Carbon Dioxide

Sid Harvey item #'s CO2X50-VAPOR & CO2X50-LIQUID SDS# Z0784

1 PRODUCT AND COMPANY IDENTIFICATION

Product Identifier:	Carbon Dioxide
Common Name:	Carbon Dioxide
SDS Number:	11
Revision Date:	10/21/2015
Version:	2.0
CAS Number:	124-38-9
Chemical Formula:	CO2
Product Use:	Industrial Use, Medical and Food Applications
Supplier Details:	Roberts Oxygen Company, Inc. P.O. Box 5507 Rockville, MD 20855
Emergency:	Chemtrec: 24 hr/day 7 days/wk (800) 424-9300: for spills, leaks, fire, exposure or accidents involving this product
Phone:	Customer Service: (301) 948-8100, Mon through Fri from 7:30 am to 5:00 pm ET
Web:	www.robertsoxygen.com

2 HAZARDS IDENTIFICATION

Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS):

Physical, Gases Under Pressure, Liquefied Gas

GHS Label elements, including precautionary statements

GHS Signal Word: **WARNING**

GHS Hazard Pictograms:

GHS Hazard Statements:

H280 - Contains gas under pressure; may explode if heated
OSHA-H01 - MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION.
CGA-HG01 - MAY CAUSE FROSTBITE.
CGA-HG03 - MAY INCREASE RESPIRATION AND HEART RATE.

GHS Precautionary Statements:

P202 - Do not handle until all safety precautions have been read and understood.
P261 - Avoid breathing dust/fume/gas/mist/vapors/spray.
P262 - Do not get in eyes, on skin, or on clothing.
P271+P403 - Use only outdoors or in a well-ventilated area.
P304+P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P336 - Thaw frosted parts with lukewarm water. Do not rub affected areas.
P313 - Get medical advice/attention.
OSHA-PG01 - DO NOT REMOVE THIS PRODUCT LABEL (or equivalent wording).
CGA-PG05 - Use a back flow preventive device in the piping.
CGA-PG10 - Use only with equipment rated for cylinder pressure.
CGA-PG06 - Close valve after each use and when empty.
CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52 °C (125 °F).
CGA-PG27 - Read and follow the Safety Data Sheet (SDS) before use.

3 COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients:

Cas#	%	Chemical Name
124-38-9	100%	Carbon dioxide

4 FIRST AID MEASURES

Inhalation: Remove to fresh air and keep comfortable for breathing. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration. Get medical attention immediately.

Skin Contact: For dermal contact or suspected frostbite, remove contaminated clothing and flush affected areas with lukewarm water. DO NOT USE HOT WATER. A physican should see the patient promptly if contact with the product has resulted in blistering of the dermal surface or in deep tissue freezing.

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.

Symptoms and Effects, Acute and Delayed:
Simple asphyxiant. May cause suffocation by displacing the oxygen in the air. Exposure to oxygen-deficient atmosphere (<19.5%) may cause dizziness, drowsiness, nausea, vomiting, excess salivation, diminished mental alertness, loss of consciousness and death. Exposure to atmospheres containing 8-10% or less oxygen will bring about unconsciousness without warning and so quickly that the individuals cannot help or protect themselves. Lack of sufficient oxygen may cause serious injury or death. Depending on concentration and duration of exposure to carbon dioxide may cause increased respirations, headache, mild narcotic effects, increased blood pressure and pulse, and asphyxiation. Symptoms of overexposure become more apparent when atmospheric oxygen is decreased to 15-17%. Contact with liquid may cause cold burns/frostbite.

5 FIRE FIGHTING MEASURES

Flammability:	N/a
Flash Point:	N/a
Flash Point Method:	N/a
Burning Rate:	N/a
Autoignition Temp:	N/a
LEL:	N/a

Fire Fighting Instructions:

Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire 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.

Compressed gas: Asphyxiant, suffocation hazard by lack of oxygen

Special Protective Clothing and Equipment: SCBA for fire fighters

Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas containers to rupture. Cool endangered containers with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems. Stop flow of product if safe to do so. Use water spray or fog to knock down fire fumes if possible.

6 ACCIDENTAL RELEASE MEASURES

Stop the release or leak if safe to do so.
Evacuate the area and ensure adequate ventilation.
Wear self-contained breathing apparatus (SCBA) when entering area, unless the atmosphere is proven to be safe.

7 HANDLING AND STORAGE

Handling Precautions:

Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cap. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. 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. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents.

For additional storage recommendations, consult Compressed Gas Association's Pamphlet P-1.

Storage Requirements:

Store in a cool, well-ventilated place. Store and use with adequate ventilation. Store only where temperature will not exceed 125°F (52°C). Firmly secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods. OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE: When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a backflow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

For additional storage recommendations, consult Compressed Gas Association's Pamphlets P-1.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: Local exhaust ventilation to prevent accumulation of high concentrations and maintain air-oxygen levels at or above 19.5%. Oxygen detectors should be used when asphyxiating gases may be released. Systems under pressure should be regularly checked for leakages.

Personal Protective Equipment: Eye protection: Wear safety glasses with side shields. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).

Hand protection: Handle gas containers with working gloves. Gloves must be inspected prior to use.

Respiratory Protections: Self-contained breathing apparatus (SCBA) or positive pressure airline masks are to be used in oxygen-deficient atmospheres.

Skin and body protection: Wear hand, head, and body protection to help prevent injury from process-associated hazards. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace and user process and may include arm protectors, hats, and shoulder protection worn over substantial clothing.

Hygiene measures: Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Other: Wear leather safety gloves and safety shoes when handling cylinders.

Carbon Dioixde, (124-38-9) Exposure Limits:
OSHA (TWA): 5000 ppm
ACGIH (TWA): 5000 ppm
NIOSH (TWA): 5000 ppm

9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Colorless gas		
Physical State:	Compressed liquefied gas	**Odor:**	No odor
Odor Threshold:	Not applicable	**Molecular Formula:**	CO_2
Particle Size:	Not applicable	**Solubility:**	Water: 0.145 mg/l
Spec Grav./Density:	8.74 lb/ft³	**Softening Point:**	Not applicable
Viscosity:	0.015 Centipoise	**Percent Volatile:**	Not applicable
Sat. Vap. Conc.:	Not applicable	**Heat Value:**	Not applicable
Boiling Point:	-78.5°C	**Freezing/Melting Pt.:**	No data available
Flammability:	Non-Flammable	**Flash Point:**	No data available
Partition Coefficient:	Not applicable	**Octanol:**	Not applicable
Vapor Pressure:	Not applicable	**Vapor Density:**	1.522
pH:	Not applicable	**VOC:**	Not applicable
Evap. Rate:	Not applicable	**Bulk Density:**	Not applicable
Molecular weight:	40 g/mol	**Auto-Ignition Temp:**	Not applicable
Decomp Temp:	Not applicable	**UFL/LFL:**	Not applicable

Triple Point (temp/pressure combination at which CO_2 can exist simultaneously as a solid, liquid or gas) -69.83°F

Temperature of solid: -109.25°F

10 STABILITY AND REACTIVITY

Stability:	No reactivity
Conditions to Avoid:	Due to the presence of carbon dioxide, carbonic acid is formed in the presence of moisture.
Materials to Avoid:	Certain reactive metals, hydrides, moist cesium monoxide, or lithium acetylene carbide diammino may ignite. Passing carbon dioxide over a mixture of sodium peroxide and aluminum or magnesium may explode. Decomposition products of arc welding and cutting originate from the volatilization, reaction, and oxidization of the material being worked
Hazardous Decomposition:	Oxygen, Carbon monoxide (CO)
Hazardous Polymerization:	None

11 TOXICOLOGICAL INFORMATION

Carbon dioxide (124-38-9) [100%]
Information on toxicological effects
Acute toxicity:
Oral LD50: No data available
Inhalation LC50
Dermal LD50
Other information on acute toxicity
Skin corrosion/irritation: No data available
Serious eye damage/eye irritation: No data available
Respiratory or skin sensitization: No data available
Germ cell mutagenicity: No data available
Carcinogenicity: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC, ACGIH, NTP, or OSHA.
Reproductive toxicity: No data available
Teratogenicity: No data available
Specific target organ toxicity - single exposure (Globally Harmonized System): No data available
Specific target organ toxicity - repeated exposure (Globally Harmonized System): No data available
Aspiration hazard: No data available
Potential health effects: Inhalation: May be harmful if inhaled. May cause respiratory tract irritation. Ingestion: May be harmful if swallowed. Skin: May cause severe frostbite. May be harmful if absorbed through skin. May cause skin and eye irritation. Aggravated: Acts as a simple asphyxiant by displacing air.
Medical Signs and Symptoms of Exposure: Nausea, Dizziness, Headache. Low to medium concentrations of carbon dioxide can: affect regulation of blood circulation, the acidity of body fluids, respiratory difficulties. At high concentrations: Breathing difficulties, increased pulse rate, change in body acidity. Very high concentrations can cause: Unconsciousness, death.
Synergistic effects: No data available

12 ECOLOGICAL INFORMATION

Carbon dioxide (124-38-9) [100%]
Information on ecological effects
Toxicity: No data available
Persistence and degradability: No data available
Bioaccumulative potential: No data available
Mobility in soil: No data available
PBT and vPvB assessment: No data available
Other adverse effects: No data available

13 DISPOSAL CONSIDERATIONS

Waste treatment methods:
May be vented to atmosphere in a well-ventilated place. Do not discharge into any place where its accumulation could be dangerous.

Waste disposal recommendations:
Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

14 TRANSPORT INFORMATION

UN1013, Carbon dioxide, 2.2

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 cylinders, ensure there is adequate ventilation. Ensure that cylinders are firmly secured. Ensure cylinder valve is closed and not leaking. Ensure valve outlet cap (where provided) is correctly fitted. Ensure valve protection device (where provided) is correctly fitted.

15 REGULATORY INFORMATION

Component (CAS#) [%] - CODES

Carbon dioxide (124-38-9) [100%] MASS, OSHAWAC, PA, TSCA, TXAIR

Listed on the United States TSCA (Toxic Substances Control Act) inventory
SARA Section 311/312 Hazard Classes: Sudden release of pressure hazard, Fire hazard

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Regulatory CODE Descriptions
-----------------------------------------------------------------
MASS = MA Massachusetts Hazardous Substances List
OSHAWAC = OSHA Workplace Air Contaminants
PA = PA Right-To-Know List of Hazardous Substances
TSCA = Toxic Substances Control Act
TXAIR = TX Air Contaminants with Health Effects Screening Level
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16 OTHER INFORMATION

The information contained in this Safety Data Sheet is believed reliable, based on technical information and industry experience. Roberts Oxygen Company, Inc. provides no warranties or guarantees pertaining to the information provided in connection with the safety suggestions made. Moreover, it should not be assumed that every acceptable safety procedure, precaution, or device is listed. Abnormal or unusual circumstances may warrant or suggest further requirements or additional precautions. Roberts Oxygen Company, Inc. requests Users to thoroughly review this SDS and become aware of the product hazards and safety information. It is the User's responsibility to determine the conditions for safe use of the product and to confirm the compatibility of any other materials in their use or processes that come in contact with this product.

User acknowledges that the chemicals listed may be hazardous and must be handled accordingly. User further acknowledges its understanding that the chemicals listed may be classified by OSHA as hazardous chemicals, and that there are hazards associated with the possession, transportation and use of the chemical(s), containers, and related equipment and that the User must take proper account of those hazards and deal with them appropriately.

User shall warn all persons who may be exposed to any hazards relating to the chemical(s), containers, and related equipment. User acknowledges that the Seller has supplied the User with all relevant (Material) Safety Data Sheets (SDS) relating to the Products, and that additional copies of the SDS are available on request. OSHA regulations require User to develop and implement a written chemical hazard communications program for its employees regarding all hazardous chemicals.

Further, federal, state and local regulations may exist that are not addressed.