OSHA HAZARD COMMUNICATION STANDARD

Glossary of Terms

ACGIH. American Conference of Governmental Industrial Hygienists, which develops and publishes recommended occupational exposure limits for hundreds of chemical substances and physical agents. See TLV.

Acid. Any chemical with a low pH that in water solution can burn the skin or eyes. Acids turn litmus paper red and have pH values of 0 to 6.

Action level. Term used by OSHA and NIOSH to express the level of toxicants which requires medical surveillance, usually one half of the PEL.

Activated charcoal. Charcoal is an amorphous form of carbon formed by burning wood, nutshells, animal bones, and other carbonaceous materials. Charcoal becomes activated by heating it with steam to 800-900^{o}C. During this treatment, a porous, submicroscopic internal structure is formed which gives it an extensive internal surface area. Activated charcoal is commonly used as a gas or vapor adsorbent in air-purifying respirators and as a solid sorbent in air-sampling.

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

Adsorption. The condensation of gases, liquids, or dissolved substances on the surfaces of solids.

AIHA. American Industrial Hygiene Association.

Air. The mixture of gases that surrounds the earth; its major components are as follows: 78.08% nitrogen, 20.95% oxygen, 0.03% carbon dioxide, and 0.93% argon. Water vapor (humidity) varies.

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

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

Alkali. Any chemical with a high pH that in water solution is irritating or caustic to the skin. Strong alkalies in solution are corrosive to the skin and mucous

membranes. Example: sodium hydroxide, referred to as caustic soda or lye. Alkalis turn litmus paper blue and have pH values from 8 to 14. Another term for alkali is base.

Allergy. An abnormal response of a hypersensitive person to chemical and physical stimuli. Allergic manifestations of major importance occur in about 10 percent of the population.

ANSI. The American National Standards Institute is a voluntary membership organization (run with private funding) that develops consensus standards nationally for a wide variety of devices and procedures.

Asphyxiant. A vapor or gas which can cause unconsciousness or death by suffocation (lack of oxygen). Asphyxiation is one of the principal potential hazards of working in confined spaces.

ASTM. American Society for Testing and Materials.

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

Atmospheric pressure. The pressure exerted in all directions by the atmosphere. At sea level, mean atmospheric pressure is 29.92 inches Hg, 14.7 psi, or 407 inches w.g.

Base. A compound that reacts with an acid to form a salt. It is another term for alkali.

Benign. Not malignant. A benign tumor is one which does not metastasize or invade tissue. Benign tumors may still be lethal, due to pressure on vital organs.

Biohazard. A combination of the words biological hazard. Organisms or products of organisms that present a risk to humans.

Boiling point. The temperature at which the vapor pressure of a liquid equals atmospheric pressure.

Carbon monoxide. A colorless, odorless toxic gas produced by any process that involves the incomplete combustion of carbon-containing substances. It is emitted through the exhaust of gasoline powered vehicles.

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.

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.

Ceiling limit (C). An airborne concentration of a toxic substance in the work environment, which should never be exceeded.

CERCLA. Comprehensive Environmental Response, Compensation and Liability Act of 1980. Commonly known as "Superfund." (US EPA)

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.

CHEMTREC. Chemical Transportation Emergency Center. Public service of the Chemical Manufacturers Association that provides immediate advice for those at the scene of hazardous materials emergencies. CHEMTREC has a 24-hour toll-free telephone number (800-424-9300) to help respond to chemical transportation emergencies.

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

Combustible liquid. Combustible liquids are those having a flash point at or above 37.8^{o}C (100^{o}F).

Concentration. The amount of a given substance in a stated unit of measure. Common methods of stating concentration are percent by weight or by volume, weight per unit volume, normality, etc.

Corrosive. A substance that causes visible destruction or permanent changes in human skin tissue at the site of contact.

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

Cutaneous. Pertaining to or affecting the skin.

Degrees Celsius (Centigrade). The temperature on a scale in which the freezing point of water is 0^{o}C and the boiling point is 100^{o}C. To convert to Degrees Fahrenheit, use the following formula: $^{o}F = (^{o}C \times 1.8) + 32$.

Degrees Fahrenheit. The temperature on a scale in which the boiling point of water is 212°F and the freezing point is 32°F.

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

Dermatitis. Inflammation of the skin from any cause.

Dermatosis. A broader term than dermatitis; it includes any cutaneous abnormality, thus encompassing folliculitis, acne, pigmentary changes, and nodules and tumors.

Dose-response relationship. Correlation between the amount of exposure to an agent or toxic chemical and the resulting effect on the body.

DOL. US Department of Labor. OSHA and MSHA are part of the DOL.

DOT. US Department of Transportation.

Dusts. Solid particles generated by handling, crushing, grinding, rapid impact, detonation, and decrepitation of organic or inorganic materials, such as rock, ore, metal, coal, wood and grain. Dusts do not tend to flocculate, except under electrostatic forces; they do not diffuse in air but settle under the influence of gravity.

Dyspnea. Shortness of breath, difficult or labored breathing.

EPA. US Environmental Protection Agency.

Evaporation. The process by which a liquid is changed into the vapor state.

Evaporation rate. The ratio of the time required to evaporate a measured volume of a liquid to the time required to evaporate the same volume of a reference liquid (butyl acetate, ethyl ether) under ideal test conditions. The higher the ratio, the slower the evaporation rate. The evaporation rate can be useful in evaluating the health and fire hazards of a material.

Federal Register. Publication of US government documents officially promulgated under the law, documents whose validity depends upon such publication. It is published on each day following a government working day. It is, in effect, the daily supplement to the Code of Federal Regulations, CFR.

Fire point. The lowest temperature at which a material can evolve vapors fast enough to support continuous combustion.

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 limits. Flammables have a minimum concentration below which propagation of flame does not occur on contact with a source of ignition. This is known as the lower flammable explosive limit (LEL). There is also a maximum concentration of vapor or gas in air above which propagation of flame does not occur. This is known as the upper flammable explosive limit (UEL). These units are expressed in percent of gas or vapor in air by volume.

Flammable liquid. Any liquid having a flash point below 37.8^{o}C (100^{o}F), except any mixture having components with flashpoints of 100^{o}F or higher, the total of which make up 99 percent or more of the total volume of the mixture.

Flammable range. The difference between the lower and upper flammable limits, expressed in terms of percentage of vapor or gas in air by volume, and is also often referred to as the "explosive range."

Flash point. The minimum temperature at which a liquid gives off vapor within a test vessel in sufficient concentration to form an ignitable mixture with air near the surface of the liquid. Two tests are used - open cup and closed cup.

Fume. Airborne particulate formed by the evaporation of solid materials, e.g. metal fume emitted during welding. Usually less than one micron in diameter.

Gage pressure. Pressure measured with respect to atmospheric pressure.

Gas. A state of matter in which the material has very low density and viscosity; can expand and contract greatly in response to changes in temperature and pressure; easily diffuses into other gases; readily and uniformly distributes itself throughout any container. A gas can be changed to the liquid or solid state only by the combined effect of increased pressure and decreased temperature. Examples include sulfur dioxide, ozone, and carbon monoxide.

Gram (g). A metric unit of weight. One ounce equals 28.4 grams.

HEPA filter. (High Efficiency Particulate Air Filter) A disposable, extended medium, dry type filter with a particle removal efficiency of no less than 99.97 percent for 0.3m particles.

IARC. International Agency for Research on Cancer.

IDLH. Immediately Dangerous to Life and Health. An atmospheric concentration of any toxic, corrosive or asphyxiant substance that poses an immediate threat to life or would cause irreversible or delayed adverse health effects or would interfere with an individual's ability to escape from a dangerous atmosphere.

Ignition source. Anything that provides heat, spark or flame sufficient to cause combustion/explosion.

Ignition temperature. The minimum temperature to initiate or cause self-sustained combustion in the absence of any source of ignition.

Impervious. A material that does not allow another substance to pass through or penetrate it. Frequently used to describe gloves.

Inches of mercury column. A unit used in measuring pressures. One inch of mercury column equals a pressure of 1.66 kPa (0.491 psi).

Inches of water column. A unit used in measuring pressures. One inch of water column equals a pressure of 0.25 kPa (0.036 psi).

Incompatible. Materials which could cause dangerous reactions from direct contact with one another.

Ingestion. Taking in by the mouth.

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

Insoluble. Incapable of being dissolved in a liquid.

Irritant. A chemical, which is not corrosive, but which causes a reversible inflammatory effect on living tissue by chemical action at the site of contact.

Latent period. The time that elapses between exposure and the first manifestation of damage.

LC_{50}. Lethal concentration that will kill 50 percent of the test animals within a specified time. See LD_{50}.

LD_{50}. The dose required to produce the death in 50 percent of the exposed species within a specified time.

Liter (L). A measure of capacity - one quart equals 0.9L.

Lower explosive limit (LEL). The lower limit of flammability of a gas or vapor at ordinary ambient temperatures expressed in percent of the gas or vapor in air by volume. This limit is assumed constant for temperatures up to 120^{o}C (250^{o}F). Above this, it should be decreased by a factor of 0.7 because explosibility increases with higher temperatures.

Malignant. As applied to a tumor. Cancerous and capable of undergoing metastasis, or invasion of surrounding tissue.

Metastasis. Transfer of the causal agent (cell or microorganism) of a disease from a primary focus to a distant one through the blood or lymphatic vessels. Also, spread of malignancy from site of primary cancer to secondary sites.

Meter. A metric unit of length, equal to about 39 inches.

Micron (micrometer, m). A unit of length equal to one millionth of a meter, approximately 1/25,000 of an inch.

Milligram (mg). A unit of weight in the metric system. One thousand milligrams equals one gram.

Milligrams per cubic meter (mg/m^3). Unit used to measure air concentrations of dusts, gases, mists, and fumes.

Milliliter (mL). A metric unit used to measure volume. One milliliter equals one cubic centimeter.

Millimeter of mercury (mmHg). The unit of pressure equal to the pressure exerted by a column of liquid mercury one millimeter high at a standard temperature.

Mists. 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 by splashing, foaming, or atomizing. Mist is formed when a finely divided liquid is suspended in air.

MSDS. Material Safety Data Sheet.

MSHA. Mine Safety and Health Administration, US Department of Labor.

Mucous membranes. Lining of the hollow organs of the body, notably the nose, mouth, stomach, intestines, bronchial tubes, and urinary tract.

NFPA. The National Fire Protection Association is a voluntary membership organization whose aim is to promote and improve fire protection and prevention. The NFPA publishes 16 volumes of codes known as the National Fire Codes.

NIOSH. The National Institute for Occupational Safety and Health is a federal agency. It conducts research on health and safety concerns, tests and certifies respirators, and trains occupational health and safety professionals.

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

Nuisance dust. Have a long history of little adverse effect on the lungs and do not produce significant organic disease or toxic effect when exposures are kept under reasonable control.

OSHA. US Occupational Safety and Health Administration, US Department of

Labor.

Oxidizer. A substance that gives up oxygen readily. Presence of an oxidizer increases the fire hazard.

Oxygen deficiency. That concentration of oxygen by volume below which atmosphere supplying respiratory protection must be provided. It exists in atmospheres where the percentage of oxygen by volume is less than 19.5 percent oxygen.

Oxygen-enriched atmosphere. An atmosphere containing more than 23.5 percent oxygen by volume.

Particulate matter. A suspension of fine solid or liquid particles in air, such as dust, fog, fume, mist, smoke or sprays. Particulate matter suspended in air is commonly known as an aerosol.

PEL. Permissible exposure limit. An exposure limit that is published and enforced by OSHA as a legal standard.

Personal protective equipment (PPE). Devices worn by the worker to protect against hazards in the environment. Respirators, gloves, and hearing protectors are examples.

pH. Means used to express the degree of acidity or alkalinity of a solution with neutrality indicated as seven.

Polymerization. A chemical reaction in which two or more small molecules (monomers) combine to form larger molecules (polymers) that contain repeating structural units of the original molecules. A hazardous polymerization is the above reaction, with an uncontrolled release of energy.

ppm. Parts per million parts of air by volume of vapor or gas or other contaminant. Used to measure air concentrations of vapors and gases.

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 absolute; that is, gauge pressure plus sea level atmospheric pressure, or psig plus approximately 14.7 pounds per square inch).

RCRA. Resource Conservation and Recovery Act of 1976. (US Environmental Protection Agency)

Reactivity (chemical). A substance's susceptibility to undergo a chemical reaction or change that may result in dangerous side effects, such as an explosion, burning, and corrosive or toxic emissions.

Respirable size particulates. Particulates in the size range that permits them to penetrate deep into the lungs upon inhalation.

Respirator (approved). A device which has met the requirements of 30 CFR Part 11 and is designed to protect the wearer from inhalation of harmful atmospheres and has been approved by the National Institute for Occupational Safety and Health (NIOSH) and the Mine Safety and Health Administration (MSHA).

Respiratory system. Consists of (in descending order) - the nose, mouth, nasal passages, nasal pharynx, pharynx, larynx, trachea, bronchi, bronchioles, air sacs (alveoli) of the lungs, and muscles of respiration.

Route of entry. The path by which chemicals can enter the body. There are three main routes of entry: inhalation, ingestion, and skin absorption.

SARA. Superfund Amendments and Reauthorization Act of 1986. (US Environmental Protection Agency)

SCBA. Self-contained breathing apparatus.

Sensitizer. A substance which on first exposure causes little or no reaction but which on repeated exposure may cause a marked response not necessarily limited to the contact site. Skin sensitization is the most common form of sensitization in the industrial setting.

Short-term exposure limit (STEL). ACGIH-recommended exposure limit. Maximum concentration to which workers can be exposed for a short period of time (15 minutes) for only four times throughout the day with at least one hour between exposures.

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

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

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

Sorbent. (1) A material that a removes toxic gases and vapors from air inhaled through a canister or cartridge. (2) Material used to collect gases and vapors during air-sampling.

Specific gravity. The ratio of the mass of a unit volume of a substance to the mass of the same volume of a standard substance at a standard temperature. Water at 4°C (39.2°F) is the standard usually referred to for liquids; for gases, dry air (at the same temperature and pressure as the gas) is often taken as the standard substance. See Density.

Stability. An expression of 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 which may cause instability (dangerous change) are stated. Examples are temperatures above 150°F, shock from dropping.

Synergism. Cooperative action of substances whose total effect is greater than the sum of their separate effects.

Systemic. Spread throughout the body, affecting all body systems and organs, not localized in one spot or area.

Threshold. The lowest dose or exposure to a chemical at which a specific effect is observed.

Time-weighted average concentration (TWA). Refers to concentrations of airborne toxic materials which have been weighted for a certain time duration, usually 8 hours.

TLV. Threshold Limit Value. A time-weighted average concentration under which most people can work consistently for 8 hours a day, day after day, with no harmful effects. A table of these values and accompanying precautions is published annually by the American Conference of Governmental Industrial Hygienists.

Toxicity. A relative property of a chemical agent and refers to a harmful effect on some biologic mechanism and the conditions under which this effect occurs.

Upper explosive limit (UEL). The highest concentration (expressed in percent vapor or gas in the air by volume) of a substance that will burn or explode when an ignition source is present.

Vapor pressure. Pressure (measured in pounds per square inch absolute - psia) exerted by a vapor. If a vapor is kept in confinement over its liquid so that the vapor can accumulate above the liquid (the temperature being held constant), the vapor pressure approaches a fixed limit called the maximum (or saturated) vapor pressure, dependent only on the temperature and the liquid.

Vapors. The gaseous form of substances that are normally in the solid or liquid state (at room temperature and pressure). The vapor can be changed back to the solid or liquid state either by increasing the pressure or decreasing the

temperature alone. Vapors also diffuse. Evaporation is the process by which a liquid is changed into the vapor state and mixed with the surrounding air. Solvents with low boiling points will volatilize readily. Examples include benzene, methyl alcohol, mercury, and toluene.

Viscosity. The property of a fluid that resists internal flow by releasing counteracting forces.

Volatility. The tendency or ability of a liquid to vaporize. Such liquids as alcohol and gasoline, because of their well-known tendency to evaporate rapidly, are called volatile liquids.

Water column. A unit used in measuring pressure. See also Inches of water column.