

# GAS/CRYOGEN DEFINITIONS

## INTRODUCTION

Gases and cryogenic liquids can exhibit a number of hazards, and users should be aware of all the hazards associated with the materials they are using. This focus sheet reviews physical and health hazards that can be associated with compressed gases and cryogens. These hazards are in addition to those due to compression which can make even inert materials hazardous when compressed.

## GENERAL

Simplified definitions:

- Normal Temperature and Pressure (NTP) are 68° F/20° C and 14.7 psi.
- A material is regulated as a gas if it is a gas at NTP.
- A cryogenic liquid is a fluid having a boiling point lower than -130° F/-89.9° C at NTP.
- Dissolved gases such as acetylene are gases that are dissolved in liquids (acetone is used for acetylene) to help stabilize them.

## HEALTH HAZARDS

**Corrosive:** A chemical that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the point of contact. Corrosive gases can also corrode valves and piping, making a release more likely if not properly managed.

**Toxic:** A chemical that has a median lethal dose (LD50) in air of more than 200 parts per million by volume of gas or vapor or more than 2 mg per L but not more than 20 mg per liter of mist, fume or dust, when administered by continuous inhalation for 1 hour (or less if death occurs within 1 hour) to albino rats weighing between 200-300 grams each.

**Highly toxic:** A material which produces a lethal dose or lethal concentration (LD50) in air of 200 parts per million by volume or less of gas or vapor, or 2 mg per liter or less of mist fume or dust, when administered by continuous inhalation for one hour (or less if death occurs within 1 hour) to albino rats weighing between 200 - 300 grams each.

**Cryogenic hazards:** Remember that cryogenic liquids and dry ice also possess the hazard of extreme cold which can cause damage to exposed skin.

## PHYSICAL HAZARDS

**Flammable cryogenic fluid:** A cryogenic fluid that is flammable in its vapor state.

**Flammable gas:** A material which is ignitable at NTP when in a mixture of 13 percent or less by volume with air; or has flammable range with air of at least 12 percent, regardless of lower limit.

**Flammable liquefied gas:** A liquefied compressed gas which, under a charged pressure is partially liquid at NTP and which is flammable.

**Oxidizing cryogenic fluid:** A cryogenic fluid with oxidizing properties which increase the burning rate of normal combustibles.

**Oxidizing gas:** A gas that can support and accelerate combustion of other materials more than air does.

**Pyrophoric:** A chemical with an auto-ignition temperature in air, at or below a temperature of 130°F (54°C).

**Unstable (reactive) material:** A material other than an explosive, which in the pure state or as commercially produced, will vigorously polymerize, decompose, condense or become self-reactive and undergo other violent chemical changes, including explosion, when exposed to heat, friction or shock, or in the absence of an inhibitor, or in the presence of contaminants, or in contact with incompatible materials.

## MIXTURES

Depending on concentration, mixtures of hazardous gases with those that are inert may or may not present the same hazards. Check the manufacturer's safety data sheet and the label on the cylinder to help determine applicable hazards.

**For questions about compressed gases and cryogens, contact EH&S at 206.543.7262.**