

# MSDS GLOSSARY

The following glossary presents brief explanations of acronyms and common terms frequently used by chemical manufacturers in their material safety data sheets.

**ACGIH** American Conference of Governmental Industrial Hygienists is an organization of professional personnel in governmental agencies or education institutions engaged in occupational safety and health programs. ACGIH establishes recommended occupational exposure limits for chemical substances and physical agents. See TLV.

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

**Acute Effect** Adverse effect on a human or animal that has severe symptoms developing rapidly and coming quickly to a crisis.

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

**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 (e.g., smoke or fog).

**Air-Line Respirator** A respirator that is connected to a compressed breathable 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 chemicals to remove specific gases and vapors from the air or that uses a mechanical filter to remove particulate matter. Any 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** Any chemical substance that forms soluble soaps with fatty acids. Alkalis are also referred to as bases. They may cause severe burns to the skin. Alkalis turn litmus paper blue and have pH values from 8 to 14.

**Allergic Reaction** An abnormal physiological response to chemical or physical stimuli.

**Amenorrhea** Absence of menstruation.

**Anesthetic** A chemical that causes a total or partial loss of sensation. Overexposure to anesthetics can cause impaired judgment, dizziness, drowsiness, headache, unconsciousness, and even death. Examples include alcohol, paint remover, and degreasers.

**ANSI** American National Standards Institute is a privately funded, voluntary membership organization that identifies industrial and public needs for national consensus standards and coordinates development of such standards.

**Antidote** A remedy to relieve, prevent, or counteract the effects of a poison.

**API** American Petroleum Institute is a organization of the petroleum industry.

**Appearance** A description of a substance at normal room temperature and normal atmospheric conditions. Appearance includes the color, size, and consistency of a material.

**Aquatic Toxicity** The adverse effects to marine life that result from being exposed to a toxic substance.

**Asphyxiant** A vapor or gas that can cause unconsciousness or death by suffocation (lack of oxygen). Most simple asphyxiants are harmful to the body only when they become so concentrated that they reduce oxygen in the air (normally about 21 percent) to dangerous levels (18 percent or lower). Asphyxiation is one of the principal potential hazards of working in confined and enclosed spaces.

**ASTM** American Society for Testing and Materials is the world's largest source of voluntary consensus standards for materials, products, systems, and services. ASTM is a resource for sampling and testing methods, health and safety aspects of materials, safe performance guidelines, effects of physical and biological agents and chemicals.

**Asymptomatic** Showing no symptoms.

**Atm** Atmosphere, a unit of pressure equal to 760 mmHg (mercury) at sea level.

**Atmosphere-Supplying Respirator** A respirator that provides breathable air from a source independent of the surrounding atmosphere. There are two types: air-line and self-contained breathing apparatus.

**Auto-Ignition Temperature** The temperature to which a closed, or nearly closed container must be heated in order that the flammable liquid, when introduced into the container, will ignite spontaneously or burn.

**BAL** British Anti-Lewisite – A name for the drug dimercaprol—a treatment for toxic inhalations.

**Base** A substance that (1) liberates hydroxide (OH) ions when dissolved in water, (2) receives hydrogen ions from a strong acid to form a weaker acid, and (3) neutralizes an acid. Bases react with acids to form salts and water. Bases have a pH greater than 7 and turn litmus paper blue. See Alkali.

**BCM** Blood-clotting mechanism effects.

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

**Biodegradable** Capable of being broken down into innocuous products by the action of living things.

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

**BLD** Blood effects.

**Boiling Points BP** 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 (760 mmHg, 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 -44oF**

**Anhydrous Ammonia -28oF**

**Butane 31oF**

**Gasoline 100oF**

**Allyl Chloride 113oF**

**Ethylene Glycol 387oF**

**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 that 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.

**Ceiling Limit (PEL or TLV)** 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 U.S. Environmental Protection Agency.

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

- a. It has been evaluated by the International Agency for Research on Cancer (IARC) and found to be a carcinogen or potential carcinogen; or
- b. 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
- c. 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 that 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.

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

**Chemical** An element (e.g., chlorine) or a compound (e.g., sodium bicarbonate) produced by chemical reaction.

**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 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 "Ketone" family; acrolein, furfural, and acetaldehyde are of the "aldehyde" family.

**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). The scientific designation of a chemical or a name that will clearly identify the chemical for hazard evaluation purposes.

**Chemical Pneumonitis** Inflammation of the lungs caused by accumulation of fluids due to chemical irritation.

**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 that develop slowly over a long period of time or that 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 Manufactures 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 byproduct of many chemical

processes. A chemical asphyxiant: it reduces the blood's ability to carry oxygen. Hemoglobin absorbs CO two hundred times more readily than it does oxygen.

**CO<sub>2</sub>** Carbon dioxide is a heavy, colorless gas that is produced by the combustion and decomposition of organic substances and as a byproduct of many chemical processes. CO<sub>2</sub> will not burn and is relatively nontoxic (although high concentrations, especially in confined spaces, can create hazardous oxygen-deficient environments).

**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 100oF (37.8oC) or higher but below 200oF (93.3oC). Also see "flammable." Non-liquid substances such as wood and paper are classified as "ordinary combustibles" by NFPA.

**Combustible Liquid** Any liquid having a flash-point at or above 100oF (37.8oC), but below 200oF (93.3oC), except any mixture having components with flashpoints of 200oF (93.3oC) or higher, the total volume of which makes up ninety-nine (99) percent or more of the total volume of the mixture.

**Common Name** Any means used to identify a chemical other than its chemical name (e.g., code name, code number, trade name, brand name, or generic name). See Generic.

**Compressed Gas:**

- a. A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 pounds per square inch (psi) at 70oF (21.1oC); or
- b. A gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130oF (54.4oC) regardless of the pressure at 70oF (21.1oC); or
- c. A liquid having a vapor pressure exceeding 40 psi at 100oF (37.8oC) 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 that could cause a substance to become unstable.

**Confined Space** Any area that 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 MSDS 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 DOT 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.

**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.

**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 regulates transportation of chemicals and other substances.

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

**Dysmenorrhea** Painful menstruation.

**Dysplasia** An abnormality of development.

**Dyspnea** A sense of difficulty in breathing; shortness of breath.

**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 hormones.

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

**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 of 1.0. Vaporization rates of other solvents or materials are then classified as:

- **FAST** evaporating if greater than 3.0. Examples: Methyl Ethyl Ketone = 3.8, Acetone = 5.6, Hexane = 8.3.
- **MEDIUM** evaporating if 0.8 to 3.0. Examples: 190 proof (95%) Ethyl Alcohol = 1.4, VM&P Naphtha = 1.4, MIBK = 1.6.
- **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 by inhalation, ingestion, skin contact, absorption, or any other course: includes potential (accidental or possible) exposure.

**Extinguishing Media** The firefighting substance to be used to control a material in the event of a fire. It is usually identified 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 212°F and freezes at 32°F.

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

**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.

**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:

- a. "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;
- b. "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;
- c. "Liquid, flammable." Any liquid having a flashpoint below 100oF (37.8oC), except any mixture having components with flashpoints of 100oF (37.8oC) or higher, the total of which make up 99 percent or more of the total volume of mixture.
- d. "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:

- a. Tagliabue Closed Tester (see American National Standard Method of Test for Flash Point by Tag Closed Tester, Z11.24 1979 [ASTM D56-79]).
- b. 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]).
- c. 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.

**Generic Name** A designation or identification used to identify a chemical by other than its chemical name (e.g., code name, code number, trade name, and brand name).

**Genetic** Pertaining to or carried by genes. Hereditary.

**Gestation** The development of the fetus in the uterus from conception to birth; pregnancy.

**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 "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.

**Hazardous Chemical** Any chemical whose presence or use is a physical hazard or a health hazard.

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

**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 that are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents that act on the hematopoietic system, and agents that damage the lungs, skin, eyes, or mucous membranes.

**Hemoglobin** An iron-containing conjugated protein or respiratory pigment occurring in the red blood cells of vertebrates.

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

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

**Hematuria** The presence of blood in the urine.

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

**Highly toxic** A chemical in any of the following categories:

- a. 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.
- b. 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.
- c. 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 between 200 and 300 grams each.

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

**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, that causes a reversible inflammatory effect on living tissue by a 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** As defined by DOT, a property of 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.

**Lacrimation** Secretion and discharge of tears.

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

**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.

**Lfm** 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.

**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 powdered 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 of a nonpregnant uterus.

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

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

**Meter** A unit of length: equivalent to 39.37 inches.

**mg** Milligram is a metric unit of weight that 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.

**Micron (Micrometer)** A unit of length equal of one-millionth of a meter; approximately 0.000039 of an inch.

**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.

**Mld** Mild

**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.

**mppef** 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>.

**MSDS** Material Safety Data Sheet.

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

**Mutagen** A substance of 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 a lethal asphyxiant. See Asphyxiant.

**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 that 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. Best known on the industrial scene for the National Fire Codes—16 volumes of codes, standards, recommended practices and manuals developed (and periodically updated) by NFPA technical committees. Among these is NFPA 704M, the code for showing hazards of materials as they might be encountered under fire or related emergency conditions, using the familiar diamond-shaped label or placard with appropriate numbers or symbols.

**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 that 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.



**Nonflammable** 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.

**NO<sub>2</sub>** Oxides of nitrogen which are undesirable air pollutants. NO emissions are regulated by EPA under the Clean Air Act.

**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 that must be called when significant oil or chemical spills or other environment-related accidents occur. The toll-free telephone number is (800) 424-8802.

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

**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.

**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 formation of organs during 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 limits.

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

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

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

**PEL** Permissible Exposure Limit is an occupational 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 70°F (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<sup>+</sup>) 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, an 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 poisons—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 semisolid 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 MSDS 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.

**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.

**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 particulate in a liquid or solid.

**Prenatal** Preceding birth.

**psi** Pounds per square inch (for MSDS 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 130°F (54.4°C) or below.

**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 byproducts—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.

**REL** The NIOSH REL (Recommended Exposure Limit) is the highest allowable airborne concentration which is not expected to injure the workers. It may be expressed as a ceiling limit or as a time-weighted average (TWA).

**Reproductive Toxin** Substances that affect either male or female reproductive systems and may impair the ability to have children.

**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 material may gain access to the body, for example, inhalation, ingestion, and skin contact.

**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.

**Sarcoma** A tumor that 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 (fibrosis) caused by the inhalation of silica dust.

**Skn** Skin.

**"Skin"** A notation (sometimes used with PEL or TLV exposure data) that 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.

**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 reextinguishing agents and methods for a material.

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

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

**Species** On the MSDS's, 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—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 that will oxidize to generate heat and ignite, or that absorbs moisture to generate heat and ignite.

**Squamous** Scaly or platelike.

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

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

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

**Steroid** 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 of self-contained breathing apparatus.

**Sys** System or systemic.

**Systemic Poison** A poison that 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 that 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 target organ categorization of effects that may occur, including examples of signs and symptoms and chemicals that have been found to cause such effects. These examples are presented to illustrate the range and diversity of effects and hazards found the workplace, and the broad scope employers must consider in this area, but they are not intended to be all inclusive.

<b>(a) Hepatotoxins</b>	Chemicals that produce liver damage.
Signs and Symptoms	Jaundice; liver enlargement.
Chemicals	Carbon tetrachloride; nitrosamines.
<b>(b) Nephrotoxins</b>	Chemicals that produce kidney damage.
Signs and Symptoms	Narcosis; behavioral changes; decrease in motor function
Chemicals	Halogenated hydrocarbons; uranium.
<b>(c) Neurotoxins</b>	Chemicals that produce their primary toxic effects on the nervous
Signs and Symptoms	Narcosis; behavioral changes; decrease in motor function

Chemicals	Mercury, carbon disulfide.
<b>(d) Agents that act on blood hematopoietic system</b>	Decrease hemoglobin function; deprive the body tissue of oxygen.
Signs and Symptoms	Cyanosis; loss of consciousness.
Chemicals	Carbon monoxide; cyanides
<b>(e) Agents that damage the lung</b>	Chemicals that irritate or damage the pulmonary tissue.
Signs and Symptoms	Cough, tightness in chest, shortness of breath.
Chemicals	Silica; asbestos.
<b>(f) Reproductive toxins</b>	Chemicals that adversely affect the reproductive capabilities including chromosomal damage (mutations) and effects on fetus (teratogens).
Signs and Symptoms	Birth Defects; Sterility.
Chemicals	Lead: DBCP
<b>(g) Cutaneous hazards</b>	Chemicals that affect the dermal layer of the body.
Signs and Symptoms	Defatting of the skin; rashes; irritation.
Chemicals compounds	Ketones; chlorinated
Eye Hazard	Chemicals that affect the eye or visual capacity.
Signs and Symptoms	Conjunctivitis; corneal damage.
Chemicals	Organic solvents; acids.

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

**TCC** Tag (Tagliabue) Closed Cup. See Flashpoint.

**TCL** Toxic concentration low, the 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:

**TLV-TWA:** The allowable Time-Weighted Average concentration for a normal 8-hour workday or 80-hour workweek.

**TLV-STEL:** The Short-Term Exposure Limit, or maximum concentration for a continuous 15-minute exposed period (maximum of four such periods per day, with at least 60 minutes between exposure periods, and provided the daily TLV-TWA is exceeded).

**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:

- a. A chemical that has 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.
- b. 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.
- c. 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 more (or less if death occurs within 1 hour) to albino rats weighing between 200 and 300 grams each.

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

**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 air-borne concentration of a material to which a person is exposed, averaged over the total exposure time—generally the total workday (8 to 12 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.

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

**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.

**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 100°F, and the vapor pressure is expressed as pounds per square inch (psig or psia), but vapor pressures reported as MSDS's are in millimeters of mercury (mmHg) at 68°F (20°C), unless stated otherwise. Three facts are important to remember:

1. Vapor pressure of a substance at 100°F will always be higher than the vapor pressure of the substance at 68°F (20°C).
2. Vapor pressures reported on MSDS's in mmHg are usually very low pressures; 760 mmHg 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.

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

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

**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.

**Zinc Fume Fever** A condition brought on by inhalation of zinc oxide fume characterized by flulike symptoms with a metallic taste in the mouth, coughing, weakness, fatigue, muscular pain, and nausea, followed by fever and chills. The onset of symptoms occurs four to twelve hours after exposure.