

SECTION 1: IDENTIFICATION

1.1. Product Identifier

Product Form: Substance

Product Name: Carbon dioxide, refrigerated liquid

CAS-No.: 124-38-9

Formula: CO₂

1.2. Intended Use of the Product

Use of the Substance/Mixture: Industrial use, Medical applications, Food applications

1.3. Name, Address, and Telephone of the Responsible Party

Company

High Precision Gas LLC

10770 Painter Avenue

Santa Fe Springs, CA 90670

1-866-868-6525

www.highprecisiongas.com

1.4. Emergency Telephone Number

Emergency Number : Professional Emergency Resource Services (PERS)
(800) 633-8253 24 / 7 / 365

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the Substance or Mixture

Refrigerated liquefied gas H281

Full text of hazard classes and H-statements : see section 16

2.2. Label Elements

GHS-US Labeling

Hazard Pictograms (GHS-US) :



GHS04

Signal Word (GHS-US) :

WARNING

Hazard Statements (GHS-US) :

H281 - CONTAINS REFRIGERATED GAS; MAY CAUSE CRYOGENIC BURNS OR INJURY
OSHA-H01 - MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION
CGA-HG03 - MAY INCREASE RESPIRATION AND HEART RATE

Precautionary Statements (GHS-US) :

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 cold insulating gloves/face shield/eye protection
CGA-PG05 - Use a 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
CGA-PG23 - Always keep container in upright position

2.3. Other Hazards

Asphyxiant in high concentrations. Contact with liquid may cause cold burns/frostbite.

2.4. Unknown Acute Toxicity (GHS-US)

No data available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substance

Name	Product Identifier	%
Carbon dioxide, refrigerated liquid (Main constituent)	(CAS-No.) 124-38-9	100

Full text of H-phrases: see section 16

3.2. Mixture

Not applicable

Carbon dioxide, refrigerated liquid

Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

SECTION 4: FIRST AID MEASURES

4.1. Description of First-aid Measures

First-aid Measures After Inhalation: Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

First-aid Measures After Skin Contact: The liquid may cause frostbite. For exposure to liquid, immediately warm frostbite area with warm water not to exceed 105°F (41°C). Water temperature should be tolerable to normal skin. Maintain skin warming for at least 15 minutes or until normal coloring and sensation have returned to the affected area. In case of massive exposure, remove clothing while showering with warm water. Seek medical evaluation and treatment as soon as possible.

First-aid Measures After 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. Contact an ophthalmologist immediately.. Get immediate medical attention.

First-aid Measures After Ingestion: Ingestion is not considered a potential route of exposure.

4.2. Most Important Symptoms and Effects Both Acute and Delayed

No additional information available

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

None.

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing Media

Use extinguishing media appropriate for surrounding fire.

5.2. Special Hazards Arising From the Substance or Mixture

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

5.3. Advice for Firefighters

Firefighting Instructions: DANGER! Extremely cold liquid and gas under pressure. Take care not to direct spray onto vents on top of container. 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. 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.

Protection During Firefighting: Compressed gas: asphyxiant. Suffocation hazard by lack of oxygen.

Special protective equipment for fire fighters: Use self-contained breathing apparatus. Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.

Specific methods: Stop flow of product if safe to do so. 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. Use water spray or fog to knock down fire fumes if possible. If leaking do not spray water onto container. Water surrounding area (from protected position) to contain fire. Exposure to fire may cause containers to rupture/explode.

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. Venting vapors may obscure visibility. Air will condense on surfaces such as vaporizers or piping exposed to liquid or cold gas. Nitrogen, which has a lower boiling point than oxygen, evaporates first, leaving an oxygen-enriched condensate.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Evacuate area. Ensure adequate air ventilation. Wear self-contained breathing apparatus when entering area unless atmosphere is proven to be safe. Stop leak if safe to do so.

6.1.1. For Non-Emergency Personnel

No additional information available

6.1.2. For Emergency Personnel

No additional information available

6.2. Environmental Precautions

Try to stop release.

6.3. Methods and Materials for Containment and Cleaning Up

No additional information available

Carbon dioxide, refrigerated liquid

Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

6.4. Reference to Other Sections

See also sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Precautions for Safe Handling: 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 cover. 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 other precautions in using this product, see section 16.

7.2. Conditions for Safe Storage, Including Any Incompatibilities

Storage Conditions: 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 back flow 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.

7.3. Specific End Use(s)

None.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control Parameters

Carbon dioxide, refrigerated liquid (124-38-9)		
ACGIH	ACGIH TLV-TWA (ppm)	5000 ppm
ACGIH	ACGIH TLV-STEL (ppm)	30000 ppm
USA OSHA	OSHA PEL (TWA) (mg/m ³)	9000 mg/m ³
USA OSHA	OSHA PEL (TWA) (ppm)	5000 ppm
USA IDLH	US IDLH (ppm)	40000 ppm

8.2. Exposure Controls

- Appropriate Engineering Controls** : Oxygen detectors should be used when asphyxiating gases may be released. Ensure exposure is below occupational exposure limits (where available).
- Hand Protection** : Wear working gloves when handling gas containers.
- Eye and Face Protection** : Wear goggles and a face shield when transfilling or breaking transfer connections. Wear safety glasses when handling cylinders; vapor-proof goggles and a face shield during cylinder changeout or whenever contact with product is possible. Select eye protection in accordance with OSHA 29 CFR 1910.133.
- Skin and body protection** : Wear metatarsal shoes and work gloves for cylinder handling, and protective clothing where needed. Wear appropriate chemical gloves during cylinder changeout or wherever contact with product is possible. Select per OSHA 29 CFR 1910.132, 1910.136, and 1910.138. Select per OSHA 29 CFR 1910.132, 1910.136, and 1910.138.
- Respiratory Protection** : When workplace conditions warrant respirator use, follow a respiratory protection program that meets OSHA 29 CFR 1910.134, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable). Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).
- Thermal Hazard Protection** : Wear cold insulating gloves. Wear cold insulating gloves when transfilling or breaking transfer connections.

Carbon dioxide, refrigerated liquid

Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on Basic Physical and Chemical Properties

Molecular Weight	: 44 g/mol
Physical State	: Gas
Appearance	: Colorless gas
Odor	: No odor warning properties.
Odor Threshold	: No data available
pH	: 3.7 (carbonic acid)
Evaporation Rate	: No data available
Melting Point	: -78.5 °C
Freezing Point	: No data available
Boiling Point	: -78.4 °C
Flash Point	: No data available
Critical Temperature	: 31 °C
Auto-ignition Temperature	: Not applicable.
Decomposition Temperature	: No data available
Flammability (solid, gas)	: No data available
Vapor Pressure	: 5730 kPa
Critical Pressure	: 7375 kPa
Relative Vapor Density at 20°C	: No data available
Density	: 762 kg/m ³
Relative Gas Density	: 1.52
Relative Density	: 0.82
Solubility	: Water: 2000 mg/l Completely soluble.
Partition Coefficient: N-Octanol/Water	: 0.83
Viscosity	: No data available
Oxidizing properties	: None.

9.2. Other Information No additional information available

Sublimation Point	: -78.5 °C
Gas group	: Refrigerated liquefied gas
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:** None.
- 10.4. Conditions 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 > 1427°F (775°C).
- 10.6. Hazardous Decomposition Products:** Electrical discharges and high temperatures decompose carbon dioxide into carbon monoxide and oxygen. The welding process may generate hazardous fumes and gases. If using carbon dioxide for welding and cutting, see SDS, Carbon Dioxide Compressed.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on Toxicological Effects

Acute Toxicity: Not classified

Carbon dioxide, refrigerated liquid (124-38-9)

Additional information	Low concentrations of CO ₂ cause increased respiration and headache
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Carbon dioxide, refrigerated liquid

Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Skin corrosion/irritation: Not classified

pH: 3.7 (carbonic acid)

Serious eye damage/irritation: Not classified

pH: 3.7 (carbonic acid)

Respiratory or skin sensitization: Not classified

Germ cell mutagenicity: Not classified

Carcinogenicity: Not classified

Reproductive toxicity: Not classified

Specific target organ toxicity (single exposure): Not classified

Specific target organ toxicity (repeated exposure): Not classified

Aspiration hazard: Not classified

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ecology - general : No ecological damage caused by this product.

12.2. Persistence and Degradability

Carbon dioxide, refrigerated liquid (124-38-9)	
Persistence and Degradability	No ecological damage caused by this product.

12.3. Bioaccumulative Potential

Carbon dioxide, refrigerated liquid (124-38-9)	
Bioaccumulative Potential	No ecological damage caused by this product.
BCF fish 1	No bioaccumulation
Log Pow	0.83
Log Kow	Not applicable.

12.4. Mobility in Soil: No additional information available

Carbon dioxide, refrigerated liquid (124-38-9)	
Mobility in soil	No data available.
Ecology - soil	No ecological damage caused by this product.

12.5. Other Adverse Effects

Other Adverse Effects : Can cause frost damage to vegetation.

Effect on ozone layer : None

Global warming potential [CO₂=1] : 1

Effect on the global warming : When discharged in large quantities may contribute to the greenhouse effect

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste Treatment Methods

Waste Disposal Recommendations: Do not attempt to dispose of residual or unused quantities. Return container to supplier.

SECTION 14: TRANSPORT INFORMATION

The shipping description(s) stated herein were prepared in accordance with certain assumptions at the time the SDS was authored and can vary based on several variables that may or may not have been known at the time the SDS was issued.

In Accordance with DOT

Transport document description : UN2187 Carbon dioxide, refrigerated liquid, 2.2

UN-No.(DOT) : UN2187

Proper Shipping Name (DOT) : Carbon dioxide, refrigerated liquid

Class (DOT) : 2.2 - Class 2.2 - Non-flammable compressed gas 49 CFR 173.115

Hazard labels (DOT) : 2.2 - Non-flammable gas

DOT Special Provisions (49 CFR 172.102) : T75 - When portable tank instruction T75 is referenced in Column (7) of the 172.101

Table, the applicable refrigerated liquefied gases are authorized to be transported in portable tanks in accordance with the requirements of 178.277 of this subchapter TP5 - For a portable tank used for the transport of flammable refrigerated liquefied gases or refrigerated liquefied oxygen, the maximum rate at which the portable tank may be filled must not exceed the liquid flow capacity of the primary pressure relief system rated at a pressure not exceeding 120 percent of the portable tank's design pressure. For portable tanks used for the transport of refrigerated liquefied helium and refrigerated liquefied atmospheric gas (except oxygen), the maximum rate at which the tank is filled must not



Carbon dioxide, refrigerated liquid

Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

exceed the liquid flow capacity of the pressure relief device rated at 130 percent of the portable tank's design pressure. Except for a portable tank containing refrigerated liquefied helium, a portable tank shall have an outage of at least two percent below the inlet of the pressure relief device or pressure control valve, under conditions of incipient opening, with the portable tank in a level attitude. No outage is required for helium

Additional information

Emergency Response Guide (ERG) : 120 (UN1013)
Number

Other information : No supplementary information available.

Special transport precautions : 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 there is adequate ventilation. - 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.

Transport by sea

UN-No. (IMDG) : 2187

Proper Shipping Name (IMDG) : CARBON DIOXIDE, REFRIGERATED LIQUID

Class (IMDG) : 2 - Gases

MFAG-No : 120

Transport by air

UN-No. (IATA) : 2187

Proper Shipping Name (IATA) : CARBON DIOXIDE, REFRIGERATED LIQUID

Class (IATA) : 2 - Gases

Civil Aeronautics Law : Gases under pressure/Gases nonflammable nontoxic under pressure

SECTION 15: REGULATORY INFORMATION

15.1. US Federal Regulations

Carbon dioxide, refrigerated liquid (124-38-9)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard Sudden release of pressure hazard

All components of this product are listed on the Toxic Substances Control Act (TSCA) inventory.

This product or mixture does not contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

15.2. International Regulations

CANADA

Carbon dioxide, refrigerated liquid (124-38-9)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

Carbon dioxide, refrigerated liquid (124-38-9)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

15.2.2 National Regulations

Carbon dioxide, refrigerated liquid (124-38-9)
Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)

Carbon dioxide, refrigerated liquid

Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on the Canadian IDL (Ingredient Disclosure List)
Listed on INSQ (Mexican National Inventory of Chemical Substances)
Listed on CICR (Turkish Inventory and Control of Chemicals)

15.3. US State Regulations

Carbon dioxide, refrigerated liquid(124-38-9)	
U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	U.S. - Massachusetts - Right to Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

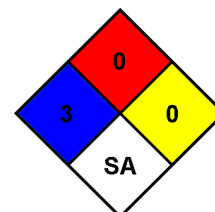
California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm.

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Date of Preparation or Latest Revision : 01/25/2021
Indication of Changes : Revision date.
Other Information : This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard 29 CFR 1910.1200

NFPA Rating

Health hazard : 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.
Fire hazard : 0 - Materials that will not burn.
Reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.
Specific hazard : SA - This denotes gases which are simple asphyxiants.



HMIS III Rating

Health : 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given
Flammability : 0 Minimal Hazard
Physical : 2 Moderate Hazard

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety, and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

SDS US (GHS HazCom)