Workplace Hazardous Materials Information System (WHMIS)

Occupational Health and Safety Act

Section 6

Sections and Schedules 88 – 221

Updated Jan 14 2019

TRAINING

All Advatek Systems Inc. Employees will receive WHMIS training regardless of where they will be working. This is to ensure that all employees are aware of the dangers around working with hazardous products.

MSDS sheets will be obtained for all hazardous products at Advatek Systems Inc. These will be stored in the following MSDS binders. Up front and in the service office, as well as in each company vehicle. Any employee may request to have a copy of any or all of the MSDS sheets at their desk.

WHIV1IS Classifications

WHMIS *(Workplace Hazardous Materials Information System)* uses classifications to group chemicals with similar properties or hazards. The Hazardous products Regulations specifies the criteria used to place materials within each classification. There are six (6) classes although several classes have divisions or subdivisions. Each class has a specific symbol to help people identify the hazard quickly. The classes are:

Class A - Compressed Gas

Class B - Flammable and Combustible Material

Division 1: Flammable Gas
Division 2: Flammable Liquid
Division 3: Combustible Liquid
Division 4: Flammable Solid
Division 5: Flammable Aerosol
Division 6: Reactive Flammable Material

Class C - Oxidizing Material

Class D - Poisonous and Infectious Material

Division 1: Materials causing immediate and serious toxic effects
  Subdivision A: Very toxic material
  Subdivision B: Toxic material

Division 2: Materials causing other toxic effects
  Subdivision A: Very toxic material
  Subdivision B: Toxic material

Division 3: Biohazardous Infection Material

Class E - Corrosive Material

Class F - Dangerously Reactive Material

What is a Class A - Compressed Gas?

Any material that is normally a gas which is placed under pressure or chilled, and contained by a cylinder is considered to be a compressed gas. These materials are dangerous because they are under pressure. If the cylinder is broken, the container can 'rocket' or 'torpedo' at great speeds and this is a danger to anyone standing too close. If the cylinder is heated (by fire or a rise in temperature), the gas may try to expand and the cylinder will explode. Leaking cylinders are also a danger because the gas that comes out is very cold, and it may cause frostbite if it touches your skin (for example: carbon dioxide or propane). Common examples include: compressed air, carbon dioxide, propane, oxygen, ethylene oxide, and welding gases. The hazard symbol is a picture of a cylinder or container of compressed gas surrounded by a circle.

Additional dangers may be present if the gas has other hazardous properties. For example: propane is both a compressed gas and it will burn easily. Propane would have two hazard symbols - the one for a compressed gas and another to show that it is a flammable material.

What is a Class B - Flammable and Combustible Material?

Flammable means that the material will burn or catch on fire easily at normal temperatures (below 37.8 degrees C or 100 deg F). Combustible materials must usually be heated before they will catch on fire at temperatures above normal (between 37.8 and 93.3 deg C or 100 and 200 deg **F).** Reactive flammable materials are those which may suddenly start burning when it touches air or water, or may react with air or water to make a flammable gas. The material may be a solid, liquid or gas which makes up the different divisions that fall under this class. Common examples include: propane, butane, acetylene, ethanol, acetone, turpentine, toluene, kerosene, Stoddard solvent, spray paints and varnish. The symbol for this class is a flame with a line under it inside a circle.

What is a Class C - Oxidizing Materials?

Oxygen is necessary for a fire to occur. Some chemicals can cause other materials to burn by supplying oxygen. Oxidizers do not usually burn themselves but they will either help the fire by providing more oxygen or they may cause materials that normally do not burn to suddenly catch on fire (spontaneous combustion). In some cases, a spark or flame (source of ignition) is not necessary for the material to catch on fire but only the presence of an oxidizer. Oxidizers can also be in the form of gases (oxygen, ozone), liquids (nitric acid, perchloric acid solutions) and solids (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. The symbol for oxidizing materials is an 'ro" with flames on top of it inside a circle.

What is a Class D Poisonous and Infectious Materials?

Class D materials are those which can cause harm to your body. They are divided into three major divisions.

Division 1: Materials Causing Immediate and Serious Toxic Effects

These are materials that are very poisonous and immediately dangerous to life and health. Serious health effects such as burns, loss of consciousness, coma or death within just minutes or hours after exposure are grouped in this category. Most D-1 materials will also cause longer term effects as well (those effects that are not noticed for months or years). Examples of some D-1 materials include carbon monoxide, sodium cyanide, sulphuric acid, toluene-2, 4-dilsocyanate (TDI), and acrylonitrile. The symbol for Class D - Division 1 (D-1) is a skull and crossed bones inside a circle.

Division 2: Materials Causing Other Toxic Effects

These materials are poisonous as well. Their effects are not always quick, or if the effects are immediate, they are only temporary. The materials that do not have immediate effects, however, may still have very serious consequences such as cancer, allergies, reproductive problems or harm to the baby, changes to your genes, or irritation/sensitization which have resulted from small exposures over a long period of time (chronic effects).

Division 2 of Class D has two subclasses called D2A (very toxic) and D2B (toxic). While it is not a legal requirement for the WHMIS sub-classification to be reported on the Safety Data Sheet (SDS) nor is it a requirement for classes D2A or D2B to be distinguished on the label, it is often possible to make this distinction using the health hazard information on the label and/or the SDS.

Products are typically classified as D2A (very toxic) if the chemical has been shown to be carcinogenic, embryo toxic, teratogenic, mutagenic (to reproductive cells), reproductive toxic, sensitizer (to respiratory tract) or chronic (long-term) toxicity (at low doses). Subdivision D2B (toxic) covers mutagenic (to non-reproductive cells), sensitization of the skin, skin or eye irritation, as well as chronic toxic effects.

Examples include: asbestos fibres, mercury, acetone, benzene, quartz silica (crystalline), lead and cadmium. The symbol for materials causing other toxic effects looks like a "T" with an exclamation point "!" at the bottom inside a circle.

Division 3: Biohazardous Infectious Materials

These materials are organisms or the toxins they produce that can cause diseases in people or animals. Included in this division are bacteria, viruses, fungi and parasites. As these organisms can live in body tissues and fluids, they should be treated as toxic. Urine and feces should be treated as toxic only if they are visibly contaminated with

blood. Biohazardous infectious materials are usually found in a hospital, health care facility, laboratories, veterinary practices and research facilities. Workers in these places do not usually know which tissues or fluids contain dangerous organisms. For this reason, the workers assume that every sample is dangerous and proper protection is used all the time. Examples of biohazardous infectious materials include the AIDS/HIV virus, Hepatitis B and salmonella. The symbol for this division looks like three "Cs joined together with a little circle in the middle all inside a circle.

What is a Class E Corrosive Material?

Corrosive is the name given to materials that can cause severe burns to skin and other human tissues such as the eye or **lung,** and can attack clothes and other materials including metal. Corrosives are grouped in this special class because their effects are permanent (irritants whose effects may be similar but temporary are grouped in Class D-2). Common corrosives include acids such as sulphuric and nitric acids, bases such as ammonium hydroxide and caustic soda and other materials such as ammonia gas, chlorine, and nitrogen dioxide. The symbol for a corrosive is a picture of two test tubes pouring **liquid** on a bar (piece of metal) and a hand with lines coming off of them inside a circle.

What is a Class F Dangerously Reactive Materials?

A material is considered to be dangerously reactive if it shows three different properties or abilities: first, if it can react very strongly and quickly (called "vigorously") with water to make a toxic gas; second, **if it will** react with itself when **it** gets shocked (bumped or dropped) or if the temperature or pressure increases; and thirdly, if it can vigorously join to itself (polymerization), break down (decomposition) or lose extra water such that it is a more dense material (condensation). If a material is dangerously reactive, it will most likely be described as "unstable." Most of these materials can be extremely hazardous if

they are not handled properly because they can react in such a quick manner very easily. Examples of these products are ethyl acrylate, vinyl chloride, ethylene oxide,

picric acid and anhydrous aluminum chloride. The symbol for dangerously reactive materials is a picture of a test tube with sparks or lines coming out of the tube surrounded by a letter "R" inside a circle.

****Employee Education Requirements****

The employer shall take every precaution that is reasonable in the circumstances to ensure that an employee who works with a hazardous product or in proximity to a hazardous product is instructed in the following:

- The general content required on a supplier label and workplace label, and the purpose and significance of the information contained thereon;
- The general content required on a Safety Data Sheet and the purpose and significance of the information contained thereon;
- Procedures for the safe use, storage, handling and disposal of hazardous products; and/or:
    - A pipe, or a piping system including valves,
    - A process vessel,
    - A reaction vessel, a tank car, tank truck, ore car, conveyor belt or similar conveyance;
    - Procedures to be followed where fugitive emissions are present; and
    - Procedures to be followed in case of an emergency involving a hazardous product.

Hazardous Materials not regulated by WHMIS

Yes. There are nine basic categories of materials that are not covered by WHMIS. When WHMIS was created, it was recognized that a lot of safety information was already being transmitted to workers for many of these products under other laws. To prevent delay in starting WHMIS, exclusions were made.

They are:

Consumer restricted products (those products sold to people in regular stores that are already labeled following the rules of the Hazardous Products Act)

- Explosives (as defined by the Explosives Act)
- Cosmetics, drugs, food or devices (as defined by the Food and Drug Act)

- Pest control products (pesticides, herbicides, insecticides, etc. as defined by the Pest Control Products Act)
- Radioactive materials (as defined by the Nuclear Safety and Control Act)
- Wood and products made of wood
- Manufactured articles
- Tobacco or products made of tobacco
- Hazardous wastes

Materials which fall under WHMIS follow the Transportation of Dangerous Goods Act and Regulations while they are in transport (shipment).

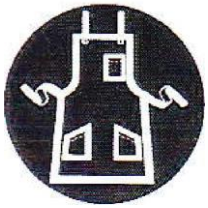
For several years, there have been proposals to make some of the above products follow the WHMIS laws. Most of the products that may be affected are the ones in categories 1, 2, 3, 4, and 5. However, there have been no changes to the WHMIS regulations yet.

These are a few of the symbols you may encounter that indicate what Personal Protective Equipment (P.P.E) must be worn when handling a particular hazardous material. This is not an exhaustive list; **if** you encounter a symbol you are unsure of contact the Safety Office for clarification.

Dust mask required -A NIOSH approved N95 dust mask must be used.

Air Purifying Respirator - A NIOSH approved chemical cartridge respirator must be used. **Use of this type of respirator requires specialized training - contact the Safety Office before using for approval and training.**

Supplied Air Respirator - A MUSH approved SCBA or Supplied Air system must be used. **Use of this type of respirator requires specialized training - contact the Safety Office before using for approval and training.**



Apron - An apron made of material resistant to the hazardous material must be worn. Consult your supervisor or the material's SDS for further information.

Chemical Protective Clothing - Either a hooded or fully-encapsulating suit of appropriate material must be worn. Consult SDS for appropriate level of protection. **Use of this type of P.P.E. requires specialized training - contact the Safety Office before using for approval and training.**

Goggles - C.S.A. approved chemical-resistant, splash-proof goggles must be worn.

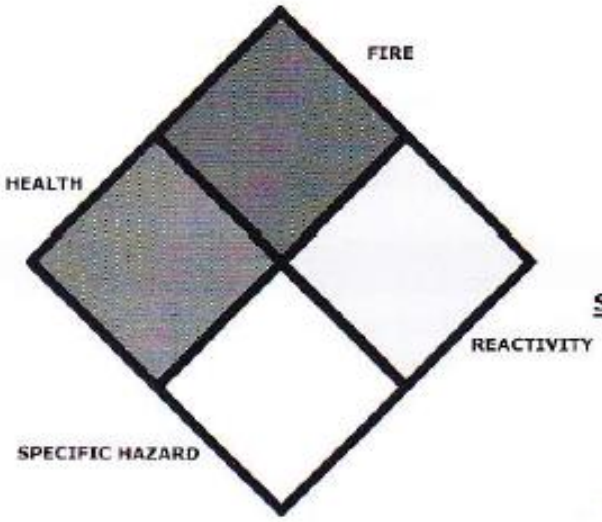
Face Shield - C.S.A. approved face shield must be worn. **Note: C.S.A. approved safety glasses or goggles must also be worn with this device.**

Foot Protection .C.S.A. approved protective footwear appropriate to the hazard must be worn.

Hand Protection .Gloves offering appropriate protection to the hazard must be worn. Consult with your supervisor of the material's SDS for further information.

Labels

This describes the NFPA Diamond on found on many workplace labels.



SPECIFIC HAZARDS

OXY - Oxidizer
ACID - Acid
ALK - Alkali
COR - Corrosive
W - Use No Water
RAD - Radioactive

Risk Number Code	Hazard	Fire Risk	Health Risk	Reactivity Risk
0	Minimal	Will not burn.	Non-hazardous.	Non-reactive.
1	Low	Flash point >93.3°C Must be pre-heated.	Slightly hazardous.	Normally stable, may become unstable if heated or may react with water, but not violently.
2	Moderate	Flash point >37.8°C but <93.3°C Must be exposed to relatively high ambient temperatures before	Intense or continued exposure could cause temporary incapacitation or possible residual injury without prompt medical	Unstable, readily undergoes violent chemical change.

		ignition can occur.	treatment.	
3	Serious	Can be ignited under almost all ambient temperature conditions.	Extremely hazardous. Short exposure could cause serious temporary or residual injury even with treatment, or could cause death.	Capable of detonation or explosive reaction, but requires a strong detonating source.
4	Extreme	Will rapidly vapourize at atmospheric pressure and normal ambient temperature, or will readily disperse in air and will burn readily.	Deadly.	May detonate.

Hazardous Material Identification System (HMIS)

Specific sections of a HMIS® label include the following:

Health

The Health section conveys the health hazards of the material. In the latest version of HMIS®, the blue Health bar has two spaces, one for an asterisk and one for a numeric hazard rating.

If present, the asterisk signifies a chronic health hazard, meaning that long-term exposure to the material could cause a health problem such as emphysema or kidney damage. NFPA lacks this important information because the NFPA system is meant only for emergency or acute (short-term) exposures.

According to NPCA, the numeric hazard assessment procedure is different than that used by NFPA. Here are the numeric rankings for the HMIS system:

4 Life-threatening, major or permanent damage may result from single or repeated overexposures.
3 Major injury likely unless prompt action is taken and medical treatment is given.
2 Temporary or minor injury may occur.
1 Irritation or minor reversible injury possible.
0 No significant risk to health.

Flammability

For HMIS I and II, the criteria used to assign numeric values (0 - low hazard to 4 = high hazard) are identical to those used by NFPA. In other words, in this category, the systems are identical.
For HMIS III, the flammability criteria are defined according to OSHA standards:

4 Flammable gases, or very volatile flammable liquids with flash points below 73 *F, and boiling points below 100 F. Materials may ignite spontaneously with air, (Class IA).
3 Materials capable of ignition under almost all normal temperature conditions. Includes flammable liquids with flash points below 73 'F and boiling points above 100 'F, as well as liquids with flash points between 73 'F and 100 "F. (Classes IB & IC).
2 Materials which must be moderately heated or exposed to high ambient temperatures before ignition will occur. Includes liquids having a flash point at or above 100 °F but below 200 F. (Classes Ii & IIIA).
1 Materials that must be preheated before ignition will occur. Includes liquids, solids and semi solids having a flash point above 200 °F. (Class 111B).
0 Materials that will not burn.

Reactivity (HMIS® I and II - now obsolete)

The criteria used to assign numeric values (0 = low hazard to 4 = high hazard) were identical to those used by NEPA. In other words, in this category, the systems were identical.

This version is now obsolete. The yellow section has been replaced with an orange section titled **Physical Hazards** - see the next section for more information.

Physical Hazard (HMIS® III)
Reactivity hazard are assessed using the OSHA criterion of physical hazard. Seven such hazard classes are recognized:

- Water Reactive
- Organic Peroxides
- Explosives
- Compressed gases
- Pyrophoric materials
- Oxidizers
- Unstable Reactives

This version replaces the now-obsolete yellow section titled Reactivity - see the previous section for more information. As with the Health and Flammability sections, the level of hazard is indicated using numeric values (0 = low hazard to 4 - high hazard):
4 Materials that are readily capable of explosive water reaction, detonation or explosive decomposition, polymerization, or self-reaction at normal temperature and pressure.
3 Materials that may form explosive mixtures with water and are capable of detonation or explosive reaction in the presence of a strong initiating source. Materials may polymerize, decompose, self-react, or undergo other chemical change at normal temperature and pressure with moderate risk of explosion.
2 Materials that are unstable and may undergo violent chemical charges at normal temperature and pressure with low risk for explosion. Materials may react violently with water or form peroxides upon exposure to air.
1 Materials that are normally stable but can become unstable (self-react) at high temperatures and pressures. Materials may react non-violently with water or undergo hazardous polymerization in the absence of inhibitors.
0 Materials that are normally stable, even under fire conditions, and will not react with water, polymerize, decompose , condense, or self-react. Non-explosives.

Personal Protection
This is by far the largest area of difference between the NFPA and HMW systems. In the NFPA system, the white area is used to convey special hazards whereas HMIS° uses the white section to indicate what personal protective equipment (PPE) should be used when working with the material.

Note: The NPCA specifically recommends that "preparers of SDSs should not place HMIS® PPE designation codes on the SDSs or labels that leave the facility, as they do not know the conditions under which their customers use those products." However, these still turn up on some SDS1s.
HMIS® uses a letter coding system for this section. This is problematic because it would be much clearer to see the PPE listed explicitly instead of having employees try to remember a bunch of codes or consult a chart, something that could lead to confusion and/or a fatal accident. Likewise,
the "custom codes" aspect is particularly dangerous for visitors and contractors who may not remember/recognize that these could vary from job site to job site.
Note: Some of the letters/symbols used in this table are also used as TSCA, CHIP, and/or DoD HMIRS/HCC codes, all of which have completely different meanings and applications!
Below is the lettering scheme, along with a series of graphics meant to reinforce the meaning of each letter:

HMIS® Letter	Required Equipment
A	 Safety Glasses
B	 Safety Glasses  Gloves
C	 Safety Glasses  Gloves  Protective Apron
D	 Face Shield  Gloves  Protective Apron
E	 Safety Glasses  Gloves  Dust Respirator
F	 Safety Glasses  Gloves  Protective Apron  Dust Respirator
G	 Safety Glasses  Gloves  Vapor Respirator
H	 Splash Goggles  Gloves  Protective Apron  Vapor Respirator
I	 Safety Glasses  Gloves  Dust Respirator  Vapor Respirator

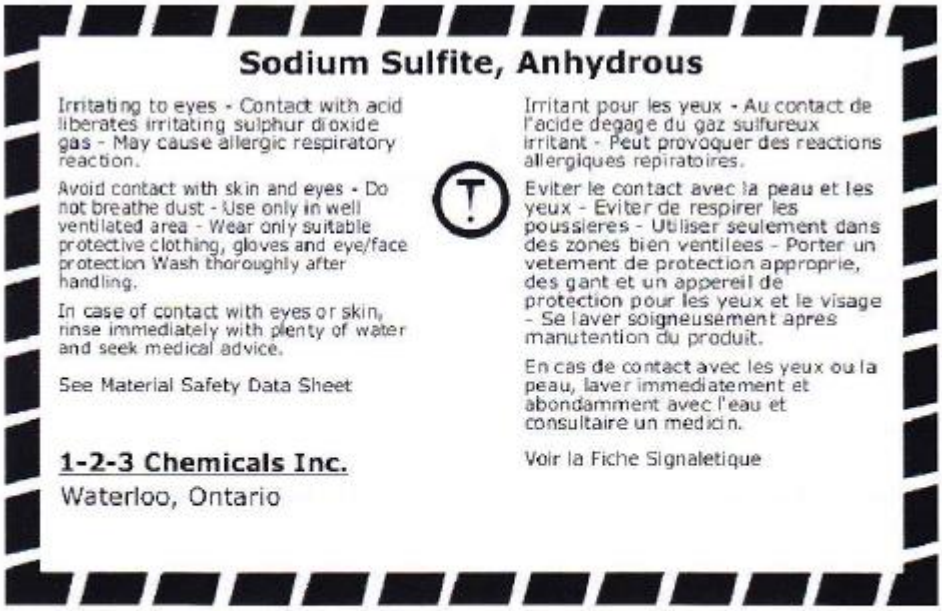
J	 Splash Goggles	 Gloves	 Protective Apron	 Dust Respirator	 Vapor Respirator
K	 Air Line Mask or Hood	 Gloves	 Full Suit	 Boots	

WHIVIIS Supplier Labels

These labels are applied, by the supplier, to a hazardous product that is sold or imported to a workplace in Canada. If the supplier label becomes damaged, unreadable or falls off it must be replaced with a workplace label. The new label must be placed on the Original containers of the hazardous product.

Items 1-6 are mandatory and will be found on the supplier label of any hazardous product. Items 7-9 are included on the supplier label of any hazardous product with a container size of more than 100m1.

Move your mouse over the menu items listed below the label to highlight the relevant section of the label.



1. **Hatched Border**
2. **Written in English and French**
3. **Product Identifier**
4. **Supplier Identifier**
5. **Hazard Symbol(s)**
6. **MSDS Reference**
7. **Risk Phrases**
8. **Precautionary Measures**
9. **First Aid Measures**

Should you transfer a hazardous product from its original container into a separate container a new workplace label must be attached to the new container. So as the product may be correctly identified.

GLOSSARY OF TERMS AND DEFINITIONS

The following glossary presents brief explanations of acronyms and common terms used and found on SDS or Sheets.

A

Acute Exposure A short-term exposure, usually occurring at high concentration.

Acute Health Effect An effect that develops either immediately or a short term after exposure.

Autoignition Temperature The minimum temperature required to initiate or cause self-sustained combustion, in the absence of a spark or flame.

B

Biohazardous Infectious Material A material that contains organisms and the toxins produced by these organisms that have been shown to cause disease or are believed to cause disease in either humans or animals.

Boiling Point The temperature at which a liquid changes from a liquid to a gas, at normal atmospheric pressure.

C

Carcinogens Agents/compounds that may induce cancer in humans.

CAS Registry Number A number assigned to a material by the Chemical Abstracts Service *(CAS)* to provide a single unique identifier.

Chemical Formula Sometimes called the molecular formula, indicates the elements that make up a chemical.

Chemical Name A proper scientific name for the active ingredient of a product.

Chronic Exposure A long-term exposure, usually occurring at low concentration.

Chronic Health Effect An effect that appears a long time after exposure.

Coefficient of Oil/Water Distribution The ratio of the solubility of the chemical in an oil to its solubility in water.

Combustible Liquid A liquid which has a flash point above 37.8°C.

Compressed Gas . A material which is a gas at normal room temperature (20°C) and pressure but is packaged as a pressurized gas, dissolved gas or gas liquefied by compression or refrigeration.

Condensation . The process of reducing from one form to another denser form such as steam to water.

Hazardous products . Under the Hazardous products Regulation, a hazardous product is defined as a material, product or substance which is imported or sold in Canada and meets the criteria for one or more of the following classes:

Class A	Compressed Gas
Class B	Flammable and Combustible Material
Class C	Oxidizing Material
Class D	Poisonous and Infectious Material
Class E	Corrosive Material
Class F	Dangerously Reactive Material

Corrosive Material . A material that can attack (corrode) metals or cause permanent damage to human tissues such as skin and eyes on contact.

Cryogenics . Materials which exist at extremely low temperatures, such as liquid nitrogen.

D

Dangerously Reactive Materials . Materials that may undergo vigorous condensation, decomposition or polymerization. They may react violently under conditions of shock or increase in pressure or temperature. They may also react vigorously with water of water vapour to release a toxic gas.

Decomposition . The breakdown of a substance, often due to heat, decay, or other effect, with the release of other compounds such as vapours or gases that may be flammable or toxic.

Density . The weight of a material in a given volume. It is usually given in grams per millilitre (gm/m1).

Dilution Ventilation . Dilution of contaminated air with uncontaminated aid in a general area, room or building for the purposes of health hazard or nuisance control, and/or for heating and cooling.

Dose . Amount of the agent that has entered the body through the various routes of entry.

E

Evaporation Rate . **The** rate at which a liquid changes to vapour at normal room temperature.

Explosive (Flammable) Limits . The lower explosive (flammable) limit (LEL) is the lowest concentration of vapour in air which will burn or explode upon contact with a source of ignition. The upper explosive (flammable) limit (UEL) is the highest concentration of vapour in air which will burn or explode upon contact with a source of ignition.

Explosive (Flammable) Range . The range between the lower explosive limit (LEL) and the upper explosive limit (UEL).

Exposure Limits . Established concentrations which, if not exceeded, will not generally cause adverse effects to the worker exposed. Exposure limits differ in name and meaning depending on origin. For example:

1) the exposure levels for the hazardous chemicals that are included in the Regulation respecting the Control of Exposure to Biological or Chemical Agents - made under the Occupational Health and Safety Act of Ontario, are expressed as follows:

> **TWAEV** . Time Weighted Average Exposure Value: **The** average airborne concentration of a biological or chemical agent to which a worker may be exposed in a work day or a work week.
>
> **STEV** . Short-Term Exposure Value: The maximum airborne concentration of a chemical or biological agent to which a worker may be exposed in any 15 minute period, provided that the TWAEV is not exceeded.
>
> **CEV** . Ceiling Exposure Value: The maximum airborne concentration of a biological or chemical agent to which a worker may be exposed at any time.
>
> **SKIN** . This notation indicates that direct or airborne contact with the product through the skin, mucous membranes or eyes. Inclusion of this notation is intended to suggest that preventative action be taken against absorption of the agent through these routes of entry.

2) Threshold Limit Values (TLVs) are exposure guidelines developed by the American Conference of Governmental Hygienists (ACGIH). They

have been adopted by several Canadian governments and others as their legal limits. They are expressed as follows:

TLV/TWA - Threshold Limit Value - Time Weighted Average: Time-weighted average concentration for a normal 8 hour work day and a 40 hour work week, to which nearly all workers may be repeatedly exposed, day after day, without adverse effects.

TLV/STEL - Threshold Limit Value - Short Term Exposure Limit: A 15 minute time-weighted average exposure which should not be exceeded at any time during a work day even if the Shr TWA is within the TLV. Exposures at the STEM should not be repeated more than 4 times a day and there should be at least 60 minutes between successive exposures at the STEL,

TLV/C - Threshold Limit Value - Ceiling: The concentration that should not be exceeded during any part of the working exposure.

F

Flammable Limits See "Explosive Limits"

Flammable Substance - One that will readily catch fire and continue to burn in air if exposed to a source of ignition.

1) **Flammable Aerosol** - A material that is packaged in an aerosol container which can release a flammable material.

2) **Flammable Gas** - A gas which can readily catch fire and continue to burn.

3) **Flammable Liquid** - A material that gives off a vapour which can readily catch fire and continue to burn, A flammable liquid has a flashpoint below 37.8°C.

4) **Flammable Solid** - A material which can readily catch fire and continue to burn vigorously and persistently. This may occur from friction, absorbing moisture, from spontaneous chemical change, or by retaining heat from manufacturing or processing.

5) **Reactive Flammable Material** - A material which is a dangerous fire risk because it can react readily with air or water.

Flashback - This occurs when a trail of flammable material is ignited by a distant source of ignition. The flame then travels back along the trail of gas, vapour or aerosol to its source.

Flash Point . The lowest temperature of a liquid at which it gives off enough vapour to form an ignitable mixture of vapour and air immediately above the surface of the liquid.

Freezing Point . The temperature at which a liquid becomes a solid, at normal atmospheric pressure.

H

Hazard . The potential for harmful effects.

Hazardous Combustion Products . Chemicals which may be formed when a material burns. These chemicals may be flammable, toxic or have other hazards.

Hazardous Decomposition Products . Formed when a material decomposes (breaks down) because it is unstable, or reacts with materials such as water or oxygen in air.

Hazardous Ingredient . Under the Hazardous Products Act, a chemical must be listed in the Hazardous ingredients section of an SDS if:

- it meets the criteria for a hazardous product,
- it is one the ingredient disclosure list,
- there is no toxicological information available, or
- the supplier has reason to believe it might be hazardous.

Hazardous Polymerization . Polymerization is a process of forming a polymer by combining large numbers of chemical units or monomers into long chains (polyethylene from ethylene or polystyrene from styrene). Uncontrolled polymerization can be extremely hazardous. Some polymerization processes can release considerable heat or can be explosive.

Ingestion . Means taking a material into the body by mouth (swallowing).

Inhalation . Means taking a material into the body by breathing it in.

Irritant . Some sort of aggravation of whatever tissue the material comes in contact with.

L

LC50 .The concentration which causes the death of 50% of a group of test animals. The material is inhaled over a set period of time, usually 4 hrs. LC stands for lethal concentration.

LD50 .The weight of material which causes the death of 50% of a group of test animals. It is usually expressed in weight of material per weight of test animal. LD stands for lethal dose.

LEL (Lower Explosive Limit) - See "Explosive Limits".

Local Exhaust Ventilation .Involves the capture of pollutants at the source.

Material Causing Immediate and Serious Toxic Effects .Classified under "Poisonous and Infectious Material" as toxic or very toxic based on information such as the LD50 or LC50.

Material Causing Other Toxic Effects .Classified under "Poisonous and Infectious Material" as a material causing toxic effects such as skin or respiratory sensitization, carcinogenicity, mutagenicity, etc.

Melting Point .The temperature at which a solid material becomes a liquid.

Mutagen .An agent that affects the genes or cells of the exposed people in such a way that it may cause cancer in the exposed individual or an undesired mutation to occur in some later generation.

N

NA Number .See "UN Number",

0

Odour Threshold The airborne concentration, usually in parts per million, at which an odour becomes detectable.

Oxidizing Material .Gives up oxygen easily or can readily oxidize other material.

P

Permissible Exposure Limits (PEL) .Legal limits in the U.S.A. set by the Occupational Safety and Health Administration (OSHA).

pH . a measure of the acidity or alkalinity of a material when dissolved in water,

Polymer A natural or man-made material formed by combining large numbers of chemical units or monomers into long chains,

Part Per Million (PPM) . Represents the concentration of gases or vapour in air. For example, **1** ppm of a gas means that 1 unit of the gas is present for every 1 million units of air.

S

Sensitization . The development, over time, of an allergic reaction to a chemical.

Solubility -The ability of a material to dissolve in water or another liquid.

Solvent . A material which is capable of dissolving another chemical,

Specific Gravity . The density of a liquid compared to the density of an equal amount of water.

Stability . The ability of a material to remain unchanged in the presence of heat, moisture or air.

T

Teratogen . Agents or compounds that a pregnant woman takes into her body that generates defects in the fetus.

TLV . See "Exposure Limits''.

Toxicity . Ability of a substance to cause harmful effects,

Trade Name . The name under which a product is commercially known.

TWA . See "Exposure Limits".

U

UEL (Upper Explosive Limits) . See "Explosive Limits".

UN Number . A four digit number assigned to a potentially hazardous material or class of materials. UN (United Nations) numbers are internationally recognized and are used by fire fighters and other emergency response personnel for identification of materials

during transportation emergencies. NA (North American) numbers are assigned by Transport Canada and the US Department of Transport to materials they consider hazardous and to which a UN number has not been assigned.

V

Vapour - A gaseous form of a material which is normally solid or liquid at room temperature and pressure.

Vapur Density - The density of a vapour compared to the density of an equal amount of air.

Vapour Pressure . The pressure of a vapour in equilibrium with its liquid or

solid form. **Ventilation** . The movement of air.

Volatility - The ability of a material to evaporate.

WHMIS Toxicity Categories - The adverse (acute) effects resulting from a single dose of or exposure to a material. Ordinarily used to denote effects observed in experimental animals. WHMIS categorizes chemicals as "toxic' or "very toxic".

WHMIS Class	Descriptive Term	LD50 wt/kg		LC50 4hr inhalation		
		Oral	Skin	Gas (ppm)	Vapour (ppm)	Dust (mg/L)
D Division 1 Subdivision A	Very Toxic	Below 50 mg	Below 200 mg	Below 2500	Below 1500	Below 0.5
D Division 1 Subdivision B	Toxic	5-500	200-1000		1500-2500	0.5-2.5
	Essentially non-Toxic	Above 500	Above 1000	Above 2500	Above 2500	Above 2.5