

WHMIS 2015 Glossary of Terms

A

ACGIH - American Conference of Governmental Industrial Hygienists. They publish chemical exposure guidelines which are used around the world.

acid - a chemical with a pH value less than 7 that can be corrosive to skin or metal. Acids can be weak (e.g. vinegar - about pH 3) or strong (e.g. sulfuric acid - about pH 1).

acute effect - a health effect that develops immediately after exposure to a chemical.

acute exposure - a single exposure to a substance or multiple exposures within a short time, usually 24 hours or less.

acute toxicity - the ability of a substance to very quickly cause damage to living tissue or body organs, including severe illness or death.

aerosol - a fine mist of solid or liquid particles suspended in the air.

alkali - a chemical with a pH value greater than 7 that can be corrosive to skin or metal. Alkalis can be weak (e.g. baking soda - about pH 8) or strong (e.g. ammonia - about pH 12).

allergic reaction - a health effect, such as a skin rash or a breathing problem, caused by exposure to a chemical substance.

anhydrous - a chemical that does not contain water; exposure to water may cause a violent reaction.

aquatic toxicity - the ability of a chemical to be harmful or fatal to marine or freshwater organisms (fish, Crustacean, algae, etc.) during short term (acute) or long term (chronic) exposure to the chemical.

aspiration hazard - aspiration means the entry of a liquid or solid chemical directly through the oral or nasal cavity, or indirectly through vomiting, into the trachea and lower respiratory system.

aspiration toxicity - aspiration toxins cause severe acute effects such as chemical pneumonia, varying degrees of pulmonary injury or death following aspiration.

ASTM - ASTM International, formerly known as the American Society for Testing and Materials.

Auto-ignition temperature - the minimum temperature at which a substance will catch fire without a spark or flame.

B

base - a chemical in solution which has a pH value higher than 7.

bioaccumulation - bioaccumulation occurs when organisms such as fish absorb a toxic substance at a rate greater than that at which the substance is lost.

biocide - a chemical that acts to kill or control a biological growth or infestation, such as bacteria or fungus.

boiling point - the temperature at which a liquid changes to a vapour (starts to boil).

C

°C - degrees Celsius, also known as centigrade, is a scale of measurement for temperature, where the freezing point of water is 0°C and the boiling point of water is 100°C.

carcinogen - a substance capable of causing cancer.

carcinogenicity - the ability of a substance to cause cancer.

CAS registry number - Chemical Abstract Service registry number, used to identify a specific material no matter what name it might be called. It appears in Section 3 of a standard 16-part SDS.

caustic - a short form for chemicals such as caustic soda (sodium hydroxide). A strongly alkaline chemical with a high pH value that can be corrosive to skin or metal.

ceiling limit - the ceiling limit is the amount of a toxic chemical in workroom air that may not be exceeded even for a moment.

chemical name - the name that identifies a chemical substance for the purpose of hazard classification using the rules of the Chemical Abstract Service (CAS) or UPAC.

chronic effect - a health effect that develops over time as a result of long-term exposure or sometimes a single extreme exposure.

chronic exposure - repeated exposures to a substance over a relatively long period of time. Even very small individual exposures to certain chemicals may "accumulate" and result in a toxic effect, including sensitization.

chronic toxicity - the ability of a chemical to cause harm from repeated exposures over a long period of time. Chronic toxicity is usually separated into the effects that can cause cancer (carcinogenic toxicity) and the effects that cause other types of harm (non-carcinogenic effects such as silicosis).

coefficient of water/oil distribution - a way of comparing a product's solubility in water with its solubility in oil. A value greater than 1 indicates that the product dissolves more readily in water; these materials may be absorbed by the membranes of the eyes or the respiratory tract. Values less than 1 indicate that the product is more soluble in oil; these materials may be absorbed by the skin.

combustible - capable of burning easily.

compound - a substance formed from two or more elements chemically united (bonded) in definite proportions by weight; e.g. water is a compound of hydrogen and oxygen, and salt (sodium chloride) is a compound of sodium and chlorine.

compressed gas - a gas which, when packaged under pressure is entirely gaseous at -50°C, including all gases with a critical temperature <-50°C. Compressed gases can be toxic, flammable, oxidizing, corrosive, or inert. In the event of a leak, inert gases can quickly displace air in a large area creating an oxygen-deficient atmosphere.

concentration - the relative amount of a substance in a mixture with other substances. Small concentrations are usually expressed in parts per million (ppm) or in milligrams per liter (mg/l). Large concentrations can be expressed as a percent (%).

conditions of instability - the situations in which the product will polymerize, decompose, or condense. These conditions might include pressure, vibration, jarring, heating or the presence of moisture or air.

conditions of reactivity - the situations in which a material will react. These conditions might include the presence of light, elevated temperature, aging, or the absence of an inhibitor.

consumer product - a product that is packaged for the consumer and available to the general public through retail systems.

controlled product - any substance classified under WHMIS 1988 as being: Compressed Gas, Flammable and Combustible Material, Oxidizing material, Poisonous and Infectious Material, Corrosive Material, Dangerously Reactive Material.

Controlled Products Regulations - part of WHMIS 1988, developed under the Hazardous Products Act. The CPR specifies the criteria for classification of controlled products and the information that must be included on labels and material safety data sheets (MSDSs). WHMIS 1988 and the Controlled Products Regulations are being replaced by WHMIS 2015 and the Hazardous Products Regulations.

corrosive - a substance that can destroy living tissue at the site of contact. This distinguishes corrosive effects from toxic effects which occur away from the contact point.

corrosive to metal - a substance which will damage or destroy metals such as steel or aluminum by chemical reactions.

critical temperature - the temperature above which a gas cannot be liquefied, regardless of the pressure applied.

CSA - Canadian Standards Association. An organization that sets standards for safety in designs

D

decomposition - the breakdown of a chemical into other substances as a result of heat, chemical reactions or other processes.

dermal toxicity - the ability of a substance to cause harmful effects by absorption through the skin. Skin prevents loss of liquids from the body and forms a barrier to the entry of many toxic substances, especially solids. Oily liquids will penetrate the skin more easily than watery liquids.

dermatitis - inflammation of the skin caused by an irritant substance.

dust - solid particles in air, formed by mechanical actions such as grinding or crushing.

E

EC⁵⁰ - the effective concentration of a chemical that causes 50% of the maximum response. Engineering controls - the control of hazards by isolating the worker from the hazard or by removing the hazard from the work area - e.g. ventilation, isolation and enclosure.

environmental hazard - the potential of a substance to cause short or long term air or water pollution, soil contamination or harm to living organisms.

evaporation rate - how fast a substance vaporizes, compared with a standard substance such as butyl acetate. (Butyl acetate has an evaporation rate of 1.) Substances with a high evaporation rate can get into the air very quickly. This is of particular concern when the vapours must be controlled because they are toxic or flammable.

explosive - a chemical or mixture of chemicals that may instantaneously release large amounts of energy as heat and gas.

exposure limit - the concentration of chemicals that may not be exceeded in workplace air, based on the concentration to which most people can be exposed without harm, usually during a certain period of time. TLVs (Threshold Limit Values) developed by ACGIH, and PELs (Permissible Exposure Limits) regulated by OSHA, are both widely used.

F

flammable - capable of being ignited easily and burning rapidly.

flammable limits - the upper and lower concentrations of a flammable gas or vapour in air between which ignition can occur.

flash point - the lowest temperature at which a product will give off enough vapour to catch fire if a source of ignition is present. The lower the flash point, the greater the potential fire hazard.

freezing point - the temperature below which a liquid material turns into a solid. It's the same as the melting point, the temperature above which the solid material becomes liquid.

fumes - very small, solid particles in air, formed when hot vapour cools - for example, during welding.

G

g (gram) - one pound equals 454 grams.

gas - a material with no specific shape or volume, which spreads out to fill the space available at normal room pressure and temperature.

GHS - Globally Harmonized System for Classification and Labeling of Chemicals. GHS was developed by the United Nations in 2003 and incorporated into WHMIS in 2015.

H

hazard class - the nature of a physical, health or environmental hazard, for example, flammable solid, carcinogen, oral acute toxicity.

hazard statement - a statement in standardized wording that describes the dangers of a chemical substance.

hazardous combustion products - chemicals that are formed when a material burns.

hazardous decomposition products - chemicals that are produced when a material breaks down (decomposes) because it is unstable or reacts with materials such as water or oxygen.

health hazard - a chemical which has been classified as posing one of the following effects: acute toxicity, skin corrosion or irritation, serious eye damage or irritation, respiratory or skin sensitization, germ cell mutagenicity, carcinogenicity, reproductive toxicity, specific target organ toxicity or aspiration hazard.

HMIRC - the Hazardous Materials Information Review Commission. It is the federal government agency that decides if specific information may be kept secret and not included on a safety data sheet.

HMIRC registry number - the number issued by the HMIRC when a WHMIS trade secret is registered.

hygroscopic - a substance that readily takes in moisture, often from the air.

I

IARC - International Agency for Research on Cancer. They publish lists of chemicals which are proven or suspected to cause cancer.

IDLH - Immediately Dangerous to Life or Health. (NIOSH definition)

ignition source - anything that can provide heat, flame or spark and cause a fire or explosion.

immediate use - the chemical will be used only by the person who transfers it from a labeled container and it will only be used in that work shift.

impervious - does not allow another substance to penetrate or pass through it; a requirement for some protective clothing. Different materials are impervious to different chemicals, but no material is impervious to all chemicals.

incompatible materials - substances which could react dangerously with one another - e.g. sodium cyanide and water will produce toxic hydrogen cyanide gas.

inflammable - see: flammable

ingestion - intake of a substance through the mouth. Chemicals, like food, have to pass through the liver before reaching the intestines. The liver may convert some toxic chemicals into less toxic substances but the intestines are where food is absorbed into the body and toxic substances may also be absorbed.

inhalation - breathing in a gas, vapor, dust, fumes or mist through the nose or mouth. Lung tissue allows easy movement of air and oxygen into the body so most gases and vapors can enter the body by this route.

inhibitor - a substance added to a chemical to slow down or prevent a reaction, to increase stability.

initial boiling point - the temperature of a liquid when the first gas bubble forms,

insoluble - not capable of dissolving in liquid.

irritant - a substance that can cause inflammation of the eyes, skin, or respiratory system from one or more exposures.

IUPAC - International Union of Pure and Applied Chemistry

K

kg (kilogram) - one kilogram equals about 2.2 pounds.

kPa - kilopascal. A unit of pressure; 1 atmosphere equals 101.3 kPa.

L

L or l - Litre. One litre equals about 35 fluid ounces.

label - on a controlled product, this can be a mark, sign, device, stamp, seal, sticker, ticket, tag or wrapper.

LC⁵⁰ - Lethal Concentration. A way of measuring the acute toxicity of a gas when it is inhaled by the test animal. It means the airborne concentration of a substance that kills 50% of the test animals. The LC⁵⁰ is usually expressed as parts of test substance per million (ppm) parts of air for gases, or as milligrams of test substance per cubic meter of air (mg/m³) for dusts, mists and fumes. The lower the LC⁵⁰ value in comparable tests, the greater the toxicity.

LD⁵⁰ - Lethal Dose. A way of measuring the acute toxicity of a chemical when it is swallowed by the test animal or when it is absorbed through the animal's skin. It means the single dose of a substance that kills 50% of the animals tested. The LD⁵⁰ for a product varies by species of test animal and by the route of entry, so this information has to be specified along with the LD⁵⁰ value. It is expressed as milligrams of substance per kilogram of test animal body weight (mg/kg). The lower the LD⁵⁰ value in comparable tests, the greater the toxicity.

LEL - Lower Explosive Limit - same as: LFL

LFL - Lower Flammable Limit. The lowest concentration of a product in air that will catch fire (or explode) if an ignition source is present. At concentrations lower than the LFL, the mixture is "too lean" to burn (or explode). It is expressed as a percent (%).

liquid - the only state of matter (others include solid, gas) with a definite volume but no fixed shape. Like a gas, a liquid is able to flow and take the shape of a container, (see also: physical state)

lower explosive limit - see: LFL

lower flammable limit - see: LFL

M

M³ - cubic meter. One cubic meter is equal to approximately 1¹/₃ cubic yards.

material safety data sheet - see: safety data sheet

means of extinction - includes both the type of fire extinguisher that should be used on a small fire involving the product, and the firefighting agents that should be used for fighting a major fire.

melting point - the temperature above which a solid material turns into a liquid. It's the same as the freezing point, the temperature below which the liquid material becomes solid.

mg - milligram. One one-thousandth of a gram.

mg/m³ - milligrams per cubic meter.

miscible liquids - liquids that are capable of mixing completely so that the result looks like a single liquid.

mist - liquid droplets suspended in air, formed when a liquid is sprayed or splashed, or when vapour condenses in the air.

MSDS - see: safety data sheet

mutagen - mutagens are chemical products which can cause changes (mutations) in the genetic material of living cells. A mutation in a body cell may cause a tumor but it cannot be inherited; a mutation in a reproductive cell (egg or sperm) can be inherited.

N

neutralize - to make a substance non-corrosive by bringing it to a neutral level of pH 7.

NFPA - National Fire Protection Association; the NFPA rating system uses color coding and numbers to warn of hazards.

NIOSH - National Institute for Occupational Safety and Health, an agency of the U.S. Department of Health and Human Services.

NTP - National Toxicology Program. A U.S. government agency that tests the carcinogenicity of chemicals and studies short-term and long-term health effects.

O

occupational exposure limit - the maximum concentration of a chemical allowed to be present in workplace air.

odour threshold - the lowest airborne concentration of a substance that can be detected by the sense of smell.

oral - taken into the body through the mouth.

oral toxicity - the ability of a substance to cause harm to the body when swallowed.

organic peroxide - a carbon compound that has two atoms of oxygen joined together (a "peroxy" group). Organic peroxides are oxidizers and are severe fire and explosion hazards; they may also be toxic or corrosive.

OSHA - Occupational Safety and Health Administration. A U.S. government agency that establishes and enforces health and safety regulations.

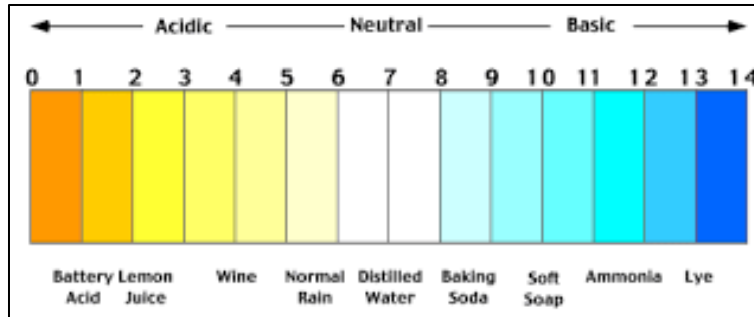
oxidizer - a chemical that by releasing oxygen can cause or contribute to the combustion of other material. Oxidizing agents include nitrate compounds, halogens (chlorine, fluorine) and their compounds (chlorates, perchlorates) and inorganic peroxides.

P

PEL - Permissible Exposure Limit. A legal limit set by OSHA, indicating the maximum amount or concentration of a substance permitted in the air.

personal protective equipment (PPE) - clothing or equipment to protect against hazards in the work environment - e.g. gloves or respirators.

pH- a measure of a substance's acidity or alkalinity. A pH of 7 is neutral. Substances with a pH greater than 7 are alkaline. Alkalinity increases as the pH increases. Substances with a pH less than 7 are acidic. Acidity increases as the pH decreases.



physical state - the physical condition of a material - e.g. a solid, liquid or gas.

pictogram - WHMIS 2015 uses the nine standard GHS warning signs (eight plus the environment pictogram) which consist of a symbol inside a diamond shape with a red border. There are no words, letters or numbers in the pictograms.

polymerize - a chemical reaction where small molecules link together to form larger molecules. The process can be used to produce useful compounds such as polyethylene and PVC. Uncontrolled polymerization can cause fires and explosions.

PPE - see: personal protective equipment

ppb - parts per billion. A unit used for measuring the concentration of one substance in another substance; for example, one second of time in 32 years.

ppm - parts per million. A unit used to measure the concentration of one substance in another substance; for example, 1 ppm of hydrogen sulfide in air is 1 part hydrogen sulfide in 1 million parts of air. One ppm is like 1 minute in 2 years or 1 cent in \$10,000.

precautionary statement - a standardized phrase that describes how to safely use, handle and store hazardous chemicals, and the recommended measures to deal with exposures, fires and spills.

product identifier - a unique name or number used on a label or an SDS to identify the chemical.

pyrophoric - Pyrophoric and water-reactive materials ignite instantly or explode upon exposure to air, oxygen, water or moisture in the air. Water-reactive materials can produce heat and hydrogen (a flammable gas).

R

reactivity - the tendency of a substance to undergo chemical reaction with the release of energy; may result in an increase in pressure or temperature or formation of toxic or corrosive by products.

REL - Recommended Exposure Limit.

relative density - see: specific gravity

reproductive toxicity - the ability of a chemical product to affect the fertility of exposed persons. The effects include changes in the sperm or egg cells, and miscarriages.

respirator - personal protective equipment designed to keep the wearer from inhaling a hazardous substance.

respiratory sensitizer - a substance that leads to hypersensitivity of the airways following inhalation.

risk phrase - a statement on the supplier label identifying a hazard that may arise as a result of the nature of the controlled product.

route of entry - the way a substance comes in contact with the body. It may cause damage by skin or eye contact, or the chemical can get inside the body by inhalation (breathing), ingestion (swallowing), injection (with a needle or a contaminated sharp object) or by absorption through the skin.

S

safety data sheet (SDS) - a technical bulletin required for hazardous products which provides detailed hazard and precautionary information, also called: material safety data sheet, or MSDS

SCBA - Self-Contained Breathing Apparatus.

SDS - see: safety data sheet

self-heating substance - a solid or liquid, other than a pyrophoric substance, which, by reaction with air and without energy supply, is liable to self-heat; this substance differs from a pyrophoric liquid or solid in that it will ignite only when in large amounts and after long periods of time.

self-reactive substance - self-reactive substances are unstable liquids or solids liable to undergo strongly exothermic decomposition even without the presence of oxygen (air). This definition excludes substances and mixtures classified under HazCom as explosives, organic peroxides or as oxidizers.

sensitizer - a substance that may cause a response such as redness, itching or swelling. The effects may become more severe with each additional exposure.

signal word - a word used on WHMIS labels and safety data sheets to indicate the degree of potential risk. "Danger" is used for the most hazardous chemicals and "Warning" for less hazardous chemicals.

silicosis - a disease caused by inflammation of the lung tissue around trapped particles of crystalline silica ("quartz sand") causing scarring and reducing the ability of the lungs to take in oxygen.

smoke - smoke is a collection of airborne solid and liquid particles and gases produced when a material burns. Hazardous combustion products in smoke may include carbon monoxide and hydrogen cyanide.

solid - a state of matter (others include liquid, gas) characterized by structural rigidity and resistance to changes of shape or volume, (see also: physical state)

solubility in water - the percentage of a material (by weight) that will dissolve in water at normal room temperature.

solvent - a material that can dissolve other materials - e.g. water is a solvent.

specific gravity - how the weight of a substance compares to the weight of an equal volume of water. Substances with a specific gravity greater than 1 are heavier than water. They will sink to the bottom of water mixtures. Substances with a specific gravity less than 1, such as oil, are lighter than water: they will float on water.

specific target organ toxicity - see: target organ toxicity

stability - the ability of a material to remain unchanged under reasonable conditions of storage or use.

STEL - Short-Term Exposure Limit. The average concentration to which a worker can be exposed for a short period (usually 15 minutes) without serious effects.

supplier - a person, who manufactures, processes, packages, imports, sells or distributes a hazardous chemical product.

supplier label- a label that is provided on a chemical product by the supplier.

supplied air - a system that supplies fresh, filtered air to the user's respirator from a central source: the source of breathing air is not designed to be carried by the user.

T

target organ toxicity - some chemicals affect specific organs or systems of the body, such as the liver, kidneys or blood system.

TCC - Tagliabue Closed Cup. A flash point test method.

TDG - Transportation of Dangerous Goods Act and Regulations.

teratogenicity - the ability of a chemical product to damage an unborn child without adversely affecting the pregnant woman. Teratogens cause harm or miscarriage during the critical stage of organ development, approximately the first three months of pregnancy. There are few known human chemical teratogens.

threshold limit value - see: TLV and exposure limit

time-weighted average - see: TWA and exposure limit

TLV - Threshold Limit Value. The concentration of a material in the air to which nearly all persons can be exposed day after day, without harmful effects.

TOC - Tagliabue Open Cup. A flash point test method.

toxicity - the ability of a substance to cause damage to living tissue or body organs, including severe illness or death. Toxic harm occurs somewhere in the body distant from where the chemical entered the body.

trade secrets - in some circumstances the supplier will be allowed to withhold the exact chemical name of one or more of the product's ingredients, or their concentrations. In these cases, the SDS will state that the ingredient and/or concentration is a trade secret.

TWA- Time-Weighted Average. The concentration of a substance to which a person is exposed when averaged over a period of time.

U

UEL - Upper Explosive Limit, same as: UFL

UFL - Upper Flammable Limit. The highest concentration of a product in air that will catch fire (or explode) if an ignition source is present. At concentrations higher than the UFL, the mixture is "too rich" to burn (or explode). It is expressed as percent (%).

UN Number - a 4-digit number used to identify dangerous goods in the Transportation of Dangerous Goods regulations.

upper explosive limit - see: UFL

upper flammable limit - see: UFL

V

vapour - the gaseous form of a material that would normally be a liquid or solid under ordinary conditions of room temperature and pressure.

vapour density - a comparison of the weight of a vapour to the weight of an equal volume of air. Substances with vapour densities greater than 1, such as propane and hydrogen sulfide, will "fall" to a low area and accumulate there. If the substance is flammable, a dropped match or a spark can cause a fire or explosion. If it is toxic, persons working in low areas may be exposed to high concentrations of the vapour and suffer the acute effects of the product.

vapour pressure - tells how likely a substance is to form vapours. Substances with high vapour pressures will evaporate very rapidly. The presence of those vapours in the air may be a hazard, especially if the vapours are flammable or toxic, or in confined spaces where they may push out the air.

ventilation - ventilation provides fresh air for breathing, to dilute and remove airborne pollutants, and to control excess humidity. Workplace ventilation systems may be necessary to keep the concentration of hazardous chemicals in workplace air below the TLV.

viscosity - the ability of a liquid to resist flow - e.g. molasses is very viscous.

volatility - the ease with which a material evaporates. This is important if the vapours are flammable or toxic.

W

WHMIS - Workplace Hazardous Materials Information System. A legislated system throughout Canada for providing information on hazardous materials in the workplace.

workplace label - a label placed on a hazardous product in the workplace, indicating the product name (matching the name on the supplier label and SDS), safe handling information such as risks and precautions, and a reference to the SDS. A workplace label can be pre-printed or hand-written.