

## Acronyms and Common Terms Used in Material Safety Data Sheets

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**Acid** - Any chemical which undergoes dissociation in water with the formation of hydrogen ions. Acids turn litmus paper red and have pH values of 0 to 6. They may cause severe skin burns.

**Acute Effect** - Adverse effect on a human or animal which has severe symptoms developing rapidly and coming quickly to a crisis. Also see chronic effect.

**Acute Toxicity** - Acute effects resulting from a single dose of or exposure to a substance. Ordinarily used to denote effects in experimental animals.

**ACGIH** - American Conference of Governmental Industrial Hygienists is an organization of professional personnel in governmental agencies or educational institutions who are employed in occupational safety and health programs.

**Adenocarcinoma** - A tumor with glandular (secreting) elements.

**Adenosis** - Any disease of a gland.

**Adhesion** - A union of two surfaces that are normally separate.

**Aerosol** - A fine aerial suspension of particles sufficiently small in size to confer some degree of stability from sedimentation (for example: smoke or fog).

**Air Line Respirator** - A respirator that is connected to a compressed breathing air source by a hose of small inside diameter. The air is delivered continuously or intermittently in a sufficient volume to meet the wearer's breathing requirements.

**Air Purifying Respirator** - A respirator that uses chemical sorbents to remove specific gases and vapors from the air or that uses a mechanical filter to remove particulate matter. An air purifying respirator must only be used when there is sufficient oxygen to sustain life and the air contaminant level is below the concentration limits of the device.

**Alkali** - The hydroxides and carbonates of the alkali metals and alkaline earth metals. They neutralize acids, impart a soapy feel to aqueous solutions and are the commonest cause of occupational dermatitis.

**Approved Respirator Wearer** - Any personnel who have met the following requirements is considered to be an approved respirator wearer: (1) medical approval within the past 12 months; (2) quantitative fit test must be performed within 30 days of medical approval; and (3) annual training in the use and care of respiratory protective equipment.

**Base** - A water soluble compound capable of reacting with an acid to form a salt by releasing an unshared pair of electrons to the acid or by receiving a proton from the acid.

**Benign** - Not recurrent or not tending to progress.

**Bioassay** - A determination of the concentration of a substance in a human body by an analysis of urine, feces, blood, bone, or tissue.

**Biodegradable** - Capable of being broken down into individual components by the action of living things.

**Biopsy** - Removal and examination of tissue from the living body.

**Boiling Point** - The temperature at which a liquid changes to a vapor state at a given pressure. The boiling point usually expressed in degrees Fahrenheit at sea level pressure (760mm Hg, or one atmosphere). For mixtures, the initial boiling point or the boiling range may be given. Flammable materials with low boiling points generally present special fire hazards. Some approximate boiling points:

Propane -44 degrees F  
Anhydrous Ammonia -28 degrees F  
Butane &nbsp;31degrees F  
Gasoline 100 degreesF  
Allyl Chloride 113 degrees F  
Ethylene Glycol 387 degrees F

**BOM or BuMines** - Bureau of Mines, U.S. Department of Interior.

**Bonding** - The interconnecting of two objects by means of a clamp and bare wire. Its purpose is to equalize the electrical potential between the objects to prevent a static discharge when transferring a flammable liquid from one container to another. The conductive path is provided by clamps which make contact with the charged object and a low resistance flexible cable which allows the charge to equalize. See Grounding.

**Bulk Density** - Mass of powdered or granulated solid material per unit of volume.

**C** - Centigrade, a unit of temperature.

**°C** - Degree Celsius.

**C or Ceiling** - The maximum allowable human exposure limit for an airborne substance which is not to be exceeded even momentarily. Also see PEL and TLV.

**ca** - Approximately

**CAA** - Clean Air Act was enacted to regulate/reduce air pollution. CAA is administered by EPA.

**CARC** - See Carcinogen

**Carcinogen** - A substance or agent capable of causing or producing cancer in mammals, including humans. A chemical is considered to be a carcinogen if:

1. It has been evaluated by the International Agency for Research on Cancer (IARC) and found to be a carcinogen or potential carcinogen; or
2. It is listed as a carcinogen or potential carcinogen in the Annual Report on Carcinogens published by the National Toxicology Program (NTP) (latest edition); or
3. It is regulated by OSHA as a carcinogen.

**Carcinogenicity** - The ability to produce cancer.

**Carcinoma** - A malignant tumor. A form of cancer.

**CAS** - Chemical Abstracts Service is an organization under the American Chemical Society. CAS abstracts and indexes chemical literature from all over the world in Chemical Abstracts. CAS Numbers are used to identify specific chemicals or mixtures.

**Caustic** - See alkali.

**cc** - Cubic centimeter is a volume measurement in the metric system which is equal in capacity to one milliliter (ml). One quart is about 946 cubic centimeters.

**Central Nervous System** - The brain and spinal cord. These organs supervise and coordinate the activity of the entire nervous system. Sensory impulses are transmitted into the central nervous system, and motor impulses are transmitted out.

**CERCLA** - Comprehensive Environmental Response, Compensation, and Liability Act of 1980. The Act requires that the Coast Guard National Response Center be notified in the event of a hazardous substance release. The Act also provides for a fund (the Superfund) to be used for the cleanup of abandoned hazardous waste disposal sites.

**Cervix** - The lower end of the uterus extending into the vagina.

**CFR** - Code of Federal Regulations. A collection of the regulations that have been promulgated under United States law.

**Chemical** - Any element, chemical compound or mixture of elements and/or compounds where chemical(s) are or distributed.

**Chemical Cartridge Respirator** - A respirator that uses various chemical substances to purify inhaled air of certain gases and vapors. This type respirator is effective for concentrations no more than ten times the TLV of the contaminant, if the contaminant has warning properties (odor or irritation) below the TLV.

**Chemical Hygiene Plan** - A written program which sets forth policy and procedures capable of protecting employees from the health hazards associated with their workplace.

**Chemical Name** - The name given to a chemical in the nomenclature system developed by the International Union of Pure and Applied Chemistry (IUPAC) or the Chemical Abstracts Service (CAS).

**Chemical Family** - A group of single elements or compounds with a common general name. Example: acetone, methyl ethyl ketone (MEK), and methyl isobutyl ketone (MIBK) are of the aldehyde family.

**Chemical Source** - The arrangement within the molecule of atoms and their chemical bonds.

**CHEMTREC** - Chemical Transportation Emergency Center is a national center established by the Chemical Manufacturers Association (CMA) to relay pertinent emergency information concerning specific chemicals on requests from individuals. CHEMTREC has a 24-hour toll-free telephone number (800-424-9300) to help respond to chemical transportation emergencies.

**Chronic Effect** - An adverse effect on a human or animal body, with symptoms which develop slowly over a long period of time or which recur frequently. Also see acute.

**Chronic Exposure** - Long-term contact with a substance.

**Chronic Toxicity** - Adverse (chronic) effects resulting from repeated doses of or exposures to a substance over a relatively prolonged period of time. Ordinarily used to denote effects in experimental animals.

**Clean Air Act** - See CAA.

**Clean Water Act** - Federal law enacted to regulate/reduce water pollution. CWA is administered by EPA.

**CMA** - Chemical Manufacturers Association. See CHEMTREC.

**CO** - Carbon monoxide is a colorless, odorless, flammable, and very toxic gas produced by the incomplete combustion of carbon. It is also a by-product of many chemical processes.

**CO<sub>2</sub>** - Carbon dioxide is a heavy, colorless gas which is produced by the combustion and decomposition of organic substances and as a by-product of many chemical processes.

**CO<sub>2</sub>** - See CO<sub>2</sub>

**COC**- Cleveland Open Cup is a flash point test method.

**Combustible** - A term used by NFPA, DOT, and others to classify certain liquids that will burn, on the basis of flash points. Both NFPA and DOT generally define combustible liquids as having a flash point of 100F (37.8C) or higher but below 200F (93.3C). Also see flammable. Non-liquid substances such as wood and paper are classified as ordinary combustibles by NFPA.

**Combustible Liquid** - Any liquid having a flashpoint at or above 100F (37.8C), but below 200F

(93.3C), except any mixture having components with flashpoints of 200F (93.3C) or higher, the total volume of which make up ninety-nine (99) percent or more of the total volume of the mixture.

**Common Name** - Any identification, such as code name, code number, trade name, brand name, or generic name, other than its chemical name, used to identify a chemical.

## **Compressed Gas**

1. A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 psi at 700F; or
2. A gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 1300F regardless of the pressure at 700F; or
3. A liquid having a vapor pressure exceeding 40 psi at 100F as determined by ASTM D-323-72.

**Conc** - See concentration

**Concentration** - The relative amount of a substance when combined or mixed with other substances. Examples: 2 ppm hydrogen sulfide in air, or a 50 percent caustic solution.

**Conditions to Avoid** - Conditions encountered during handling or storage which could cause a substance to become unstable.

**Confined Space** - Any area which has limited openings for entry and exit that would make escape difficult in an emergency, has a lack of ventilation, contains known and potential hazards, and is not intended nor designated for continuous human occupancy.

**Conjunctivitis** - Inflammation of the conjunctiva, the delicate membrane that lines the eyelids and covers the eyeballs.

**Container** - Any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical. For purposes of material safety data sheets or HCS, pipes or piping systems are not considered to be containers.

**Corrosive** - A chemical that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the site of contact. For example, a chemical is considered to be corrosive if, when tested on the intact skin of albino rabbits by the method described by the U.S. Department of Transportation in Appendix A to 49 CFR Part 173, it destroys or changes irreversibly the structure of the tissue at the site of contact following an exposure period of 4 hours. This term shall not refer to action on inanimate surfaces.

**CPSC** - Consumer Products Safety Commission has responsibility for regulating hazardous materials when they appear in consumer goods. For CPSC purposes, hazards are defined in the Hazardous Substances Act and the Poison Prevention Packaging Act of 1970.

**Curettage** - Cleansing of a diseased surface.

**Cutaneous Toxicity** - See Dermal Toxicity.

**CWA** - Clean Water Act was enacted to regulate/reduce water pollution. It is administered by EPA.

**Cyst** - A sac containing a liquid. Most cysts are harmless.

**Cytology** - The scientific study of cells.

**DASHO** - Designated Agency Safety and Health Official is the executive official of a Federal Department or Agency who is responsible for safety and occupational health matters within a Federal agency, and is so designated or appointed by the head of the agency.

**Decomposition** - Breakdown of a material or substance (by heat, chemical reaction, electrolysis, decay, or other processes) into parts or elements or simpler compounds.

**Density** - The mass (weight) per unit volume of a substance. For example, lead is much more dense than aluminum.

**Depressant** - A substance that reduces a bodily functional activity or an instinctive desire, such as appetite.

**Dermal** - Relating to the skin.

**Dermal Toxicity** - Adverse effects resulting from skin exposure to a substance. Ordinarily used to denote effects in experimental animals.

**Designated Area** - An area which may be used for work involving carcinogens, reproductive toxins or acutely toxic chemicals. A designated area may be the entire laboratory, a controlled area within the laboratory or engineering controls such as a chemical hood.

**DHHS** - U.S. Department of Health and Human Services (replaced U.S. Department of Health, Education and Welfare). NIOSH and the Public Health Service (PHS) are part of DHHS.

**Dike** - A barrier constructed to control or confine hazardous substances and prevent them from entering sewers, ditches, streams, or other flowing waters.

**Dilution Ventilation** - Air flow designed to dilute contaminants to acceptable levels. Also see general ventilation or exhaust.

**DOL** - U.S. Department of Labor. OSHA and MSHA are part of DOL.

**DOT** - U.S. Department of Transportation.

**Dry Chemical** - A powdered fire extinguishing agent usually composed of sodium bicarbonate, potassium bicarbonate, etc.

**Dysmenorrhea** - Painful menstruation.

**Dysplastic** - An abnormality of development.

**Ectopic Pregnancy** - The fertilized ovum becomes implanted outside of the uterus.

**Edema** - An abnormal accumulation of clear watery fluid in the tissues.

**Endocrine Glands** - Glands that regulate body activity by secreting hormone.

**Endometrium** - The mucous membrane lining the uterus.

**Engineering Controls** - Environmental, mechanical, or structural factors that serve to encourage, facilitate, or complement safe and healthful behaviors in the workplace. Engineering controls work by removing the worker from the hazard or by removing the hazard from the work environment (by using ventilation in particular).

**Environmental Toxicity** - Information obtained as a result of conducting environmental testing designed to study the effects on aquatic and plant life.

**EPA** - U.S. Environmental Protection Agency.

**Epidemiology** - Science concerned with the study of disease in a general population. Determination of the incidence (rate of occurrence) and distribution of a particular disease (as by age, sex, or occupation) which may provide information about the cause of the disease.

**Epithelium** - The covering of internal and external surfaces of the body.

**Estrogen** - Principal female sex hormone.

**Evaporation Rate** - The rate at which a material will vaporize (evaporate) when compared to the known rate of vaporization of a standard material. The evaporation rate can be useful in evaluating the health and fire hazards of a material. The designated standard material is usually normal butyl acetate (NBUAC or n-BuAc), with a vaporization rate designated as 1.0. Vaporization rates of other solvents or materials are then classified as:

1. **FAST evaporating** if greater than 3.0. Examples: Methyl Ethyl Ketone = 3.8, Acetone=5.6, Hexane = 8.3.
2. **MEDIUM evaporating** if 0.8 to 3.0. Examples: 190 proof (95%) Ethyl Alcohol = 1.4, VM & P Naphtha = 1.4, MIBK = 1.6
3. **SLOW evaporating** if less than 0.8. Examples: Xylene =0.6, Isobutyl Alcohol = 0.6, Normal Butyl Alcohol = 0.4, Water = 0.3, Mineral Spirits = 0.1.

**Explosive** - A chemical that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature.

**Exposure or Exposed** - State of being open and vulnerable to a hazardous chemical in the course of employment by inhalation, ingestion, skin contact, absorption, or any other course; includes potential (accidental or possible) exposure.

**Extinguishing Media** - The fire fighting substance to be used to control a material in the event of a fire. It is usually named by its generic name, such as fog, foam, water, etc.

**Eye Protection** - Recommended safety glasses, chemical splash goggles, face shields, etc. to be utilized when handling a hazardous material.

**F** - Fahrenheit is a scale for measuring temperature. On the Fahrenheit scale, water boils at 212F and freezes at 32F.

**°F** - See F

**f/cc** - Fibers per cubic centimeter of air.

**Face Velocity** - Air velocity at the face opening required to retain contaminants in the hood or booth.

**FACOSH** - Federal Advisory Council for Occupational Safety and Health is a joint management-labor council that advises the Secretary of Labor on matters relating to the occupational safety and health of Federal employees.

**FDA** - U.S. Food and Drug Administration.

**Fetal** - Pertaining to the fetus.

**Fetus** - The developing young in the uterus from the seventh week of gestation until birth.

**FFSHC** - Field Federal Safety and Health Councils are organized throughout the country to improve Federal safety and health programs at the field level and within a geographic location.

**FHCP** - Federal Hazard Communication Program.

**Fibrosis** - An abnormal thickening of fibrous connective tissue, usually in the lungs.

**FIFRA** - Federal Insecticide, Fungicide, and Rodenticide Act requires that certain useful poisons, such as chemical pesticides, sold to the public contain labels that carry health hazard warnings to protect users. It is administered by EPA.

**First Aid** - Emergency measures to be taken when a person is suffering from overexposure to a hazardous material, before regular medical help can be obtained.

**Flammable** - A chemical that includes one of the following categories:

- 1. Aerosol, flammable** . An aerosol that, when tested by the method described in 16 CFR 1500.45, yields a flame projection exceeding 18 inches at full valve opening, or a flashback (a flame extending back to the valve) at any degree of valve opening.
- 2. Gas, flammable.** (1) A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of 13 percent by volume or less; or (2) A gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than 12 percent by volume, regardless of the lower limit.
- 3. Liquid, flammable.** Any liquid having a flashpoint below 100F (37.8C), except any mixture having components with flashpoints of 100F (37.8C) or higher, the total of which make up 99 percent or more of the total volume of mixture.
- 4. Solid, flammable.** A solid, other than a blasting agent or explosive as defined in



1910.109(a), that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard. A solid is a flammable solid if, when tested by the method described in 16 CFR 1500.44, it ignites and burns with a self-sustained flame at a rate greater than one tenth of an inch per second along its major axis.

**Flashback** - Occurs when flame from a torch burns back into the tip, the torch, or the hose. It is often accompanied by a hissing or squealing sound with a smoky or sharp-pointed flame.

**Flashpoint** - The minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested by the following methods:

1. **Tagliabue Closed Tester** (see American National Standard Method of Test for Flash Point by Tag Closed Tester, Z11.24 -1979 [ASTM D56-79]).
2. **Pensky-Martens Closed Tester** (see American National Standard Method of Test for Flash Point by Pensky-Martens Closed Tester, Z11.7-1979 [ASTM D93-79]).
3. **Setaflash Closed Tester** (see American National Standard Method of Test for Flash Point by Setaflash Closed Tester [ASTM D3278-78]).

**Foreseeable Emergency** - Any potential occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment which could result in an uncontrolled release of a hazardous chemical into the workplace.

**Formula** - The scientific expression of the chemical composition of a material (e.g., water is H<sub>2</sub>O, sulfuric acid is H<sub>2</sub>SO<sub>4</sub>, sulfur dioxide is SO<sub>2</sub>).

**Fume** - A solid condensation particle of extremely small diameter, commonly generated from molten metal as metal fume.

**g** - Gram is a metric unit of weight. One ounce U.S. (avoirdupois) is about 28.4 grams.

**General exhaust** - A system for exhausting air containing contaminants from a general work area. Also see local exhaust .

**Genetic** - Pertaining to or carried by genes. Heredity.

**Gestation** - The development of the fetus from conception to birth.

**g/kg** - Grams per kilogram is an expression of dose used in oral and dermal toxicology testing to denote grams of a substance dosed per kilogram of animal body weight. Also see kg (kilogram).

**Grounding** - The procedure used to carry an electrical charge to ground through a conductive path. A typical ground may be connected directly to a conductive water pipe or to a grounding bus and ground rod. See bonding.

**Gynecology** - The study of the reproductive organs in women.

**Hand Protection** - Specific type of gloves or other hand protection required to prevent harmful

exposure to hazardous materials.

**Hazard Warning** - Words, pictures, symbols, or combination thereof presented on a label or other appropriate form to inform of the presence of various materials.

**Hazardous Chemical** - A chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in an exposed employee. This includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic (blood-forming) systems, and agents which can damage the lungs, skin, eyes or mucous membranes.

**HCS** - Hazard Communication Standard is an OSHA regulation issued under 29 CFR Part 1910.1200.

**Health Hazard** - A chemical for which there is significant evidence, based on at least one study conducted in accordance with established scientific principles, that acute or chronic health effects may occur in exposed employees. The term health hazard includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes.

**Hematology** - The study of blood.

**Hematoma** - A blood clot under the surface of the skin.

**Hematopoietic System** - The blood forming mechanism of the human body.

**Hepatotoxin** - A substance that causes injury to the liver.

**Highly Toxic** - A chemical falling within any of the following categories:

1. **A chemical with a median lethal dose (LD50) of 50 milligrams** or less per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.
2. **A chemical with a median lethal dose (LD50) of 200 milligrams** or less per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between 2 and 3 kilograms each.
3. **A chemical that has a median lethal concentration (LC50) in air** of 200 parts per million by volume or less of gas or vapor, or 2 milligrams per liter or less of mist, fume, or dust, when administered by continuous inhalation for 1 hour (or less if death occurs within 1 hour) to albino rats weighing 200 and 300 grams each.

**High Risk Operations** - Experimental procedures involving the manipulation, handling or reaction of hazardous chemicals where the potential for release of gas, vapor, or aerosol contamination is high. This category includes, but is not limited to (1) rapid exothermic reactions, (2) transfer of electrostatic powders, (3) heating, mixing or transfer of volatile chemicals, (4) pressurized operations where there is a potential for uncontrolled release, and (5) work involving aerosol generation.

**HMIS** - Hazardous Material Information System is a material safety data sheet file maintained by the

Department of Defense and contains material safety data sheets and transportation data for products purchased by DOD and GSA. Also refers to the Hazardous Materials Identification System of the National Paint and Coatings Association system.

**Hormones** - Act as chemical messengers to body organs.

**HVI - High Viscosity Index**

**Hyperplasia** - Increase in volume of a tissue or organ caused by the growth of new cells.

**IARC** - International Agency for Research on Cancer.

**Ignitable** - Capable of being set afire.

**Impervious** - A material that does not allow another substance to pass through or penetrate it.

**Incompatible** - Materials that could cause dangerous reactions by direct contact with one another.

**Ingestion** - Taking in by the mouth.

**Inhal** - see inhalation.

**Inhalation** - Breathing in of a substance in the form of a gas, vapor, fume, mist, or dust.

**Inhibitor** - A chemical added to another substance to prevent an unwanted chemical change.

**Insol** - See insoluble.

**Insoluble** - Incapable of being dissolved in a liquid.

**Intrauterine** - Within the uterus.

**Irritant** - A chemical, which is not corrosive, but which causes a reversible inflammatory effect on living tissue by chemical action at the site of contact. A chemical is a skin irritant if, when tested on the intact skin of albino rabbits by the methods of 16 CFR 1500.41 for 4 hours exposure or by other appropriate techniques, it results in an empirical score of 5 or more. A chemical is an eye irritant if so determined under the procedure listed in 16 CFR 1500.42 or other appropriate techniques.

**Irritating** - An irritating material, as defined by DOT, is a liquid or solid substance which, upon contact with fire or when exposed to air, gives off dangerous or intensely irritating fumes (not including poisonous materials). See Poison, Class A and Poison, Class B.

**kg** - Kilogram is a metric unit of weight, about 2.2 U.S. pounds. Also see g/kg, g, and mg.

**L** - Liter is a metric unit of capacity. A U.S. quart is about 9/10 of a liter.

**Label** - Notice attached to a container, bearing information concerning its contents.

**Lacrimation** - Secretion and discharge of tears.

**Lactation** - The secretion of milk by the breasts.

**LC** - Lethal concentration is the concentration of a substance being tested that will kill.

**LCL** - Lethal concentration low. Lowest concentration of a gas or vapor capable of killing a specified species. Over a specified time.

**LC50** - The concentration of a material in air that will kill 50 percent of a group of test animals with a single exposure (usually 1 to 4 hours). The LC50 is expressed as parts of material per million parts of air, by volume (ppm) for gases and vapors, or as micrograms of material per liter of air (g/l) or milligrams of material per cubic meter of air (mg/m<sup>3</sup>) for dusts and mists, as well as for gases and vapors.

**LD** - Lethal dose is the quantity of a substance being tested that will kill.

**LDL** - Lethal dose low. Lowest administered dose of a material capable of killing a specified test species.

**LD50** - A single dose of a material expected to kill 50 percent of a group of test animals. The LD50 dose is usually expressed as milligrams or grams of material per kilogram of animal body weight (mg/kg or g/kg). The material may be administered by mouth or applied to the skin.

**LEL or LFL** - Lower explosive limit, or lower flammable limit, of a vapor or gas; the lowest concentration (lowest percentage of the substance in air) that will produce a flash of fire when an ignition source (heat, arc or flame) is present. At concentrations lower than the LEL, the mixture is too lean to burn. Also see UEL.

**Lesion** - Any damage to a tissue.

**Lfpm** - Linear feet per minute, a unit of air velocity.

**Local exhaust** - A system for capturing and exhausting contaminants from the air at the point where the contaminants are produced (welding, grinding, sanding, other processes or operations). Also see general exhaust.

**Low Risk Operations** - Experimental procedures where the potential for release of gas, vapor, or aerosol contamination is remote.

**M** - Meter is a unit of length in the metric system. One meter is about 39 inches.

**m<sup>3</sup>** - Cubic meter is a metric measure of volume, approximately 35.3 cubic feet or 1.3 cubic yards.

**Malaise** - A feeling of general discomfort, distress, or uneasiness, an out-of-sorts feeling.

**Malignant** - Tending to become progressively worse and to result in death.

**Mammary** - Pertaining to the breast.

**Mechanical exhaust** - A powered device, such as a motor-driven fan or air stream venturi tube, for exhausting contaminants from a workplace, vessel, or enclosure.

**Mechanical Filter Respirator** - A respirator used to protect against airborne particulate matter like dusts, mists, metal fume, and smoke. Mechanical filter respirators do not provide protection against gases, vapors, or oxygen deficient atmospheres.

**Melting point** - The temperature at which a solid substance changes to a liquid state.

**Menorrhagia** - Excessive menstruation.

**Menstruation** - Periodic discharge of blood from the vagina from a non-pregnant uterus.

**Metabolism** - Physical and chemical processes taking place among the ions, atoms, and molecules of the body.

**Metastasize** - The transfer of disease from one organ or part to another not directly connected with it.

**mg** - Milligram is a metric unit of weight which is one-thousandth of a gram.

**mg/kg** - Milligrams of substance per kilogram of body weight is an expression of toxicological dose.

**mg/m<sup>3</sup>** - Milligrams per cubic meter is a unit for expressing concentrations of dusts, gases, or mists in air.

**Micrometer** - A unit of length equal to one-millionth of a meter.

**Micron** - A unit of length equal to one-millionth of a meter or 1/23,000 of an inch.

**Mld** - Mild

**Mist** - Suspended liquid droplets generated by condensation from the gaseous to the liquid state, or by breaking up a liquid into a dispersed state, such as splashing, foaming or atomizing. Mist is formed when a finely divided liquid is suspended in air.

**Mixture** - Any combination of two or more chemicals if the combination is not, in whole or part, the result of a chemical reaction.

**ml** - Milliliter is a metric unit of capacity, equal in volume to 1 cubic centimeter (cc), or approximately one-sixteenth of a cubic inch. One-thousandth of a liter.

**mmHg** - Millimeters (mm) of mercury (Hg) is a unit of measurement for low pressures or partial vacuums. Molecular Weight - Weight (mass) of a molecule based on the sum of the atomic weights of the atoms that make up the molecule.

**mppcf** - Million particles per cubic foot is a unit for expressing concentration of particles of a substance suspended in air. Exposure limits for mineral dusts (silica, graphite, Portland cement, nuisance dusts, and others), formerly expressed as mppcf, are now more commonly expressed in mg/m<sup>3</sup>.

**MSHA** - Mine Safety and Health Administration, U.S. Department of Labor.

**g** - Microgram, one-millionth of a gram.

**Mutagen** - A substance or agent capable of altering the genetic material in a living cell.

**MW** - See molecular weight.

**N<sub>2</sub>** - Nitrogen is a colorless, odorless, and tasteless gas that will not burn and will not support combustion. The earth's atmosphere (air) is about 78 percent nitrogen. At higher concentrations, nitrogen can displace oxygen and become an asphyxiant. See Asphyxiant.

**N/A** - Not applicable, or Not available.

**Narcosis** - A state of stupor, unconsciousness, or arrested activity produced by the influence of narcotics or other chemicals.

**Nausea** - Tendency to vomit, feeling of sickness at the stomach.

**NCI** - National Cancer Institute is that part of the National Institutes of Health which studies cancer causes and prevention as well as diagnosis, treatment, and rehabilitation of cancer patients.

**NFPA** - National Fire Protection Association is an international membership organization which promotes/improves fire protection and prevention and establishes safeguards against loss of life and property by fire.

**Neo** - See neoplasia

**Neonatal** - The first 4 weeks after birth.

**Neoplasia** - A condition characterized by the presence of new growths (tumors).

**Nephrotoxin** - A substance that causes injury to the kidneys.

**Neurotoxin** - A material that affects the nerve cells and may produce emotional or behavioral abnormalities.

**Neutralize** - To eliminate potential hazards by inactivating strong acids, caustics, and oxidizers. For example, acids can be neutralized by adding an appropriate amount of caustic substance to the spill.

**ng** - nanogram, one-billionth of a gram.

**NIOSH** - National Institute for Occupational Safety and Health, U.S. Public Health Service, U.S. Department of Health and Human Services (DHHS), among other activities, tests and certifies respiratory protective devices and air sampling detector tubes, recommends occupational exposure limits for various substances, and assists OSHA and MSHA in occupational safety and health investigations

and research.

**N/K - Not known**

**Non-flammable** - Not easily ignited, or if ignited, not burning rapidly.

**Non-Sparking Tools** - Tools made from beryllium-copper or aluminum-bronze greatly reduce the possibility of igniting dusts, gases, or flammable vapors. Although these tools may emit some sparks when striking metal, the sparks have a low heat content and are not likely to ignite most flammable liquids.

**NPIRS** - National Pesticide Information Retrieval System is an automated data base operated by Purdue University containing information on EPA registered pesticides, including reference file material safety data sheets.

**NRC** - National Response Center is a notification center which must be called when significant oil or chemical spills or other environment-related accidents occur. The toll-free telephone number is 1-800-424-8802.

**NOx** - Oxides of nitrogen which are undesirable air pollutants. NOx emissions are regulated by EPA under the Clean Air Act.

**NTP** - National Toxicology Program. The NTP publishes an Annual Report on Carcinogens.

**O<sup>2</sup> - Oxygen, Atomic Number: 8, Atomic Weight: 15.9994**

**Odor** - A description of the smell of the substance.

**Odor Threshold** - The lowest concentration of a substance's vapor, in air, that can be smelled.

**Olfactory** - Relating to the sense of smell.

**Oral** - Used in or taken into the body through the mouth.

**OFAP** - Office of Federal Agency Programs is the organizational unit of OSHA which provides Federal agencies with guidance to develop and implement occupational safety and health programs for Federal employees.

**Oral Toxicity** - Adverse effects resulting from taking a substance into the body by mouth. Ordinarily used to denote effects in experimental animals.

**Organic Peroxide** - An organic compound that contains the bivalent -O-O structure and may be considered a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms has been replaced by an organic radical.

**Organogenesis** - The secretion of tissues into different organs in embryonic development.

**OSHA** - Occupational Safety and Health Administration, U.S. Department of Labor.

**Ovary** - The female sex gland in which ova are formed.

**Overexposure** - Exposure to a hazardous material beyond the allowable exposure levels.

**Ovulation** - The process in which an ovum is discharged from an ovary.

**Ovum** - Egg.

**Oxidation** - In a literal sense, oxidation is a reaction in which a substance combines with oxygen provided by an oxidizer or oxidizing agent.

**Oxidizer** - A chemical other than a blasting agent or explosive that initiates or promotes combustion in other materials, causing fire either by itself or through the release of oxygen or other gases.

**Oxidizing Agent** - A chemical or substance that brings about an oxidation reaction. The agent may (1) provide the oxygen to the substance being oxidized (in which case the agent has to be oxygen or contain oxygen), or (2) it may receive electrons being transferred from the substance undergoing oxidation (chlorine is a good oxidizing agent for electron-transfer purposes, even though it contains no oxygen).

**Papanicolaou Smear** - Test most commonly used to detect cancer of the uterus and cervix.

**Pathologic** - Pertaining to or caused by disease.

**Pathology** - Scientific study of alterations produced by disease.

**PEL** - Permissible exposure limit is an exposure limit established by OSHA'S regulatory authority. It may be a time weighted average (TWA) limit or a maximum concentration exposure limit.

**Percent Volatile** - Percent volatile by volume is the percentage of a liquid or solid (by volume) that will evaporate at an ambient temperature of 70F (unless some other temperature is specified). Examples: butane, gasoline, and paint thinner (mineral spirits) are 100 percent volatile; their individual evaporation rates vary, but, in time, each will evaporate completely.

**pH** - The symbol relating the hydrogen ion (H-) concentration to that of a given standard solution. A pH of 7 is neutral. Numbers increasing from 7 to 14 indicate greater alkalinity. Numbers decreasing from 7 to 0 indicate greater acidity.

**Physical Hazard** - Means a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, and organic peroxide, an oxidizer, pyrophoric, unstable (reactive) or water-reactive.

**Placenta** - A structure that grows on the wall of the uterus during pregnancy, through which the fetus is nourished

**PMCC** - Pensky-Martens Closed Cup. See flashpoint.

**Pneumoconiosis** - A condition of the lung in which there is permanent deposition of particulate matter and the tissue reaction to its presence. It may range from relatively harmless forms of iron oxide



deposition to destructive forms of silicosis.

**Poison, Class A** - A DOT term for extremely dangerous poison, poisonous gases or liquids that, in very small amounts, either as gas or as vapor of the liquid, mixed with air, are dangerous to life. Examples: phosgene, cyanogen, hydrocyanic acid, nitrogen peroxide.

**Poison, Class B** - A DOT term for liquid, solid, paste or semi-solid substances, other than Class A poisons or irritating materials, that are known (or presumed on the basis of animal tests) to be so toxic to humans that they are a hazard to health during transportation.

**Polymerization** - A chemical reaction in which one or more small molecules combine to form larger molecules. A hazardous polymerization is such a reaction that takes place at a rate that releases large amounts of energy. If hazardous polymerization can occur with a given material, the material safety data sheet usually will list conditions that could start the reaction and, since the material usually contains a polymerization inhibitor, the length of time during which the inhibitor will be effective.

**ppm** - Parts per million is the concentration of a gas or vapor in air, parts (by volume) of the gas or vapor in a million parts of air; also the concentration of a particular in a liquid or solid.

**ppb** - Parts per billion is the concentration of a gas or vapor in air, parts (by volume) of the gas or vapor in a billion parts of air. Usually used to express extremely low concentrations of unusually toxic gases or vapors; also the concentration of a particular substance in a liquid or solid.

**Prenatal** - Preceding birth.

**Protective Laboratory Practices and Equipment** - Those laboratory procedures, engineering/administrative controls, work practices and protective clothing and equipment used to minimize employee exposure to hazardous chemicals.

**psi** - Pounds per square inch (for material safety data sheet purposes) is the pressure a material exerts on the walls of a confining vessel or enclosure. For technical accuracy, pressure must be expressed as psig (pounds per square inch gauge) or psia (pounds per square inch absolute; that is, gauge pressure plus sea level atmospheric pressure, or psig plus approximately 14.7 pounds per square inch). Also see mmHg.

**Pul** - See pulmonary.

**Pulmonary** - Relating to, or associated with, the lungs.

**Pulmonary Edema** - Fluid in the lungs.

**Pyrophoric** - A chemical that will ignite spontaneously in air at a temperature of 13F (54.4C) or below.

**RCRA** - Resource Conservation and Recovery Act is environmental legislation aimed at controlling the generation, treating, storage, transportation and disposal of hazardous wastes. It is administered by EPA.

**Reaction** - A chemical transformation or change. The interaction of two or more substances to form

new substances.

**Reactive** - See Unstable.

**Reactivity** - Chemical reaction with the release of energy. Undesirable effects, such as pressure buildup, temperature increase, formation of noxious, toxic or corrosive by-products may occur because of the reactivity of a substance to heating burning, direct contact with other materials, or other conditions in use or in storage.

**Reducing agent** - In a reduction reaction (which always occurs simultaneously with an oxidation reaction) the reducing agent is the chemical or substance which (1) combines with oxygen or (2) loses electrons to the reaction. See oxidation.

**Reproductive Toxin** - A chemical which affects the reproductive system and may produce chromosomal damage (mutation) and/or adverse effects on the fetus (teratogenesis). For the purposes of this guidance, any chemical with a mutagenic or teratogenic quotation in the Registry of Toxic Effects of Chemical Substances (RTECS) shall be considered a reproductive hazard.

**Respiratory protection** - Devices that will protect the wearer's respiratory system from overexposure by inhalation to airborne contaminants. Respiratory protection is used when a worker must work in an area where he/she might be exposed to concentration in excess of the allowable exposure limit.

**Respiratory system** - The breathing system that includes the lungs and the air passages (trachea or windpipe, larynx, mouth, and nose) to the air outside the body, plus the associated nervous and circulatory supply.

**Routes of Entry** - The means by which a material may gain access to the body, for example, inhalation, ingestion, and skin contact.

**Sarcoma** - A tumor which is often malignant.

**Self-Contained Breathing Apparatus** - A respiratory protection device that consists of a supply or a means of respirable air, oxygen, or oxygen-generating material, carried by the wearer.

**Sensitizer** - A chemical that causes a substantial proportion of exposed people or animals to develop an allergic reaction in normal tissue after repeated exposure to the chemical.

**SETA** - Setaflash Closed Tester. See flashpoint.

**Silicosis** - A disease of the lungs caused by the inhalation of silica dust.

**Skn** - Skin

**Skin** - A notation (sometimes used with PEL or TLV exposure data) which indicates that the stated substance may be absorbed by the skin, mucous membranes, and eyes either airborne or by direct contact and that this additional exposure must be considered part of the total exposure to avoid

exceeding the PEL or TLV for that substance.

**Skin Absorption** - Ability of some hazardous chemicals to pass directly through the skin and enter the bloodstream.

**Skin Sensitizer** - See Sensitizer.

**Skin Toxicity** - See Dermal Toxicity.

**SO<sub>x</sub>** - Oxides of sulfur.

**Solubility in water** - A term expressing the percentage of a material (by weight) that will dissolve in water at ambient temperature. Solubility information can be useful in determining spill cleanup methods and re-extinguishing agents and methods for a material.

**Solvent** - A substance, usually a liquid, in which other substances are dissolved. The most common solvent is water.

**Species** - On the material safety data sheets, species refers to the test animals, usually rats, mice, or rabbits, used to obtain the toxicity test data reported.

**Specific Chemical Identity** - The chemical name, Chemical Abstracts Service (CAS) Registry Number, or any precise chemical designation of a substance.

**Specific Gravity** - The weight of a material compared to the weight of an equal volume of water is an expression of the density (or heaviness) of a material. Insoluble materials with specific gravity of less than 1.0 will float in (or on) water. Insoluble materials with specific gravity greater than 1.0 will sink in water. Most (but not all) flammable liquids have specific gravity less than 1.0 and, if not soluble, will float on water, which is an important consideration for fire suppression.

**Spill or Leak Procedures** - The methods, equipment, and precautions that should be used to control or clean up a leak or spill.

**Splash Proof Goggles** - Eye protection made of a noncorrosive material that fits snugly against the face, and has indirect ventilation ports.

**Spontaneously Combustible** - A material that ignites as a result of retained heat from processing, or which will oxidize to generate heat and ignite, or which absorbs moisture to generate heat and ignite.

**Squamous** - Scaly or platelike.

**Stability** - The ability of a material to remain unchanged. For material safety data sheet purposes, a material is stable if it remains in the same form under expected and reasonable conditions of storage or use. Conditions which may cause instability (dangerous change) are stated; for example, temperatures above 150F; shock from dropping.

**STEL** - Short Term Exposure Limit (ACGIH terminology). See TLV.

**Stenosis** - Narrowing of a body passage or opening.

**Steroids** - A complex molecule among which are the male and female sex hormones.

**Subcutaneous** - Beneath the layers of the skin.

**Supplied Air Respirators** - Air line respirators or self-contained breathing apparatus.

**Sys** - System or systemic.

**Systemic Poison** - A poison which spreads throughout the body, affecting all body systems and organs. Its adverse effect is not localized in one spot or area.

**Systemic Toxicity** - Adverse effects caused by a substance which affects the body in a general rather than local manner.

**Synonym** - Another name or names by which a material is known. Methyl alcohol, for example, is known as methanol or wood alcohol.

**Target Organ Effects** - The following is a listing of target organs, toxicants specific for these organs, and some of the toxic effects produced by these agents. These examples are presented to illustrate the diversity of hazards employers must consider in the workplace and are not intended as a complete listing of such agents and their target organs.

<b>ORGAN</b>	<b>TOXICANT</b>	<b>EFFECTS</b>
Blood	Carbon monoxide; Cyanides	Cyanosis; Loss of consciousness
Dermis	Ketones; Chlorinated compounds	Rashes; Defatting of skin
Eyes	Organic solvents; Acids	Conjunctivitis; Corneal damage
Kidney	Halogenated hydrocarbons; Uranium	Edema; Proteinuria
Liver	Carbon tetrachloride; Nitrosamines	Jaundice; Liver enlargement
Lung	Silica; Asbestos	Cough; Shortness of breath
Gonads	Lead; DBCP	Birth defects; Sterility

**Target Organ Toxin** - A toxic substance that attacks a specific organ of the body. For example, overexposure to carbon tetrachloride can cause liver damage.

**TCC** - Tag (Tagliabue) Closed Cup. See flashpoint.

**TCL** - Toxic concentration low. Lowest concentration of a gas or vapor capable of producing a defined toxic effect in a specified test species over a specified time.

**TDL** - Toxic dose low. Lowest administered dose of a material capable of producing a defined toxic effect in a specified test species.

**Temp** - Temperature.

**Ter** - See Teratogen.

**Teratogen** - A substance or agent, exposure to which by a pregnant female can result in malformations in the fetus.

**Tfx** - Toxic effect(s).

**TLV** - Threshold Limit Value is a term used by ACGIH to express the airborne concentration of material to which nearly all persons can be exposed day after day without adverse effects. ACGIH expresses TLVs in three ways:

1. **TLV-TWA: The allowable Time Weighted Average** concentration for a normal 8-hour workday or 40-hour workweek.
2. **TLV-STEL: The Short-Term Exposure Limit**, or maximum concentration for a continuous 15-minute exposure period (maximum of four such periods per day, with at least 60 minutes between exposure periods, and provided the daily TLV-TWA is not exceeded).
3. **TLV-C: The ceiling exposure limit**, the concentration that should not be exceeded even instantaneously.

**TOC** - TAG Open Cup. See flashpoint.

**Torr** - A unit of pressure, equal to 1/760 atmosphere.

**Toxic** - A chemical falling within any of the following categories:

1. **A chemical with a median lethal dose (LD50) of more than 50 milligrams** per kilogram but not more than 500 milligrams per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.
2. **A chemical that has a median lethal dose (LD50) of more than 200 milligrams** per kilogram but not more than 1,000 milligrams per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between two and three kilograms each.
3. **A chemical that has a median lethal concentration (LC50) in air** of more than 200 parts per million but not more than 2,000 parts per million by volume of gas or vapor, or more than two milligrams per liter but not more than 20 milligrams per liter of mist, fume, or dust, when administered by continuous inhalation for one hour (or less if death occurs within 1 hour) to albino rats weighing between 200 and 300 grams each.

**Toxic Substance** - Any substance which can cause acute or chronic injury to the human body, or which is suspected of being able to cause diseases or injury under some conditions.

**Toxicant** - Any substance producing a toxic effect.

**Toxicity** - The sum of adverse effects resulting from exposure to a material, generally by the mouth, skin, or respiratory tract.

**Trade Name** - The trademark name or commercial trade name for a material or product.

**Transplacental** - An agent that causes physical defects in the developing embryo.

**TSCA** - Toxic Substances Control Act (Federal Environmental Legislation administered by EPA) regulates the manufacture, handling, and use of materials classified as toxic substances.

**TWA** - Time-Weighted Average exposure is the airborne concentration of a material to which a person is exposed, averaged over the total exposure time, generally the total workday (8 hours). Also see TLV.

**UEL or UFL** - Upper explosive limit or upper flammable limit of a vapor or gas; the highest concentration (highest percentage of the substance in air) that will produce a flash of fire when an ignition source (heat, arc, or flame) is present. At higher concentrations, the mixture is too rich to burn. Also see LEL.

**Unstable** - Tending toward decomposition or other unwanted chemical change during normal handling or storage.

**Unstable Reactive** - A chemical that, in the pure state, or as produced or transported, will vigorously polymerize, decompose, condense, or become self-reactive under conditions of shocks, pressure, or temperature.

**USDA** - U.S. Department of Agriculture.

**Uterus** - A muscular organ which holds and nourishes the growing fetus.

**Vapor** - The gaseous form of a solid or liquid substance as it evaporates.

**Vapor density** - The weight of a vapor or gas compared to the weight of an equal volume of air is an expression of the density of the vapor or gas. Materials lighter than air have vapor densities less than 1.0 (examples: acetylene, methane, hydrogen). Materials heavier than air (examples: propane, hydrogen sulfide, ethane, butane, chlorine, sulfur dioxide) have vapor densities greater than 1.0. All vapors and gases will mix with air, but the lighter materials will tend to rise and dissipate (unless confined). Heavier vapors and gases are likely to concentrate in low places along or under floors, in sumps, sewers, and manholes, in trenches and ditches where they may create fire or health hazards.

**Vapor pressure** - The pressure exerted by a saturated vapor above its own liquid in a closed container. When quality control tests are performed on products, the test temperature is usually 100F, and the vapor pressure is expressed as pounds per square inch (psig or psia), but vapor pressures reported on material safety data sheets are in millimeters of mercury (mmHg) at 68F (20C), unless stated otherwise. Three facts are important to remember:

1. Vapor pressure of a substance at 100F will always be higher than the vapor pressure of the substance at 68F (20C).
  2. Vapor pressures reported on material safety data sheets in mmHg are usually very low pressures; 760 mm Hg is equivalent to 14.7 pounds per square inch.
  3. The lower the boiling point of a substance, the higher its vapor pressure.
- Ventilation - See General Exhaust, Local Exhaust, and Mechanical Exhaust.

**Vermiculite** - An expanded mica (hydrated magnesium-aluminum-iron silicate) used as sorbent for spill control and cleanup.

**Volatility** - A measure of how quickly a substance forms a vapor at ordinary temperatures.

**Viscosity** - The tendency of a fluid to resist internal flow without regard to its density.

**Water Disposal Methods** - Proper disposal methods for contaminated material, recovered liquids or solids, and their containers.

**Water-Reactive** - A chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

**Work Area** - A room or defined space in a workplace where hazardous chemicals are produced or used, and where employees are present.

**Workplace** - An establishment at one geographical location containing one or more work areas.