

Printing date 04/24/2009

Revision date 04/24/2009

1 Identification of Substance

Product Details

Trade Name: Carbon dioxide, gas 99 - 99.5%

Product No: G-8

Manufacturer/Supplier:

Linde
575 Mountain Avenue
Murray Hill, NJ 07974 USA
ph: 908-464-8100

Linde Gas Puerto Rico, Inc.
Las Palmas Village
Road No. 869, Street No. 7
Catano, Puerto Rico 00962
ph: 787-754-7445

Linde Canada Limited
5860 Chedworth Way
Mississauga, Ontario L5R 0A2
ph: 905-501-1700

Information Department:

Linde U.S. National Operations Center: 1-800-232-4726 (for US and Puerto Rico assistance)

Emergency Information:

For U.S & Puerto Rico, CHEMTREC 24-HOUR EMERGENCY TELEPHONE NUMBER: 800-424-9300
For Canada, 24-HOUR EMERGENCY TELEPHONE NUMBER: 905-501-0802

2 Hazards Identification

Hazard Description:

Odorless, colorless, nonflammable gas. Simple asphyxiant - this product does not contain oxygen and may cause asphyxia if released in a confined area. Maintain oxygen levels above 19.5%. Contents under pressure. Use and store below 125°F.

Emergency Overview:

Carbon dioxide is heavier than air and may accumulate in low spaces, causing oxygen deficiency in the area. Upon rapid release from storage containers, carbon dioxide gas can cause build-up of static electricity and may ignite any explosive products or mixtures present. Carbon dioxide acts as a weak narcotic at high concentrations (30,000 ppm). Inhalation of high concentrations of carbon dioxide can cause reduced hearing acuity, changes in respiration and increased blood pressure and pulse.

CLASSIFICATION SYSTEM:

NFPA Ratings (scale 0 - 4)



Health = 1
Fire = 0
Instability = 0
Special = SA

HMIS Ratings (scale 0 - 4)



Health = 1
Fire = 0
Physical Hazard = 3

3 Composition/Data on Components

CAS No. Description

124-38-9 Carbon dioxide, gas 99 - 99.5%

IDENTIFICATION NUMBER(S):

EINECS Number: 204-696-9

(Contd. on page 2)

MATERIAL SAFETY DATA SHEET

Printing date 04/24/2009

Revision date 04/24/2009

Trade Name: Carbon dioxide, gas 99 - 99.5%

4 First aid measures

General Information:

Gas under pressure. Simple asphyxiant - this product does not contain oxygen and may cause rapid suffocation if released in a confined area. Contact with rapidly venting gas may cause frostbite or "cold" deep tissue burns.

After Inhalation:

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area and, if breathing has stopped, administer artificial resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive.

After skin contact:

None required for gas. For suspected frostbite, immerse skin in lukewarm water. DO NOT USE HOT WATER. Obtain prompt medical attention.

After eye contact:

None required for gas. If frostbite is suspected, flush contaminated eye(s) with cool water for fifteen minutes. Seek immediate medical attention.

After ingestion:

Unlikely, as the product is a gas at normal conditions of temperature and pressure. If cryogenic burns have resulted in blistering of the dermal surface or deep freezing tissues, seek medical attention promptly.

5 Fire fighting measures

Flammable Properties:

Nonflammable. Cylinder may rupture violently from pressure or vent rapidly when involved in a fire situation.

Suitable extinguishing agents:

Use extinguishing media appropriate for the combustible material present. Use water spray to keep cylinders cool.

Protective equipment:

Firefighters should wear respiratory protection (SCBA) and full turnout or Bunker gear.

Fire Fighting Instructions:

Continue to cool fire-exposed containers until well after flames are extinguished.

6 Accidental release measures

Person-related safety precautions:

Evacuate all personnel from the affected area. Use appropriate personal protective equipment (see Section 8). Stop the flow of gas or remove cylinder to outdoor location - ONLY if possible to do so without risk. Ventilate enclosed areas. If leak is in user's equipment, be certain to purge piping with inert gas prior to attempting repairs. If leak is in container or container valve, contact the appropriate emergency telephone number listed in Section 1 or call your closest Linde location.

(Contd. on page 3)

MATERIAL SAFETY DATA SHEET

Printing date 04/24/2009

Revision date 04/24/2009

Trade Name: Carbon dioxide, gas 99 - 99.5%**7 Handling and storage****HANDLING:**

Dry carbon dioxide can be handled in most common structural materials. Moist carbon dioxide is generally corrosive by its formation of carbonic acid. For applications with moist carbon dioxide, 313, 309 and 310 stainless steels may be used as well as Hastelloy®A, B and C and Monel®. Ferrous nickel alloys are slightly susceptible to corrosion. At normal temperatures, carbon dioxide is compatible with most plastics and elastomers.

Information about protection against explosions and fires:

Keep ignition sources away. Do not smoke. Pressurized container - protect from sunlight and do not expose to temperatures exceeding 125°F. Do not pierce or burn container, even after use.

STORAGE:**Requirements to be met by storerooms and receptacles:**

Use only in well-ventilated areas in accordance with manufacturer's and Linde's instructions. Carbon dioxide vapor is heavier than air and will accumulate in low areas. Do not tip, drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Valve protection caps must remain in place unless container is secured with valve outlet piped to the use point. Use a pressure-reducing regulator when connecting cylinder to lower pressure piping or systems. Do not heat container 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 into the system. If user experiences any difficulty operating container valve, discontinue use and contact supplier. Do not insert any object (i.e., screwdriver) into valve cap openings as this can damage valve, causing leakage.

Protect containers from physical damage. Store in cool, dry, well-ventilated area away from heavily trafficked areas and emergency exits. Cylinders should 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 from being stored for excessive periods of time.

For additional recommendations, consult Compressed Gas Association's pamphlets P-1, P-6, PS-5, G-6, G-6.1, G-6.2, G-6.3, G-6.5, G-6.7, G-6.9, TB-10 and AV-7.

Specific applications:

Never carry a compressed gas cylinder or a container of gas in a cryogenic liquid form in an enclosed space such as a car trunk, van or station wagon. A leak may result in a fire, explosion, asphyxiation or a toxic exposure.

Security:

Store container in a secured area. Limit access to authorized personnel only. Report any incidents involving thefts, misuse or inventory shortages to law enforcement and the supplier. Security shall be provided in accordance with all local, state and federal regulations.

8 Exposure controls and personal protection**Engineering Controls:**

Use local exhaust ventilation in combination with general ventilation as necessary to maintain atmospheric oxygen concentrations above 19.5%.

Components with limit values that require monitoring at the workplace:

124-38-9 Carbon dioxide, gas 99 - 99.5%

(Contd. on page 4)

MATERIAL SAFETY DATA SHEET

Printing date 04/24/2009

Revision date 04/24/2009

Trade Name: Carbon dioxide, gas 99 - 99.5%

PEL	Short-term value: 54.000 mg/m ³ , 30.000 ppm Long-term value: 9000 mg/m ³ , 5000 ppm
REL	Short-term value: 54.000 mg/m ³ , 30.000 ppm Long-term value: 9000 mg/m ³ , 5000 ppm
TLV	Short-term value: 54.000 mg/m ³ , 30.000 ppm Long-term value: 9000 mg/m ³ , 5000 ppm

PERSONAL PROTECTIVE EQUIPMENT:**Breathing equipment:**

Positive pressure NIOSH-approved air-supplying respirator system (SCBA or airline/escape bottle) with a full-face mask and at a minimum of Grade D air should be available for emergency use.

Hand/skin protection: Gloves and work clothing appropriate for the materials and work.

Eye/face protection: Safety glasses or chemical goggles.

Other/General Protection:

Safety shoes or other footwear appropriate for the job, safety shower and emergency eyewash station.

9 Physical and chemical properties**GENERAL INFORMATION:**

Form:	Compressed gas
Color:	Colorless
Odor:	Odorless

CHANGE IN CONDITION:

Melting point/Melting range:	-56.6°C (-70°F)
Boiling point/Boiling range:	-78.5°C (-109°F)

Flash point: Not applicable

Danger of explosion: m

Vapor pressure at 20°C (68°F): 57300 hPa (42979 mm Hg)

Density at 20°C (68°F): 0.00197 g/cm³

**Solubility in / Miscibility with
Water at 20°C (68°F):** 2000 g/l

10 Stability and reactivity

Thermal decomposition / Conditions to be avoided: Stable.

Materials to be avoided:

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. Avoid heat, sparks and flames.

Dangerous products of decomposition:

When heated over 3092°F (1700°C), will decompose to carbon monoxide and oxygen. Carbonic acid is formed in the presence of moisture.

(Contd. on page 5)

MATERIAL SAFETY DATA SHEET

Printing date 04/24/2009

Revision date 04/24/2009

Trade Name: Carbon dioxide, gas 99 - 99.5%**11 Toxicological information****ACUTE TOXICITY****Toxicological Overview:**

Acidosis, adrenal cortical exhaustion, and other metabolic stresses have resulted from prolonged continuous exposure to 1-2% carbon dioxide (10,000 - 20,000 ppm). The ACGIH TLV of 5,000 ppm is expected to provide a good margin of safety from asphyxiation and undue metabolic stress, provided sufficient oxygen levels are maintained in the air. Increased physical activity, duration of exposure, and decreased oxygen content can affect systemic and respiratory effects resulting from exposure to carbon dioxide.

PRIMARY IRRITANT EFFECT:

On the skin/eye: Adverse effects not expected.

On inhalation:

See "Toxicological Overview" section above. Chronic, harmful effects are not known from repeated inhalation of low (3 to 5 molar%) concentrations.

Additional toxicological information:

Exposure of female rats to 60,000 ppm carbon dioxide for 24 hours has produced toxic effects to the embryo and fetus of in pregnant rats. Toxic effects to the reproductive system have been observed in other mammalian species at similar concentrations.

Oxygen deficiency during pregnancy has produced developmental abnormalities in humans and experimental animals.

12 Ecological information**Environmental impact:**

Not classified as a Class I or Class II ozone depleting substance. Not toxic. Will not bioconcentrate.

13 Disposal considerations**PRODUCT:****Recommendation:**

Do not attempt to dispose of residual waste or unused quantities. Return in the shipping container PROPERLY LABELED, WITH ALL VALVE OUTLET PLUGS OR CAPS SECURED AND VALVE PROTECTION CAP IN PLACE to Linde or authorized distributor for proper disposal.

UNCLEANED PACKAGING:

Recommendation: Same as above.

14 Transport information**DOT regulations:****Hazard class:**

2.2

Identification number:

UN1013

Packing group:

-

Proper shipping name (technical name): CARBON DIOXIDE

(Contd. on page 6)

MATERIAL SAFETY DATA SHEET

Printing date 04/24/2009

Revision date 04/24/2009

Trade Name: Carbon dioxide, gas 99 - 99.5%

Label 2

Land transport ADR/RID (cross-border):


ADR/RID class:	2 Gases
UN-Number:	1013
Packaging group:	-
Label:	2.2
Description of goods:	1013 CARBON DIOXIDE

Maritime transport IMDG:


IMDG Class:	2
UN Number:	1013
Label	2
Packaging group:	-
EMS Number:	F-C,S-V
Propper shipping name:	CARBON DIOXIDE

Air transport ICAO-TI and IATA-DGR:


ICAO/IATA Class:	2
UN/ID Number:	1013
Label	2
Packaging group:	-
Propper shipping name:	CARBON DIOXIDE

15 Regulations

SARA
Section 355 (extremely hazardous substances): Substance is not listed.

Section 313 (Specific toxic chemical listings): Substance is not listed.

TSCA (Toxic Substance Control Act):

The substance is listed.

The substances below are listed:

PROPOSITION 65:
Chemicals known to cause cancer: Substance is not listed.

Chemicals known to cause reproductive toxicity for females: Substance is not listed.

Chemicals known to cause reproductive toxicity for males: Substance is not listed.

Chemicals known to cause developmental toxicity: Substance is not listed.

CARCINOGENICITY CATEGORIES:
EPA (Environmental Protection Agency) Substance is not listed.

(Contd. on page 7)

MATERIAL SAFETY DATA SHEET

Printing date 04/24/2009

Revision date 04/24/2009

Trade Name: Carbon dioxide, gas 99 - 99.5%

IARC (International Agency for Research on Cancer) Substance is not listed.
NTP (National Toxicology Program) Substance is not listed.
TLV (Threshold Limit Value established by ACGIH) Substance is not listed.
NIOSH (National Institute for Occupational Safety and Health) Substance is not listed.
OSHA (Occupational Safety & Health Administration) Substance is not listed.

Product related hazard informations:**Safety phrases:** 3 Keep in a cool place.**16 Other information**

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Department Issuing MSDS: Linde Safety, Health, Environment and Quality**Contact:** Refer to Linde web site for contact and product information at www.lindeus.com**Sources:**

ABBREVIATIONS AND ACRONYMS:

ACGIH: American Conference of Governmental Industrial Hygienists

ADR/RID: Agreement on Dangerous Goods by Road/Regulation concerning the International Transport of Goods by Rail

CAS: Chemical Abstracts Service

DOT: US Department of Transportation

EINECS: European Inventory of Existing Chemical Substances

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

HMIS: Health Management Information System

IATA: International Air Transport Organization

IATA-DGR: Dangerous Goods Regulations by the International Air Transport Organization

ICAO: International Civil Aviation Organization

ICAO-TI: Technical Instructions by the International Civil Aviation Organization

IMDG: International Marine Code for Dangerous Goods

NFPA: National Fire Protection Association

GENERAL DISCLAIMER

For terms and conditions, including limitation of liability, please refer to the purchase agreement in effect between Linde LLC, Linde Merchant Products or Linde Gas North America LLC (or any of their affiliates and subsidiaries) and the purchaser.

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).