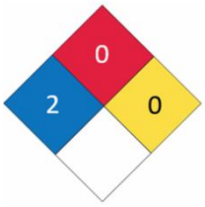
Liquid Carbon Dioxide

SAFETY DATA SHEET

Label 2.2: Non-flammable, nontoxic gas



NFPA Rating

SECTION 1: PRODUCT AND COMPANY IDENTIFATION

Trade Name	: Carbon Dioxide (Liquid)
Formula	: CO2
Chemical Family	: Acid Anhydride (Acid)
Company Indentation	: Barrak Industrial Gases Factory.
Emergency telephone number	: +966 13 5826507

SECTION 2: COMPOSITION / INFORMATION ON INGREDIENTS

Name	Product identifier	%
Carbon Dioxide (Liquid)	(CAS-No.) 124-38-9	>98%

SECTION 3: HAZARDS IDENTIFICATION

Emergency Overview : CAUTION! High-pressure liquid and gas. Can cause rapid suffocation. Can increase respiration and heart rate. May cause nervous system damage. May cause frostbite. May cause dizziness and drowsiness. Self-contained breathing apparatus and protective clothing may be required by rescue workers.

Effects of a Single (Acute) Overexposure

-Inhalation : Asphyxiant. Effects are due to lack of oxygen. Moderate concentrations may cause headaches, drowsiness, dizziness, excitation, excess salivation, vomiting, and unconciousness. Lack of oxygen can kill.

Skin Contact : No harm expected from vapour. Liquid may cause frostbite.

Swallowing : This product is a gas at normal temperature and pressure. Liquid may cause frostbite.

Skin Absorption : No harm expected from vapour. Liquid may cause frostbite.

Eye Contact : Vapour may cause a stinging sensation; liquid may cause frostbite. may cause severe frostbite.

Effects of Repeated (Chronic) Overexposure : No harm expected

Other Effects of Overexposure : Damage to retinal or ganglion cells and central nervous system may occur.

Medical Conditions Aggravated by Overexposure : Repeated or prolonged exposure is unlikely to aggravate existing medical conditions.

Significant Laboratory Data With Possible Relevance to Human Health Hazard Evaluation A single study has shown an increase in heart defects in rats exposed to 6% carbon dioxide in air for 24 hours at different time during gestation. There is no evidence that carbon dioxide is tetratogenic in humans

SECTION 4: FIRST AID MEASURES

Inhalation	: If inhaled, remove to fresh air. If not breathing, give artificial respiration. Get medical attention. Keep patient warm and at rest.
Skin/eye contact	: For exposure to cold vapor or solid, immediately warm frostbite area with warm water not to exceed 41°C (105°F). In case of massive exposure, remove contaminated clothing while showering with warm water. Call a physician.
Swallowing	: This product is a gas at normal temperature and pressure.
Notes to Physician	: There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient. Victim may not be aware of asphyxiation.

SECTION 5: FIRE FIGHTING MEASURES

Flammable class	: Non-flammable.
Extinguishing media - Suitable extinguishing media	: All known extinguishants can be used.
Hazardous combustion products	: None.
Specific physical and chemical hazards	: Heat of fire can build pressure in cylinder and cause it to rupture. No part of cylinder should be subjected to a temperature higher than 52°C (125°F). Carbon dioxide cylinders are equipped with a pressure relief device. (Exceptions may exist).
Specific methods	: If possible, stop flow of product. Move away from the container and cool with water from a protected position. If leaking do not spray water on to container. Water surrounding area (from protected position) to contain fire.
Sensitivity to Impact	Avoid impact against container.
Sensitivity to Static Discharge	Not applicable.
Protective equipment and precautions for firefighters	: Firefighters should wear personal protective equipment and fire-fighting turnout gear as appropriate for surrounding fire.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions	: Evacuate area. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.
Environmental precautions	: Try to stop release. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.
Cleanup methods	: Ventilate area.

SECTION 7: HANDLING AND STORAGE

Precautions to be taken in handling	: Protect cylinders from damage. Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Open valve slowly. If valve is hard to open, discontinue use and contact BGas.

SECTION 7: HANDLING AND STORAGE (Continued)

Precautions to be taken in storage : Store and use with adequate ventilation. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. Store only where temperature will not exceed 52 C. Store full and empty cylinders separately. Use a first-in, first-out inventory system to prevent storing full cylinders for long periods.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering controls

Local exhaust : Preferred.

Mechanical (General) : General exhaust ventilation may be acceptable if it can maintain an adequate supply of air.

Special : Not applicable.

Other : Not applicable.

Personal protective equipment

Respiratory Protection : Use air supplied respirator when working in confined space or where local exhaust or ventilation does not keep exposure below TLV.

Skin Protection : Insulated neoprene gloves.

Eye/Face Protection : Wear safety glasses when handling cylinders.

Other Protective Equipment : Metatarsal shoes for cylinder handling. Protective clothing where needed.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance	**Colorless.**
Odor	Odourless. It is felt by some to have a slight, pungent odour and biting taste.
Odor Threshold	Odourless.
Physical State	Compressed Liquefied Gas.
pH	Not applicable.
Boiling Point	Sublimation -78.5 C
Freezing Point	Not applicable.
Evaporation Rate (Butyl Acetate = 1)	>1 compared to (Butyl Acetate = 1)
Flammable Limits In Air, % by volume	Lower: Not applicable. Upper: Not applicable.
Vapor Pressure	5775.2 k Pa (@ 20°C)
Vapor Density	0.00198 g/ml @ 0 C
Specific Gravity (H2O = 1)	Not applicable.
Specific Gravity (Air = 1)	1.522g/ml @ 0 °C
Solubility In Water	Slight.
Coefficient of water/oil distribution	Not applicable.
Autoignition Temperature	Not applicable.
Percent Volatiles By Volume	100% (v/v)
Molecular Weight	44.01 g/mole.
Molecular Formula	CO2

SECTION 10: STABILITY AND REACTIVITY

Chemical Stability	: Stable
Conditions of Chemical Instability	: Not applicable.
Incompatibility (materials to avoid)	: Alkali metals, alkaline earth metals, metal acetylides, chromium, titanium above 550 C, uranium above 750 C.
Hazardous Decomposition Products	: In the presence of an electrical discharge, carbon dioxide is decomposed to form carbon monoxide and oxygen.
Hazardous Polymerization	: will not oocur.
Conditions to Avoid	: None Known.
Conditions to Reactivity	: None Known.

SECTION 11: TOXICOLOGICAL INFORMATION

Acute Dose Effect	: LCLo = 90,000 ppm, 5 min., human.
Study Results	: Carbon dioxide is an asphyxiant. It initially stimulates respiration and then causes respiratory depression. High concentrations result in narcosis. Symptoms in humans are as follows:
Effect:	Concentration:
-Breathing rate increases slightly	: 1%
-Breathing rate increases to 50% above normal level. Prolonged exposure can cause headache, tiredness.	: 2%
-Breathing increases to twice normal rate and becomes labored. Weak narcotic effect.	: 3%
-Breathing increases to approximately four times normal rate, symptoms of intoxication become evident, and slight choking may be felt.	: 4-5%
-Characteristic sharp odor noticeable. Very labored breathing, headache, visual impairment, and ringing in the ears. Judgment may be impaired,	: 5-10%
-Unconsciousness occurs more rapidly above10%level. Prolonged exposure to high concentrations may eventually result in death from asphyxiation.	: 10 - 100%
Reproductive Effects	: A single study has shown an increase in heart defects in rats exposed to 6% carbon dioxide in air for 24 hours at different times during gestation. There is no evidence that carbon dioxide is teratogenic in humans.

SECTION 12: ECOLOGICAL INFORMATION

Ecological Information	: No adverse ecological effects expected. Carbon dioxide does not contain any Class I or Class II ozone-depleting chemicals.

SECTION 13: DISPOSAL CONSIDERATION

Waste Disposal Method : Do not attempt to dispose of residual or unused quantities. Return cylinder to BGas.

SECTION 14: TRANSPORT INFORMATION

Transport Information

: Avoid transport on vehicles where the load space is not separated from the driver's compartment.
: Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency.
: Before transporting product containers:
- Ensure that containers are firmly secured.
- Ensure cylinder valve is closed and not leaking.
- Ensure valve outlet cap nut or plug (where provided) is correctly fitted.
- Ensure valve protection device (where provided) is correctly fitted.
- Ensure there is adequate ventilation.
- Compliance with applicable regulations.

SECTION 15: OTHER INFORMATION

Asphyxiant in high concentrations.
Keep container in a well-ventilated place.
Do not breathe the gas.
Ensure all national/local regulations are observed.
The hazard of asphyxiation is often overlooked and must be stressed during operator training.

Hazard Rating Systems

NFPA Ratings:	**HMIS Ratings:**
Health =2	Health =1
Flammability =0	Flammability =0
Instability =0	Physical Hazard =3
Special = SA (CGA recommends this to designate Simple Asphyxiant).	

Standard valve connections

Threaded	CGA-320
Pin-Indexed Yoke	CGA-940 (Medical Use)
Use the proper CGA connections **Do Not Use Adapters.**	

End of Documents