicity Oral, Dermal, Inhalation (Category 4) •Skin corrosion/irritation – Skin irritation o (Category 2) Serious eye damage/eye irritation – Eye irritation o (Category 2 and 2A)	**Acute toxicity -** These products are fatal, toxic or harmful if inhaled, following skin contact, or if swallowed. **Skin corrosion/irritation -** This class covers products that cause severe skin burns (i.e., corrosion) and products that cause skin irritation. **Serious eye damage/eye irritation** - This class covers products that cause serious eye damage (i.e.,	•Obtain and read the Material Safety Data Sheets for all materials you work with. • Use engineered controls such as a fume hood or snorkel when working with the material. • Wear appropriate PPE. • Establish standard operating procedures

	Respiratory or skin sensitization – Skin sensitizer o (Category 1, 1A and 1B) Specific target organ toxicity – Single exposure o (Category 3)	corrosion) and products that eye irritation. **Specific target organ toxicity -** This hazard class covers products that cause or may cause damage to organs (e.g., liver, kidneys, or blood) following a single exposure. This class also includes a category for products that cause **respiratory**	when working with materials. • Keep only the minimum quantity required in work areas. • Know the signs and symptoms of exposure to materials being used. • Establish cleaning and decontamination procedures.
	The **biohazardous infectious materials** pictogram is used for the following classes and categories: • Biohazardous Infectious Materials (Category 1)	These materials are microorganisms, nucleic acids or proteins that cause or is a probable cause of **infection**, with or without toxicity, in humans or animals.	• Obtain and read the Material Safety Data Sheets for all materials you work with. • Work with the materials in a biosafety cabinet. • Wear appropriate PPE. • Establish standard operating procedures when working with materials. • Keep only the minimum quantity required in work areas. • Establish medical surveillance program (e.g. immunization, medical monitoring and reporting). • Establish cleaning and

			decontamination procedures.

** Both the Flame and Explosive pictogram are used for *Self-reactive substances and mixtures (Type B)* and *Organic peroxides (Type B)* **

Physical hazards not otherwise classified - This class is meant to cover any physical hazards that are not covered in any other physical hazard class. These hazards must have the characteristic of occurring by chemical reaction and result in the serious injury or death of a person at the time the reaction occurs. If a product is classified in this class, the hazard statement on the label and SDS will describe the nature of the hazard.

Health hazards not otherwise classified - This class covers products that are not included in any other health hazard class. These hazards have the characteristic of occurring following acute or repeated exposure and have 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 class, the hazard statement will describe the nature of the hazard.

NOTE: "Physical Hazards Not Otherwise Classified" and "Health Hazards Not Otherwise Classified" classes are required to have a GHS pictogram that is appropriate to the hazard identified.

WHMIS 2015 classes and categories that do not require a pictogram are:
- Flammable gases – Category 2
- Flammable liquids – Category 4
- Self-reactive substances and mixtures – Type G
- Organic peroxides – Type G
- Combustible dusts – Category 1
- Simple Asphyxiants – Category 1
- Serious eye damage/eye irritation – Eye Irritation – Category 2B
- Reproductive toxicity – Effects on or via lactation

Hazard Class Details

Flammable and Combustible Material

Flammable and combustible materials are those that can ignite, explode or react with other chemicals.
Flammable materials are more dangerous than combustible because they ignite more easily. During use, they must be kept away from ignition sources such as sparks or open flames. When not in use, flammable materials must be stored in fire-resistant cabinets or other specified storage

areas. Flammable storage cabinets must be grounded. Contact Facilities Management Class at 4496 for assistance.

All work with flammable materials is to be performed in fume hoods to minimize the potential to build up dangerous concentrations of flammable vapours.

Oxidizing Material

Oxidizing material, or oxidizers, are hazardous materials that cause or contribute to the combustion of other materials.

An oxidizer may react with a combustible material to cause a fire without a source of ignition. Consequently, oxidizing material greatly increase the risk of fire, if they come in contact with materials that can burn.

Oxidizers can be in the form of gases (e.g. oxygen, ozone), liquids (e.g. nitric acid, perchloric acid solutions) and solids (e.g. potassium permanganate, sodium chlorite). Some oxidizers such as the organic peroxide family are extremely hazardous because they will burn (they are combustible) as well as they have the ability to provide oxygen for the fire. They can have strong reactions which can result in an explosion.
These materials should never be stored or used near flammable or combustible materials. For example, do not store oil-based paints or solvents like toluene or xylene near oxidizers such as hydrogen peroxide or bleach. Any spills of oxidizing materials need to be cleaned up immediately and thoroughly. All appropriate PPE, gloves, glasses and lab coat need to be worn.

Compressed Gases

These hazardous materials include gases under pressure or which are chilled.

The main hazards associated with compressed gases are:
• A leaking cylinder can rapidly release extremely large amounts of gas into the workplace, which may be toxic or lower the oxygen concentration.
• Leaking gas cylinders can be very cold and may cause frostbite if it touches your skin.
• If a pressurized cylinder is punctured because it is dropped or exposed to excessive heat, the exploding fragments or rocket-like projectiles present a serious physical hazard.
• Compressed gas cylinders can be large and heavy and can pose physical safety hazards when handling them (e.g. risk of musculoskeletal injuries).

Examples of compressed gases include propane, chlorine gas as disinfectant, oxygen and oxyacetylene for welding.
Compressed gases may have additional hazardous properties. Chlorine is a compressed gas but is also toxic. Propane is a compressed gas, but is also flammable.

When working with compressed gases they must be securely fastened to a stable structure such as a bench top or wall mount bracket. When not in use the protective cap must always be put back on and when transporting full or empty cylinders the proper cylinder cart must be used.

Corrosive Material

Corrosive materials are hazardous materials that can cause severe burns to the skin, eyes and respiratory tract.

Corrosive materials can also attack metals and eat through containers resulting in spills, reactivity and fire hazards.

Examples of corrosive material include acids and bases (alkalis) such as hydrochloric acid, hydrofluoric acid, and sodium hydroxide.

The degree of damage caused by a corrosive material will depend on the pH, concentration of the corrosive, and the length of exposure.

When handling corrosive acids and bases additional protective equipment may be required such as aprons, goggles, face shields and heavy gloves.

Self-Reactive Substances and Mixtures

This class of hazardous materials are unstable or extremely reactive.

Dangerously reactive materials may:
- Explode or catch fire if shocked, pressurized, or heated;
- React vigorously with water or air to release poisonous gas;
- Undergo vigorous polymerization, decomposition or condensation and;
- Reactive explosively on their own at normal temperatures and pressures.

Examples of dangerously reactive materials include hydrogen cyanide, benzoyl peroxide, chlorine dioxide, organic peroxides.

The GHS establishes seven categories for self-reactive substances and mixtures.

These are:
- **Type A** – as packaged, will detonate or deflagrate rapidly;
- **Type B** – as packaged, does not detonate or deflagrate rapidly but is capable of undergoing a thermal explosion;
- **Type C** – as packaged, possesses explosive properties but will not detonate, deflagrate or thermally explode;
- **Types D through G** – have shown hazards such as partial detonation, etc. when tested in a laboratory but do not possess these hazards as packaged.

When working with these types of chemicals, work should be performed in a fume hood and if there is the possibility of a vigorous or explosive reaction, a blast shield should be used. Workers should consider wearing a face shield in addition to protective eyewear as well. If the chemical is highly flammable or air reactive, a Nomex (or other fire resistant lab coat) lab coat should be worn.

Acutely Toxic Materials

This class of materials covers a wide range of hazardous materials that can cause adverse health effects upon a single exposure.

Effects of exposure these materials may include nausea, dizziness, breathing difficulty, headaches and, in severe cases, loss of consciousness, coma, or death. Recall, that **adverse health effects which occur shortly after exposure are termed acute effects.** Examples include arsenic, methylene chloride, formaldehyde, hydrogen sulphide.

Depending upon the toxicity of the material, work with these chemicals may require the use of a glove box if the potential for airborne contaminants is great. Personal protective equipment required would include safety goggles, gloves and lab coat.

All spills of these types of materials need to be cleaned up immediately and thoroughly.
Also, if it is practicable to substitute to something less toxic the employer must do so.

Health Hazards

Materials in this subclass are toxic but do not cause immediate (acute) adverse health effects.

Possible adverse health effects include:
- Immediate skin or eye irritation;
- Chronic health effects on body organs, cardiovascular or nervous system;
- Sensitivities (allergies);
- Cancers and;
- Birth defects.

Examples of materials causing other toxic effects include asbestos, benzene, formaldehyde, xylene, calcium chloride, mercury.
Work with these types of materials in a properly functioning fume hood and wear safety googles, gloves, and lab coat.

Exclamation Mark

These materials may cause less serious health effects (compared to Health Hazard class materials), or the materials may be harmful to the ozone.

The exclamation mark pictogram is used for indicating products that can cause the following:
- Acute toxicity – Oral, Dermal, Inhalation
- Skin corrosion/irritation – Skin irritation
- Serious eye damage/eye irritation – Eye irritation

• Respiratory or skin sensitization – Skin sensitizer
• Specific target organ toxicity – Single exposure

These materials are considered “irritants” and should be handled with care. Work with these types of materials in a properly functioning fume hood and wear safety googles, gloves, and lab coat.

Biohazardous Infectious Material

These materials are organisms (and the toxins they produce) that cause disease in people or animals.

Bacteria, viruses, fungi and parasites are examples of organisms included in this class. Because biohazardous organisms can live in body tissues or fluids (blood, sputum, urine, body tissues), these materials are included within this class and class.

Environmental Hazards

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

Hazard categories include:
• Acute aquatic toxicity (short term)
• Chronic aquatic toxicity (long term)

Labelling

Labels are used a mechanism to alert and inform workers regarding the main hazards of controlled products, to provide for safe handling instructions, and to direct them to consult the information on the SDS.

All hazardous products in the workplace require a label. Supervisors are required to ensure that all of the hazardous products that are used and stored in the workplace have the proper labels. If workers discover a product missing a label or that has an unreadable label, they are required to report it to their Supervisor immediately.

There are 2 types of labels:
- Supplier labels
- Workplace labels

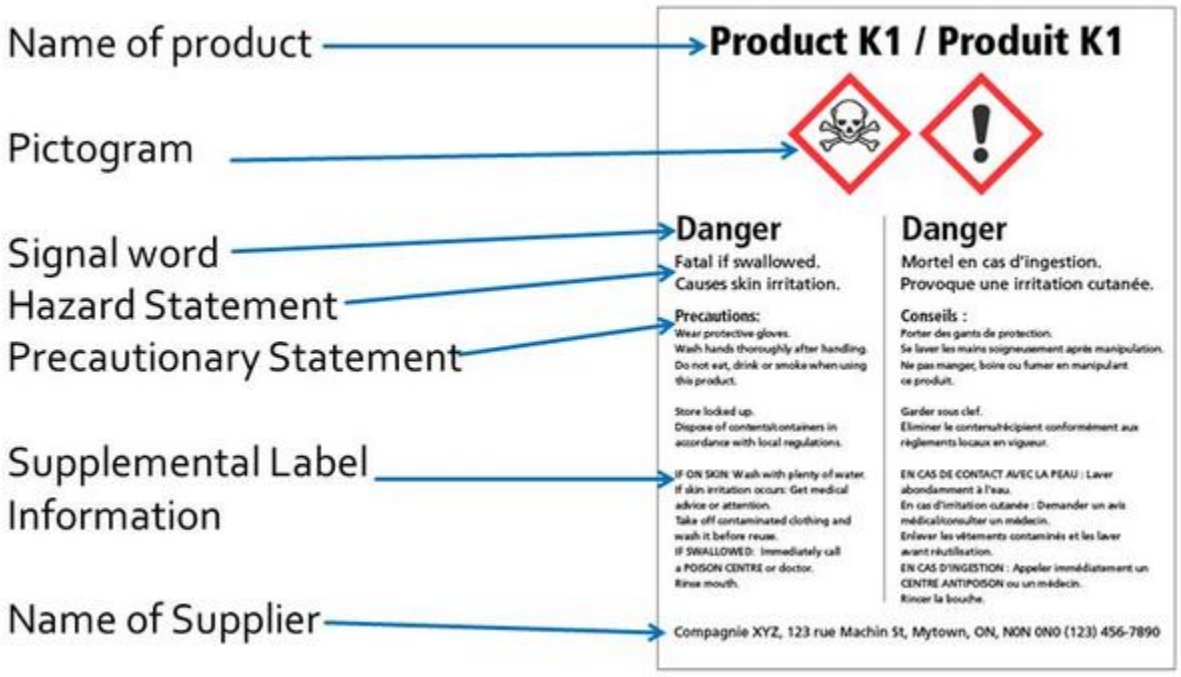
Supplier Labels

Supplier are required to be placed the exterior of the product container, and must include the following information:

- Product identifier (product name)
- Hazard symbol
- Risk phrases
- Precautionary statements
- Firs aid measures
- Reference to the SDS
- Supplier identifier (suppler name)

All of the information on the supplier label must be provided in English and in French.

Sample Supplier Label:



Small Quantity Supplier Label Requirements

Controlled products in containers less than 100ml in volume, supplier labels must include the following information:

- Product identifier (product name);
- Supplier information;
- Hazard symbols and;
- Reference to SDS;
- WHMIS information on the supplier labels must be bilingual.

Laboratory Use Only Suppler Label Requirements

Controlled products that are intended for use in a laboratory, and which are less than 10ml in volume have slightly less restrictive WHMIS requirements. The following information is required:

- Product identifier (product name);
- Supplier information;
- Hazard symbols and;
- Reference to SDS;
- WHMIS information on supplier labels must be bilingual.

If products are developed in a laboratory, and will be handled, used or stored in the workplace, and fi thee products meet the criteria for the WHMIS 2015 hazard classes, the laboratory must classify the products and provide a label and SDS. For many newly created products, the hazards of the product may be unknown until testing is completed. In this case, the newly created product may be treated as a laboratory sample until it is analyzed and evaluated.

Workplace Labels

Workplace labels are required on containers of controlled products when the chemical has been decanted (transferred) from the original container to a secondary container. Workplace labels are not required if the controlled product remains in its original container with a supplier label on it. Workplace labels should be used if a label becomes damaged or missing from the original container.

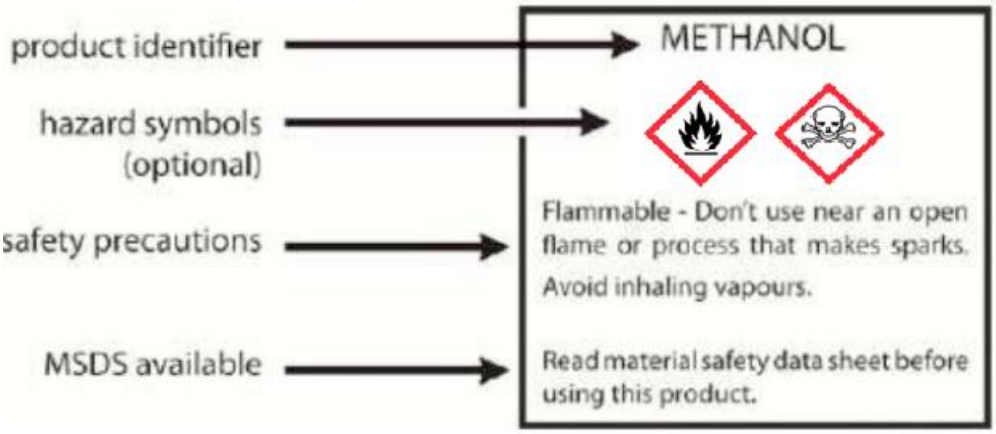
Workplace labels are not required when the controlled product is poured into a container and used immediately. It is also not required if the material is under the control of the person who decanted it and it issued during the work shift by the person. A product identifier must be attached to the container however.

Workplace labels require the following information:

- Product identifier (product name);
- Safe handling information;
- Reference to the SDS.

Additional information is optional, such as hazard symbols or pictograms but the label must be in English.

Sample Workplace Label



Laboratory only use Supplier Labels

For controlled products that are intended only for laboratory use, and which are less than 10 L in volume, there are slightly less restrictive WHMIS labeling requirements.

Safety Data Sheets (SDS)

Suppliers are required to develop and provide customers with a technical document that provides specific information, for all products under the Hazardous Product Regulation, regarding hazards, controls, safe handling, storage guidelines, and emergency procedures, etc. This document is called the Safety Data Sheet (SDS).

Before working with any controlled products, Supervisors should instruct workers to review the SDS to ensure they understand that hazards associated with the product, the safe handling and storage requirements and emergency procedures.

The SDS must be updated by the supplier when there is new information, or 'new significant data", that changes how the hazardous product is classified, or when there are changes to how the product shod be stored, handled or how workers protect themselves from exposure.

Suppliers must update the SDS within 90 days of becoming aware of this new information. If the product is purchased within that 90 day period, the supplier must notify the purchaser of the new information and the date on which is will become available.

SDS Categories

SDSs have 16 categories of information that must be provided. They are:

1. Identification
2. Hazard identification (including classification and label text)
3. Composition/information on ingredients
4. First-aid measures
5. Fire-fighting measures
6. Accidental release measures
7. Handling and storage

8. Exposure controls/personal protection
9. Physical and chemical properties
10. Stability and reactivity
11. Toxicological information
12. Ecological considerations
13. Transport considerations
14. Regulatory considerations
15. Disposal considerations
16. Other information

<u>Section 1</u> – Identification

Identification includes:

- Product identifier (e.g. Product name)
- Other means of identification (e.g. product family, synonyms, etc.)
- Recommended use
- Restrictions on use
- Canadian supplier identifier
    - Name, full address and phone number(s)
- Emergency telephone number and any restrictions on the use of that number, if applicable

<u>Section 2</u> – Hazard Identification

Hazardous ingredients must be listed in this section of the SDS. This section must include:

- Hazard classification (class, category) of substance or mixture or a description of the identified hazard for *Physical or Health Hazards Not Otherwise Classified*
- Label elements:
    - Symbol (image) or the name of the symbol (e.g., flame, skull and crossbones)
    - Signal word
    - Hazard statement(s)
    - Precautionary statement(s)
- Other hazards which do not result in classification (e.g., molten metal hazard)

<u>Section 3</u> – Composition/information on ingredients

Includes material composition information such as:

- When a hazardous product is a material or substance:
    - Chemical name
    - Common name and synonyms
    - Chemical Abstract Service (CAS) registry number and any unique identifiers
    - Chemical name of impurities, stabilizing solvents and/or additives*

- For each material or substance in a mixture that is classified in a health hazard class**: Chemical name
    - Common name and synonyms
    - CAS registry number and any unique identifiers
    - Concentration

NOTE: *Confidential business information rules can apply*

Section 4 – First-aid measures

This section includes information for when first-aid is required, relating to exposure to a material:

- First-aid measures are described by route of exposure:
  - Inhalation
  - Skin contact
  - Eye contact
  - Ingestion
- Most important symptoms and effects (acute or delayed)
- Immediate medical attention and special treatment, if necessary

Section 5 – Fire-fighting measures

In the event of a fire, this section provides fire-fighting information including:

- Suitable extinguishing media
- Unsuitable extinguishing media
- Specific hazards arising from the hazardous product (e.g., hazardous combustion products)
- Special protective equipment and precautions for fire-fighters

Section 6 – Accidental release measures

In the event of a spill / accidental release, this section advises on measures relating to personal protection and clean-up, including:

- Personal precautions, protective equipment and emergency procedures
- Methods and materials for containment and cleaning up

In the event of an accident spill during regular business hours, please follow our Spills Clean-Up Safe Operating Procedure, and call Physical Resources at ext. 7710.

During off-hours (evening and weekends), please contact Physical Resources Duty Officer at Ext. 7710 and Security at ext. 5000.

Section 7 – Handling and storage

Information regarding substance handling, and appropriate storage including:

• Precautions for safe handling
• Conditions for safe storage (including incompatible materials)

Section 8 – Exposure controls/personal protection

This section provides information on how to work with substances, including:

- Control parameters, including occupational exposure guidelines or biological exposure limits and the source of those values
- Appropriate engineering controls
- Individual protection measures (e.g. personal protective equipment)

Section 9 – Physical and chemical properties

This section describes the properties of the substance, including (though not all may be applicable):

- Appearance (physical state, color, etc.)
- Odour
- Odour threshold
- pH
- Melting point/Freezing point
- Initial boiling point/boiling range
- Flash point
- Evaporation rate
- Flammability (solid; gas)
- Lower flammable/explosive limit
- Upper flammable/explosive limit
- Vapour pressure
- Vapour density
- Relative density
- Solubility
- Partition coefficient - n-octanol/water
- Auto-ignition temperature
- Decomposition temperature
- Viscosity

Section 10 – Stability and reactivity

This section describes the inherent stability of the substance, and includes information on the possible hazardous reactions that could be encountered with this substance:

- Reactivity
- Chemical stability
- Possibility of hazardous reactions
- Conditions to avoid (e.g., static discharge, shock, or vibration)
- Incompatible materials
- Hazardous decomposition products

Section 11 – Toxicological information

Concise but complete description of the various toxic health effects and the data used to identify those effects, including:

- 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

Section 12 – Ecological information

If a substance poses a threat to the environment if released (e.g. toxicity to fish, birds, plants and microorganisms), information in this section will include:

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

Section 13 – Disposal Considerations

This section includes information on **safe handling for disposal and methods of disposal,** including any contaminated packaging that is required.

Please contact Physical Resources at ext. 7710 to dispose of hazardous waste products.

Confidential Business Information

WHMIS 2015 requires suppliers to provide employers with all of the necessary information to inform workers of the hazards associated with hazardous products, in order to ensure worker safety through safe handling. If a product is considered hazardous but certain information is considered a trade secret, they can request to protect this confidential business information under the Hazardous Materials Information Review Act (HMIRA). The types of information that suppliers can claim for exemption include:

- chemical identity of an ingredient, substance or material (including impurities and stabilizing solvents);
- concentration or concentration range of an ingredient, substance or material;
- the name of any toxicological study that identifies the ingredient, substance or material.

This process has not changed from WHMIS 1988 to WHMIS 2015.

Variances

Health Canada and United States (U.S.) Occupational Safety and Health Administration have worked collaboratively to align the implementation of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) in the two countries. However, variances are

sometimes necessary in order to maintain the current level of protection for workers or due to the requirements of the respective legislative frameworks. A key objective of implementing the GHS is to create a system that will allow Canadian and U.S. requirements to be met through the use of a single label and safety data sheet (SDS) for each hazardous product.

A “variance” is defined as a difference between the *Hazardous Products Regulations* (HPR) and the U.S. *Hazard Communication Standard* (HCS 2012) that would result in a different classification, labelling, SDS or other information requirements for a hazardous product in Canada versus the U.S.

The following are the key variances between the requirements of the HPR and the U.S. HCS 2012:

Variance	Canada	United States
Bilingual labels and SDSs	Labels and SDSs must be in both English and French. This information may appear either on a single bilingual SDS or on two separate unilingual documents that constitute one bilingual SDS. The same requirement applies to labels.	Labels and SDSs must be in English.
Supplier identifier	A Canadian supplier identifier must appear on the label and SDS. A Canadian distributor may change the name of the initial supplier if they list their own identity (name, address and telephone number) instead. A Canadian importer may keep the name of the foreign supplier instead of replacing it with their own identity only if the hazardous product is imported for use in their own workplace.	The name, address and telephone number of the U.S. manufacturer, importer, or other responsible party must appear on the label and SDS.
Mixture containing a Category 2 carcinogen at a concentration between 0.1-1.0%	All mixtures containing a carcinogenic ingredient (whether Category 1 or 2) at a concentration of 0.1% or	All mixtures containing a carcinogenic ingredient (whether Category 1 or 2) at a concentration of 0.1% or more are required to have an

	more are required to have label and an SDS.	SDS. All mixtures containing a Category 1 carcinogen at 0.1% or more, or a Category 2 carcinogen at 1% or more must have a label. Mixtures containing a Category 2 carcinogen at a concentration between 0.1% and 1% are not required to have a label (a label warning is optional for such mixtures).
Physical Hazards Not Otherwise Classified (PHNOC)/Health Hazards Not Otherwise Classified (HHNOC) vs. Hazards Not Otherwise Classified (HNOC)	Label elements are required for PHNOC and HHNOC. For mixtures that contain an HHNOC ingredient at a concentration of 1% or more, information relating to the HHNOC ingredient, including its chemical name and concentration or concentration range, must be disclosed on the SDS.	No label elements required for HNOC. For a mixture that contains an HNOC ingredient at a concentration of 1% or more, there is no requirement to disclose the chemical name or concentration of the HNOC ingredient on the SDS.
Biohazardous Infectious Materials (BIM)	A hazard class for BIM is included and products that meet the criteria for this hazards class must be appropriately labelled. Also, besides the standard SDS, there is a requirement for an appendix that provides information specific to the BIM.	There is no hazard class for biohazardous infectious materials since these materials in the workplace are not regulated by U.S. HCS 2012.
Water-Activated Toxicants	A supplemental hazard statement is required on the label and SDS indicating that, in contact with water, the product releases gases which are fatal/ toxic/harmful if inhaled.	A supplemental hazard statement is required on the SDS if substances which, upon contact with water, release a toxic gas are present in the workplace in such a manner that employees may be exposed under normal conditions of use or in a foreseeable emergency.
Updating of SDS and label information	Suppliers and importers are allowed a period of 90 days to update SDSs with new	Chemical manufacturers, importers, distributors, and employers are allowed a

	data and 180 days to update labels. If a hazardous product is sold or imported within 90 days after significant new data became available, the new data is not required to be included on the SDS so long as a written notice providing the new data and the date upon which it became available is transmitted to the purchaser of the product, or obtained or prepared where the product is imported. The same requirement applies also to labels, except that the corresponding period of time is 180 days.	period of 3 months to update SDSs with new information and 6 months to update labels. There is no requirement for a written notice providing the significant new information for importation or sale occurring within the 3 month or 6 month period.
Labels on multi-container shipments	For a hazardous product is packaged in more than one container, each container must be fully labelled, unless: (a) the small capacity container (≤ 100 mL) exemption applies; or (b) one of the outer container exemptions applies.	Only the innermost container is required to be labelled. The outer container does not need to be labelled.
Labels on kit outer containers	Outer container of a kit (containing at least two different hazardous products) must be labelled. There is an exemption which allows reduced information on the outer container label, as long as a special statement referring the user to the individual product labels for signal words, hazard statements and precautionary statements is provided on the outer container label.	Only the inner containers are required to be labelled. The outer container of a kit does not need to be labelled.

From: Health Canada (2016): "WHMIS 2015 - Variances between the HPR and the United States Hazard Communication Standard (2012)"

Chemical Storage Requirements

The SDS should be consulted to determine the storage requirements for each chemical. Improper storage of chemicals can lead to accidental exposures, releases and spills, or fires/explosions. Chemicals should be stored in the appropriate containers, with compatible products, and in the appropriate storage environments. All products require proper labelling.

Class of WHMIS Materials	Recommended Storage	Incompatible WHMIS Materials for Storage
Flammable Liquids	In grounded flammable storage cabinet	Corrosives (acids and bases), Oxidizers, Poisons
Flammable Solids	Store in a separate dry, cool area away from incompatible materials	Corrosives (acids and bases), Oxidizers, Poisons
Compressed Gases – Flammable	Store in a cool, dry gas storage area away from incompatible materials	Oxidizers and Toxic Compressed Gases, Oxidizing Solids, Corrosives, Poisons
Compressed Gases – Oxidizing	Store in a cool, dry gas storage area away from incompatible materials	Flammable Gases
Compressed Gases – Poisonous	Store in a cool, dry toxic gas storage area away from incompatible materials	Flammable Liquids, Flammable and Oxidizing Gases, Oxidizers, Corrosives
Corrosives – Acids	Store in a separate storage cabinet away from incompatible materials	Flammable Liquids and Solids, Corrosives (bases), Oxidizers, Toxics
Corrosives – Bases	Store in a separate storage cabinet away from incompatible materials	Flammable Liquids and Solids, Corrosives (acids), Oxidizers, Toxics
Oxidizers	Store in a spill tray inside a non-combustible cabinet, separate from incompatible materials	Flammable and Combustible Liquids and Solids, Corrosives, Toxics
Poisons	Store separately, in vented, cool, dry area in an unbreakable chemically resistant secondary container	Flammable Liquids and Solids, Corrosives (acids and bases), Oxidizers
Biohazardous Materials	Special storage	Refer to SDS
Explosives	Special storage	
Shock-Sensitive Materials	Store in secure location away from all other chemicals	Flammable Liquids, Oxidizers, Corrosives (acids and bases), Poisons
Water-Reactive Chemicals	Store in a dry, cool location and protect from water fire sprinklers	Separate from all aqueous solutions, Oxidizers
Radioactive Materials	Special storage	
General Chemicals – Non-Reactive	Store on general laboratory benches or shelving preferably behind glass doors	Refer to SDS

Source: Canadian Center for Occupational Health and Safety website: WHMIS 2015

Chemical Inventory

All Managers/Supervisors shall compile and maintain an inventory of hazardous materials in the areas for which they are responsible, and shall forward a copy of the updated inventory on a yearly basis to Occupational Health and Safety. The updated inventory lists for each storage location shall be kept at the front of the SDS binder for that storage location. The binder shall be readily accessible to the employees at all times.

Training

All College employees are required to take mandatory WHMIS 2015 within the first week of employment at the College. This training is available on the Risk Management website under Occupational Health and Safety Training Resources. It is recommended that WHMIS 2015 training be refreshed every 5 years for employees who do not work with controlled products on a regular basis.

WHMIS 2015 training should include:

- The information on both the supplier label and workplace label, and what that information means.
- The information on the Safety Data Sheet (SDS) and what that information means.
- The procedures required for safe use, handling and disposal of a hazardous product.
- Any other procedures required when the product is in a pipe, piping system, vessel, tank car, etc.
- The procedure to follow if the hazardous product may be present in the air and a worker may be exposed.
- All procedures that must be followed in an emergency that involves the hazardous product.

Workers who handle chemicals should refresher WHMIS 2015 at a great frequency, at least every 1-2 years, depending on the hazards.

Employees and Supervisors who will be working with hazardous materials require training on chemical handling, specific to the tasks and chemicals in their areas. This training must be provided **before** workers handle any chemicals. Supervisors are responsible to ensure that employees who work with hazardous materials attend refresher training at least once every three years and more frequently, as required.

Appendix A: Comparison of WHMIS 1988 and WHMIS 2015 Pictograms

WHMIS 1988 Hazard Class	WHMIS 1988 Symbols	WHMIS 2015 Pictograms	WHMIS 2015 Hazard Class
A			Gases Under Pressure
B1 to B6			Flammables, Self-Heating, Emit Flammable Gases, Pyrophoric Gases, Liquids & Solids Organic Peroxides
C			Oxidizing Gases, Liquids, Solids
D1			Acute Toxicity - Oral, Dermal, Inhalation
D2			Eye Irritation, Skin Irritation Skin/Respiratory Sensitization, Carcinogenicity Mutagenicity Reproductive Hazards
D3			Biohazardous Infectious Materials
E			Skin/Eye Corrosion Corrosive to Metals
F			Self-Reactive Substances Organic Peroxides
N/A	N/A		Explosive Substances (Explosives are still covered under WHMIS exclusions for now)
N/A	N/A		Aspiration, STOT (Single Exposure, Repeated Exposure)
N/A	N/A	N/A	Combustible Dusts
N/A	N/A	N/A	Simple Asphyxiants
N/A	N/A	Use appropriate symbol	Use appropriate symbol Physical Hazards Not Otherwise Classified, Health Hazards Not Otherwise Classified

Source: Canadian Center for Occupational Health and Safety website: WHMIS 2015