

# Material Safety Data Sheet

Prepared according to US OSHA, CMA, ANSI and Canadian WHMIS Standards.

## CARBON DIOXIDE (GAS & LIQUID)



### Section 1. Chemical product and company identification

<b>Commercial name(s).</b>	<b>: CARBON DIOXIDE (GAS &amp; LIQUID)</b>
<b>MSDS no.</b>	10040
<b>Product use</b>	For carbonation, chilling and freezing, medical, inerting, pH control, fire protection, and general analytical/synthetic chemical uses.
<b>Manufactured/supplied</b>	
<b>Address</b>	2700 Post Oak Drive Houston, TX 77056-8229
<b>Emergency telephone number</b>	CHEMTREC: 1-800-424-9300
<b>Telephone no.</b>	
GENERAL MSDS INFORMATION	1-(713)-896-2896
Fax on Demand	1-(800)-231-1366

### Section 2. Hazards identification

<b>Physical state</b>	<b>:</b> Gas or liquefied gas.
<b>OSHA/HCS status</b>	<b>:</b> This material is classified hazardous under OSHA regulations in the United States and the WHMIS Controlled Product Regulation in Canada.
<b>Emergency overview</b>	<b>:</b> WARNING! HIGH PRESSURE GAS. GAS REDUCES OXYGEN AVAILABLE FOR BREATHING. Keep away from heat (<52°C/125°F). Use only with adequate ventilation. Extremely hazardous gas/liquid under pressure. Keep cylinder valve closed when the product is not used. Gas may accumulate in confined areas.
<b>Routes of entry</b>	<b>:</b> Inhalation. Dermal contact. Eye contact.
<b>Potential acute health effects</b>	
<b>Inhalation</b>	<b>:</b> Inhalation of this product may cause dizziness, an irregular heartbeat, narcosis, nausea or asphyxiation.
<b>Skin</b>	<b>:</b> No known significant effects or critical hazards.
<b>Eyes</b>	<b>:</b> No known significant effects or critical hazards.
<b>Ingestion</b>	<b>:</b> Ingestion of liquid can cause burns similar to frostbite. Since the product is a gas, it will probably be inhaled rather than ingested. See above.
<b>Potential chronic health effects</b>	<b>:</b> Carcinogenic effects: Not classified or listed by IARC, NTP, OSHA, EU and ACGIH. Mutagenic effects: Not available. Teratogenic effects: Not available.
<b>Over-exposure signs/symptoms</b>	
<b>Inhalation</b>	<b>:</b> No specific data.
<b>Ingestion</b>	<b>:</b> No specific data.
<b>Skin</b>	<b>:</b> No specific data.
<b>Eyes</b>	<b>:</b> No specific data.
<b>Medical conditions aggravated by over-exposure</b>	<b>:</b> Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (section 11)

## Section 3. Composition, Information on Ingredients

	CAS number	mole %
<b>Canada</b> Carbon Dioxide	124-38-9	> 99.5

### United States

Chemical name	CAS #	mole %	Occupational exposure limits	IDLH
Carbon dioxide	124-38-9	> 99.5	<b>ACGIH TLV (United States, 1/2004).</b> STEL: 54000 mg/m <sup>3</sup> 15 minute(s). Form: All forms. STEL: 30000 ppm 15 minute(s). Form: All forms. TWA: 9000 mg/m <sup>3</sup> 8 hour(s). Form: All forms. TWA: 5000 ppm 8 hour(s). Form: All forms. <b>NIOSH REL (United States, 12/2001).</b> STEL: 54000 mg/m <sup>3</sup> 15 minute(s). Form: All forms. STEL: 30000 ppm 15 minute(s). Form: All forms. TWA: 9000 mg/m <sup>3</sup> 10 hour(s). Form: All forms. TWA: 5000 ppm 10 hour(s). Form: All forms. <b>OSHA PEL (United States, 8/1997).</b> TWA: 9000 mg/m <sup>3</sup> 8 hour(s). Form: All forms. TWA: 5000 ppm 8 hour(s). Form: All forms.	40000 ppm

NE: Not Established

C: Ceiling Limit

See Section 16 for possible acronym definitions

See Sections 8, 11, 14 and 15 for details.

## Section 4. First aid measures

Prompt medical attention is mandatory in all cases of overexposure to this gas. Rescue personnel should wear a self-contained breathing apparatus.

- Inhalation** : If inhaled, remove to fresh air. If not breathing, give artificial respiration. Get medical attention if symptoms appear.
- Skin contact** : Not applicable.
- Eye contact** : Not applicable.
- Ingestion** : Since the product is a gas, it will probably be inhaled rather than ingested. See above.
- Notes to physician** : The medical doctor must be warned that the person may suffer from anoxia.

## Section 5. Fire fighting measures

- Flammability of the product** : Non-flammable.
- Products of combustion** : Decomposition products may include the following materials:  
carbon dioxide  
carbon monoxide
- Explosion hazards in the presence of various substances** : Container explosion may occur under fire conditions or when heated.
- Fire-fighting media and instructions** : Use an extinguishing agent suitable for the surrounding fire.

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Contains gas under pressure. In a fire or if heated, a pressure increase will occur and the container may burst or explode.

**Special protective equipment for fire-fighters**

: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## Section 6. Accidental release measures

**Personal precautions**

: EVACUATE ALL PERSONNEL FROM AFFECTED AREA.  
Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with an inert gas prior to attempting repairs. If leak is on cylinder or cylinder valve, contact the closest Air Liquide location.

**Environmental precautions**

: In case of a leak, clear the affected area, protect people, eliminate sources of ignition and respond with trained personnel.

If leaking incidentally from the cylinder or its valve, contact your supplier. Use non-sparking tools and equipment during the response.

**Methods for cleaning up**

: Contact your local Air Liquide Gas supplier for details.

## Section 7. Handling and storage

**Handling**

: Valve protection caps must remain in place unless cylinder is secured with valve outlet piped to usage point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure regulator when connecting cylinder to lower pressure piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow to the cylinder. Do not tamper with (valve) safety device. Close valve after each use and when empty.

**Storage**

: Protect cylinders from physical damage. Store in cool, dry, well-ventilated area of non combustible construction away from heavy traffic areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 52°C/125°F. Cylinders must be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Prevent full cylinders being stored for excessive periods of time. Post "No Smoking or Open Flames" signs in the storage or use area. There should be no source of ignition in the storage or use area.

## Section 8. Exposure controls/personal protection

**Engineering controls**

: Use only in well-ventilated areas. Gas is heavier than air and will therefore accumulate in low lying areas.

**Personal protection**

**Respiratory**

: Maintain oxygen levels above 19.5% in the workplace. Use supplied air respiratory protection if oxygen levels are below 19.5% (air purifying respirators will not function) or during emergency response to a release of this gas. During an emergency situation, before entering the area, check for oxygen-deficient atmospheres. If respiratory protection is required, follow the requirements of the Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), or equivalent State standard.

**Hands**

: Wear leather gloves when handling cylinders of this gas. Otherwise, wear glove protection appropriate to the specific operation for which this gas is used.

**Eyes**

: Safety glasses with side shields.

**Skin/Body**

: Use body protection appropriate for task. Cotton clothing is recommended for use to prevent static electric build-up. Pressurized product may require use of fire retardant clothing.

Metal cap, safety shoes are recommended when handling cylinders.



Some applications of this product may require additional or other specific protective clothings. Please consult your supervisor.

**Personal protection in case of a major leak** : Safety glasses with side shields, goggles or face shield. Impervious gloves. Protective clothing. Metal cap, safety shoes. Wear MSHA/NIOSH-approved self-contained breathing apparatus or equivalent and full protective gear.

**Product name**  
**Canada**

Carbon dioxide

**Exposure limits**

**ACGIH TLV (United States, 1/2006).**

STEL: 54000 mg/m<sup>3</sup> 15 minute(s).

TWA: 9000 mg/m<sup>3</sup> 8 hour(s).

**United States**

Carbon dioxide

**ACGIH TLV (United States, 1/2006).**

STEL: 54000 mg/m<sup>3</sup> 15 minute(s).

TWA: 9000 mg/m<sup>3</sup> 8 hour(s).

**NIOSH REL (United States, 12/2001).**

STEL: 54000 mg/m<sup>3</sup> 15 minute(s).

TWA: 9000 mg/m<sup>3</sup> 10 hour(s).

**OSHA PEL (United States, 11/2006).**

TWA: 9000 mg/m<sup>3</sup> 8 hour(s).

**NE: Not Established**

## Section 9. Physical and chemical properties

<b>Physical state</b>	: Gas or liquefied gas.
<b>Color</b>	: Colorless.
<b>Odor</b>	: Odorless.
<b>Molecular weight</b>	: 44.01 g/mole
<b>Molecular formula</b>	: CO <sub>2</sub>
<b>Boiling/condensation point</b>	: -78.55°C (-109.4°F)
<b>Melting/freezing point</b>	: Sublimation temperature: -78.5°C (-109.3°F)
<b>Critical temperature</b>	: 30.9°C (87.6°F)
<b>Specific gravity</b>	: 1.56 (Air = 1)
<b>Vapor density</b>	: 1.53 [Air = 1]
<b>Solubility</b>	: Partially soluble in the following materials: cold water.

## Section 10. Stability and reactivity

<b>Stability and reactivity</b>	: The product is stable.
<b>Hazardous decomposition products</b>	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
<b>Hazardous polymerization</b>	: Under normal conditions of storage and use, hazardous polymerization will not occur.

## Section 11. Toxicological information

**Toxicity data**

**IDLH** : 40000 ppm

**Acute Effects**

<b>Inhalation</b>	: Inhalation of this product may cause dizziness, an irregular heartbeat, narcosis, nausea or asphyxiation.
<b>Skin</b>	: No known significant effects or critical hazards.
<b>Eyes</b>	: No known significant effects or critical hazards.
<b>Ingestion</b>	: Ingestion of liquid can cause burns similar to frostbite. Since the product is a gas, it will probably be inhaled rather than ingested. See above.

**Potential chronic health effects** : Carcinogenic effects: Not classified or listed by IARC, NTP, OSHA, EU and ACGIH.  
 Mutagenic effects: Not available.  
 Teratogenic effects: Not available.

**Section 12. Ecological information**




**Products of degradation** : This gas is released as is in the atmosphere.

**Section 13. Disposal considerations**

**Disposal** : Residual materials contained in customer-owned cylinders should be disposed of in accordance with Federal, State and Local regulations on waste management. For residual materials contained in cylinders owned by Air Liquide, contact Sales or Customer Service to determine appropriate disposal. Do not return cylinders without authorization from Air Liquide.

**14 . Transport information**

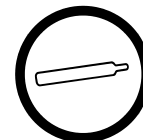
**AERG** : 120

Regulatory information	Proper shipping name	Class	UN number	PG	Label
<b>UN / IMDG / IATA Classification</b>	CARBON DIOXIDE	2.2	UN1013	-	
<b>DOT Classification</b>	CARBON DIOXIDE	2.2	UN1013	-	
<b>TDG Classification</b>	CARBON DIOXIDE	2.2	UN1013	-	
<b>Additional information</b>	<b>UN</b>	<b>IMDG</b>	<b>IATA</b>	<b>DOT</b>	<b>TDG</b>
	-	-	<u>Passenger and Cargo Aircraft</u> Quantity limitation: 75 kg	<u>Limited quantity</u> Yes.	-
			<u>Cargo Aircraft Only</u> Quantity limitation: 150 kg	<u>Packaging instruction</u> <b>Passenger aircraft</b> Quantity limitation: 75 kg  <b>Cargo aircraft</b> Quantity limitation: 150 kg	

Cylinders should be transported in a secure position, in a well ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present serious safety hazards and should be discouraged.

**Section 15. Regulatory information**

**Canada WHMIS (Canada)** : Class A: Compressed gas.



**Canada inventory:** This material is listed or exempted.  
 CEPA DSL: All components listed.

**United States**

**OSHA HAZARD COMMUNICATION STANDARD (29CFR PART 1910.1200).**

Compressed gas  
Target organ effects

**SARA 302/304 emergency planning and notification:** No products were found.

**SARA 311/312 MSDS distribution - chemical inventory - hazard identification:** Carbon dioxide: Sudden release of pressure, Immediate (acute) health hazard, Delayed (chronic) health hazard

**CERCLA: Hazardous substances.:** No products were found.

**US INVENTORY (TSCA)**

TSCA 8(b) inventory: All components listed.

**State regulations**

**California prop. 65:** No products were found.

**Connecticut Carcinogen Reporting:** This material is not listed.

**Connecticut Hazardous Material Survey:** This material is not listed.

**Florida substances:** This material is not listed.

**Illinois Chemical Safety Act:** This material is not listed.

**Illinois Toxic Substances Disclosure to Employee Act:** This material is not listed.

**Louisiana Reporting:** This material is not listed.

**Louisiana Spill:** This material is not listed.

**Massachusetts Spill:** This material is not listed.

**Massachusetts Substances:** This material is listed.

**Michigan Critical Material:** This material is not listed.

**Minnesota Hazardous Substances:** This material is not listed.

**New Jersey Hazardous Substances:** This material is listed.

**New Jersey Spill:** This material is not listed.

**New Jersey Toxic Catastrophe Prevention Act:** This material is not listed.

**New York Acutely Hazardous Substances:** This material is not listed.

**New York Toxic Chemical Release Reporting:** This material is not listed.

**Pennsylvania RTK Hazardous Substances:** This material is listed.

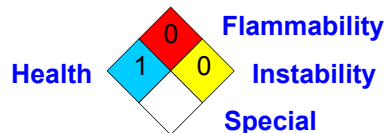
**Rhode Island Hazardous Substances:** This material is not listed.

**Section 16. Other information**

**Hazardous Material Information System (U.S.A.)** :

Health	1
Fire hazard	0
Reactivity	0
Personal protection	G

**National Fire Protection Association (U.S.A.)** :



Consult an Industrial Hygienist or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.

Further information about gas mixtures can be found in pamphlets published by: Compressed Gas Association Inc (CGA), 4221 Walney Road, 5th floor, Chantilly, VA 20151-2923 Telephone: (703) 788-2700.

**Acronyms**

- : ACGIH: American Conference of Governmental Industrial Hygiene.
- IARC: International Agency for Research on Cancer.
- NIOSH: National Institute of Occupational Safety and Health.
- OSHA: Occupational Safety and Health Administration
- NTP: National Toxicology program.
- OECD: Organisation for Economic Co-operation and Development.

PEL: Permissible Exposure Limit.  
IDLH: Immediately Dangerous to Life and Health.  
NE: Not established.  
C: Ceiling Limit.  
DSL: Domestic Substance List.  
NDSL: Non-Domestic Substance List.  
CFR: Code of Federal Regulations.  
TSCA: Toxic Substance Control Act.

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**Date of previous issue** : 06/30/2006  
**Version** : 4

**Notice to reader**

This Material Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR, 1910.1200, American National Standard Institute Z400.1, 2004, the Canadian Workplace Hazardous Material Information Systems (WHMIS). Other government regulations must be reviewed for applicability to this gas mixture. To the best of Air Liquide's knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness are not guaranteed and no warranties of any type, either express or implied, are provided. The information contained herein relates only to this specific product. If this gas mixture is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.

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