

## Glossary

### A

**ABSOLUTE PRESSURE** – Pressure measured with respect to total vacuum. Equal to the sum of a pressure gauge reading and atmospheric pressure.

**ABSOLUTE ZERO** – The minimum point in thermodynamic temperature scale (-273.16°C or -459.69°F).

**ABSORPTION** – The penetration of matter in bulk into other matter, as in the dissolving of a gas in liquid.

**ACCURACY** – The degree of agreement of a measured value with the true or expected value of the quantity of concern.

**ADSORPTION** – Adherence of the atoms, ions or molecules of a gas or liquid to the surface of another substance, called the adsorbent. Molecular sieves are adsorbents.

**AEROBIC MIXTURE** – A biological atmospheric gas mixture, containing Oxygen, used as a controlled atmosphere for the growth of aerobic bacteria.

**ACGIH (AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS)** – This Conference is a professional society, not an official Government agency. It is an organization devoted to the development of administrative and technical aspects of worker protection.

**ANAEROBIC MIXTURE** – A biological atmospheric gas mixture, oxygen free, used as a controlled atmosphere for the growth of anaerobic bacteria.

**ANALYTICAL ACCURACY** – Guaranteed accuracy of reported analytical result.

**ANHYDROUS** – A descriptive term meaning without water (ie: anhydrous ammonia).

**ANNEALING GAS** – A hydrogen and nitrogen mixture used to provide a reducing atmosphere during heating of metals to render them less brittle on cooling.

**ASPHYXIAN GAS** – A gas which has little or no positive toxic effect but which can bring about unconsciousness and death by replacing air and thus depriving an organism of oxygen.

**ATTACHED POPPET (TIED-SEAT; TIED-DIAPHRAGM)** – A feature of certain regulators whereby the stem (poppet) is physically attached to the diaphragm.

**ATMOSPHERIC PRESSURE** – The amount of force exerted by the Earth's atmosphere. Equal to 14.7 psia or 0 psig.

**AA (ATOMIC ABSORPTION)** – An analytical instrumental method that is normally used to measure metal concentrations.

**ATOMIC WEIGHT** – The relative weight of an atom of an element, compared to carbon-12. Equivalent to the sum of protons and neutrons in the nucleus.

**AUTOIGNITION TEMPERATURE** – The minimum temperature for a material to ignite without an external ignition source.

**AZEOTROPIC MIXTURE (AZEOTROPE)** – A liquid mixture of two or more substances which behaves like a single substance in that the vapor produced by partial evaporation of liquid has the same composition as the liquid. The constant boiling mixture exhibits either a maximum or minimum boiling point as compared with that of other mixtures of the same substances.

### B

**BACK-PRESSURE REGULATOR** – A pressure regulator which controls upstream (inlet) pressure. Similar in function to a relief valve.

**BALANCED POPPET (BALANCED VALVE; BALANCED STEM)** – A valve which has been designed to be pressure balanced; hence the valve spring provides the shutoff force. Used essentially to reduce or minimize decaying inlet pressure effect.

**BIOLOGICAL ATMOSPHERE GASES** – Mixtures, usually of air or oxygen with varying amounts of carbon dioxide, for growth of biological cultures. If oxygen is present it is Aerobic, if not it is Anaerobic.

**BLEND** – See "MIXTURES."

**BOILING POINT** – The temperature at which the vapor pressure of the liquid is equal to the prevailing pressure of the atmosphere. The normal boiling point is the temperature at which the vapor pressure of the liquid is 14.7 psia (1 atm).

**BONNET (SPRING HOUSING)** – The part of a regulator which houses the control spring.

**BRASS** – copper/zinc alloys of varying composition. Some brass also contains low percentages of other elements such as manganese, aluminum, silicon, lead and tin.

**BTU (BRITISH THERMAL UNIT)** – The quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit at or near its point of maximum density (39.1°F).

**BURSTING DISK (FRANGIBLE DISK)** – A metal disk which is part of a safety device, and which is intended to burst and allow gas to escape within predetermined pressure limits to prevent rupture of the device it is installed on. Similar in function to a safety relief valve, except it has no reseal capability.

**BURST PRESSURE** – A design test pressure which allows for permanent deformation and leakage, but parts must remain assembled (i.e., no sudden ruptures). Normal industry standard is 4 times (400%) of maximum operating pressure. See also "PROOF PRESSURE" and "MAXIMUM OPERATING PRESSURE."

### C

**CP (CHEMICALLY PURE)** – Denotes a high purity gas, but the actual % purity will depend on the particular gas.

**CALIBRATION** – Comparison of a measurement standard or instrument with another standard or instrument to report or eliminate by adjustment any variation (deviation) in the accuracy of the item being compared.

**CALIBRATION GAS** – A gas or gas mixture of accurately known composition used as a comparative standard in analytical instrumentation.

**CALORIE** – The amount of heat required to raise the temperature of one gram of water one degree Celsius.

**CARRIER GAS** – Gas used with gas chromatography to carry the sample through the system.

**CATALYST** – A substance that initiates a chemical reaction and allows it to proceed under different conditions than otherwise possible.

**CERTIFIED MIXTURE** – A mixture whose concentration is determined by analysis and comparison with a Primary Standard of NIST reference material.

**CGA NUMBER** – Cylinder/container valve outlet connection number assigned by the Compressed Gas Association. CGA numbers are detailed in CGA Standard V-1.

**CHECK VALVE** – A mechanical device that allows flow of gas in only one predetermined direction, to prevent backflow of gas or contaminants.

**CAS (CHEMICAL ABSTRACT SERVICES)** – CAS numbers represent chemical substances recorded in the CAS Chemical Registry System. This numbering system identifies chemical substances by an unambiguous computer language description of its molecular structure, including all stereochemical detail. The CAS number, which has no chemical significance, is simply a number assigned in sequential order to each substance as it enters the Registry System. All specific substances reported in the world's scientific and technical literature, and indexed in Chemical Abstracts (CA) since 1965 (when the Registry System began), are included in this master file.

**CHEMILUMINESCENCE** – A species which chemically absorbs and emits light (usually at low temperatures).

**CHROMATOGRAM** – The record produced by the gas or liquid chromatograph. It is also a measure of instrument performance.

**COEFFICIENT OF FLOW (Cv)** – Defined as the actual flow performance in U.S. gallons of water per minute at 60°F when inlet pressure (P1) is 1 psig and outlet pressure (P2) is atmospheric (14.7 psia).

**COLUMN** – Part of the gas chromatography system where the separation of the sample takes place (can be packed or capillary).

**COMBUSTION** – An exothermic oxidation reaction which may occur with any organic compound, as well as with certain elements.

**COMPRESSED GAS** – (1) A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 psi at 70°F; or (2) a gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130°F, regardless of the pressure at 70°F; or (3) a liquid flammable material having a vapor pressure exceeding 40 psi at 100°F as determined by ASTM D-323-72.

**CGA (COMPRESSED GAS ASSOCIATION)** – This is a nonprofit technical association whose membership includes many corporations active in all phases of the compressed gas industry. Founded in 1913, the CGA uses the experience and knowledge of its members to promote industrywide standards and procedures for safety in the manufacture, storage, transport, and use of compressed gases.

**CORROSIVE** – The ability of a chemical compound to attack, and produce irreversible damage to, human tissues, such as eyes, skin or mucous membranes. Also, the ability of a chemical compound to attack and eat away rubber, metal and other substances.

**CRACKING PRESSURE** – A term used in back pressure control only (e.g., back pressure regulators, relief valves), for determining the inlet pressure at which flow starts.

**CREEP** – Any increase in outlet pressure of a pressure regulator subsequent to lockup, usually seen as a long term, slow pressure increase. This generally indicates a seat leak, which is an abnormal condition.

**CRITICAL DENSITY** – The density of a pure material at its critical temperature and critical pressure.

**CRITICAL POINT** – The transition point at which the liquid and gaseous states of a substance merge into each other. It is the temperature above which a substance cannot exist in two phases, no

matter how great the pressure. See also “CRITICAL TEMPERATURE” and “CRITICAL PRESSURE.”

**CRITICAL PRESSURE** – At the “CRITICAL TEMPERATURE,” the highest pressure at which a pure material can exist as a gas in equilibrium with its liquid.

**CRITICAL TEMPERATURE** – The temperature above which a gas cannot be liquefied by pressure alone. At this temperature, there is no distinction between liquid and vapor, both having the same density and constituting one homogenous system.

**CRYOGENIC LIQUID** – A liquid having a normal boiling point below -240°F (-151.11°C)

**CRYOGENIC LIQUID CONTAINER** – An insulated container designed to store, handle, and transport liquids having boiling points below -130°F.

**CYLINDER** – A container designed to hold compressed gases or liquefied compressed gases. Cylinders are manufactured and tested according to DOT/CTC/MEX specifications.

## D

**DEHYDRATION** – Removal of one or more molecules of water from a chemical compound.

**DELAYED (CHRONIC) HEALTH HAZARD** – See “EPA HAZARD CATEGORIES.”

**DELIVERY PRESSURE** – See “OUTLET PRESSURE.”

**DENSITY** – The ratio of the amount of anything per unit volume; e.g., mass of any substance per unit volume at any definite temperature. It is usually expressed in pounds per cubic foot (lbs/ft<sup>3</sup>). See also “SPECIFIC GRAVITY.”

**DEPARTMENT OF TRANSPORTATION (DOT)** – This is a government agency whose Title 49, Code of Federal Regulations, regulates the transport of hazardous materials.

**DEVICE GAS MIXTURE** – A gas mixture that is used for the calibration of medical diagnostic equipment. The gas may enter the body, but its action is not dependent upon its being metabolized.

**DEWAR** – Vessel which contains cryogenic liquefied gases.

**DEW POINT** – The temperature at which the liquefaction of vapor begins; the term is usually applied to condensation of moisture from the water vapor in the atmosphere.

**DISS (DIAMETER INDEX SAFETY SYSTEM)** – DISS outlet valves are generally used with high-purity products, toxics, and corrosives. Valves equipped with DISS outlet assignment provide a metal-to-metal seal that creates low particle generation, a permeation-free environment, and good leak integrity.

**DIAPHRAGM VALVE** – Packless valve using a metal diaphragm to prevent leakage of gas through the valve stem. There is no direct connection between the hand wheel and the valve stem.

**DIP TUBE** – See “EDUCTOR TUBE.”

**DOPANT** – An impurity usually added in small amounts to a pure substance to alter its properties.

**DOT ID NUMBERS** – These are product identification numbers, assigned by the Department of Transportation (DOT) to assist members of fire and police departments in using the DOT Emergency Response Guidebook. DOT ID numbers contain two letters followed by four digits. The prefix UN (for United Nations) identifies products recognized throughout the world. Gaseous nitrogen, for example, is identified as UN 1066.

**DROOP** – The decrease in outlet set pressure of a pressure regulator which results from an increase in flow rate. Essentially the reverse of lockup. See also “LOCKUP.”

**DRUG GAS** – A gas or gas mixture that is inhaled and has a physiological effect upon the body.

## E

**ECD (ELECTRON CAPTURE DETECTOR)** – A gas chromatography detector that is very sensitive to halogen-containing compounds. Uses P-5, nitrogen or helium.

**EDUCTOR (LIQUID DELIVERY) TUBE** – A tube inside a cylinder or container attached to the cylinder valve which allows liquid product withdrawal from the cylinder.

**EFFLUENT SPLITTER** – The part of the analytical instrument that splits the effluent stream into multiple detectors or some to vent for a lower volume of effluent.

**EPA (ENVIRONMENTAL PROTECTION AGENCY)** – This is a government agency that establishes environmental standards within the United States.

**EPA HAZARD CATEGORIES** – The hazard categories used throughout this manual as defined under EPA SARA Title III and 1910.1200 of Title 29 of the Code of Federal Regulations are as follows:

- Immediate (Acute) Health Hazard, including highly toxic, corrosive, toxic, irritant, sensitizer, and other hazardous chemicals which cause an adverse effect to a target organ, and manifest themselves within a short period of time following a one time, high exposure to the substance.

- Delayed (Chronic) Health Hazard, including carcinogens and other hazardous chemicals which cause an adverse effect to a target organ and manifest themselves after a long period of time following or during repeated contacts with the substance.
- Fire Hazard, including flammable, combustible pyrophoric, and oxidizer.
- Sudden Release of Pressure Hazard, including explosive and compressed gas.
- Reactive Hazard, including unstable reactive, organic peroxide, and water reactive.

**EPA PROTOCOL GASES** – Gas mixtures used for the calibration of stationary source continuous emission monitors (CEMs). The mixtures are manufactured according to procedures laid down by the EPA and are traceable to NIST SRMs.

**EXPOSURE LIMITS** – Concentrations of substances (and conditions) under which it is believed that nearly all workers may be repeatedly exposed day after day without adverse effects. “ACGIH” limits are called “TLV” and “OSHA” exposure limits are called “PEL.” See “THRESHOLD LIMIT VALUE.”

## F

**FID DETECTOR – FLAME IONIZATION DETECTOR** – A gas chromatography detector that looks for substances that can be ionized in a flame. Commonly uses helium, hydrogen, and air.

**FILLING DENSITY** – The percent ratio of the weight of liquified compressed gas in a container to the weight of water that the container will hold at 60°F.

**FIRE HAZARD** – See “EPA HAZARD CATEGORIES.”

**FLAME PHOTOMETRY** – An instrument utilizing a flame for the analysis of metals, particularly in medical applications. Usually uses propane or methane.

**FLAMMABLE GAS** – (1) A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of 13% 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% by volume, regardless of the lower limit.

**FLAMMABLE LIMITS** – The concentration of flammable vapor in air, oxygen, or other oxidants that will propagate flame upon contact when provided with a source of ignition. The lower explosive limit (LEL) is the concentration below which a flame will not propagate; the upper explosive limit (UEL) is the concentration above which a flame will not propagate. A change in temperature or pressure may alter the flammable limits.

**FLAMMABLE RANGE** – The range over which a gas at normal temperature and pressure will form a flammable mixture with air.

**FLASH POINT** – The lowest temperature at which a flammable liquid will give off enough vapor at or near its surface to form an ignitable mixture with air.

**FLOW CAPACITY** – The maximum flow capability of a control device established at a specific set of conditions.

**FLOWMETER** – An instrument used to measure flow rate. Measurement is either by a floating ball (Rotameter) or by heat transfer (Mass Flowmeter).

**FLUID** – Any material or substance that changes shape uniformly in response to an external force imposed upon it. The term applies to liquids, gases, and finely divided solids.

**FREEZING POINT** – The temperature at which a liquid solidifies. It is the temperature at which the liquid and solid states of a substance are in equilibrium at a given pressure.

## G

**GMIS (GAS MANUFACTURER'S INTERMEDIATE STANDARD)** – An internal standard, directly traceable to a NIST SRM, used in the certification of mixtures.

**GROSS WEIGHT** – The weight of a package plus the weight of its contents.

## H

**HALOCARBONS** – Any hydrocarbon combined with any of the five (F<sub>2</sub>, Cl<sub>2</sub>, Br, I, At) elements in the VIIA group of the periodic table.

**HEAT OF ADSORPTION** – The total heat involved in the adsorption process from zero adsorbate loading to some final adsorbate loading at a constant temperature (also called isothermal integral heat of adsorption).

**HEAT OF FUSION** – The heat energy required to transform one MOLE of substance from the liquid phase to the vapor phase at one atmosphere of pressure.

**HYDROCARBON** – An organic compound containing carbon and hydrogen.

## I

**I/M GASES** – Calibration gas mixtures used for testing of mobile source emissions. Typically they contain CO, CO<sub>2</sub>, Propane, and NO, are traceable to NIST SRMs.

**IMMEDIATE (ACUTE) HEALTH HAZARD** – See “EPA HAZARD CATEGORIES.”

**INERT** – A material which, under normal temperatures and pressures, does not react with other materials.

**IR (INFRARED)** – An area of the spectrum at longer wavelength than red light. Used in analysis as certain compounds absorb Infrared light at characteristic wavelengths.

**INHIBITOR** – A compound (usually organic) that retards or stops an undesired chemical reaction such as corrosion, oxidation or polymerization.

**INLET PRESSURE (P1; SUPPLY PRESSURE; UPSTREAM PRESSURE)** – The pressure of the fluid to the supply connection of a control device.

**INORGANIC SUBSTANCE** – Substances that do not contain carbon in their chemical structure.

**IRRITANT** – The ability of a chemical, which is not corrosive, to cause a reversible inflammatory effect on living tissue by chemical action at the site of contact.

**ISOTHERMAL INTEGRAL HEAT OF ADSORPTION** – See “HEAT OF ADSORPTION.”

**ISOTOPES** – Forms of an element that differ from one another in the mass of their atoms and in the properties dependent on that mass. Having the same atomic number and the same number of valence electrons, isotopes occupy the same position in the periodic table and have identical properties. They are distinguishable only by the small differences in atomic weight or by radioactive transformations.

## K

**KELVIN (K)** – A unit of temperature related to the triple point of water.

## L

**LIQUEFIED COMPRESSED GAS** – A gas which, under the charged pressure, is partially liquid at a temperature of 70°F (21.1°C).

**LIQUID DENSITY** – The ratio of the mass of a liquid per unit volume at any definite temperature. It is usually expressed in pounds per gallon or pounds per cubic foot.

**LOCKUP** – The increase in outlet pressure of a pressure regulator that occurs when flow is stopped. Essentially the reverse of DROOP.

**LEL (LOWER EXPLOSIVE LIMIT)** – The minimum percent by volume of a gas which, when mixed with air at normal temperature and pressure, will form a flammable mixture. See “FLAMMABLE GAS.”



## M

**MANIFOLD** – A series of connectors to a common outlet allowing several cylinders to be used simultaneously.

**MSDS (MATERIAL SAFETY DATA SHEET)** – An MSDS is a substance fact sheet containing characteristics and hazards of specific hazardous industrial material. Also, these data sheets provide precautionary information on safe handling of the material, as well as emergency and first aid procedures.

**MAXIMUM OPERATING PRESSURE** – The maximum allowable use pressure for which a system is designed. Also referred to as “WORKING PRESSURE.”

**MELTING POINT** – The temperature at which the solid and liquid phase of a substance are in equilibrium (normally specified at one atm).

**METERING VALVE** – A valve capable of accurately controlling the flow of a gas. Usually a needle valve.

**MICRON** – One millionth of a meter.

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

**MOLE** – The weight of a substance equal numerically to its molecular weight. A gram-mole is the weight in grams equal to the molecular weight; a pound-mole is the weight in pounds equal to the molecular weight.

**MOLECULAR WEIGHT** – The sum of the atomic weights of all the constituent atoms in the molecule of an element or a compound.

## N

**NANOGRAM (ng)** – One billionth of a gram ( $10^{-9}$ ).

**NANOMETER (m)** – One billionth of a meter ( $10^{-9}$ ).

**NF (NATIONAL FORMULARY)** – A supplement to the United States Pharmacopoeia.

**NEEDLE VALVE** – Valve using a needle-shaped stem moving into and closing a small orifice. Accurately meters flow.

**NIST (NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY)** – Government organization that supplies Standard Reference Materials – “THE NATIONAL STANDARD.”

**NTRM (NIST TRACEABLE REFERENCE MATERIAL)** – A standard produced by a gas manufacturer and certified by NIST. Considered by NIST and EPA to be equivalent to an SRM.

**NO<sub>x</sub>** – General symbol for Oxides of Nitrogen. Can include Nitric Oxide, Nitrogen Dioxide and Nitrogen Trioxide.

**NON-LIQUIFIED GAS** – A substance that exists entirely as a gas at 70°F.

**NORMAL BOILING POINT (nbp)** – The temperature at which the vapor pressure of a liquid reaches 760 mm of mercury.

**NORMAL EVAPORATION RATE (NER)** – The degree of product loss from a cryogenic liquid container due to heat leak into the container as designed. The NER is checked by measuring the amount of product loss over a specified time and serves to confirm whether the insulation is still effective.

**NORMAL TEMPERATURE AND PRESSURE (NTP)** – A gas industry reference base. Normal temperature is 70°F. Normal pressure is one atmosphere, or 14.696 psia.

## O

**OSHA (OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION)** – An organization within the U.S. Department of Labor which sets standards for employers to ensure safe and healthful working conditions for employees.

**OUTLET PRESSURE (P<sub>2</sub>; DELIVERY PRESSURE; DOWNSTREAM PRESSURE)** – The pressure of the fluid from the discharge connection of a control device.

**OXIDIZING AGENT** – A chemical reagent which causes oxidation of other substances and is thereby reduced.

## P

**PACKED VALVE** – A valve that relies on a compressed packing to prevent leakage of gas between the valve stem and body.

**PACKLESS VALVE** – A valve that uses a metal seal, such as a diaphragm, to seal the body from the valve stem and prevent any gas leakage.

**PARTIAL PRESSURE** – In any gas mixture the total pressure is equal to the sum of the pressures (partial) which each gas would exert were it alone in the volume occupied by the “MIXTURE.”

**PEL (PERMISSIBLE EXPOSURE LIMITS)** – See “EXPOSURE LIMIT.”

**PHYSICAL HAZARD** – Descriptive of a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable reactive or water reactive.

**POISON** – A substance that in relatively small doses has an action, when it is ingested by, injected into, inhaled or absorbed by, or applied to a living organism, that either destroys life or impairs seriously the function of one or more organs or tissues.

**POLYMERIZATION** – A chemical reaction, usually carried out with a catalyst, heat or light, and often under high pressure, in which a large number of relatively simple molecules combine to form a chain-like macromolecule.

**ppb (PARTS PER BILLION)** – Equal to 0.0000001%.

**ppm (PARTS PER MILLION)** – A convenient means for expressing low concentrations. As applied to gases, ppm stands for moles per million moles. ppm by weight is expressed as pounds per million pounds. ppm by volume is usually expressed in cubic feet per million cubic feet. Equal to 0.00001%.

**PRIMARY STANDARD** – A standard whose concentration can be traced directly to a fundamental unit of measurement such as mass. Standard of highest accuracy and precision.

**PROOF PRESSURE** – A test pressure applied to control devices to verify structural integrity. No deformation or excessive leakage is permitted at this pressure and the control device must function normally subsequent to this test. Normal industry standard is 1.5 times (150%) of “WORKING PRESSURE.” See also “BURST PRESSURE” and “MAXIMUM OPERATING PRESSURE.”

**PURGE** – Flushing of cylinders, manifolds or other equipment with an inert gas to remove contamination or residue. Purging improves efficiency of the process.

**PYROPHORIC** – The ability of a chemical to ignite spontaneously in air at a temperature of 130°F or below.

**PYROPHORIC GAS** – A gas that can spontaneously self-ignite when exposed to normal atmospheric conditions.

## R

**RARE GAS** – Refers to those constituents of air which comprise less than 1% of air and are generally considered inert, such as argon, helium, krypton, neon and xenon.

**REACTIVE HAZARD** – See “EPA HAZARD.”

**REFERENCE GAS** – A gas or gas mixture with precisely defined composition used as a reference standard in instrumental analysis.

**RELIEF VALVE** – A type of pressure relief device which is designed to relieve excessive pressure, and to reclose and reseal, to prevent further flow of gas from the cylinder after reseating pressure has been achieved.

**RFO (RESTRICTIVE FLOW ORIFICE)** – A safety device placed in the outlet of a cylinder valve intended to limit the release rate of a hazardous gas to a maximum specified range in the event of the inadvertent opening of the valve or the failure of the system downstream of the valve outlet.

**ROTAMETER** – See “FLOWMETER.”

## S

**SAFETY RELIEF DEVICE** – A safety device usually incorporated in a cylinder valve and actuated by excessive pressure or temperature, or both, at predetermined limits to avoid failure of the pressure vessel.

**SELF-RELIEVING (SELF-VENTING)** – A feature incorporated in certain pressure reducing regulators which enables the unit to relieve the outlet pressure when adjusted in the decrease direction.

**SENSITIZER** – The ability of a chemical to cause a substantial proportion of exposed people or animals to develop an allergic reaction in normal tissue after repeated exposure to the chemical.

**STEL (SHORT TERM EXPOSURE LIMIT)** – See “THRESHOLD LIMIT VALUE – SHORT TERM EXPOSURE LIMIT.”

**SUPPLY PRESSURE** – See “INLET PRESSURE.”

**SKIN** – The skin designation, used with the terms TLV-TWA and OSHA-PEL, indicates that cutaneous absorption may contribute to the overall exposure.

**SOLVENT** – A substance capable of dissolving another substance (solute) to form a uniformly dispersed mixture (solution) at the molecular or ionic size level.

**SPAN GAS** – Gases which are used as a reference point to span an analyzer.

**SPECIFIC GRAVITY (Sp. Gr.)** – The ratio of the weight of one substance compared to the weight of an equal volume of another substance which is used as a standard. Usually gases are compared to air (air = 1) while liquids and solids are compared to water ( $H_2O = 1$ ).

**SPECIFIC HEAT** – Amount of heat required to raise a unit mass of a substance one degree of temperature at either constant pressure (Cp) or constant volume (Cv).

**SPECIFIC HEAT RATIO** – The ratio of “SPECIFIC HEAT” at constant pressure ( $0^\circ C$ ) to the specific heat at constant volume (Cv).

**SPECIFIC VOLUME (Sp. Vol.)** – Volume occupied by a unit mass of a substance at a given temperature. It is usually expressed in cubic feet per pound or gallons per pound.

**SPRING HOUSING** – See “BONNET.”

**SRM (STANDARD REFERENCE MATERIAL)** – A national standard produced by NIST. The highest level of standard available.

**STAINLESS STEEL** – Alloy steels containing high percentages of chromium, from less than 10% to more than 25%.

**STP (STANDARD TEMPERATURE AND PRESSURE)** – An internationally accepted reference base. Standard temperature is  $0^\circ C$ . Standard pressure is one atmosphere or 14.6960 psia.

**SUBLIMATION** – The direct passage of a substance from solid to vapor without appearing in the intermediate (liquid) state. An example is solid carbon dioxide (dry ice) which vaporizes at room temperature.

**SUDDEN RELEASE OF PRESSURE HAZARD** – See “EPA HAZARD CATEGORIES.”

**SUCK BACK** – The reverse flow of gas or liquid. Usually refers to the back flow of liquid into a gas cylinder.

## T

**TARE WEIGHT** – The weight of an empty cylinder without cap and valve.

**TLV (THRESHOLD LIMIT VALUE)** – TLVs are measures of toxicity established by the ACGIH. The TLV of a substance refers, in general, to airborne concentrations at or below which nearly all workers may be repeatedly exposed without adverse effect.

**THRESHOLD LIMIT VALUE – CEILING (TLV-CEILING)** – Refers to an airborne concentration that should not be exceeded, even instantaneously.

**TLV-STEL (THRESHOLD LIMIT VALUE – SHORT TERM EXPOSURE LIMIT)** – Refers to a 15-minute time-weighted average exposure which should not be exceeded at any time during a workday, even if the time-weighted average is within the TLV. It supplements the 8-hour TLV-TWA for certain substances that produce acute effects on high, short-term exposure.

**TLV-TWA (THRESHOLD LIMIT VALUE – TIME WEIGHTED AVERAGE)** – Refers to the time-weighted average concentration for a normal 8 hour workday and a 40-hour workweek to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.

**TIED-DIAPHRAGM** – See “ATTACHED POPPET.”

**TIED-SEAT** – See “ATTACHED POPPET.”

**THC (TOTAL HYDROCARBON CONTENT)** – THC is used to describe the quantity of the hydrocarbon impurities present. Usually expressed as methane equivalents.

**TOXIC** – A substance that has the ability to produce injurious or lethal effects through its chemical interaction with the body.

**TRIPLE POINT (tp)** – The definite temperature and pressure for a pure substance at which the three phases (solid, liquid, and vapor) coexist in equilibrium as an invariant system.

## U

**UN (UNITED NATIONS)** – See “DOT ID NUMBERS.”

**USP (UNITED STATES PHARMACOPOEIA)** – The official publication for drug product standards.

**UNSTABLE REACTIVE** – The ability of a chemical in the pure state, or as produced or transported, to vigorously polymerize, decompose, condense, or become self-reactive under conditions of shock, pressure or temperature.

**UPSTREAM PRESSURE** – See “INLET PRESSURE.”

## V

**VAPOR PRESSURE** – The pressure characteristic at any given temperature of a vapor in equilibrium with its liquid or solid form.

## W

**WATER REACTIVE** – The ability of a chemical to react with water to release a gas that is either flammable or presents a health hazard.

**WORKING PRESSURE** – See “MAXIMUM OPERATING PRESSURE.”

## Z

**ZERO GAS** – Gases which are used as a reference point to “zero” an analyzer.