

Safety Data Sheet

Trade name: Carbon Dioxide (Refrigerated Liquid)

Printing date 06/10/2009

Version 3

Reviewed on 06/10/2009

1. Identification of Substances

Product details

Trade name: Carbon Dioxide (Refrigerated Liquid)

Article number: 023-01-0004

Manufacturer/Supplier: Linde Gas Singapore Private Limited.

Address: 50 Jurong Island Highway Singapore 627877.

Telephone (0065) 68678998.

24-HOUR EMERGENCY TELEPHONE NUMBER

Telephone (0065) 68678998

Please ensure that this MSDS is received by the appropriate person.

2. Composition/Data on composition

Chemical characterization:

CAS No.: 124-38-9 Carbon Dioxide

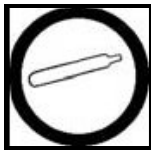
Identification number(s): EINECS Number: 204-696-9

3. Hazards Identification

Hazard description: Refrigerated liquefied gas.

WHMIS-symbols:

A - Compressed gas



HMIS-ratings (scale 0 - 4)

Health = 3

Fire = 0

Reactivity = 0

NFPA ratings (scale 0 - 4)

Health = 3

Fire = 0

Reactivity = 0

Information pertaining to particular dangers for man and environment:

Danger of suffocation at accumulation in lower-lying or closed rooms;

Cold burns and frostbite.

Classification system:

The classification is in line with internationally approved calculation standards. It is expanded, however, by information from technical literature and by information furnished by supplier companies.

GHS label elements



Warning



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2.5/L - Contains gas under pressure; may explode if heated.

Storage: Protect from sunlight. Store in a well-ventilated place;

4. First Aid Measures

After inhalation: Supply fresh air; consult doctor in case of complaints.

After skin contact: In cases of frost bites, rinse with plenty of water. Do not remove clothing.

After eye contact: Rinse opened eye for at least 15 minutes under running water. Then consult a doctor.

After swallowing: Not applicable

5. Fire Fighting Measures

Suitable extinguishing agents: Use fire fighting measures that suit the environment.

Protective equipment: Wear self-contained respiratory protective device.

6. Accidental Release Measures

Person-related safety precautions:

Wear protective equipment. Keep unprotected persons away.

Ensure adequate ventilation.

Stop leak - ONLY if possible to do so without risk.

Measures for environmental protection: Prevent seepage into sewage system, workpits and/or cellars.

Measures for cleaning/collecting: Ensure adequate ventilation.

Additional information: No dangerous substances are released.

7. Health and Storage

Handling:

Information for safe handling:

Handle with care. Avoid jolting, friction, and impact.

Use only in well ventilated areas.

Store cylinders upright with valve protection cap in place and firmly secured to prevent falling or being knocked over.

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 50°C. Do not pierce or burn, even after use.

Storage:

Requirements to be met by storerooms and receptacles:

Do not expose cylinder to temperatures higher than 50°C (122 °F)

Information about storage in one common storage facility:

Sources of ignition should be removed from storage area.

Further information about storage conditions: Keep cylinder valve tightly closed.

8. Exposure Control and Personal Protection

Additional information about design of technical systems:

Adequate local ventilation;

Safety showers and eyewash stations should be nearby.

Components with limit values that require monitoring at the workplace:

124-38-9 Carbon Dioxide (23-100%)

EL Short-term value: 15000 ppm

Long-term value: 5000 ppm

Additional information: The lists that were valid during the creation were used as basis.

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Personal protective equipment:

General protective and hygienic measures:

Protective clothing should be kept free of oil and grease.

PPE should be inspected and maintained regularly to retain its effectiveness.

Breathing equipment:

Use atmosphere-supplying respirators (e.g. supplied-air: demand, pressure-demand, or continuous-flow or self-contained breathing apparatus: demand or pressure-demand or combination supplied-air with auxiliary self-contained air supply atmosphere-supplying respirator) in case of insufficient ventilation.

Protection of hands: Insulation gloves

Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

Eye protection: Goggles recommended during refilling.

9. Physical and Chemical Properties

General Information

Form: Gaseous.

Color: Colorless

Odor: Odorless

Change in condition

Melting point/Melting range: -56.6°C

Boiling point/Boiling range: -78°C

Flash point: Not applicable.

Danger of explosion: Product does not present an explosion hazard.

Solubility in / Miscibility with

Water at 20°C: 2000 g/l

10. Stability and Reactivity

Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.

Dangerous reactions No dangerous reactions known.

Dangerous products of decomposition: No dangerous decomposition products known.

11. Toxicological information

Acute toxicity:

LD/LC50 values that are relevant for classification: LC50 > 5000ppm

Primary irritant effect:

On the skin: No irritating effect.

On the eye: No irritating effect.

Sensitization: No sensitizing effects known.

Additional toxicological information:

When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

The substance is not subject to classification.

12. Ecological information

General notes: Generally not hazardous for water.

13. Disposal considerations

Product:

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Recommendation: Unused product should be returned to vendor.

Un-cleaned packaging:

Recommendation:

Cylinder and unused product should be returned to vendor. Disposable

Cylinder must be disposed of in accordance with local regulations.

Recommended cleaning agent: None applicable;

14. Transport information

TDG and DOT regulations:



Hazard class: 2

Identification number: UN2187

Proper shipping name (technical name): CARBON DIOXIDE, REFRIGERATED LIQUID

Label 2.2

Maritime transport IMDG:



IMDG Class: 2

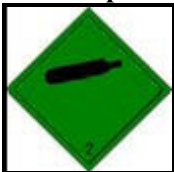
UN Number: 2187

Label 2.2

Marine pollutant: No

Proper shipping name: CARBON DIOXIDE, REFRIGERATED LIQUID

Air transport ICAO-TI and IATA-DGR:



ICAO/IATA Class: 2

UN/ID Number: 2187

Label 2.2

Proper shipping name: CARBON DIOXIDE, REFRIGERATED LIQUID

UN "Model Regulation": UN2187; CARBON DIOXIDE, REFRIGERATED LIQUID; 2.2

15. Regulations

Section 355 (extremely hazardous substances):

Substance is not listed.

Section 313 (Specific toxic chemical listings):

Substance is not listed.



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TSCA (Toxic Substances Control Act):

Substance is 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.

NTP (National Toxicology Program)

Substance is not listed.

TLV (Threshold Limit Value established by ACGIH)

Substance is not listed.

NIOSH-Ca (National Institute for Occupational Safety and Health)

Substance is not listed.

OSHA-Ca (Occupational Safety & Health Administration)

Substance is not listed.

Canadian substance listings:

Canadian Domestic Substances List (DSL)

Substance is listed.

Canadian Ingredient Disclosure list (limit 0.1%)

Substance is not listed.

Canadian Ingredient Disclosure list (limit 1%)

Substance is listed.

Product related hazard information:

Observe the general safety regulations when handling chemicals.

The substance is not subject to classification according to the sources of literature known to us.

The product was classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

Safety phrases:

Keep container tightly closed 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.

Please refer to the section 3 for NFPA and HMIS Hazard Codes.

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GENERAL DISCLAIMER

For terms and conditions, including limitation of liability, please refer to the purchase agreement in effect between Linde Inc. (or any of its affiliates and subsidiaries) and the purchaser.

Department issuing MSDS: Customer Service Centre: 0065-68670898

Abbreviations and Acronyms:

ACGIH: American Conference of Governmental Industrial Hygienists

CAS: Chemical Abstract Service (Division of the American Chemical Society)

DOT: US Department of Transportation

EINECS: European Inventory of Existing Commercial Chemical Substances

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

HMIS: Hazardous Material Identification System

IATA: International Air Transportation Association

IATA-DGR: Dangerous Goods Regulations by the "International Air Transportation Association"

ICAO: International Civil Aviation Association

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

IMDG: International Marine Code for Dangerous Goods

WHIMS: Workplace Hazardous Material Information System

LC50: Lethal Concentration, 50 Percent

LD50: Lethal Dose, 50 Percent

N/A: Not Applicable

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