

IOWA STATE UNIVERSITY
Environmental Health and Safety

Safety Data Sheets (SDSs) Information and Glossary



Safety Data Sheets (SDSs) Information

Safety Data Sheets (SDSs) are informational sheets required by the Occupational Safety and Health Administration (OSHA) for hazardous substances. The OSHA Hazard Communication Standard (29 CFR 1910.1200) and the Iowa Hazardous Chemical Risks Right to Know Standard (Iowa Administrative Code Section 875, Chapters 110-140) requires SDSs be “readily accessible” for any hazardous chemical in the workplace. Employees must be made aware of the SDS content and chemical storage location. SDSs can be obtained from manufacturers and distributors at the time of initial shipment. Each university workplace must maintain an SDS for each hazardous chemical in its inventory. SDSs that are available electronically meet the “readily accessible” criteria, as long as computer access is available to all employees whenever work is being conducted. Environmental Health and Safety (EH&S) suggests that each workspace also maintain paper copies of commonly used hazardous chemicals for ease of access.

OSHA requires specific information be included on an SDS, in a 16-section format as described in the UN Globally Harmonized System of Classification and Labeling of Chemicals (GHS). The SDS must be in English and must include at least the following information:

- **Section 1: Identification** includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.
- **Section 2: Hazard(s) Identification** includes all hazards regarding the chemical; required label elements.
- **Section 3: Composition/Information on Ingredients** includes information on chemical ingredients; trade secret claims.
- **Section 4: First-Aid Measures** includes important symptoms/effects (acute and delayed); required treatment.
- **Section 5: Fire-fighting Measures** lists suitable extinguishing techniques, equipment; chemical hazards from fire.
- **Section 6: Accidental Release Measures** lists emergency procedures, protective equipment, proper methods of containment and cleanup.
- **Section 7: Handling and Storage** lists precautions for safe handling and storage, including incompatibilities.
- **Section 8: Exposure Controls/Personal Protection** lists OSHA’s Permissible Exposure Limits (PELs), Threshold Limit Values (TLVs), appropriate engineering controls, and personal protective equipment (PPE).
- **Section 9: Physical and Chemical Properties** lists the chemical’s characteristics.
- **Section 10: Stability and Reactivity** lists chemical stability and possibility of hazardous reactions.
- **Section 11: Toxicological Information** includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.
- **Section 12: Ecological Information** lists the environmental impact of the chemical(s) if released to the environment.
- **Section 13: Disposal Considerations** provides guidance on proper disposal practices, recycling

or reclamation of the chemical(s) or its container, and safe handling practices.

- **Section 14: Transport Information** provides guidance on classification information for shipping and transporting of hazardous chemical(s) by road, air, rail or sea.
- **Section 15: Regulatory Information** identifies the safety, health and environmental regulations specific for the product.
- **Section 16: Other Information** includes the date of preparation or last revision.

Glossary

The following glossary provides brief explanations of acronyms and common terms frequently used by chemical manufacturers in their SDSs. Explanations and definitions were compiled from various sources, but were gathered mainly from three sources: *Fundamentals of Industrial Hygiene*, 4th ed. (National Safety Council), *The Occupational Environment—Its Evaluation and Control*, 2nd ed. (American Industrial Hygiene Association), and The Globally Harmonized System of Classification and Labeling of Chemicals (GHS - United Nations).

Absorbed Dose

The mass or moles of exposing compound that enter(s) the bloodstream through any external routes of exposure; the absolute bioavailability.

Amount of a substance penetrating the tissues or organs of an organism after contact. Calculated from intake and absorption efficiency and expressed as mg/kg/day.

Absorption

The process of taking in a substance across the tissues or organs of an organism (skin, lungs, or gastrointestinal tract) and ultimately into body fluids and tissues.

ACGIH

American Conference of Governmental Industrial Hygienists is an organization of professional 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.

Activity

The rate of disintegration or transformation or decay of radioactive material. The units of activity are the becquerel (Bq) and the curie (Ci).

Acute Effect

An adverse effect (usually) arising from a short exposure (minutes to hours) to a chemical.

Acute Exposure

A large dose exposure over a short period of time.

Acute Toxicity

Acute effects resulting from a single exposure dose 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

Solid or liquid particles of microscopic size dispersed in a gaseous medium, solid or liquid, suspended in air (dust, fumes, fog, and smoke). As the particles are so fine they often remain suspended in the air for a period of time.

AIHA

American Industrial Hygiene Association is an organization of industrial hygienists from the private and public sectors. AIHA is recognized for its technical committee publications, its proactive role in governmental affairs, and for promoting the profession of industrial hygiene.

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. 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.

ALARA

As Low As Reasonably Achievable means making every reasonable effort to maintain exposures to radiation as far below the dose limits as is practical or achievable.

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.

Alpha Particle

A strongly ionizing particle emitted from the nucleus during radioactive decay having a mass and charge equal in magnitude to a helium nucleus, consisting of 2 protons and 2 neutrons with a double positive charge.

Alveoli

Tiny air sacs of the lungs, formed at the ends of bronchioles; through the thin walls of the alveoli, the blood takes in oxygen and gives up carbon dioxide in respiration.

Amenorrhea

Absence of menstruation.

Anaphylaxis

Hypersensitivity resulting from sensitization following prior contact with a chemical protein.

Anemia

A condition in which the blood is deficient in red blood cells, hemoglobin, or total volume.

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.

Anesthetic Effect

The loss of the ability to perceive pain and other sensory stimulation.

Anorexia

An eating disorder where one of the symptoms causes a lack of or loss of the appetite for food.

Anoxia

A lack of or significant reduction in oxygen.

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 an organization of the petroleum industry.

Aplastic Anemia

A condition in which the bone marrow fails to produce an adequate number of red blood corpuscles.

Apnea

The temporary cessation of breathing.

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.

Asthma

Constriction of the bronchial tubes in response to irritation, allergy, or other stimulus.

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). A chemical asphyxiant chemically interferes with the body's ability to take up and transport oxygen. 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.

Ataxia

Loss of balance with an unsteady gait; a failure of muscular coordination, total or partial.

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.

Atrophy

Wasting of muscles or other tissues in the body caused by a decrease in the number of cells or shrinkage of the cells.

Auto-Ignition Temperature

The lowest temperature at which a flammable gas- or vapor-air mixture will ignite from its own heat source or a contacted heated surface without the necessity of a spark or flame. Vapors and gases will spontaneously ignite at a lower temperature in oxygen than in air, and their auto-ignition temperature may be influenced by the presence of catalytic substances..

BAL

British Anti-Lewisite. A name for the drug dimercaprol, a treatment for toxic inhalations.

Basal Cell Carcinoma

A locally invasive, rarely metastatic nevoid tumor of the epidermis.

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 malignant or recurrent; often used to describe tumors that might grow in size but do not spread throughout the body. Not cancerous.

Beta Particle

Charged particle emitted from the nucleus of an atom during radioactive decay. A negatively charged beta particle is identical to an electron. A positively charged beta particle is called a positron.

Bioassay

A test to determine the potency of a substance at producing some adverse health effect on a biological system.

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

When noted on an SDS, it means the substance may effect the blood or the body's ability to create blood.

Blink Reflex or Aversion Response

The closure of the eyelid or movement of the head to avoid exposure to a noxious stimulant or bright light. It often occurs within 0.25 seconds which includes the blink reflex time.

Body Burden

The total amount of a chemical retained in the body.

Boiling Points-BP

The temperature at which a liquid changes to a vapor state at a given pressure. The boiling point is 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	-44°F
Anhydrous Ammonia	-28°F
Butane	31°F
Gasoline	100°F
Allyl Chloride	113°F
Ethylene Glycol	387°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 that make contact with the charged object and a low resistance flexible cable which allows the charge to equalize. See Grounding.

Bradycardia

Abnormal slowness of the heartbeat, as evidenced by slowing of the pulse rate to 50 or less.

Bronchiectasis

A chronic dilation of the bronchi or bronchioles marked by fetid breath and paroxysmal coughing, with the expectoration of mucopurulent matter.

Bronchitis

Inflammation of the bronchi or bronchial tubes.

Bronchopneumonia

A name given to an inflammation of the lungs that usually begins in the terminal bronchioles. These become clogged with a mucopurulent exudate forming consolidated patches in adjacent lobules. The disease is essentially secondary in character, following infections of the upper respiratory tract, specific infectious fevers, and debilitating diseases. Bronchiolitis and Bronchoalveolitis are alternate names for this condition.

Bulk Density

Mass of powdered or granulated solid material per unit of volume.

C

Centigrade, a unit of temperature.

ca

Approximately

CAA

See Clean Air Act

Carcinogen

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

- It has been evaluated by the International Agency for Research on Cancer (IARC) and found to be a carcinogen or potential carcinogen; or
- 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
- It is regulated by OSHA as a carcinogen.

Carcinogenicity

The ability to produce cancer.

Carcinoma

A malignant tumor. A form of cancer.

Cardiovascular

Relating to the heart and to the blood vessels or circulation.

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.

Cataract

Opacity in the lens of the eye that may obscure vision.

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.

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.

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.

Charged Particle

An ion; an elementary particle carrying a positive or negative electric charge.

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 of 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.

Chloracne

Caused by chlorinated naphthalenes and polyphenyls acting on sebaceous glands.

Cholestasis

An acute reaction within the liver where the production and/or secretion of bile is impaired. It is caused by exposure to environmental and occupational agents.

Chronic Effect

An adverse effect on a human or animal body, with symptoms that develop slowly over a period of time or that recur frequently. Also see Acute.

Chronic Exposure

Repeated small dose exposure over a long period of time.

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.

Cilia

Tiny hairlike whips in the bronchi and other respiratory passages that aid in the removal of dust trapped on these moist surfaces.

Cirrhosis

A condition in which the liver has become hardened and its physiological functions are highly impaired.

Clean Air Act (CAA)

Enacted to regulate/reduce air pollution. CAA is administered by the U.S. Environmental Protection Agency.

Clean Water Act (CWA)

Federal law enacted to regulate/reduce water pollution. CWA is administered by the United States Environmental Protection Agency (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 a by-product 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.

CO₂

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. CO₂ 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.

Colic

A severe cramping, gripping pain in or around the abdomen.

Combustible

Capable of catching fire or burning; usually a liquid with a flash point at or above 140°F (60°C) but below 200°F (93.3°C). Non-liquid substances such as wood and paper are classified as "ordinary combustibles" by NFPA. See also "Flammable."

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 also "Generic."

Compressed Gas

- A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 pounds per square inch (psi) at 70°F (21.1 °C); or
- A gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130°F (54.4°C) regardless of the pressure at 70°F (21.1°C); or

- A liquid having a vapor pressure exceeding 40 psi at 100°F (37.8°C) as determined by ASTM D-323-72.

Concentration (Conc)

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.

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.

Congenital

A health problem that originates at or before birth.

Conjunctivitis

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

Contact Dermatitis

An acute or chronic inflammation of the skin resulting from contact with an irritating or sensitizing substance.

Container

Any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank or the like that contains a hazardous chemical. For purposes of the Right to Know program, 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. A chemical is considered to be corrosive if, when tested on the intact skin of 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.

Curie

The quantity of any radioactive material in which the number of disintegrations is 3.7×10^{10} per second. Abbreviated Ci.

Cutaneous

Pertaining to or affecting the skin

Cutaneous Toxicity

See "Dermal Toxicity."

CWA

See "Clean Water Act."

Cyanosis

Blue appearance of the skin, especially on the face and extremities, indicating a lack of sufficient oxygen in the arterial blood.

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.

Decontamination

The reduction or removal of contamination from a structure, area, object, or person.

Density

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

Department of Transportation (DOT)

A United States governmental agency responsible for promoting the safe transportation of hazardous materials by all modes (land, air, water).

Depressant

A substance that diminishes bodily functions, activity, or 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.

Dermatitis

Inflammation of the skin from any cause. There are two general types of skin reaction: primary irritation dermatitis and sensitization dermatitis.

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.

Disease

A departure from a state of health, usually recognized by a sequence of signs and symptoms.

DOL

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

Dose

The amount of energy or substance absorbed in a unit volume of an organ or individual. Dose rate is the dose delivered per unit of time. Concentration of a contaminant multiplied by the duration of human exposure ($D=C \times T$).

DOT

See "Department of Transportation".

Dry Chemical

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

Dysplasia

An abnormality of development.

Dysmenorrhea

Painful menstruation.

Dyspnea

A sense of difficulty in breathing; shortness of breath.

Dysuria

Difficulty or pain in urination.

Ectopic Pregnancy

The fertilized ovum becomes implanted outside of the uterus.

Eczema

A disease of the skin characterized by inflammation, itching and formation of scales.

Edema

An abnormal accumulation of clear watery fluid in the tissues.

Electron

Negatively charged elementary particle which is a constituent of every neutral atom. Its unit of negative electricity equals 4.8×10^{-19} coulombs. Its mass is 0.00549 atomic mass units.

Embryotoxin

A material that is harmful to a developing embryo.

Emphysema

A lung disease resulting from the enlargements of the alveoli accompanied by destruction of normal tissue.

Encephalopathy

Any disease of the brain.

Acute toxic encephalopathy is characterized by headaches, irritability, poor coordination, seizures, coma, and death. Causative agents include carbon monoxide, organic solvents such as carbon disulfide, and metals (including lead and manganese).

Chronic toxic encephalopathy is characterized by a gradual loss of memory and psychomotor control, dementia, and motor disorder. Associated toxicants include arsenic, lead, manganese, and mercury.

Endocrine Glands

Glands that regulate body activity by secreting hormones.

Endometrium

The mucous membrane lining the uterus.

Enteric

Intestinal.

Enterotoxin

A toxin specific for cells of the intestine; gives rise to symptoms of food poisoning.

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.

Epithelioma

Carcinoma of the epithelial cells of the skin and other epithelial surfaces.

Epithelium

The covering of internal and external surfaces of the body.

Erg

The unit of energy or work in the centimeter-gram-second system; the work performed by a force acting over a distance of one centimeter so as to result in a one gram mass being accelerated at a rate of one centimeter per second squared.

Erythema

Redness of the skin.

Eschar

A dry scab that forms as a result of a burn or other corrosive action.

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:

- 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, 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.

Exfoliation

Peeling or flaking of skin.

Exothermic, Exothermal

Characterized by or formed with evolution of heat.

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 (radiation)

- Being exposed to ionizing radiation or radioactive material.
- A measure of the ionization produced in air by x or gamma radiation. It is the sum of the electrical charges on all ions of one sign produced in air when all electrons liberated by photons in a volume element of air are completely stopped in air, divided by the mass of air in the volume element. The special unit of exposure is the Roentgen.

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.

Extravasate

To exude a substance from the body's vessels into tissues.

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.

Fetotoxin

A material harmful to the fetus.

Fetus

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

Fibrillation

Rapid uncoordinated contractions of the heart that are ineffective in pumping blood.

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:

- "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.
- "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.
- "Liquid, flammable." Any liquid having a flash point at or below 140°F (60°C).
- "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.

Flashpoint

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

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

- 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]). “
- Setaflash Closed Tester (see American National Standard Method of Test for Flash Point by Setaflash Closed Tester [ASTM D 3278-78]).

Fog

General term applied to visible aerosols in which the dispersed phase is liquid: formation by condensation is implied.

Folliculitis

Infection of a hair follicle, often caused by obstruction by natural or industrial oils.

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_2O , sulfuric acid is H_2SO_4 , sulfur dioxide is SO_2).

Fume

- Minute solid particles generated by condensation from the gaseous state, generally after volatilization (evaporation) from melted substances, such as welding, and often accompanied by a chemical reaction, such as oxidation. Examples are iron oxide from welding, lead oxide from soldering, and copper oxide from smelting.
- Very small, airborne particles commonly formed by condensing vapors from burning or melting materials.

Fume Fever

Metal fume fever is an acute condition caused by a brief high exposure to the freshly generated fumes of metals, such as zinc or magnesium, or their oxides.

g

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

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).

Gamma Ray

The most penetrating form of electromagnetic radiation consisting of a photon emitted from a nucleus. Except for origin, identical to x-ray.

Gastritis

Inflammation of the stomach.

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

Relating to genes or heredity.

Gestation

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

Gingivitis

Inflammation of the gums.

Gland

Any body organ that manufactures some liquid product and secretes it from its cells.

Granuloma

A mass or nodule of chronically inflamed tissue with granulations; usually associated with an infective process.

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.

Hazardous Warning

Words, pictures, symbols or a combination thereof presented on a label or other appropriate form to warn of the presence of various hazards.

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.

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.

Hemoglobin

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

Hemoptysis

Bleeding from the lungs, spitting blood, or blood-stained sputum.

Hemorrhage

Bleeding, especially profuse bleeding, as from a ruptured or cut blood vessel (artery or vein).

Hemorrhagic

Pertaining to or characterized by hemorrhage.

Hepatitis

Inflammation of the liver.

Hepatotoxin

A substance that causes injury to the liver.

Highly Toxic

A chemical in any of the following categories:

- A chemical with a median lethal dose (LD_{50}) of 50 milligrams or less per kilogram of body weight when administered orally as a single dose or multiple doses given within 24 hours to laboratory animals.
- A chemical with a median lethal dose (LD_{50}) of 200 milligrams or less per kilogram of body weight when administered by continuous contact with the bare skin of laboratory animals as a single dose or multiple doses given within 24 hours
- A chemical that has a median lethal concentration (LC_{50}) in air of 500 parts per million by volume or less of gas or 2 milligrams per liter or less of vapors or 0.5 milligrams per liter or less of mist, fume, or dust. The LC_{50} values are based on 4-hour tests in laboratory animals.

Hormones

Chemical substances secreted by the endocrine glands, exerting influence over practically all body activities.

Hydrophobic

Repelled by water, or water-hating.

Hygroscopic

Readily absorbing or retaining moisture.

Hyperemia

An increased blood flow or congestion of blood anywhere in the body.

Hypergolic

Ignites on contact.

Hyperplasia

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

Hypersensitivity

A state of heightened responsiveness in which the body reacts to a foreign agent or substance more strongly than normal; generally results from prior exposures to the agent or substance.

Hyponatremia

Subnormal or reduced blood sodium levels.

Hypoxia

Occurs when there is an insufficient amount of oxygen delivered to the tissues.

IARC

International Agency for Research on Cancer.

Idiopathic

Disease or condition that arise spontaneously or for which the cause is unknown.

IDLH

Immediately dangerous to life and health is any atmosphere that poses an immediate hazard to life or poses immediate irreversible debilitating effects on health.

Ignitable

Capable of being set afire.

Immiscible

Any liquid that does not mix with another liquid, in which case the result is two separate layers or cloudiness or turbidity.

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.

Infrared Radiation

Electromagnetic radiation with wavelengths that lie within a range of 700 nm to 1 mm.

Ingestion

Taken in by mouth.

Inhalation (Inhal)

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.

Insoluble (Insol)

Incapable of being dissolved in a liquid.

Interstitial

Situated between the cellular components of an organ or structure.

Intraperitoneal

Inside the space formed by the membrane that lines the interior wall of the abdomen and covers the abdominal organs.

Intrauterine

Within the uterus.

In Vitro

Literally, in glass; experimental work done on cell cultures.

In Vivo

Literally, "in life;" an experiment that is conducted in a living organism.

Ion

An atom or molecule with a net electric charge as a result of the gain or loss of electrons. Ions may be positively or negatively charged, and vary in size.

Ionization

The process by which a neutral atom or molecule acquires either a positive or a negative charge.

Ionizing Radiation

Alpha particles, beta particles, gamma rays, x-rays, neutrons, high speed electrons, high speed protons, and other particles or electromagnetic radiation capable of producing ions.

Irritant

A non-corrosive chemical that causes a reversible inflammatory effect on living tissue by chemical action at the site of contact. A chemical is a skin irritant if changes in skin are produced with application on intact skin of laboratory animals for up to 4 hours exposure. A chemical is an eye irritant if changes in the eye are produced following applications to the anterior surface of the eye, which are fully reversible within 21 days of application.

Irritating

As defined by DOT, a property of a liquid or solid substance which, upon contact with fire or where exposed to air, gives off dangerous or intensely irritating fumes (not including poisonous materials). See Poison, Class A and Poison, Class B.

Isotopes

Elements having the same number of protons in their nuclei, and hence the same atomic number, but differing in the number of neutrons, and therefore in mass number. Almost identical chemical properties exist between isotopes of a particular element.

Jaundice

Also known as Icterus. A serious symptom of disease that causes the skin, the whites of the eyes, and even the mucous membranes to turn yellow.

Joule

The meter-kilogram-second unit of work or energy, equal to the work done by the force of one Newton when its point of application moves through a distance of one meter in the direction of the force.

Keratitis

Inflammation of the cornea.

kg

Kilogram is a metric unit of weight, about 2.2 U.S. pounds. See also “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.

Laryngitis

Inflammation of the larynx.

LC

Lethal concentration is the concentration of a substance being tested that will result in death.

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/m³) for dusts and mists, as well as for gases and vapors.

LCL or LC_{Lo}

Lethal concentration low; lowest concentration of a gas or vapor capable of killing a specified species over a specified time.

LD

Lethal dose is the quantity of a substance being tested that will result in death.

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.

LDL or LD_{Lo}

Lethal dose low, lowest administered dose of a material capable of killing a specified test species.

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.

Leukemia

A group of malignant blood diseases distinguished by overproduction of white blood cells.

Leukopenia

A serious reduction in the number of white blood cells.

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.

Lymph Node

Small oval bodies with a gland-like structure scattered throughout the body in the course of the lymph vessels. Also known as lymphatic nodes, lymph glands, and lymphatic glands.

M

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

m³

Cubic meter is a metric measure of volume, approximately 35.3 cubic feet or 1.3 cubic yards.

Maceration

Softening of the skin by action of a liquid.

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.

Melanoderma

Abnormal darkening of the skin.

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/m³

Milligrams per cubic meter is a unit for expressing concentrations of dusts, gases or mists in air.

Micron

(Micrometer) A unit of length equal to 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.

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.

Mld

Mild

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/m³.

MSDS

Material Safety Data Sheet - former name for information sheets that describe chemical hazards.

MSHA

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

Mutagen

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

MW

See "Molecular weight."

N₂

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.

Necrosis

Death of a cell or group of cells as a result of injury, disease, or other pathological state.

Neonatal

The first 4 weeks after birth.

Neoplasia (Neo)

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

Nephritis

Inflammation of the kidneys.

Nephrotoxin

A substance that causes injury to the kidneys.

Neuritis

Inflammation of a nerve.

Neuropathy

Functional disturbance or pathology of the nervous system; may be central (affecting the brain or spinal cord) or peripheral (affecting nerves outside the brain and spinal cord).

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.

Neutron

Elementary particle with a mass approximately the same as that of a hydrogen atom and electrically neutral. It has a half-life in minutes and decays in a free state into a proton and an electron.

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.

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, does not burn 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_x

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 SDSs.

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 1-800-424-8802.

NTP

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

Nuclear Regulatory Commission (NRC)

An independent federal regulatory agency responsible for licensing and inspecting nuclear power plants, universities and other facilities using radioactive materials.

Nucleus

The small, central, positively charged region of an atom that carries essentially all the mass. Except for the nucleus of ordinary (light) hydrogen, which has a single proton, all atomic nuclei contain both protons and neutrons. The number of protons determines the total positive charge, or atomic number; this is the same for all the atomic nuclei of a given chemical element. The total number of neutrons and protons is called the mass number.

Nuclide

A species of atom characterized by its mass number, atomic number, and energy state of its nucleus, provided that the atom is capable of existing for a measurable time.

Occupational Disease

Disease associated with a work environment, usually caused by a specific agent.

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.

Oncogenic

Tumor-generating.

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.

Otitis Media

An inflammation and infection of the middle ear.

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).

Palpitation

Rapid heartbeat of which a person is acutely aware.

Papilloma

A small growth or tumor of the skin or mucous membrane; warts and polyps, for example.

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.

Percutaneous

Performed through the unbroken skin, as by absorption of an ointment through the skin.

Permeation

The movement of a chemical through a protective clothing barrier that has no visible holes. Permeation rate is the rate of movement of a chemical through a protective barrier.

Perturbation

An outside effect (or influence) that results in a modification, or deviation from a system's normal state.

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.

Pharyngeal

Pertaining to the pharynx (the musculo-membranous sac between the mouth, nares, and esophagus).

Photon

A quantum (or packet) of energy emitted in the form of electromagnetic radiation. Gamma rays and x-rays are examples of photons.

Physical Hazard

Based on the intrinsic properties of the chemical. There are five main classes: Explosive, Flammable, Oxidizing, Gases under pressure and Corrosive to metals.

Placenta

A structure that grows on the wall of the uterus during pregnancy through which the fetus is nourished.

Pleurisy

Caused when the outer lung lining (visceral pleura) and the chest cavity's inner lining (parietal pleura) lose their lubricating properties; the resultant friction causes irritation and pain.

PMCC

Pensky-Martens Closed Cup. See "Flashpoint."

Pneumonitis

Inflammation of the lungs.

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 a reaction that takes place at a rate that releases large amounts of energy. If hazardous polymerization can occur with a given material, the SDS 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.

Positron

Particle equal in mass, but opposite in charge, to the electron; a positive charge.

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.

Prophylactic

Preventive treatment for protection against disease.

Proton

An elementary nuclear particle with a positive electric charge located in the nucleus of an atom.

psi

Pounds per square inch (for SDS 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.

Pulmonary (Pul)

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 13°F (54.4°C) or below.

Rad

Roentgen absorbed dose or radiation absorbed dose; a standard unit of absorbed ionizing radiation dose equal to 100 ergs absorbed per gram.

Radiography

The making of shadow images on photographic film by the action of ionizing radiation.

Radioisotope

A nuclide with an unstable ratio of neutrons to protons placing the nucleus in a state of stress. In an attempt to reorganize to a more stable state, it may undergo various types of rearrangement that involve the release of radiation.

Radiology

That branch of medicine dealing with the diagnostic and therapeutic applications of radiant energy, including x-rays and radioisotopes.

Radionuclide

A radioactive isotope of an element.

Radiosensitivity

The relative susceptibility of cells, tissues, organs, organisms, or other substances to the injurious

action of radiation. Radiotoxicity term referring to the potential of an isotope to cause damage to living tissue by absorption of energy from the disintegration of the radioactive material introduced into the body.

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" or "Unstable Reactives"

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.

REL

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

REM

Roentgen equivalent man; a radiation dose unit that equals the dose in rads multiplied by the appropriate value of relative biological effect or Quality Factor for the particular radiation.

Renal

Relating to or associated with the kidney.

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.

Rheumatoid

Resembling rheumatism, a disease marked by inflammation of the connective tissue structures of the body, especially the membranous linings of the joints, and by pain in these parts; eventually the joints become stiff and deformed.

Rhinitis

Inflammation of the mucous membrane lining in the nasal passages.

Roentgen (R)

A unit of radioactive dose or exposure. See "Rad."

Routes of Entry

The means by which material may gain access to the body, for example, inhalation, ingestion, and skin contact.

Sarcoma

A malignant tumor that develops from connective tissue cells.

Scleroderma

Hardening of the skin.

SDS

Safety Data Sheet - Name for information sheets required by OSHA that describe chemical hazards in 16 standardized sections.

Sebaceous

Of, related to, or being fatty material.

Self-Contained Breathing Apparatus (SCBA)

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.

Septicemia

Blood poisoning; growth of infectious organisms in the blood.

SETA

Setaflash Closed Tester. See "Flashpoint."

SI

The abbreviation for the International System of Units.

Silicosis

A disease of the lungs (fibrosis) caused by the inhalation of silica dust.

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."

Skn

Skin

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.

SOx

Oxides of sulfur.

Species

On the SDSs, 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. Also denoting layer of epithelium.

Stability

The ability of a material to remain unchanged. For SDS 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 150°F.; shock from dropping.

Standard Operating Procedure (SOP)

A written document that details an operation, analysis, or action whose mechanisms are thoroughly prescribed and that is commonly accepted as the method for performing certain routine or repetitive tasks.

Steatosis

An acute reaction within the liver where lipid droplets may accumulate and produce what is known as fatty liver.

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 or self-contained breathing apparatus.

Syncope

Fainting spell.

Synonym

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

Systemic (Sys)

Spread throughout the body; affecting all body systems and organs. 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.

Target Organ Effects

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

- **Hepatotoxins** - Chemicals that produce liver damage.
 - Signs and symptoms: jaundice; liver enlargement
 - Chemicals: carbon tetrachloride; nitrosamines
- **Nephrotoxins** - Chemicals that produce kidney damage.
 - Signs and symptoms: edema; proteinuria
 - Chemicals: halogenated hydrocarbons; uranium
- **Neurotoxins** - Chemicals that produce their primary toxic effects on the nervous system.
 - Signs and symptoms: narcosis; behavioral changes; decrease in motor functions
 - Chemicals: mercury; carbon disulfide
- **Agents that act on blood hematopoietic system** - decrease hemoglobin function; deprive the body tissues of oxygen.
 - Signs and symptoms: cyanosis; loss of consciousness
 - Chemicals: carbon monoxide; cyanides
- **Agents that damage the lung** - chemicals that irritate or damage the pulmonary tissue.
 - Signs and symptoms: cough, tightness in chest, shortness of breath
 - Chemicals: silica; asbestos
- **Reproductive toxins** - chemicals that adversely affect the reproductive capabilities including chromosomal damage (mutations) and affects the fetus (teratogenesis).
 - Signs and symptoms - birth defects; sterility
 - Chemicals: lead; DBCP
- **Cutaneous hazards** - chemicals that affect the dermal layer of the body.
 - Signs and symptoms: defatting of the skin; rashes; irritation
 - Chemicals: ketones; chlorinated compounds

- **Eye hazards** - 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, overexposure to carbon tetrachloride can cause liver damage.

TCC

Tag (Tagliabue) Closed Cup. See “Flashpoint.”

TCL or TC_{Lo}

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 or TD_{Lo}

Toxic dose low, lowest administered dose of a material capable of producing a defined toxic effect in a specified test species.

Temp

Temperature.

Teratogen (Ter)

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

Tfx

Toxic effect(s).

Tinnitus

A ringing, roaring, or hissing sound in one or both ears.

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 40-hour workweek.

- 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).
- 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.

Toxemia

Poisoning by way of the bloodstream.

Toxic

A chemical falling within any of the following categories:

- A chemical that has a median lethal dose (LD_{50}) of more than 50 milligrams per kilogram but not more than 300 milligrams per kilogram of body weight when administered orally as a single dose to laboratory animals.
- A chemical that has a median lethal dose (LD_{50}) of more than 200 milligrams per kilogram but not more than 1,000 milligrams per kilogram of body weight when administered by continuous contact with the bare skin of laboratory animals as a single dose or multiple doses given within 24 hours.
- A chemical that has a median lethal concentration (LC_{50}) in air of more than 500 parts per million but not more than 2,500 parts per million by volume of gas or more than two milligrams per liter but not more than 10 milligrams per liter of vapor, or more than 0.5 milligrams per liter but not more than 1.0 milligrams per liter of mist, fume or dust. The LC_{50} values are based on 4 hour tests in laboratory animals.

Toxic Substance

Any substance that 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.

Toxicity

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

Toxicology

Scientific study of poisons, their actions, their detection, and the treatment of conditions produced by them.

Tracheitis

Inflammation of the trachea.

Trade Name

The trademark name or commercial trade name for a material or product.

Transplacental

Through the placenta. When noted on an SDS, the chemical could pass through the placental barrier to cause harm to the developing fetus.

Trauma

An injury or wound brought about by an outside force.

Tremor

Involuntary shaking, trembling, or quivering.

TSCA

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

Tumor

Abnormal mass of tissue that may or may not be malignant.

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 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.”

ug

Microgram, one-millionth of a gram.

Ulcer

The destruction of an area of skin or mucous membrane.

Ulceration

The formation or development of an ulcer.

Ultraviolet Radiation (Light)

Electromagnetic radiation with wavelengths shorter than those of visible radiation and longer than those of x-rays; wavelengths 10^{-5} cm to 10^{-6} cm.

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.

Urticaria

Hives.

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, manholes, 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 on SDSs are in millimeters of mercury (mmHg) at 68°F (20°C), unless stated otherwise. Three facts are important to remember:

- Vapor pressure of a substance at 100°F will always be higher than the vapor pressure of the substance at 68°F (20°C).

- Vapor pressures reported on SDSs in mmHg are usually very low pressures; 760 mmHg is equivalent to 14.7 pounds per square inch.
- The lower the boiling point of a substance, the higher its vapor pressure.

Vasoconstriction

Decrease in the cross-sectional area of blood vessels. This may result from contraction of a muscle layer within the walls of the vessels or may be the result of mechanical pressure. Reduction in blood flow results.

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.

Vertigo

Dizziness; more specifically, the sensation that the environment is revolving around you.

Vesicant

Any substance capable of producing blisters on the skin.

Vesicle

A small blister on the skin.

Viscera

Internal organs of the abdomen.

Viscosity

The measure of a fluid’s resistance to flow. The state of being thick, sticky, and semifluid in consistency, due to internal friction.

Visible Radiation (Light)

Electromagnetic radiation that can be detected by the human eye. This term is commonly used to describe wavelengths of 400 nm to 700 nm.

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 work-place 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.

Xeroderma

Dry skin; may be rough as well as dry.

X-Rays

Penetrating electromagnetic radiation having wave lengths shorter than those of visible light. They are usually produced by bombarding a metallic target with fast electrons in a high vacuum. In nuclear reactions it is customary to refer to photons originating in the nucleus as gamma rays, and those originating in the extranuclear part of the atom as x-rays. These rays are sometimes called Roentgen rays after their discoverer, W.C. Roentgen.

Zinc Fume Fever

A condition brought on by inhalation of zinc oxide fume characterized by flu-like 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.