Safety data sheet
Carbon dioxide, refrigerated liquid.

Creation date: 05/12/2015 Revision date: 01/13/2017

Section 1: IDENTIFICIATION

1.1 Product Identifier Information

Name:	Carbon dioxide, refrigerated liquid
CAS No.:	124-38-9
Chemical formula:	CO2

1.2 Known uses Beverage, Food, and Industrial

1.3 Details of Company Information

Carbonic Systems Incorporated
905 Lackawanna Avenue
Elmira, NY 14901
800.727.9676 Phone
607.734.6438 Fax
www.carbonic.com

1.4 Emergency phone numbers

1.800.727.9676 Carbonic Systems

CHEMTEL – 24hr/day 7days/week, within the US 1-800-255-3924

Section 2: HAZARDS IDENTIFICATION

2.1 GHS Classification Gasses under pressure, Contains refrigerated gas, May cause cryogenic burns or injury, Simple Asphyxiate

2.2 GHS Label Elements

Pictograms:

Signal word: Warning

Hazard Statements:
H281: Contains refrigerated gas; may cause cryogenic burns or injury.
OSHA-101: May displace oxygen and cause rapid suffocation.
CGA-HG03: May increase respiration and heartrate.

Precautionary Statements:	P202: Do not handle until all safety precautions have been read and understood. P271 + P403: Use and store only outdoors or in a well-ventilated place. P282: Wear neoprene gloves, eye protection, face shield, protective clothing and cold insulating gloves. CGA-PG05: Use back flow preventive device in the piping. CGA-PG24: DO NOT change or force fit connections. CGA-PG06: Close valve after each use and when empty.
2.3 Other Hazards:	Asphyxiant in high concentrations Contact with liquid may cause cold burns/frostbite.

Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substance

Components:	Carbon dioxide
CAS No:	124-38-9
Volume:	>99%

Section 4: FIRST AID MEASURES

4.1 Description of first aid measures

Inhalation:	In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Low concentrations of CO2 cause increased respiration and headache. Remove victim to uncontaminated area wearing self-contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
Skin/eye contact:	Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Get immediate medical attention.
Ingestion:	Ingestion is not considered a potential route of exposure.

4.2 Most important symptoms and effects

No additional information available

Section 5: FIRE FIGHTING MEASURES

5.1 Extinguishing Media

Suitable extinguishing media: Use extinguishing media appropriate for surrounding fire.

5.2 Specific methods:

Special Instructions: If possible, stop flow of product. Move container away or cool with water from a protected position.

5.3 Advice for firefighters

Firefighting instructions: **D**ANGER! Extremely cold liquid and gas under pressure. Do not discharge sprays directly into liquid; cryogenic liquid can freeze water rapidly.
Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 subpart L – Fire Protection.

5.4 Other Information

Cryogenic liquid causes severe frostbite, a burn like injury. Heat of fire can build pressure in a closed container and cause it to rupture.

Section 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions

General Measures: Evacuate area. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Ensure adequate air ventilation.

6.2 Environmental precautions

Try to stop release. Prevent from entering sewers, basements and
work pits, or any place where its accumulation can be dangerous.

6.3 Clean-up methods

Ventilate area.

Section 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Precautions for safe handling Never allow any unprotected part of the body to touch uninsulated pipes or vessels that contain cold fluids. The extremely cold metal will cause moist flesh to stick fast and tear when one attempts to withdraw from it. Use an adjustable strap wrench to

remove over-tight or rusted caps. Close valve after each use and when empty. If user has trouble, operating cylinder valve discontinue use and contact supplier. Never put cylinders into trunks of cars or unventilated areas of passenger vehicles. Never attempt to refill a compressed gas cylinder without the owner's written consent. Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit. For applications with moist Carbon Dioxide, 316, 309 and 310 stainless steels may be used as well as Hastelloy® A, B, it C and Monel®. Ferrous nickel alloys are slightly susceptible to corrosion. At normal temperatures, carbon dioxide is compatible with most plastics and elastomers. For additional storage recommendations, consult Compressed Gas Association's Pamphlets P-1,AV-7, G-6, G-6.1, G-6.2, G6.3, G-6.5, G-6.7, G-6.9, PS-5,TB-10, and SB-2.

7.2 Conditions for safe storage

Safe storage:

Protect from physical damage. Cylinders should be stored upright with valve protection cap in place and firmly secured to prevent falling. Store in cool, dry, well-ventilated area of non-combustible construction away from heavily trafficked areas and emergency exits. Keep at temperatures below 52°C / 125°F. Full and empty cylinders should be segregated. Use a "first in-first out" inventory system to prevent full cylinders from being stored for excessive periods. Always store and handle compressed gas cylinders in accordance with Compressed Gas Association, pamphlet CGA-P1, Safe Handling of Compressed Gases in Containers.

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Exposure Limits

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Carbon Dioxide 124-38-9	STEL = 30000 ppm TWA: 5000 ppm	TWA: 5000 ppm TWA: 9000 mg/m^3 (vacated) TWA: 10000 ppm (vacated) TWA: 18000 mg/m^3 (vacated) STEL: 30000 ppm (vacated) STEL: 54000 mg/m^3	IDLH: 40000 ppm TWA: 5000 ppm TWA: 9000 mg/m^3 STEL: 54000 mg/m^3 STEL: 30000 ppm

Remarks: Simple asphyxiate

8.2 Exposure Control

Engineering measures:	Provide natural or mechanical ventilation to prevent accumulation above exposure limits. Natural or mechanical to prevent oxygen deficient atmospheres below 19.5% oxygen. Keep self-contained breathing apparatus readily available for emergency use.

8.3. Personal protective equipment

Respiratory protection:	Self-contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmosphere. Air purifying respirators will not provide protection. Users of breathing apparatus must be trained.
Hand protection**:**	Wear working gloves when handling gas containers. If the operation involves possible exposure to a cryogenic liquid, wear loose fitting thermal insulated or cryo-gloves. Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Eye protection**:**	Safety glasses recommended when handling cylinders. Wear goggles and a face shield when trans filling or breaking transfer connections.
Skin and body protection:	Never allow any unprotected part of the body to touch uninsulated pipes or vessels which contain cryogenic fluids. The extremely cold metal will cause the flesh to stick fast and tear when one attempts to withdraw from it. Safety shoes are recommended when handling cylinders.
Special instructions for protection and hygiene**:**	Ensure adequate ventilation, especially in confined areas.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance/Color:	Colorless liquid.
Odor:	None
Molecular weight:	44 g/mol
Melting point:	-56,6 °C
Sublimation point:	-78,5 °C
Critical temperature:	31 °C
Relative density, gas:	1,52
Relative density, liquid:	0,82
Solubility mg/l water:	2000 mg/l

9.2 Other data

Additional information:	Gas/vapor heavier than air. May accumulate in confined spaces, particularly at or below ground level.

Section 10: STABILITY AND REACTIVITY

10.1 Reactivity

No reactivity hazard other than the effects described in sub-sections below.

10.2 Chemical Stability:

Stable under normal conditions

10.3 Possibility of hazardous reactions

No data available

10.4 Materials to avoid

None under recommended storage and handling conditions (see section 7)

10.5 Incompatible materials

Alkali metals, Alkaline earth metals, Acetylide forming metals, Chromium, Titanium >1022*F (550*C), Uranium (U)>1382*F (750*C), Magnesium >1472*F (775*C)

10.6 Hazardous decomposition product

Electrical discharges and high temperatures decompose carbon dioxide into carbon monoxide and oxygen.

Section 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

No known toxicological effects from this product.

Section 12: ECOLOGICAL INFORMATION

12.1 Information on ecological effects

When discharged in large quantities may contribute to the greenhouse effect.

12.2 Global Warming Potential:

GWP 1

Section 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Do not discharge into any place where its accumulation could be dangerous. To atmosphere in a well ventilated place. Discharge to atmosphere in large quantities

should be avoided. Contact supplier if guidance is required.

Section 14: TRANSPORT INFORMATION

14.2 Information for transportation

ADR/RID

Class:	2
Classification Code:	3A
UN number and proper shipping name:	UN 2187 Carbon dioxide, refrigerated, liquid
Labels:	2.2
Hazard number:	22
Packing Instruction:	P203

IMDG

Class:	2.2
UN number and proper shipping name:	UN 2187 Carbon dioxide, refrigerated, liquid
Labels:	2.2
Packing Instruction:	P203
EmS:	FC;SV

IATA

Class:	2.2
UN number and proper shipping name:	UN 2187 Carbon dioxide, refrigerated, liquid
Labels:	2.2
Packing Instruction:	P203

14.2 Other transport information

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. Ensure adequate ventilation. Avoid transport on vehicles where the load space is not separated from the driver's compartment. Before transporting product containers ensure that they are firmly secured. Ensure compliance with applicable regulations.

Section 15: REGULATORY INFORMATION

15.1 Federal Regulations

TSCA:	United States Toxic Substances Control Act Section 8(b) Inventory – Complies
SARA 313:	Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title

	40 of the Code of Federal Regulations, Part 372. SARA 311/312 Hazard Categories: Acute Health Hazard: Yes, Chronic Health Hazard: No, Fire Hazard: No, Sudden Release of Pressure Hazard: Yes, Reactive Hazard: No
Clean Water Act:	This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).
Clean Air Act:	Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61) This product does not contain any substances regulated as hazardous air pollutants (HAPS) under Section 112 of the Clean Air Act Amendments of 1990.
CERCLA/SARA:	This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

Section 16: OTHER INFORMATION

16.1 Other general information

Ensure all national/local regulations are observed. The hazard of asphyxiation is often overlooked and must be stressed during operator training. Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

16.2 Other Information

HAZARD RATINGS:

NFPA RATINGS:		**HMIS RATINGS:**	
HEALTH:	**1**	**HEALTH:**	**0**
FLAMMABILITY:	**0**	**FLAMMABILITY:**	**0**
REACTIVITY:	**0**	**REACTIVITY:**	**0**
SPECIAL:	**SA***		

***Compressed Gas Association recommendation to designate simple asphyxiant.**

END OF DOCUMENT