Material Safety Data Sheet

Carbon Dioxide (Gas/Liquid)

AIR LIQUIDE

Section 1. Chemical product and company identification

Commercial name(s). : **Carbon dioxide/*ALIGAL*™ 2/*ALIGAL* BEVERAGE**
Material uses : Various./Special atmospheres for food.
Supplier/Manufacturer : Air Liquide Canada Inc. 1250, René-Lévesque West, Suite 1700, Montreal, QC H3B 5E6
In case of emergency : (514) 878-1667

Section 2. Hazards identification

Physical state : Gas or liquefied gas.
Emergency overview : 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.

Routes of entry : Inhalation. Dermal contact. Eye contact.

Potential acute health effects

Inhalation : Inhalation of this product may cause dizziness, an irregular heartbeat, narcosis, nausea or asphyxiation.

Skin : Dermal contact with a rapidly evaporating liquid could result in freezing of the tissues or frostbite.

Eyes : Liquid or rapidly evolving gas can cause burns similar to frostbite.

Ingestion : Since the product is a gas, it will probably be inhaled rather than ingested. Consider first the preventive measures in case of inhalation. Ingestion of liquid can cause burns similar to frostbite.

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.

Medical conditions aggravated by over-exposure : None known.

Over-exposure signs/symptoms : Repeated or prolonged exposure to the substance can produce target organs damage.

See toxicological information (section 11)

Section 3. Composition, Information on Ingredients

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

This material is classified hazardous under the WHMIS Controlled Product Regulation in Canada.
See Chapters 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 : In case of inhalation, conscious persons should be assisted to an uncontaminated area and inhale fresh air. The person should be kept warmed and calm. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area, given assisted resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive.

Skin contact : Remove contaminated clothing and rinse affected skin with lukewarm water. Do not rinse with hot water. Provide medical prompt attention, frozen tissue is painless and appear waxy, with a possible yellow color. Frozen tissue will become swollen, painful and prone to infection when thawed.

Eye contact : Individual in contact with a gas should not wear contact lenses. Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 20 minutes. Get medical attention if symptoms occur.

Ingestion : Since the product is a gas, it will probably be inhaled rather than ingested. Consider first the preventive measures in case of inhalation.

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.

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. Adequate fire protection must be provided.

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 heavily trafficked 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. Use a "first in - first out" inventory system to 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 mixture. 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 mixture. Otherwise, wear glove protection appropriate to the specific operation for which this gas mixture 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 additionnal or other specific protective clothings. Please consult your supervisor.

Personal protection in case of a major leak : Safety glasses, goggles or face shield. Impervious gloves. Full suit. Metal cap, safety boots. Wear MSHA/NIOSH-approved self-contained breathing apparatus or equivalent and full protective gear.

Product name	Exposure limits
Canada	
Carbon dioxide	**CA Alberta Provincial (Canada, 10/2006).** 15 min OEL: 54000 mg/m³ 15 minute(s). 8 hrs OEL: 5000 ppm 8 hour(s). 15 min OEL: 30000 ppm 15 minute(s). 8 hrs OEL: 9000 mg/m³ 8 hour(s). **CA British Columbia Provincial (Canada, 7/2007).** TWA: 5000 ppm 8 hour(s). STEL: 15000 ppm 15 minute(s). **CA Ontario Provincial (Canada, 3/2007).** TWAEV: 5000 ppm 8 hour(s). TWAEV: 9000 mg/m³ 8 hour(s). STEV: 30000 ppm 15 minute(s). STEV: 54000 mg/m³ 15 minute(s). **CA Quebec Provincial (Canada, 12/2006).** TWAEV: 5000 ppm 8 hour(s). TWAEV: 9000 mg/m³ 8 hour(s). STEV: 30000 ppm 15 minute(s). STEV: 54000 mg/m³ 15 minute(s).

In Canadian provinces where no value is specifically suggested, the lowest value above should be used.
Consult local authorities for acceptable exposure limits.

Section 9. Physical and chemical properties

Physical state : Gas or liquefied gas.

Color : Colorless.

Odor : Odorless.

Molecular weight : 44.01 g/mole

Molecular formula : CO_2

Boiling/condensation point : -78.55°C (-109.4°F)

Melting/freezing point : Sublimation temperature: -78.5°C (-109.3°F)

Critical temperature : 30.9°C (87.6°F)

Specific gravity : 1.56 (Air = 1)

Vapor density : 1.53 [Air = 1]

Solubility : Partially soluble in the following materials: cold water.

Section 10. Stability and reactivity

Stability and reactivity : The product is stable.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

IDLH : 40000 ppm

Acute Effects

Inhalation : Inhalation of this product may cause dizziness, an irregular heartbeat, narcosis, nausea or asphyxiation.

Skin : Dermal contact with a rapidly evaporating liquid could result in freezing of the tissues or frostbite.

Eyes : Liquid or rapidly evolving gas can cause burns similar to frostbite.

Ingestion : Since the product is a gas, it will probably be inhaled rather than ingested. Consider first the preventive measures in case of inhalation. Ingestion of liquid can cause burns similar to frostbite.

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 : Do not attempt to dispose of the container or of its content. Return in the shipping container properly labeled, with any valve outlet plugs or caps secured and valve protection cap in place to Air Liquide Canada for proper disposal. For emergency disposal, contact the closest Air Liquide Canada location.

Section 14. Transport information

NAERG : 120

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label
TDG Classification	GAS: UN1013 LIQUID: UN2187	CARBON DIOXIDE CARBON DIOXIDE, refrigerated liquid	2.2 2.2	-	
IMDG Class	GAS: UN1013 LIQUID: UN2187	CARBON DIOXIDE CARBON DIOXIDE, refrigerated liquid	2.2 2.2	-	
IATA-DGR Class	GAS: UN1013 LIQUID: UN2187	CARBON DIOXIDE CARBON DIOXIDE, refrigerated liquid	2.2 2.2	-	

PG* : Packing group

Additional information

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.

UN	TDG	IMDG	IATA
-	-	-	**Passenger Aircraft** Quantity limitation: 75 kg **Cargo Aircraft Only** Quantity limitation: 150 kg

Section 15. Regulatory information

Canada

WHMIS (Canada) : Class A: Compressed gas.

Canadian lists : **CEPA Toxic substances**: This material is listed.
Canadian ARET: This material is not listed.
Canadian NPRI: This material is not listed.
Alberta Designated Substances: This material is not listed.
Ontario Designated Substances: This material is not listed.
Quebec Designated Substances: This material is not listed.

Canada inventory (DSL/NDSL) : This material is listed or exempted.

Section 16. Other information

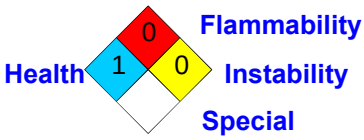
Hazardous Material Information System (U.S.A.)

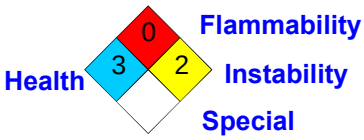
Gas.		Liquid.	
Health	1	Health	3
Fire hazard	0	Fire hazard	0
Physical Hazard	0	Physical Hazard	2
Personal protection	G	Personal protection	X

HAZARD RATINGS

4- Extreme
3- Serious
2- Moderate
1- Slight
0- Minimal

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





See section 8 for more detailed information on personal protection.

References : ANSI Z400.5, MSDS Standard, 2004. - Manufacturer's Material Safety Data Sheet. - Canada Gazette Part II, Vol. 122, No. 2. Registration SOR/88-64, 31 December 1987. Hazardous Products Act "Ingredient Disclosure List" - Canadian Transport of Dangerous Goods, Regulations and Schedules, Clear Language version 2005. CGA C-7 Guide to the Preparation of Precautionary Labels and Marking of Compressed Gas Containers. CGA P-20 Standard for Classification of Toxic Gas Mixtures. CGA P-23 Standard for Categorizing Gas Mixtures Containing Flammable and Nonflammable Components.

Date of issue : 06/30/2008
Date of previous issue : 06/30/2005
Version : 4

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