APPENDIX G

Glossary of Terms and Abbreviations for use with Material Safety Data Sheets (SDS) and Chemical Labels

A

Absolute--a chemical substance that is not mixed; pure. An example is absolute alcohol, which is ethyl alcohol containing not more than one percent by weight of water.

ACGIH--American Conference of Governmental Industrial Hygienists; a group of safety and health professionals. The ACGIH publishes recommended exposure limits for chemicals, noise, microwaves, and heat stress. These exposure limits are called TLV's.

Acute health effect--an adverse effect on a human or animal body, with severe symptoms developing rapidly and coming quickly to a crisis. See also "chronic health effect".

Acute toxicity--the adverse (acute) effects resulting from a single dose of, or exposure to, a substance.

Alopecia--loss of hair.

Anesthetics--chemicals that cause drowsiness and in large doses can result in unconsciousness, coma, or death. Many solvents and alcohols are anesthetics.

Anhydride--an oxide or compound that when combined with water gives an acid or base.

Anhydrous--Free of water. An anhydrous compound does not contain water in its crystalline structure.

Anoxia--A lack of oxygen.

ANSI--American National Standards Institute. A voluntary organization that identifies and coordinates the development of standards for the safe design of equipment and safe practices or procedures.

API--American Petroleum Institute; voluntary membership organization of the petroleum industry. Among its services, API assists member committees in developing--by the consensus process--and publishing recommended practices for drilling and well servicing, storage tank installation, tank cleaning, piping and fittings, other industry-related design, installation and operating practices; also funds and publishes basic reference books and manuals (example: "industrial hygiene monitoring manual for petroleum refineries and selected petrochemical operations").

Aqueous--A water-based solution.

AQTX--Aquatic toxicity.

ASHRAE--American Society of Heating, Refrigeration and Air Conditioning Engineers.

Asphyxia--Lack of oxygen and thus interference with the oxygenation of the blood. Can lead to unconsciousness.

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

Asthma--A disease characterized by recurrent attacks of dyspnea, wheezing, and perhaps coughing due to spasmodic contraction of the bronchioles.

ASTM--American Society for Testing and Materials. A voluntary membership organization including a broad range of individuals, agencies, and industries concerned with materials. ASTM is a resource for sampling and testing methods, information on health and safety in relation to materials, safe performance guidelines, effects of physical and biological agents and chemicals.

Asymptomatic--Neither causing nor exhibiting symptoms.

Ataxia--A loss of muscular coordination.

Atm--Atmosphere; unit of measure for pressure.

Auto ignition temperature--The minimum temperature to which a substance must be heated without application of a flame or spark in order to cause that substance to ignite.

B

Boiling point--The temperature at which a liquid changes to a vapor state, at a given pressure; 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.

Bradycardia--A slow heartbeat; pulse rate below 60.

Bronchitis--Chronic or acute inflammation of the mucous membrane of the bronchial tubes.

C

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

CAA--Clean Air Act; federal law enacted to regulate/reduce air pollution; administered by EPA.

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

1. It has been evaluated by the international agency for research on cancer, and has been found to be a carcinogen or potential carcinogen; or
2. It is listed as a carcinogen or potential carcinogen in the annual report on carcinogens published by the national toxicology program (latest edition); or
3. It is regulated by OSHA as a carcinogen.

CAS number--An assigned number that identifies the material. CAS stands for chemical abstracts service, a Columbus, Ohio, organization that indexes information published in *Chemical Abstracts* by the American Chemical Society and provides index guides by which information about particular substances may be located in the *Abstracts* when needed. CAS numbers identify specific chemicals and are assigned sequentially.

cc--Cubic centimeter, which is a volume measurement in the metric system. For comparison purposes, one quart is about 946 cubic centimeters.

Centimeter--1/100 meter.

cfm--Cubic feet per minute

CFR--Code of federal regulations.

Chemical family--A group of chemicals with similar characteristics. Examples include acids and ethers.

CHEMTREC--Chemical Transportation Emergency Center, a national center established by the Chemical Manufacturers Association in Washington, D.C., In 1970 to relay pertinent emergency information concerning specific chemicals on request. CHEMTREC has a 24-hour toll-free telephone number (800-424-9300), intended primarily for use by personnel who respond to chemical transportation emergencies.

Chronic exposure--Multiple, low-level exposure occurring over several months or years.

Chronic health effect--An adverse effect on a human or animal body, with symptoms that develop slowly over a long period of time or that recur frequently. See also "acute health effect".

Chronic toxicity--Adverse (chronic) effects resulting from repeated doses of, or exposures to, a substance over a relatively prolonged period of time.

CL--Ceiling value for air contaminant standards.

CNS--Central nervous system.

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

CO_2--Carbon dioxide; a heavy, colorless gas, produced by the combustion and decomposition of organic substances and as a by-product of many chemical processes. CO_2 will not burn and is relatively non-toxic (although high concentrations, especially in confined spaces, can create hazardous oxygen-deficient environments).

COC--Cleveland open cup; a flash point test method.

Combustible--A substance that will burn. Combustible liquids are classified as having flash points above 100 degrees Fahrenheit (37.8 degrees centigrade) and below 200 degrees Fahrenheit (93.3 degrees centigrade). Non-liquid substances, such as wood and fibers, are classified as "ordinary combustibles."

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

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

Contact hazard--Any substance which is a health hazard whereby potential acute or chronic health effects occur as a result of direct contact between the substance and human tissue. See "health hazard". Care should be taken when handling these substances; protective clothing is usually recommended. Health effects can range from dermal irritation to severe burns.

Cornea--Transparent structure of the external layer of the eyeball.

Corrosive--A chemical solid or liquid that causes (1) visible destruction of, or irreversible alterations in, living tissue by chemical action at the site of contact (or in the case of leakage from its packaging) and (2) degradation of metals or alloys (the metal steel is used as a standard in determining corrosivity of a liquid). A solid or liquid waste that exhibits a "characteristic or corrosivity", as defined by RCRA, may be regulated (by EPA) as a hazardous waste. Major classes of corrosive chemicals are strong bases, strong acids, dehydrating agents, and oxidizing agents. Exposure to the vapors of corrosives can cause severe bronchial irritation and eye and skin damage.

CPSC--Consumer Products Safety Commission; a federal agency with responsibility for regulating hazardous substances 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.

cu m or m^3--Cubic meter.

CWA--Clean Water Act, a federal law enacted to regulate/reduce water pollution; administered by EPA.

Cyanosis (cyanotic)--A dark purplish coloration of the skin due to deficient oxygenation of the blood.

D

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

Density--The mass of a substance per unit volume. Gold is a very dense substance because a small amount weighs a lot. Plastic foams have low densities because large volumes weigh very little. The density of a substance is usually compared to water, which has a density of 1. Substances which float on water have densities less than 1; substances which sink have densities greater than 1.

Dermal--Relating to the skin.

Dermal toxicity--Adverse effects resulting from the skin's exposure to a substance.

Dermatitis--An inflammation of the skin that can be caused by chemical, physical, or mechanical irritations or by an allergic reaction to a substance.

DHHS--U.S. Department of Health and Human Services, created in 1980 to replace the Department of Health, Education and Welfare as "parent" for NIOSH, the public health service, and other agencies concerned with health and safety.

Diaphoresis--Perspiration.

DOL--U.S. Department of Labor. Includes the Occupational Safety and Health Administration.

DOT--U.S. Department of Transportation. Regulates transportation of chemicals and other substances to aid in the protection of the public as well as fire, law enforcement, and other emergency response personnel, particularly when transportation incidents occur involving hazardous materials. Detailed dot classification lists specify appropriate warnings such as "oxidizing agent" or "flammable liquid" that must be used for various substances.

DOT identification numbers--Four-digit numbers that are used to identify particular substances for regulation of their transportation.

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

E

Electrolyte--Any substance that conducts an electric current in solution.

Emphysema--A swelling or inflation due to presence of air in the connective tissues of the lungs.

EPA--U.S. Environmental Protection Agency. A federal agency with environmental protection regulatory and enforcement authority. Administers clean air act, clean water act, FIFRA, CERCLA, RCRA, TSCA, and other federal environmental laws.

Epidemiology--The science, which deals 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) can provide information about the causes of the disease.

Epistaxis--Nosebleed; hemorrhage from the nose.

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

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 follows:

- fast - evaporating if greater than 3.0
- medium - evaporating if 0.8 to 3.0
- slow - evaporating if less than 0.8

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

Explosive limits--The amounts of vapor in air which form explosive mixtures. Explosive limits are expressed as "lower explosive limits" and "upper explosive limits". These give the range of vapor concentrations in air, which will explode if heat is added. Explosive limits are expressed as percent of vapor in air.

Exposure or exposed--Subjected to a hazardous chemical through any route of entry (inhalation, ingestion, skin contact, absorption, etc.).

F

FD&CA--Food, Drug, and Cosmetics Act.

FDA--The U.S. Food and Drug Administration. Under the provisions of the federal food, drug and cosmetics act, the FDA establishes requirements for the labeling of foods and drugs to protect consumers from misbranded,

unwholesome, ineffective, and hazardous products. FDA also regulates materials or food-contact services and the conditions under which materials are approved.

FHSA--Federal hazardous substances act. Regulates hazardous substances in consumer products. The regulations are under CPSC.

FIFRA--Federal insecticide, fungicide and rodenticide act. Regulations administered by EPA under this act require that certain useful poisons, such as chemical pesticides, sold to the public carry labels that present health hazard warnings to protect users.

Flammable--Easily ignited. Describes any solid, liquid, vapor, or gas that will ignite easily and burn rapidly. A flammable liquid is defined by NFPA and DOT as a liquid with a flash point below 100 degrees Fahrenheit (37.8 degrees centigrade).

Flammable limits--The minimum and maximum concentrations of a flammable gas or vapor between which ignition can occur. Concentrations below the lower flammable limit (LFL) are too lean to burn, while concentrations above the upper flammable limit (UFL) are too rich. All concentrations between LFL and UFL are in the flammable range, and special precautions are needed to prevent ignition or explosion.

Flash point--Lowest temperature at which a flammable liquid gives off sufficient vapors to form a flammable mixture with air. Flash points may vary somewhat depending on the test method used. For this reason, the method of testing is noted on the SDS. Any substance with a flash point below 100 degrees Fahrenheit is considered flammable.

Formula--The conventional scientific designation for a material (water is H_2O, sulfuric acid is H_2SO_4 , sulfur dioxide is SO_2, etc.).

FPM, fpm--Feet per minute.

G

G--Gram. A unit of weight in the metric system. For comparison purposes, one ounce is the equivalent of 28.4 grams.

G/Kg--Grams per kilogram. This term is used in experimental testing to indicate the dosage in grams of a substance per kilogram of animal body weight.

Gastroenteritis--Inflammation of the stomach and intestines.

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

G.I. or gi--Gastrointestinal.

GHS—Globally Harmonized System for the Classification of Chemicals.

Gingivitis--Inflammation of the gums.

H

Hazardous material--In a broad sense, any substance or mixture of substances having properties capable of producing adverse effects on the health or safety of a human being. In 1971, the Occupational Safety and Health Administration (OSHA) adopted the following definition in regulations affecting employers in operations subject to the federal longshoremen's and harbor workers' compensation act:

The term hazardous material means a material, which has one or more of the following characteristics:

1. Has a flash point below 140 degrees Fahrenheit, or is subject to spontaneous heating.
2. Has a threshold limit value below 500 ppm for gases and vapors, below 500 mg/m for fumes, and below 25 mppcf for dusts.
3. Has a single dose oral LD50 below 50 mg/kg.
4. Is subject to polymerization with the release of large amounts of energy.
5. Is a strong oxidizing or reducing agent.
6. Causes first degree burns to skin in short time exposure, or is systematically toxic by skin contact.
7. In the course of normal operations, may produce dusts, gases, fumes, vapors, mists, or smokes, which have one or more of the above characteristics.

Hazardous waste--Any discarded material that may cause or contribute to an increase in death or serious illness or pose a substantial hazard to health or the environment. These are regulated by EPA. See "RCRA".

HCS--Hazard communication standard.

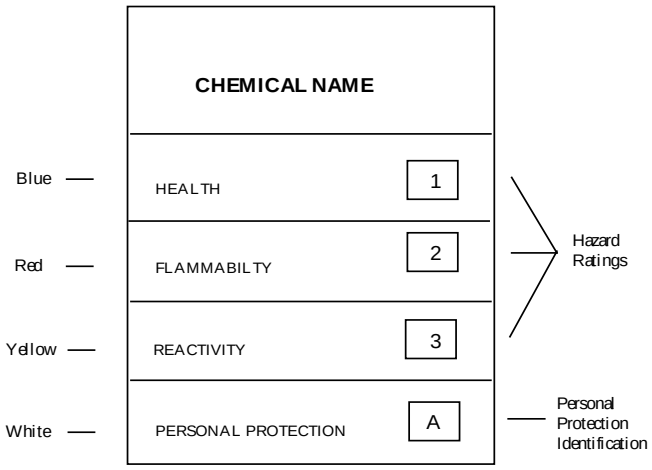
Health hazard--A chemical for which there is significant evidence--based on at least one study conducted in accordance with established scientific principles--that acute or chronic health effects may occur in exposed employees. The term "health hazard" applies to chemicals that are carcinogens, toxic 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.

Hepatic--Pertaining to the liver.

Hepatoxin--A chemical that can produce liver damage in humans. Examples include carbon tetrachloride and nitrosamines. highly toxic having (1) an LD 50 of

50 mg/kg or less when administered to albino rats weighing 200-300 grams each, (2) LD50 of 200mg/kg or less when administered by continuous contact for 24 hours with the bare skin of albino rabbits weighing 2-3 kilograms, or (3) an LC50 in air of 200 ppm or less (gas or vapor) or 2 mg/l or less (mist, fume, or dust) when administered by continuous inhalation for one hour to albino rats weighing 200-300 grams each.

HMIS--Hazardous Material Identification System; a labeling system that uses letters and numbers to communicate hazard information. The following example explains how to read the label.



Personal protection identification:

hazard rating:

A-	safety glasses	4-	severe hazard
B-	safety glasses, gloves	3-	serious hazard
C-	safety glasses, gloves, synthetic apron	2-	moderate hazard
D-	face shield, gloves, synthetic apron	1-	slight

hazard

E- safety glasses, gloves, dust respirator
minimal hazard

F- safety glasses, gloves, synthetic apron, dust respirator

G- safety glasses, gloves, vapor respirator

H- splash goggles, gloves, synthetic apron, vapor respirator

I- safety glasses, gloves, dust and vapor respirator

J- splash goggles, gloves, synthetic apron, dust and vapor respirator

K- air line hood or mask, gloves, full suit, boots

X- ask your supervisor for guidance

Hygroscopic--Readily absorbs moisture from the air.

Hypoxia--Insufficient oxygen especially applied to body cells.

I

IARC--International Agency For Research on Cancer; one of the three sources that OSHA refers to for data on whether a material is a carcinogen.

Ignition temperature--The lowest temperature at which a substance will catch on fire and continue to burn. The lower the ignition temperature, the more likely the substance is going to be a fire hazard.

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

Ingestion--The taking in of a substance through the mouth.

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

Inhibitor--A chemical that is added to another substance to prevent an undesirable chemical reaction.

IRDS--Primary irritation dose.

Irr--Irritant effects--any irritant effects on the skin, eye, or mucous membrane.

Irreversible effect--The inability of tissue to regenerate or recover after an exposure.

Irritant--A chemical that is not corrosive but that causes a reversible inflammatory effect on living tissue by chemical action at the site of contact, such as the skin, eye, or respiratory system.

Irritating--An irritating material, as defined by dot, is a liquid or solid substance which, upon contact with fire or when exposed to air, gives off dangerous or intensely irritating fumes (not including poisonous materials; see poison, class A and poison, class B).

J

Jaundice--Yellowish discoloration with bile pigment (bilirubin) of tissues (skin), whites of eyes (sclera), and bodily fluids caused by any of several pathological conditions that interrupt liver function.

K

Kg--Kilogram; a unit of weight from the metric system. For comparison, one kilogram is equal to 2.2 pounds.

Kilogram--1,000 grams. One kilogram equals about 2.2 pounds.

L

L (or l)--Liter; a unit of volume from the metric system. A quart is equal to 9/10 of a liter.

LC--Lethal concentration; the concentration of a substance that will kill a test animal.

LC50--Lethal concentration 50; the concentration of a material in air that on the basis of laboratory tests is expected to kill 50 percent of a group of test animals when administered as a single exposure (usually one or four 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 (µg/l) or milligrams of material per cubic meter of air (mg/m^3) for dusts and mists, as well as for gases and vapors.

LCLO--Lowest published lethal concentration.

LD--Lethal dose; a quantity of a substance being tested that will kill.

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.

LDLO--Lowest published lethal dose.

LEL or LFL--Lower explosive limit or lower flammable limit. The lowest concentration of fuel (vapor) in air that will ignite or explode if a source of ignition is present. If the fuel air mixture is below the lel, it is said to be too lean to ignite.

LFM, LFPM, lfm, lfpm--Linear feet per minute.

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

M

M^3--Cubic meter; a metric measure of volume, approximately 35.3 cubic feet or 1.3 cubic yards.

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

Melting point--The temperature at which a solid substance changes to a liquid state. For mixtures, the melting range may be given.

Meter (m)--A measure of length; 100 cm; the equivalent of 39.371 inch.

Mg--Milligram; a unit of weight from the metric system. One gram of a substance is equal to 1,000 milligrams.

Mg/kg--Milligrams per kilogram; a term used in experimental testing to indicate the dosage in milligrams of a substance per kilogram of animal body weight.

Mg/m^3--Milligrams per cubic meter; a unit for measuring concentrations of dusts, gases, or mists in air.

Microgram (µg)--One one-millionth of a gram.

Micrometer (µm)--One one-millionth of a meter; occasionally referred to as a micron.

Millimeter (mm)--1/1,000 of a meter.

mL--Milliliter; a metric unit of capacity, equal in volume to one cubic centimeter (cc), or approximately 1/16 of a cubic inch; one thousandth of a liter.

mm hg--Millimeters (mm) of mercury (hg); a unit of measurement for low pressures or partial vacuums.

MPPCF--Million particles per cubic foot; a unit for measuring particles of a substance suspended in air.

MSHA--The mine safety and health administration of the U.S. Department of the Interior; a federal agency with safety and health regulatory and enforcement authority for the mining industry. Also see "OSHA".

Mucous membranes--A protective lining of cells found in the mouth and throat and throughout the respiratory and digestive system.

Mutagen--A substance or agent that can alter the genetic makeup of a sperm or egg cell. Examples include ozone and radiation.

N

N_2--Nitrogen; a colorless, odorless, and tasteless gas that will not burn and will not support combustion. The earth's atmosphere (air) is about 78% nitrogen; at higher concentrations, nitrogen can displace oxygen and become a lethal asphyxiant. See "asphyxiant",

NaOH--Sodium hydroxide, or caustic soda.

Narcosis--Stupor or unconsciousness produced by some narcotic drug.

NCI--National Cancer Institute.

Neo--Neoplastic effects; a new or abnormal growth of tissue in which the growth is uncontrollable and progressive.

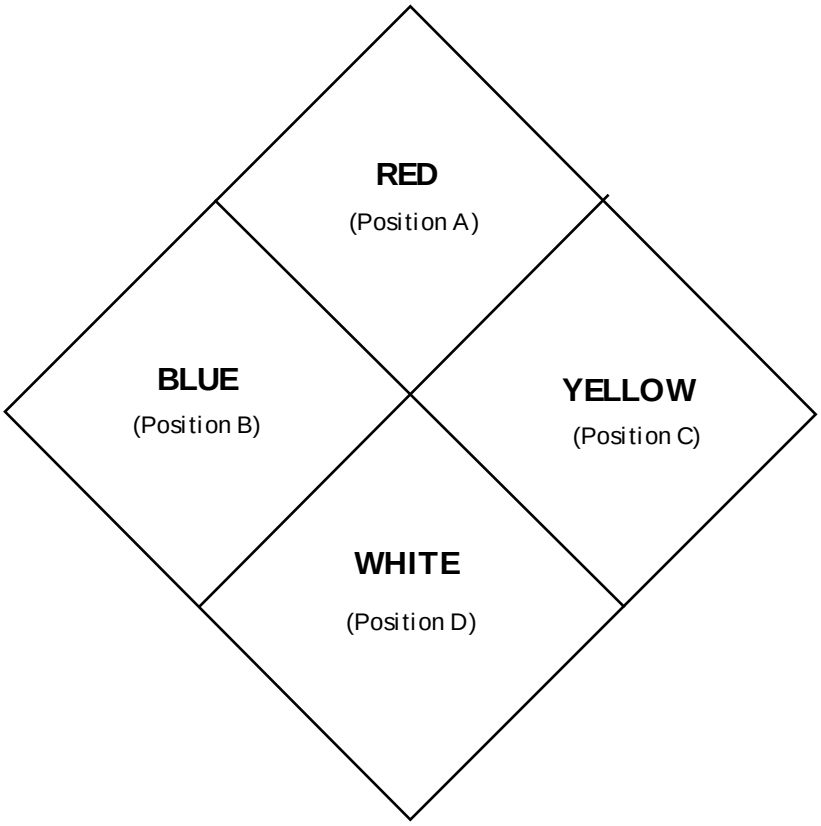
Nephrotoxins--Chemicals, which produce kidney, damage in humans. Examples include uranium and halogenated hydrocarbons that are contained in many solvents.

NESHAP--National emissions standards for hazardous air pollutants.

Neurotoxins--Chemicals, which have toxic effects on the nervous system. Examples include mercury and carbon disulfide.

NFPA--National Fire Protection Association; an international voluntary membership organization to promote/improve fire protection and prevention and establish 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 manual developed (and periodically updated) by NFPA technical committees. Among these is NFPA 704m, the code for showing hazards of materials using the familiar diamond-shaped label or placard with appropriate numbers or symbols. The brief explanation that follows illustrates the NFPA principle of using scales of 0 to 4 (low to high) to classify material hazards.

The "fire triangle" has four classes of entries by position:



Position a - flammability (red) position b - health hazard (blue)

0=	will not burn	0=	no hazard
1=	will ignite if preheated	1=	slightly hazardous
2=	will ignite if moderately heated	2=	hazardous
3=	will ignite at most ambient conditions	3=	extreme danger
4=	burns readily at ambient conditions	4=	deadly

Position c - reactivity (yellow) position d - specific hazard (white)

0=	stable and not reactive with water	oxy=	oxidizer
1=	unstable if heated	acid=	acid
2=	violent chemical change	alkali=	alkali
3=	shock and heat may detonate	cor=	corrosive
4=	may detonate	w=	water reactive

NIOSH--National Institute For Occupational Safety and Health; a federal agency that tests and certifies respiratory protection devices, recommends occupational exposure limits, and assists OSHA in safety and health research and investigations.

NOX--Oxides of nitrogen; undesirable air pollutants. NOX emissions are regulated by EPA under the clean air act.

NRC--National Response Center; a notification center in the Coast Guard building in Washington, D.C., with a toll-free telephone number (1-800-424-8802) that must be called when significant oil or chemicals spills or other environment-related accidents occur.

NTIS--National Technical Information Service.

NTP--National Toxicology Program. The U.S. Public Health Service publishes an annual report that lists substances that are known to be, or may reasonably be anticipated to be, carcinogens. This report is issued pursuant to Public Law 95-622.

Nystagmus--Spastic, involuntary motion of the eyeballs in a horizontal, rotary, or vertical direction.

O

Olfactory--Relating to the sense of smell.

Oral toxicity--Adverse effects resulting from taking a substance into the body by mouth.

OSHA--Occupational Safety and Health Administration of the U.S. Department of Labor; a federal agency with safety and health regulatory and enforcement authorities for most U.S. Industry and business. Also see "MSHA".

Oxidation--A reaction in which a substance combines with oxygen to bring about a chemical change. The most common example of oxidation is combustion or fire.

Oxidizer--A material which may cause the ignition of combustible materials without the aid of an external source of ignition or which, when mixed with combustible materials, increases the rate of burning of these materials when the mixtures are ignited. DOT defines an oxidizer or oxidizing material as a substance that yields oxygen readily to stimulate the combustion (oxidation) of organic matter. Chlorate (Cl03), permanganate (MNO_4), and nitrate (NO_3) compounds are examples of oxidizers. Note that all contain oxygen (O).

Oxidizing agent--A chemical or substance that brings about an oxidation reaction.

P

Palpitation--Irregular, rapid heartbeat.

PEL--Permissible exposure limit; an exposure limit established by OSHA regulatory authority. May be a time-weighted average (TWA) limit or a maximum concentration exposure limit. Also see "skin".

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

Peroxide--Strong oxidizing agent. Peroxides are fire hazards when in contact with combustible materials, especially under high-temperature conditions.

PH--A measure of how acidic or how caustic (basic) a substance is on a scale of 1-14. PH 1 indicates that a substance is very acidic; PH 7 indicates that a substance is neutral; and PH 14 indicates that a substance is very caustic (basic).

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

PMCC--Pensky-Martens Closed Cup; a type of flash point test.

Pneumoconiosis--Respiratory tract and lung condition caused by inhalation and retention of respirable material.

Poison, Class A--A DOT term for extremely dangerous poisons such as poisonous gases or liquids of such a nature that a very small amount of the gas or vapor of the liquid mixed with air is dangerous to life; for example, phosgene, cyanogen, hydrocyanic acid, and nitrogen peroxide.

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

Polymerization--A chemical reaction in which one or more small molecules combine to form larger molecules. A hazardous polymerization is such a reaction that takes place at a rate that releases large amounts of energy. If hazardous polymerization can occur with a given material, the 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.

PPB--Parts per billion; the concentration (by volume) of a gas or vapor in a billion parts of air. Usually used to express extremely low concentrations of unusually toxic gases or vapors.

PPM--Parts per million; the concentration (by volume) of a gas or vapor in a million parts of air. Also the concentration of a particular substance in a liquid or solid.

PPT--Parts per trillion.

PSI--Pounds per square inch. A unit for measuring pressure.

Pyrophoric--A material that will ignite spontaneously in air below 130 degrees Fahrenheit (54 degrees centigrade).

R

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

RCW--Revised Code of Washington.

Reaction--A chemical transformation or change; the interaction of two or more substances to form new substances.

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

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

Reproductive hazard--A chemical, which is capable of affecting the fertility of the parents or offspring or the production of offspring, including the causing of chromosomal damage, mutations, and harmful effects on fetuses.

Respiratory protection--Air-cleaning or air-supplying devices that protect the breathing system from contaminants or supply fresh air in toxic oxygen-deficient atmospheres.

Respiratory system--The breathing system, including the lungs and air passages (trachea or "windpipe", larynx, mouth, and nose).

Reversible effect--An effect or symptom caused by exposure that returns to normal state after the exposure is removed.

Route of entry--The means by which hazardous chemicals can get into the body--specifically, the respiratory system, the digestive system, and the skin.

RQ--Reportable quantity; the amount of a material that when spilled must be reported under CERCLA.

RTECS--Registry of toxic effects of chemical substances. This document is published by NIOSH and lists the known toxic and biological effects of chemical substances. Listing does not necessarily mean that a chemical is hazardous; not being listed does not necessarily mean that a chemical is non-hazardous.

S

SCBAF--Self-contained breathing apparatus with full facepiece.

SCC--Setaflash closed cup; method of testing flash point.

SDS--Material safety data sheet.

Sensitizer--A substance that on first exposure causes little or no reaction in humans or test animals, 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, although respiratory sensitization to a few chemicals is also known to occur.

Seta--Setaflash closed tester; a type of flash point test.

"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.

Skn--Skin effects--such as erythema, rash, sensitization of skin, petechial hemorrhage.

Solubility in water--Material that will dissolve in water. This information is important for determining spill cleanup or containment measures and fire fighting agents. Expressions for degree of solubility are as follows:

Negligible	-	less than 0.1%
Slight	-	0.1 to 1.0%
Moderate	-	1 to 10%
Appreciable	-	more than 10%
Complete	-	soluble in all proportions

Species--A biological type; on SDSs, species refers to the test animals--usually rats, mice, or rabbits--which were used to obtain the toxicity test data reported.

Specific gravity--An expression of the density (or heaviness) of a material; ratio of the mass of a body to the mass of an equal volume of water at 4 degrees centigrade or other specified temperature. If a volume of a material weighs 8 pounds, and an equal volume of water weighs 10 pounds, the material is said to have a specific gravity of 0.8 (8 divided by 10 = .8). 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 (or go to the bottom) in water. Most (but not all) flammable liquids have specific gravity less than 1.0 and will float on water--an important consideration for fire suppression and spill cleanup.

Stability--An expression of 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 such as temperatures above 150 degrees Fahrenheit or shock from being dropped that may cause instability (dangerous change) are stated on the SDS.

STEL--Short-term exposure limit; ACGIH terminology. See "TLV".

Storage color codes--Labeling procedure that encourages proper storage of chemicals. All storage color-code systems are designed to classify chemical hazards and to ensure that incompatible chemicals are not stored in close proximity. Storage color codes may vary slightly among manufacturers. For example:

J. T. Baker

Red-	flammability hazard: store in a flammable chemical storage area.
Red stripe-	flammability hazard: not compatible with other flammable substances.
Yellow-	reactivity hazard: store separately from other chemicals.
Yellow stripe-	reactivity hazard: do not store with other yellow-coded chemicals; store separately.
White-	contact hazard: store separately in a corrosion-proof location.
White stripe-	contact hazard: not compatible with chemicals in solid white category.
Blue-	health hazard: store in a secure poison area.
Orange-	not suitably characterized by any of the foregoing. categories.

Fisher Scientific

Red-	flammable. Store in area segregated for flammable reagents.
Blue-	health hazard. Toxic if inhaled, ingested, or absorbed

through skin. Store in secure area.

Yellow- reactive and oxidizing reagents. May react violently with air, water, or other substances. Store away from flammable and combustible materials.

White- corrosive. May harm skin, eyes, mucous membranes. Store away from red, yellow, and blue-coded reagents above.

Gray- no hazard. Is not considered a hazard in any of categories above. For general chemical storage.

Stop- exception. Reagent incompatible with other reagents of same color bar. Store separately.

Mallinckrodt

White- contact hazard. Store in a corrosion-proof area.

Yellow- reactivity hazard. Store separately from flammables and combustibles.

Blue- health hazard. Store in a secure poison area.

Red- flammable hazard. Store in an area segregated for flammables.

Green- minimum or no hazard. Store in a general chemical storage area.

Sargent-Welch

White- acid, contact hazard.

Yellow- oxidizer, reactivity hazard.

Blue- poison, health hazard.

Red- flammable hazard.

Green- minimum or no hazard.

Stupor--Partial or nearly complete unconsciousness.

Subcutaneous--Beneath the layers of the skin.

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

Sys--Systemic effects--effects on the metabolism and excretory function of the liver or kidneys.

Systemic--Affecting the entire body.

T

Table "Z"--The list of chemicals regulated by OSHA as air contaminants that require administrative or engineering controls or protective equipment to keep exposure of employees below specified limits.

Tachycardia--Excessively rapid heartbeat; pulse rate above 100.

Target organ effects--Chemically caused effects upon organs and systems such as the liver, kidneys, nervous system, lungs, skin, and eyes from exposure to a material.

TCC--Tag (tagliabue) closed cup; flash point determination test.

TCLO--Lowest published toxic concentration.

TDLO--Lowest published toxic dose.

Teratogen--An agent or substance that causes physical defects in the developing embryo.

TFX--Toxic effects--used to introduce the principal organ system affected.

Tinnitus--A ringing or singing sound in the ears.

TLV--Threshold limit value; a term used by ACIGH to express the airborne concentration of a material to which nearly all persons can be exposed day after day without adverse effects. ACGIH expresses TLV's in three ways:

TLV-TWA: the allowable time-weighted average concentration for a Normal 8-hour workday or 40-hour week.

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 that 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; a type of flash point test. See "flash point".

Toxic--Having (1) an LD50 of 50-500 mg/kg when administered orally to albino rats weighing 200-300 grams each, (2) an LD50 of 200-1000 mg/kg when administered by continuous contact for 24 hours with the bare skin of albino rabbits weighing 2-3 kilograms each, or (3) an LC50 of 200-2000 ppm (gas or vapor) or 2-20 mg/1 (mist, fume, or dust) when administered by continuous inhalation for one hour to albino rats weighing 200-300 grams each.

Toxicity--The sum of adverse effects resulting from exposure to a material, generally by the mouth, skin, or respiratory tract. For RCRA purposes, solid or liquid wastes which exhibit certain specified "characteristics of toxicity" may be regulated by EPA as hazardous wastes.

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

TSCA--Toxic substances control act; federal environmental legislation, administered by EPA, for regulating the manufacture, handling and use of materials classified as "hazardous chemical substances".

TWA--Time-weighted average exposure; 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".

U

UEL or UFL--Upper explosive limit or upper flammable limit.

µg--Microgram (one millionth, $10^{6,}$ of a gram).

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.

Upper explosive limit (UEL) or upper flammable limits (UFL)--The highest concentration of a material in air that will produce an explosion or fire when it contacts an ignition source (high heat, electric arc, spark, or flame). A higher concentration of the material in a smaller percentage of concentration of air may be too rich to be ignited.

V

Vapor density--The weight of a vapor or gas compared to the weight of an equal volume of air; 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 disparate (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 degrees Fahrenheit, and the vapor pressure is expressed as pounds per square inch, but vapor pressures reported on SDS are in millimeters of mercury (mmhg) at 68 degrees Fahrenheit (20 degrees centigrade) unless stated otherwise. Three facts are important to remember:

1. Vapor pressure of a substance at 100 degrees Fahrenheit will always be higher than the vapor pressure of the substance at 68 degrees Fahrenheit (20 degrees Centigrade).
2. Vapor pressures reported on SDS in mm hg are usually very low; 760 mm hg is equivalent to 14.7 pounds per square inch.
3. The lower the boiling point of a substance, the higher its vapor pressure.

Ventilation--See "general exhaust," "local exhaust," and "mechanical exhaust".

Viscosity--A relative measure of how slowly a substance pours or flows. Very viscous substances, like molasses, pour very slowly. Slightly viscous substances, like water, pour and splash easily.

W

WAC--Washington Administrative Code.

Water-reactive--A material that readily reacts with water to release a gas which is either flammable or a health hazard. Some water-reactive chemicals can react so violently with water as to cause explosions.

WISHA--Washington Industrial Safety and Health Act.

Z

“Z“ List - OSHA - (same as “Table Z")--The list of chemicals regulated by OSHA as air contaminants that require administrative or engineering controls or protective equipment to keep exposure of employees below specified limits. (In Washington state, WAC 296-62-07515 - 11/91.)