

GAS HAZARD CLASSIFICATION

Most of the gases are classified under the following properties / categories:

FLAMMABLE



Flammable gases when mixed with air, oxygen, or other oxidants, burn or explode upon ignition, depending upon the degree of confinement. Each flammable gas has a gas-in-oxidant concentration range within the limits of which the gas may be ignited. Flammable ranges are expressed in terms of air at ambient temperature and atmospheric pressure. A change in temperature, pressure, or oxidant concentration may vary the flammable range considerably. Mixtures above and below the flammable range do not ignite. As a precaution in handling flammables, care must be taken to eliminate all possible sources of ignition

through the proper design of facilities, the installation of approved electrical systems, and the restriction of smoking and use of open flames. A gas detector should be used to measure and alert the existence of a flammable mixture in area of suspected leakage.

OXIDANT

A number of gases, although non-flammable, may initiate and support combustion. Materials that burn in air, burn more vigorously or even explosively in oxygen and certain other oxidants. All possible sources of ignition must be eliminated when handling oxidants. Oxidants must not be stored with combustible materials. Oil, grease or other readily combustible substances must not come in contact with cylinders or equipments used in oxidant service.



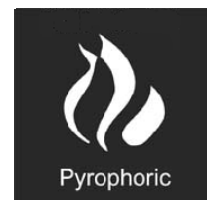
CORROSIVE / IRRITANT



Corrosives are those products that erode and deteriorate materials with which they come in contact, such as metals, fabrics, and human tissue. Some gases, although not corrosive in their anhydrous form, become corrosive in the presence of water. Special care must be taken when selecting the proper construction materials for equipment in which corrosives are handled. Gases that damage human tissue are corrosive. Those that cause inflammatory reactions after immediate, prolonged or repeated contact without further damage are irritant. Protective clothing and equipment must be used to minimize exposure to corrosive or irritating materials.

PYROPHORIC

Flammable gases which burn spontaneously upon exposure to air are called pyrophoric.



INERT / ASPHYXIAN

Gases that at ordinary temperature and pressure do not react with other materials are classified as inert. If released in a confined area, these gases may displace the oxygen content of the air below the level necessary to sustain life. There is therefore a hazard of asphyxiation and adequate ventilation, and monitoring of the oxygen content of confined area should be carried out to minimize this possibility.

TOXIC



Gases that can damage living tissue, cause ill-health, endanger life or bring about death are toxic. Those that do so at low concentrations are highly toxic. Some gases are especially noxious because they do not provide adequate warning of their presence (by colour, odour, etc.) at low levels of concentration. Also, some products that are non-toxic in themselves may react with certain chemicals or decompose at elevated temperatures to produce toxic materials. Adequate ventilation, protective clothing, and suitable breathing equipment must be used to minimize exposure.

ANESTHETIC

An anesthetic gas is one which, inhaled, brings about loss of consciousness without necessarily giving rise to other symptoms.

HIGH PRESSURE

Specialty Gases & some commercial Gases are compressed to pressures up to 200 bar. A sudden release of pressure may cause serious damage to personnel and equipment by propelling a cylinder or whipping a line. Factors that must be considered when choosing construction materials and designing gas handling systems are the temperature, the pressure of the gas, and the possibility of pressure build up in the system.



CRYOGENICS



Some gases, having very low boiling points, are stored as liquids in insulated vacuum-jacketed dewars or insulated pressurized cylinders. Contact with these liquids causes 'burns' due to the freezing of skin tissue by the rapidly evaporating liquid. Also, the liquid produces a large volume of gas upon vaporizing. In inadequately ventilated areas except for oxygen, this may decrease the oxygen content of the air below that necessary to sustain life. Adequate ventilation, monitoring of the oxygen content of confined areas and the use of protective clothing minimize the hazard.

ALL THE LABELS SHOWN ABOVE ARE AS PER THE U.S. D.O.T (DEPARTMENT OF TRANSPORTATION)



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