



UN 2187  
HAZCHEM 2RE  
CLASS 2.2

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## LIQUID CARBON DIOXIDE

### TECHNICAL SPECIFICATION

#### **SPECIFICATION**

Carbon Dioxide > 99.9%

Moisture < 20 ppm

#### **PHYSICAL DATA**

Chemical Symbol CO<sub>2</sub>

Vapour Pressure (kPa @ 15°C) 5090

Relative Density (Air = 1) 1.53

Molecular Weight 44.01

Sublimation Point -78.5°C

Critical Temperature 31.0°C

Specific Volume (@101.3 kPa & 15°C) 0.535 m<sup>3</sup>/kg

#### **PROPERTIES**

Carbon Dioxide is a colorless, odorless, non-flammable gas. It is heavier than air.

#### **USES**

The food industries consume most of the carbon dioxide produced. It is employed for:

- carbonation of soft drinks, lemonade, soda, fruit juices, etc, recharging of natural mineral waters with carbon dioxide. conservation of wine, unfermented grape juice and various fruit juices, tapping of beer and prevention of oxidation through contact with the air, accelerating the growth of farm produce as an atmospheric additive.

It is employed in the chemical industry in the following applications:

- preparation of sodium carbonate, alkaline bicarbonates, lead carbonate and various organic substances (e.g. salicylic acid), neutralization of sedentary alkalis, manufacture of foam rubber, precipitation of lime after clarification of juices in the sugar industry, dehydration of penicillin, tanning of hides, production of paints and varnishes.

It is employed as a protective atmosphere for arc welding and in reactor cooling circuits in nuclear power plants.

Pressurized carbon dioxide is employed in fire extinguishers. It serves to inflate buoys and pneumatic rescue dinghies. It is also used as a propellant gas in aerosols.

Carbon dioxide is employed in the laboratory as a carrier gas for gas analysis, and as a standard gas. Owing to its stimulating effect on the nerve centres, carbon dioxide is employed in medicine in mixtures with oxygen, for reviving victims of asphyxiation (drowning, electrocution, carbon dioxide poisoning, diphtheric toxin morphine, scopolamine). It also serves in the treatment of certain skin lesions. Mixed with ethylene oxide, it is employed as a fumigant in the destruction of insects in grain silos, and in leguminous plants, dates and dried figs

#### **SUPPLY & STORAGE**

As Liquid in Cryogenic Storage Tanks, Bulk Tankers, , Liquid containers, Dewars etc

### HANDLING & SAFETY

#### **HAZARDS**

Inhalation of carbon dioxide in high concentration is dangerous to respiration. At very high concentrations leads to loss of consciousness, and eventually death. Mental alertness (narcotic effect) and respiration begin to become affected at a concentration of 2% in air. Above 7%, loss of consciousness can occur very rapidly.

There is a risk of accumulation in low points (pits, culverts, basements, etc.) where it will create hazardous conditions.

#### **MATERIALS COMPATIBILITY**

Carbon dioxide is non-corrosive and so any common metal is acceptable, provided equipment is designed to withstand process pressure.

#### **PRECAUTIONS IN USE**

Use only in a well-ventilated area to prevent accumulation of high concentration of carbon dioxide. Ensure that oxygen content of air is maintained above 18%. It is recommended that the user of CO<sub>2</sub> is familiar with relevant standards "The storage and handling of nonflammable cryogenic and refrigerated liquids".

#### **PERSONAL PROTECTION**

Full face mask, well-fitting cryogenic gloves and full overalls without cuffs should be worn when handling liquid carbon dioxide supply systems.

#### **FIRST AID**

If victim is conscious:

- Move to uncontaminated area to breathe fresh air, Keep warm and quiet, Call doctor.

If victim is unconscious:

- Move to uncontaminated area and give assisted respiration, when breathing is restored, treatment as above.

Continued treatment should be symptomatic and supportive.

Cold burns/Frostbite:

- Flush with luke warm water for at least 10 minutes then treat as thermal burns, Seek hospital attention for all but the most superficial cases. Do not apply direct heat or give alcohol or cigarettes.

- Protect frozen parts from infection. Hospital treatment of cold burns/frostbite may differ from heat burns

#### **ADDITIONAL INFORMATION**

The information, recommendations and data contained in this publication are intended to give basic guidance to users for their safe handling and use.

For further information please refer Material Safety Data Sheets (MSDS)

It is essential for the safe use of gases that personnel are properly trained and are fully aware of the possible hazards.