

Section 1

WHMIS Classes and Symbols

Classes and Symbols

Class/Division/Subdivision	Description
	<p>Class A</p> <p>Compressed Gas</p>
	<p>Class B</p> <p>Division 1 Division 2 Division 3 Division 4 Division 5 Division 6</p> <p>Flammable and Combustible Material Flammable Gases Flammable Liquids Combustible Liquids Flammable Solids Flammable Aerosols Reactive Flammable Materials</p>
	<p>Class C</p> <p>Oxidizing Material</p>
  	<p>Class D</p> <p>Division 1</p> <ul style="list-style-type: none"> ▪ Subdivision A ▪ Subdivision B <p>Division 2</p> <ul style="list-style-type: none"> ▪ Subdivision A ▪ Subdivision B <p>Division 3</p> <p>Poisonous and Infectious Material</p> <p>Materials Causing Immediate and Serious Toxic Effects</p> <ul style="list-style-type: none"> ▪ Very Toxic Material ▪ Toxic Material <p>Materials Causing Other Toxic Effects</p> <ul style="list-style-type: none"> ▪ Very Toxic Material ▪ Toxic Material <p>Biohazardous Infectious Materials</p>
	<p>Class E</p> <p>Corrosive Material</p>
	<p>Class F</p> <p>Dangerously Reactive Material</p>

Class A: Compressed Gas



Definition:

A product, material, or substance falls within in Class A if it is a gas at normal room temperature (20° C) and kept:

1. Under pressure
2. As a dissolved gas under pressure
3. As a gas liquefied by compression or refrigeration

Examples:

- Liquefied petroleum gas
- Cylinders of acetylene
- Oxygen, nitrogen, ammonia, acetylene, helium
- Fire extinguishers
- Propane
- Scott air packs
- Aerosol cans are not under sufficient pressure to be considered compressed gases.

Precautions:

- Know the hazards associated with the gases you work with
- Secure cylinders upright at all times
- Use the personal protective equipment that is provided for your safety
- Keep cylinders away from fire, sparks and electricity
- Always have an approved fire extinguisher in the area where flammable gases are in use
- Never drop cylinders, bang them against each other or permit anything to fall on them
- Move full cylinders with special hand trucks - so not to drag or roll them on the ground
- Never use cylinders as rollers or supports
- Never leave flammable gas cylinders in stairwells or hallways
- Protect cylinders from any objects that might cut or scrape them - avoid contamination by oil and grease, whether in storage or use
- Store cylinders with valve caps in place, even when empty
- With propane, only cylinders that are hooked up to an appliance, such as an ice machine, truck, etc., should be stored inside a building

Class B: Flammable and Combustible Material



Definition:

There are six divisions within this class: Flammable Gases, Flammable Liquids, Combustible Liquids, Flammable Solids, Flammable Aerosols, and Reactive Flammable Materials.

Division 1: Flammable Gases

A product, material, or substance is classified into this Division 1 if it is a Compressed Gas (Class A), and at normal atmospheric pressure forms a flammable mixture with air when the compressed gas is between 12-13% by volume:

Examples:

- Hydrogen
- Methane
- Propane

Division 2: Flammable Liquids

A product, material, or substance is classified into Division 2 if it has a flashpoint less than 37.8° C (100° F).

Examples:

- Benzene
- Gasoline
- Turpentine
- Toluene

Division 3: Combustible Liquids

A product, material, or substance is classified into Division 3 if it has a flashpoint of 37.8° C (100° F) or more but less than 93.3° C (200° F).

Examples:

- Mineral spirits
- Kerosene
- Diesel Fuel

Division 4: Flammable Solids

A product, material, or substance is classified into Division 4 if it meets any one of four criteria:

- a) It causes fire through friction or through retained heat from manufacturing or processing.
- b) It can be ignited readily and when ignited burns so vigorously and persistently as to create a hazard.
- c) It ignites readily and burns with a self-sustained flame
- d) It meets the criterion for flammable solids (Division 1 of Class 4) of the TDG Regulations.

Examples:

- Magnesium
- Beryllium
- Sodium
- Potassium
- Magnesium alloys

Division 5: Flammable Aerosols

Any product, material, or substance is classified into Division 5 if it is packaged in an aerosol container and when tested in accordance with test method in Schedule VI of the Controlled Products Regulation produces a flame projection or a flashback of any length. Most aerosols contain flammable propellants.

Examples:

- Butane
- Isobutene

Division 6: Reactive Flammable Materials

A product, material, or substance is classified into Division 6 if it meets either of the following conditions:

- a) It is spontaneously combustible and liable to spontaneous heating under normal conditions of use or liable to heat in contact with air to the point where it begins to burn.
- b) It emits a flammable gas or becomes spontaneously combustible on contact with water or water vapour.

Examples:

Spontaneously combustible with air:

- Lithium aluminum hydride
- Celluloid
- Aluminum alkyl compounds

Spontaneously combustible with water:

- Metallic sodium
- Lithium amide
- Lithium aluminum hydride

Precautions:

- Never smoke when working with or near flammable and combustible materials
- Keep the material away from heat sources and other combustible materials
- Don't carry matches, lighters or other spark-producing devices around flammable and combustible materials
- Store the material in a cool, fire-proof area
- Keep away from powerful oxidizing materials, susceptible spontaneous heating materials, explosives, and materials that react with air/moisture to produce heat
- Keep flammable liquids in a closed safety container when not in use
- Clean up spills promptly and dispose of oily rags and waste in all-metal, covered safety containers
- Never pour flammable liquids into sewers or drains
- Never mix flammables - mixing flammables can lower the flashpoint of flammables they are added to
- Do not cause static discharges or impacts that could cause sparks
- Wear the proper protective equipment when pouring from metal container to metal container
- Properly ground and bond the containers before pouring to prevent a fire from occurring.

Class C: Oxidizing Material



Definition:

Oxidizing materials are liquids or solids that readily give off oxygen or other oxidizing substances (such as bromine, chlorine, or fluorine).

They also include materials that react chemically to oxidize combustible (burnable) materials; this means that oxygen combines chemically with the other material in a way that increases the chance of a fire or explosion. This reaction may be spontaneous at either room temperature or may occur under slight heating.

Examples:

- Sulphuric acid
- Nitrates
- Nitrites
- Inorganic peroxides
- Dichromates
- Chlorine
- Permanganates

Precautions:

- Storage area should be well ventilated and kept cool (as some oxidizers require heat before they will yield oxygen)
- Avoid storing strong or powerful oxidizers on wooden floors or shelves
- Keep the material away from flammable and combustible materials
- Keep the material away from sources of ignition
- Use large quantities of water for fire-fighting procedures
- Never smoke when working near the materials

Class D: Poisonous and Infectious Material

Definition:

A product, material, or substance known to cause temporary or permanent adverse health effects in humans are classified into Class D. Adverse effects cover a broad range from acute lethality to mutagenicity and cancer.

There are three divisions within Class D.

Division 1 (D-1): Materials Causing Immediate and Serious Toxic Effects:

These are products, substances, and materials that may cause acute lethal effects, immediately or within 24 hours following a single dose exposure to a toxic material. Products that cause such effects have low LC50 and LD50 values.



Examples:

- Carbon monoxide
- Toluene
- Cyanide
- Ammonia
- Chlorine

Division 2 (D-2): Materials Causing Other Toxic Effects:

This includes materials with effects other than those that are immediate. For example, eyes, skin and lung irritation, organ damage. Long-term effects in persons or animals include mutagenicity, allergies, sensitization and cancer. The effects usually result from repeated exposures over a long period of time.



Examples:

- Asbestos
- Silica
- Lead
- Solvents (benzene, acetone, turpentine, d-limonene)

Division 3 (D-3): Biohazardous Infectious Material:

This Division applies to organisms and the toxins they produce which cause disease or are reasonably believed to cause disease in persons or animals.

Organisms which cause disease in animals are of concern to WHMIS particularly where transmission of the disease may occur from animals to persons.



Examples:

- Blood samples
- Viruses (HIV, hepatitis)
- Bacteria
- Moulds

Precautions for Class D Materials:

- Handle material with extreme caution
- Avoid contact with the skin or eyes by wearing the proper protective equipment
- Avoid inhaling by working in well-ventilated areas and/or wearing respiratory equipment as required
- Store the material in designated areas only
- Do not eat, drink or smoke in areas where chemicals are used or stored
- After handling poisonous materials, before eating, smoking, drinking or going home, wash your hands and face.

Class E: Corrosive Materials



Definitions:

Corrosives are materials or substances that will corrode steel, destroy aluminum or human tissue at the site of contact. Corrosion is the production of **irreversible** tissue damage to the skin as a result of chemical reaction between the product and dermal tissue. It differs from irritation, which is the production of **reversible** inflammatory changes.

Examples:

- Acetic acid
- Bromine
- Chlorine
- Fluorine
- Hydrochloric acid, muriatic acid
- Nitric acid
- Potassium hydroxide
- Sodium hydroxide
- Sulfuric acid – battery acid
- Chromic acid

Precautions:

- Keep containers tightly closed
- Store in cool, dry area well above freezing points
- Adequate ventilation to prevent accumulation of corrosive vapours that could be leaking from imperfectly sealed containers
- Storage area should have a floor that is protected against corrosion in the event of a spill
- Acids and bases can be stored in similar areas, but they must be well separated
- Corrosives should not be stored near oxidizing materials
- Avoid skin and eye contact by wearing all necessary protective equipment, including eye, face and hand protection and protective clothing

Class F: Dangerously Reactive Materials



Definition:

A product, material, or substance belongs in this Class if it meets any one of three criteria:

- a) It undergoes vigorous polymerization, decomposition, or condensation.
- b) It becomes self-reactive under conditions of shock or increased pressure or temperature.
- c) It reacts vigorously with water to release a gas

Note:

- Polymerization is a chemical reaction in which many small molecules (monomers) join together to form a large molecule (polymer). Often the reaction produces heat and pressure
- Condensation is when two or more molecules join together to produce a new substance
- The category “Dangerously Reactive Material” must not be confused with the hazard concept of “incompatibility.” Materials that are incompatible are those that react dangerously on contact to produce excessive heat, explosions, or toxic products. For example, many caustics are incompatible with acids, and many oxidizers are incompatible with flammables. Only criterion #3 of Class F involves an incompatibility—between a product and water. Many other materials that are incompatible with other products are not classified as Dangerously Reactive. This point must be considered when reviewing the MSDS item on “Incompatibility.”

Examples:

- Acrylic acid
- Ethyl acrylate
- Hydrocyanic acid
- Vinyl Acetate

Precautions:

- Keep material away from heat
- Store the material in a cool, flame-proof area
- Containers should be water-tight and air-tight
- Wear suitable protective clothing
- Avoid shock and friction
- Before storing large quantities of water-sensitive material, make sure that proper extinguishers are provided in case of emergency

Exclusions

Ten types of products are exempt in whole or part from WHMIS information requirements. The following categories of products are exempt from WHMIS labels and MSDSs:

Partially Exempted

Partially exempt products, which are labelled under federal legislation other than WHMIS, can be sold without WHMIS labels and MSDSs. However, when these products are used in the workplace, provincial OSH regulations require worker education and training, and workplace labels must be applied if they are not in their original containers.

- Consumer products (packaged as a consumer product and labelled under the *Consumer Chemicals Containers Regulations (CCCR)* in quantities normally used by a member of the general public);
- Cosmetics, food, drugs or devices (within the meaning of the Food and Drugs Act) ;
- Explosives (under the Explosives Act);
- Pesticides (under the Pest Control Products Act);
- Radioactive materials (under the Nuclear Safety and Control Act);

Completely Exempted

Completely exempt products are excluded from both federal (HPA, CPR) and provincial OHS WHMIS requirements, although general occupational health and safety requirements governing workplace education and training, as well as hazard identification, must be met. Completely exempt products are:

- Wood or products made of wood
- Manufactured articles
- Tobacco or products made of tobacco
- Hazardous wastes
- Products handled or transported pursuant to the *TDG Act*

These products are controlled by other safety laws and should be referred to when handling such products. A workplace label must still be applied if the product is decanted into another container.