

Material Safety Data Sheet



Carbon Dioxide (Dry Ice)

Section 1. Chemical product and company identification

Commercial name(s). : Carbon Dioxide (Dry Ice)
Material uses : Refrigerant.
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 : Solid.
Emergency overview : USE WITH CARE.
Please also refer to the MSDS for carbon dioxide (Gas/Liquid) for more information on the gaseous form of this product.
Solid can cause burns similar to frostbite.
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 the solid could result in freezing of the tissues or frostbite.
Eyes : Solid can cause burns similar to frostbite.
Ingestion : Ingestion of solid can cause burns similar to frostbite.
Potential chronic health effects : **CARCINOGENIC EFFECTS:** Not available.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
Medical conditions aggravated by over-exposure : 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 %
Canada Carbon Dioxide (Dry Ice)	124-38-9	> 99

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 product. 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 this product 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** : If potentially dangerous quantities of this material have been swallowed, call a physician immediately. Do not induce vomiting unless directed to do so by medical personnel.
- 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** : Not considered to be a product presenting a risk of explosion.
- 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.
- No specific fire or explosion hazard.
- 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.
- Environmental precautions** : Avoid dispersal of spilled material.
- Methods for cleaning up** : Place spilled material in an appropriate container for disposal.

Section 7. Handling and storage

- Handling** : Avoid contact with eyes, skin and clothing. Carbon dioxide is generally delivered as blocks or pellets and should be placed in isolated containers with an upward opening so that sublimation vapors of CO₂ may be released. Dry ice should always be manipulated with pliers (blocks) or with appropriate tools.
- Storage** : Store in a dry, cool and well-ventilated area.

Section 8. Exposure controls/personal protection

- Engineering controls** : Use only in well-ventilated areas. Gas may accumulate in confined areas.
- Personal protection**
- Respiratory** : Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- Hands** : Wear insulated gloves.
- Eyes** : Safety glasses with side shields.
- Skin/Body** : Wear appropriate personal protective suit.
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, 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.

<u>Occupational exposure limits</u>		TWA (8 hours)			STEL (15 mins)			Ceiling		
Ingredient	List name	ppm	mg/m ³	Other	ppm	mg/m ³	Other	ppm	mg/m ³	Other
Carbon dioxide	US ACGIH 2/2010	5000	9000	-	30000	54000	-	-	-	-
	AB 4/2009	5000	9000	-	30000	54000	-	-	-	-
	BC 9/2010	5000	-	-	15000	-	-	-	-	-
	ON 7/2010	5000	9000	-	30000	54000	-	-	-	-
	QC 6/2008	5000	9000	-	30000	54000	-	-	-	-

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 : Solid.
Color : White.
Odor : Odorless.
Molecular weight : 44.01 g/mole
Molecular formula : CO₂
Melting/freezing point : Sublimation temperature: -78.5°C (-109.3°F)
Critical temperature : 30.9°C (87.6°F)
Specific gravity : 1.014
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

Toxicity data

Acute toxicity

IDLH : 40000 ppm

Acute Effects

Inhalation : Inhalation of this product may cause dizziness, an irregular heartbeat, narcosis, nausea or asphyxiation.
Skin : Dermal contact with the solid could result in freezing of the tissues or frostbite.
Eyes : Solid can cause burns similar to frostbite.
Ingestion : Ingestion of solid can cause burns similar to frostbite.
Potential chronic health effects : **CARCINOGENIC EFFECTS**: Not available.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.

Section 12. Ecological information

Aquatic ecotoxicity

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. 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	UN1845	CARBON DIOXIDE, Solid (Dry ice)	9	III	
IMDG Class	UN1845	CARBON DIOXIDE, Solid (Dry ice)	9	III	
IATA-DGR Class	UN1845	CARBON DIOXIDE, Solid (Dry ice)	9	III	

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

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TDG

Explosive Limit and Limited Quantity Index
5

Passenger Carrying Road or Rail Index
200

Special provisions
18, 81

IMDG

Emergency schedules (EmS)
F-C, S-V

IATA

Passenger and Cargo Aircraft Quantity limitation: 200 kg
Packaging instructions: 954
Cargo Aircraft Only Quantity limitation: 200 kg
Packaging instructions: 954
Limited Quantities - Passenger Aircraft Quantity limitation: Forbidden
Packaging instructions: Forbidden

Section 15. Regulatory information

Canada

WHMIS (Canada)

: Not controlled under WHMIS (Canada).

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/NDL)

: All components are listed or exempted.

Section 16. Other information

Hazardous Material Information System (U.S.A.) :	Health	3
	Fire hazard	0
	Physical Hazard	0
	Personal protection	G

National Fire Protection Association (U.S.A.) :	0	Flammability
	3	Health
	0	Instability
		Special

References :

- ANSI Z400.1, 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.

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