

Carbon dioxide (refrigerated)**ALSA018B**

2.2 : Non flammable, non toxic gas.

Warning**SECTION 1. Identification of the substance/mixture and of the company/undertaking****Product identifier**

Trade name : Carbon dioxide (refrigerated)
SDS Nr : ALSA018B
Chemical description : Carbon dioxide (refrigerated)
CAS No :000124-38-9
EC No :204-696-9
Index No :---
Registration-No. : Listed in Annex IV / V REACH, exempted from registration.
Chemical formula : CO₂

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses : Industrial and professional. Perform risk assessment prior to use. Purging. Laboratory use
Contact supplier for more uses information

Details of the supplier of the safety data sheet

Company identification : AIR LIQUIDE (PTY) LTD
Crn Vereeniging Road & Andre Marais Street
Alrode, Alberton
Gauteng SOUTH AFRICA
Tel. : +27 87 288 1100
E-Mail address (competent person) : scr.sales@airliquide.com

Emergency telephone number

Emergency telephone number : +27 87 288 1100

SECTION 2. Hazards identification**Classification of the substance or mixture****Hazard Class and Category Code Regulation EC 1272/2008 (CLP)**

• Physical hazards : Gases under pressure - Refrigerated liquefied gas - Warning - (CLP : Press. Gas) - H281

Classification EC 67/548 or EC 1999/45

: Not classified as dangerous substance/mixture.
Not included in Annex VI.
No EC labelling required.

Label elements**Labelling Regulation EC 1272/2008 (CLP)**

• Hazard pictograms



Carbon dioxide (refrigerated)

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SECTION 2. Hazards identification (continued)

- Hazard pictograms code : GHS04
- Signal word : Warning
- Hazard statements : H281 - Contains refrigerated gas; may cause cryogenic burns or injury.
- Precautionary statements
 - Prevention : P282 - Wear cold insulating gloves, face shield, eye protection.
 - Response : P336+P315 - Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice / attention.
 - Storage : P403 - Store in a well-ventilated place.

Other hazards

: Asphyxiant in high concentrations.

SECTION 3. Composition/information on ingredients

Substance / 3.2. Mixture

Substance.

Substance name	Contents	CAS No	EC No	Index No	Registration no	Classification
Carbon dioxide (refrigerated)	100	124-38-9	204-696-9	----	* 1	Not classified (DSD/DPD) Press. Gas (H281)

Contains no other components or impurities which will influence the classification of the product.

* 1: Listed in Annex IV / V REACH, exempted from registration.

* 2: Registration deadline not expired.

* 3: Registration not required: Substance manufactured or imported < 1t/y

Full text of R-phrases see chapter 16.

Full text of H-statements see chapter 16

SECTION 4. First aid measures

Description of first aid measures

- Inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
- Skin contact : In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance.
- Eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes.
- Ingestion : Ingestion is not considered a potential route of exposure.

Most important symptoms and effects, both acute and delayed: In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/ consciousness. Victim may not be aware of asphyxiation.
Low concentrations of CO2 cause increased respiration and headache.Indication of any immediate medical attention and special treatment needed

: None.

Carbon dioxide (refrigerated)**ALSA018B****SECTION 5. Fire-fighting measures****Extinguishing media****Extinguishing media****- Suitable extinguishing media** : All known extinguishants can be used.**Special hazards arising from the substance or mixture****Specific hazards** : Exposure to fire may cause containers to rupture/explode.**Hazardous combustion products** : None.**Advice for fire-fighters****Specific methods** : If possible, stop flow of product.
Coordinate fire measure to the surrounding fire. Cool endangered containers with water spray jet from a protected position. Do not empty contaminated fire water into drains.
If leaking do not spray water onto container. Water surrounding area (from protected position) to contain fire.**Special protective equipment for fire fighters** : In confined space use self-contained breathing apparatus.**SECTION 6. Accidental release measures****Personal precautions, protective equipment and emergency procedures**: Try to stop release.
Evacuate area.
Use protective clothing.
Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.
Ensure adequate air ventilation.
Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.**Environmental precautions**

: Try to stop release.

Methods and material for containment and cleaning up: Ventilate area.
Liquid spillages can cause embrittlement of structural materials.**Reference to other sections**

: See also sections 8 and 13.

SECTION 7. Handling and storage**Precautions for safe handling****Safe use of the product** : Only experienced and properly instructed persons should handle gases under pressure. The product must be handled in accordance with good industrial hygiene and safety procedures.
Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
Do not smoke while handling product.
Ensure the complete gas system was (or is regularly) checked for leaks before use.
Avoid suck back of water, acid and alkalis.
Do not remove or deface labels provided by the supplier for the identification of the cylinder contents.**Safe handling of the gas receptacle** : Refer to supplier's container handling instructions.
Do not allow backfeed into the container.
Never attempt to repair or modify container valves or safety relief devices.
Damaged valves should be reported immediately to the supplier.
Keep container valve outlets clean and free from contaminants particularly oil and water.
Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment.
Close container valve after each use and when empty, even if still connected to equipment.

Carbon dioxide (refrigerated)**ALSA018B****SECTION 7. Handling and storage (continued)**

General : Never attempt to transfer gases from one cylinder/container to another.
Never use direct flame or electrical heating devices to raise the pressure of a container.
: Containers, which contain or have contained flammable or explosive substances, must not be inerted with liquid carbon dioxide. Potential production of solid CO₂ particles must be ruled out. In order to rule out potential electrostatic discharge production, the system must be adequately grounded.

Conditions for safe storage, including any incompatibilities

: Observe all regulations and local requirements regarding storage of containers.
Keep container below 50°C in a well ventilated place. Containers should be stored in the vertical position and properly secured to prevent toppling. Stored containers should be periodically checked for general condition and leakage. Container valve guards or caps should be in place. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible materials.
Containers should not be stored in conditions likely to encourage corrosion.

Specific end use(s)

: None.

SECTION 8. Exposure controls/personal protection**Control parameters**

Occupational Exposure Limits : Carbon dioxide (refrigerated) : ILV (EU) - 8 H - [mg/m³] : 9000
Carbon dioxide (refrigerated) : ILV (EU) - 8 H - [ppm] : 5000
Carbon dioxide (refrigerated) : TLV© -TWA [ppm] : 5000
Carbon dioxide (refrigerated) : TLV© -STEL [ppm] : 30000

DNEL: Derived no effect level : None available.

PNEC: Predicted no effect concentration : None available.

Exposure controls

Appropriate engineering controls : Oxygen detectors should be used when asphyxiating gases may be released.
Consider work permit system e.g. for maintenance activities.
Systems under pressure should be regularly checked for leakages.
Ensure exposure is below occupational exposure limits (where available).
Provide adequate general and local exhaust ventilation.

Individual protection measures, e.g. personal protective equipment : A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk.
The following recommendations should be considered.
Wear cold insulating gloves when transfilling or breaking transfer connections.
Wear cold insulating gloves when transfilling or breaking transfer connections.
Protect eyes, face and skin from liquid splashes.
Wear goggles and a face shield when transfilling or breaking transfer connections

Environmental exposure controls : None necessary.

SECTION 9. Physical and chemical properties**Information on basic physical and chemical properties****Appearance**

- Physical state at 20°C / 101.3kPa : Gas.

- Colour : Colourless.

Odour : No odour warning properties.

Odour threshold : Odour threshold is subjective and inadequate to warn for overexposure.

Molar mass [g/mol] : 44

Melting point [°C] : -56.6

Boiling point [°C] : -78.5 (s)

Carbon dioxide (refrigerated)**ALSA018B****SECTION 9. Physical and chemical properties (continued)**

Critical temperature [°C]	: 30
Flash point [°C]	: Not applicable for gases and gas-mixtures.
Evaporation rate (ether=1)	: Not applicable for gases and gas-mixtures.
Flammability range [vol% in air]	: Non flammable.
Vapour pressure [20°C]	: 57.3 bar
Relative density, gas (air=1)	: 1.52
Relative density, liquid (water=1)	: 1.03
Solubility in water [mg/l]	: 2000 Completely soluble.
Partition coefficient n-octanol/water	: 0.83
Auto-ignition temperature [°C]	: 0.83 Not applicable.

Other information

Other data	: Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.
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SECTION 10. Stability and reactivity**Reactivity**

: No reactivity hazard other than the effects described in sub-sections below.

Chemical stability

: Stable under normal conditions.

Possibility of hazardous reactions

: None.

Conditions to avoid

: None under recommended storage and handling conditions (see section 7).

Incompatible materials: None.
For additional information on compatibility refer to ISO 11114**Hazardous decomposition products**

: None.

SECTION 11. Toxicological information**Information on toxicological effects**

Acute toxicity	: In high concentrations cause rapid circulatory insufficiency even at normal levels of oxygen concentration. Symptoms are headache, nausea and vomiting, which may lead to unconsciousness and death
Skin corrosion/irritation	: No known effects from this product.
Serious eye damage/irritation	: No known effects from this product.
Respiratory or skin sensitisation	: No known effects from this product.
Carcinogenicity	: No known effects from this product.
Germ cell mutagenicity	: No known effects from this product.
Reproductive toxicity	: No known effects from this product.
STOT-single exposure	: No known effects from this product.
STOT-repeated exposure	: No known effects from this product.
Aspiration hazard	: Not applicable for gases and gas-mixtures.

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SECTION 12. Ecological information

Toxicity

: No known ecological damage caused by this product.

Persistence - degradability

: No data available.

Bioaccumulative potential

: No data available.

Mobility in soil

: No data available.

Results of PBT and vPvB assessment

: Not classified as PBT or vPvB.

Other adverse effects

: Can cause frost damage to vegetation.

Effect on ozone layer

: None.

Global warming potential [CO₂=1]

: 1

Effect on the global warming

: When discharged in large quantities may contribute to the greenhouse effect.
Contains Fluorinated greenhouse gases covered by the Kyoto protocol.

SECTION 13. Disposal considerations

Waste treatment methods: Discharge to atmosphere in large quantities should be avoided.
Do not discharge into any place where its accumulation could be dangerous.
Refer to the code of practice of EIGA (Doc. 30/10 "Disposal of Gases, downloadable at <http://www.eiga.org>) for more guidance on suitable disposal methods
May be vented to atmosphere in a well ventilated place.
Consult supplier for specific recommendations.**Additional information**

: None.

SECTION 14. Transport information

UN number

: 2187

Labelling ADR, IMDG, IATA



: 2.2 : Non flammable, non toxic gas.

Land transport (ADR/RID)

H.I. nr

: 22

UN proper shipping name

: CARBON DIOXIDE, REFRIGERATED LIQUID

Transport hazard class(es)

: 2

Classification code

: 3 A

Packing Instruction(s)

: P203

Tunnel Restriction

: C/E Tank carriage: Passage forbidden through tunnels of category C, D and E; Other carriage: Passage forbidden through tunnels of category E

Environmental hazards

: None.

Sea transport (IMDG)

Carbon dioxide (refrigerated)**ALSA018B****SECTION 14. Transport information (continued)**

Proper shipping name : CARBON DIOXIDE, REFRIGERATED LIQUID
Class : 2.2
Packing group : P203
Emergency Schedule (EmS) - Fire : F-C
Emergency Schedule (EmS) - Spillage : S-V
Packing instruction : P203

Air transport (ICAO-TI / IATA-DGR)

Proper shipping name (IATA) : CARBON DIOXIDE, REFRIGERATED LIQUID
Class : 2.2
Passenger and Cargo Aircraft : Allowed.

Special precautions for user

: Avoid transport on vehicles where the load space is not separated from the driver's compartment.
Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency.
Before transporting product containers :
- Ensure that containers are firmly secured.
- Ensure cylinder valve is closed and not leaking.
- Ensure valve outlet cap nut or plug (where provided) is correctly fitted.
- Ensure valve protection device (where provided) is correctly fitted.
- Ensure there is adequate ventilation.

SECTION 15. Regulatory information**Safety, health and environmental regulations/legislation specific for the substance or mixture****EU legislation**

Restrictions on use : None.
Seveso directive 96/82/EC : Not covered.

National legislation

: Ensure all national/local regulations are observed.

Chemical Safety Assessment

: A CSA does not need to be carried out for this product.

SECTION 16. Other information

Indication of changes : Revised safety data sheet in accordance with commission regulation (EU) No 453/2010
Training advice : The hazard of asphyxiation is often overlooked and must be stressed during operator training.
List of full text of H-statements in section 3. : H281 - Contains refrigerated gas; may cause cryogenic burns or injury.
Note : This Safety Data Sheet has been established in accordance with the applicable European Union legislation.
DISCLAIMER OF LIABILITY : Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.
Details given in this document are believed to be correct at the time of going to press. Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

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