CARBON DIOXIDE, Solid (CO2), Dry Ice

AL066

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Trade name : CARBON DIOXIDE, Solid (CO2), Dry Ice
SDS Nr : AL066
Chemical formula : CO2

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

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

Use : Freezing applications. Medical applications. Scientific applications. Special effects.

1.3. Details of the supplier of the safety data sheet

Company identification : Air Liquide Australia Limited
Level 9 / 380 St. Kilda Road
Melbourne VIC 3004 Australia
Tel: + 61 3 9697 9888
Fax: + 61 3 9690 7107
ALAEnquiries@AirLiquide.com

1.4. Emergency telephone number

Emergency telephone number : 1800 812 588

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

Hazard Class and Category Code Regulation EC 1272/2008 (CLP)

: Not regulated.

Classification EC 67/548 or EC 1999/45

: Not classified as dangerous substance/mixture.

2.2. Label elements

Labelling Regulation EC 1272/2008 (CLP)

- **Precautionary statements**

2.3. Other hazards

: None.

SECTION 3. Composition/information on ingredients

3.1. Substance / 3.2. Mixture

Substance.

Substance name		Contents	CAS No	EC No	Annex No		Classification
Carbon dioxide (solid)	:	100 %	124-38-9	204-696-9	-----	* 1	Not classified (DSD/DPD) --- Not classified (GHS)

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

4.1. Description of first aid measures

First aid measures

- Inhalation : 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.
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/eye contact : In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance.

- Skin contact : Adverse effects not expected from this product.

- Eye contact : Adverse effects not expected from this product.

- Ingestion : Potential choking hazard exists for dry ice pellets to lodge in the airway if swallowed. Seek urgent medical advice.

4.2. Most important symptoms and effects, both acute and delayed

: Refer to section 11.

4.3. Indication of any immediate medical attention and special treatment needed

: None.

SECTION 5. Fire-fighting measures

5.1. Extinguishing media

Extinguishing media

- Suitable extinguishing media : All known extinguishants can be used.

5.2. Special hazards arising from the substance or mixture

Specific hazards : Exposure to fire may cause containers to rupture/explode.

Hazardous combustion products : None.

5.3. Advice for fire-fighters

Specific methods : 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 possible, stop flow of product.

Special protective equipment for fire fighters : In confined space use self-contained breathing apparatus.

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

: Try to stop release.

Personal precautions : Evacuate area.
Use protective clothing.
Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.
Ensure adequate air ventilation.

6.2. Environmental precautions

: None.

: Try to stop release.
Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

6.3. Methods and material for containment and cleaning up

: None.

SECTION 6. Accidental release measures (continued)

Clean up methods : Ventilate area.

6.4. Reference to other sections

: See also sections 8 and 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Safe use of the product : The product must be handled in accordance with good industrial hygiene and safety procedures.

Handling : Use insulating gloves.
Refer to supplier's container handling instructions.

7.2. Conditions for safe storage, including any incompatibilities

: Observe all regulations and local requirements regarding storage of containers.

Storage : Minimize exposure to water contacting this material.
Ventilate to prevent pressure buildup.
Closed containers may generate internal gas pressure. Ensure lids on containers are loose-fitting to avoid buildup of gas pressure.
Keep container below 50℃ in a well ventilated plac e.

7.3. Specific end use(s)

: None.

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

Occupational Exposure Limits

Carbon dioxide (solid)

: Value 8h (CZ) [mg/m3] : 9000
: ILV (EU) - 8 H - [mg/m³] : 9000
: ILV (EU) - 8 H - [ppm] : 5000
: TLV© -TWA [ppm] : 5000
: TLV© -STEL [ppm] : 30000
: AGW (8h) - Germany [mg/m³] TRGS 900 : 9100
: AGW (8h) - Germany [ppm] TRGS 900 : 5000
: MAK (AU) Tagesmittelwert (ml/m³) : 5000
: MAK (AU) Tagesmittelwert (mg/m³) : 9000
: MAK (AU) Kurzzeitwerte (ml/m³) : 10000
: MAK (AU) Kurzzeitwerte (mg/m³) : 18000
: VLA-ED - Spain [ppm] : 5000
: VLA-ED - Spain [mg/m3] : 9150
: VLA-EC - Spain [ppm] : 15000
: VLA-EC - Spain [mg/m3] : 27400
: NGV - [ppm] : 5000
: NGV - [mg/m³] : 9000
: KTV - [ppm] : 10
: KTV - [mg/m³] : 10
: HTP-värden (FI) - 8 H - [ppm] : 5000
: HTP-värden (FI) - 8 H - [mg/m³] : 9100
: Grænserværdier (DK) (ppm) : 5000
: Grænserværdier (DK) (ppm) : 9000
: Grænserværdier (DK) : 9000

SECTION 8. Exposure controls/personal protection (continued)

: GV Value Limit (Norway) [ppm] : 5000
: GV Value Limit (Norway) [mg/m³] : 9000
: 8-Hour TWA (PL) (NDS) (mg/m³) : 9000
: 15-Minute STEL (PL)(NDSCh) (mg/m³) : 27000
: Valori Limite di Soglia (IT) 8 ore [ppm] : 5000
: Valori Limite di Soglia (IT) 8 ore [mg/m3] : 9000
: TLV-TWA (Belgium) (ppm) : 5000
: TLV-STEL (Belgium) (ppm) : 30000
: Value 15min. (CZ) [mg/m3] : 45000

DNEL: Derived no effect level : None available.

PNEC: Predicted no effect concentration : None available.

8.2. Exposure controls

8.2.1. Appropriate engineering controls : Systems under pressure shoud be regularily checked for leakages.
Provide adequate general and local exhaust ventilation.
Consider work permit system e.g. for maintenance activities.

8.2.2. 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 safety glasses with side shields
Wear leather safety gloves and safety shoes when handling cylinders.

Personal protection : Ensure adequate ventilation.
Protect eyes, face and skin from contact with product.

8.2.3. Environmental exposure controls : Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance

- Physical state at 20℃ / 101.3kPa : Gas.

Physical state : Refrigerated solidified gas.

- Colour : Colourless.

Odour : No odour warning properties.

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

pH value : Not applicable for gas-mixtures.

Molar mass [g/mol] : Not applicable for gases and gas-mixtures.

Melting point [℃] : -56.6

Boiling point [℃] : -78.5 (s)

Critical temperature [℃] : 30

Flash point [℃] : Not flammable.

Evaporation rate (ether=1) : Not applicable for gas-mixtures.

Flammability range [vol% in air] : Non flammable.

Vapour pressure [20℃] : 57.3 bar
Not applicable.

Relative density, gas (air=1) : 1.52

Solubility in water [mg/l] : 2000

Partition coefficient n-octanol/water : Not applicable for gas-mixtures.

Viscosity at 20℃ [mPa.s] : Not applicable.

Explosive Properties : Not applicable.

9.2. Other information

SECTION 9. Physical and chemical properties (continued)

Other data : Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

Molecular weight : 44

SECTION 10. Stability and reactivity

10.1. Reactivity

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

Stability and reactivity : Stable under normal conditions.
Water on solid carbon dioxide increases sublimation and greatens the risk of asphyxiation.

10.2. Chemical stability

: Stable under normal conditions.

10.3. Possibility of hazardous reactions

: Water on solid carbon dioxide increases sublimation and greatens the risk of asphyxiation.

10.4. Conditions to avoid

: None.

10.5. Incompatible materials

: None.

10.6. Hazardous decomposition products

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

SECTION 11. Toxicological information

11.1. Information on toxicological effects

Toxicity information : 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

Acute toxicity : No known toxicological effects from this product.

Rat inhalation LC50 [ppm/4h] : No data available.

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.

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.

SECTION 12. Ecological information

12.1. Toxicity

: No data available.

12.2. Persistence - degradability

: No data available.

12.3. Bioaccumulative potential

: No data available.

12.4. Mobility in soil

: No data available.

SECTION 12. Ecological information (continued)

12.5. Results of PBT and vPvB assessment

: No data available.

12.6. Other adverse effects

Ecological effects information : When discharged in large quantities may contribute to the greenhouse effect.
Can cause frost damage to vegetation.

Global warming potential [CO2=1] : 1

SECTION 13. Disposal considerations

13.1. Waste treatment methods

: May be vented to atmosphere in a well ventilated place.
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
Contact supplier if guidance is required.

General : Do not discharge into any place where its accumulation could be dangerous.
Discharge to atmosphere in large quantities should be avoided.
Contact supplier if guidance is required.

13.2. Additional information

: None.

SECTION 14. Transport information

UN number : 1845

Land transport (ADR/RID)

H.I. nr : --

UN proper shipping name : CARBON DIOXIDE, SOLID
UN1845 CARBON DIOXIDE, SOLID, , III

Transport hazard class(es) : 9

Classification code : M11 III

Packing group : III

HAZCHEM - Emergency Action Code : 2T
2 = Fine water spray.
T = Recommended personal protective equipment : Full fire kit and breathing apparatus.
Appropriate measures : dilute.

Sea transport (IMDG)

Proper shipping name : CARBON DIOXIDE, SOLID

Emergency Schedule (EmS) - Fire : F-C S-V

Emergency Schedule (EmS) - Spillage : S-V

Packing instruction : P003

IMDG-Marine pollution : NO -

Air transport (ICAO-TI / IATA-DGR)

Proper shipping name (IATA) : CARBON DIOXIDE, SOLID

Class : 9

Passenger and Cargo Aircraft : Allowed.

Packing instruction - Passenger and Cargo Aircraft : 904

Packing instruction - Cargo Aircraft only : 904

SECTION 14. Transport information (continued)

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 there is adequate ventilation.
- 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.

- IMO-IMDG code : Class 9

- ICAO/IATA : Packaging instructions cargo : 904
Packaging instructions passenger: 904

- IATA Packing group : III

In case of spillage and/or leakage : Clean up even minor leaks or spills if possible without unecessary risk.

Other transport information : 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 there is adequate ventilation.
- Compliance with applicable regulations.

Personal precautions : The driver shall not attempt to deal with any fire of the load.

Emergency action in case of accident : Stop the engine.
No naked lights. No smoking.
Mark roads and warns other road users.
Keep public away from danger area.
NOTIFY POLICE AND FIRE BRIGADE IMMEDIATELY.

Additional information : None.

General information

SECTION 15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

EU legislation

Seveso directive 96/82/EC : Not covered.

National legislation

: Ensure all national/local regulations are observed.

15.2. 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 commisssion regulation (EU) No 453/2010

Training advice : Asphyxiant in high concentrations.
May cause frostbite.
Keep container in a well-ventilated place.
Do not breathe the gas.
Ensure all national/local regulations are observed.
The hazard of asphyxiation is often overlooked and must be stressed during operator training.

Further information : Classification in accordance with calculation methods of regulation (EC) 1272/2008 CLP / (EC) 1999/45 DPD.
This Safety Data Sheet has been established in accordance with the applicable European Union legislation.

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Level 9 / 380 St. Kilda Road Melbourne VIC 3004 Australia
Tel: + 61 3 9697 9888
Fax: + 61 3 9690 7107
ALAEnquiries@AirLiquide.com

In case of emergency : 1800 812 588

SECTION 16. Other information (continued)

Note : This Safety Data Sheet has been established in accordance with the applicable European Union legislation.

DISCLAIMER OF LIABILITY : 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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