

## Material Safety Data Sheet

### CARBON DIOXIDE, Refrigerated Liquid (CO2)

**Infosafe™:** 8AEFE      **Issue Date:** May 2009      **Status:** ISSUED by      **BS:** 1.9.21  
No.                                    AIRLIQUID

**Not classified as hazardous**

#### 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

**Product Name:** CARBON DIOXIDE, Refrigerated Liquid (CO2)

**Product Use:** Food freezing, refrigerated transport.

**Company Name:** Air Liquide Australia Limited (ABN 57 004 385 782)  
**Address:** Level 9, 380 St. Kilda Road Melbourne, Victoria 3004  
**Emergency Tel:** 1800 812588 (24hr)  
**Tel:** (03) 9697 9888  
**Fax:** (03) 9690 7107

#### 2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients	Name	CAS	Proportion
	Carbon Dioxide	124-38-9	99.8 %

#### 3. HAZARDS IDENTIFICATION

**Chronic Effects:** Long term exposure to carbon dioxide has no known health effects. Prolonged exposure to an oxygen deficient atmosphere (below 18% oxygen in air) may affect the heart and nervous system.

**Inhalation:** Carbon dioxide is non-toxic at normal temperature and pressure. By diluting the oxygen concentration in air below the level necessary to support life, it can act as an asphyxiant. Effects of oxygen deficiency are: 12-16%: breathing and pulse rate increased, muscular coordination slightly disturbed; 10-14%: emotional upset, abnormal fatigue, disturbed respiration; 6-10%: nausea and vomiting, collapse or loss of consciousness; below 6%: convulsive movements, possible respiratory collapse and death.

**Ingestion:** Not applicable to gases.

**Skin:** Can cause frostburn if brought into contact with the skin.

**Eye:** Can cause frostburn if brought into contact with the eye.

#### 4. FIRST AID MEASURES

Inhalation:	If inhaled, remove affected person from contaminated area. Keep at rest until recovered. If symptoms persist seek medical attention.
Ingestion:	Not applicable to gases.
Skin:	Liquid carbon dioxide can cause severe frostburn upon contact with skin. Flood with cool water. Apply cold compress.
Eye:	Wash affected area thoroughly with soap and water. If symptoms develop seek medical attention.
First Aid Facilities:	Eyewash and normal washroom facilities. A safety shower is strongly recommended.
Advice to Doctor:	Treat symptomatically.
Other Information:	Specialist advice for treatment of cryogenic burns is available at State Burns Unit, Capital Cities.

#### 5. FIRE FIGHTING MEASURES

Extinguishing Media:	Use extinguishing media suitable for surrounding environment.
Specific Hazards:	Vessels involved in a fire should be sprayed with water to avoid heat damage and excessive pressure rise. Low air temperature due to close proximity of liquefied gases can cause hypothermia and all persons at risk should be warmly clad. Avoid liquid spillage as very cold liquids embrittle many materials on contact.
Hazardous Combustion Products	Carbon dioxide is non-flammable, but container may release large quantities of carbon dioxide if ruptured. Carbon dioxide may serve to extinguish fire. Low air temperature due to close proximity of liquefied gases can cause hypothermia. Avoid liquid spillage as cryogenic liquids embrittle many materials on contact.
Precautions in connection with Fire	Fire fighters should wear Self-Contained Breathing Apparatus (SCBA) operated in positive pressure mode and full protective clothing to prevent exposure to vapour or fumes. Water spray may be used to cool down heat-exposed containers.
Flash Point:	Not applicable
Ignition Temperature:	Not available
Flammable Limits	
UEL:	Not applicable
Flammable Limits	
LEL:	Not applicable
Flammability:	Non-flammable

## 6. ACCIDENTAL RELEASE MEASURES

Carbon Dioxide is heavier than air and will accumulate in low points. Remove all sources of ignition. Increase ventilation. Evacuate all unnecessary personnel. Use self-contained breathing apparatus (S.C.B.A) and full protective clothing to minimise exposure. Allow gas to vent safely to atmosphere, preferably in well ventilated, remote location. Monitor oxygen concentration in confined spaces. Wear air-supplied mask. Check for leaks using pressure drop test or soapy water on joints and outlets. Shut cylinder valve to stop leak if possible and safe to do so. Cold vapours are heavier than air.

## 7. HANDLING AND STORAGE

**Handling:** Use away from all sources of heat and ignition. Avoid skin and eye contact and breathing of gas. Avoid release of gas into workplace air. Use smallest possible amounts in designated areas with adequate ventilation. Have emergency equipment (for fires, leaks, etc.) readily available.

**Storage:** Supplied in portable cryogenic liquid containers or by bulk road tanker to cryogenic storage vessels installed at users' premises. Containers shall be stored in a cool, dry, well ventilated area out of direct sunlight and away from heat and ignition sources. Outside or detached storage is preferred. Containers shall be stored upright on a level, fireproof floor, secure in position and protected from damage. Label empty containers and store full containers separately from empty ones. Limit quantity in storage. Restrict access to storage area and post warning signs. Inspect periodically for deficiencies such as damage or leaks.

**Packaging Portable liquid vessels:**

COLOUR: Metallic silver on white with AS 2700 N32 green grey band. OUTLET: Liquid CGA 320.

Gas AS2743 Type 30.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

National Exposure Standards

No exposure value assigned for this specific material by the National Occupational Health and Safety Commission (NOHSC), Australia. However, the available exposure limits for ingredients are listed below:

National Occupational Health And Safety Commission (NOHSC), Australia Exposure Standards:

Substance TWA STEL NOTICES

ppm mg/m<sup>3</sup> ppm mg/m<sup>3</sup>

Carbon dioxide 5000 9000 30000 54000 - TWA (Time Weighted Average): The average airborne concentration of a particular substance when calculated over a normal eight-hour working day, for a five-day week.

STEL (Short Term Exposure Limit): The average airborne concentration over a 15 minute period which should not be exceeded at any time during a normal eight-hour workday.

#### Respiratory Protection

If engineering controls are not effective in controlling airborne exposure then self-contained breathing apparatus (S.C.B.A) should be used.

#### Eye Protection

Safety glasses with side shields or chemical goggles should be worn. Final choice of appropriate eye/face protection will vary according to individual circumstances. Eye protection devices should conform with Australian/New Zealand Standard AS/NZS 1337 - Eye Protectors for Industrial Applications.

#### Hand Protection

Wear gloves of impervious material. Final choice of appropriate gloves will vary according to individual circumstances i.e. methods of handling or according to risk assessments undertaken. Reference should be made to AS/NZS 2161.1: Occupational protective gloves - Selection, use and maintenance.

#### Footwear

Personnel engaged in the movement of gas cylinders shall be provided with safety footwear.

#### Body Protection

Suitable protective workwear, e.g. cotton overalls buttoned at neck and wrist is recommended. Chemical resistant apron is recommended where large quantities are handled. Industrial clothing should conform to the specifications detailed in AS/NZS 2919: Industrial clothing.

#### Eng. Controls

Provide adequate local exhaust and dilution ventilation and supply sufficient replacement air to maintain oxygen concentration above 18%.

#### Biological Limit

Values No biological limits allocated.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Colourless gas
Odour	Sharp odour
Melting Point	Not available
Boiling Point	Not available
Solubility in Water	1.716 m <sup>3</sup> /kg at 0°C
Specific Gravity (H <sub>2</sub> O=1)	Not available
pH Value	Not applicable
Vapour Pressure	5090 kPa at 15°C
Vapour Density (Air=1)	1.53 at 15°C (Air=1)
Density	1.873 kg/m <sup>3</sup> (101.3 kPa) at 15°C
Flash Point	Not applicable
Flammability	Non-flammable
Ignition Temperature	Not available
Flammable Limits LEL	Not applicable
Flammable Limits UEL	Not applicable
Molecular Weight	44.01
Other Information	Critical Temperature: 31.06°C

## 10. STABILITY AND REACTIVITY

Stability	Stable under normal conditions of storage and handling.
Hazardous Decomposition Products	Not applicable
Hazardous Reaction Conditions to Avoid	Will not occur Extremes of temperature and direct sunlight.

## 11. TOXICOLOGICAL INFORMATION

Toxicology Information: Not available

Inhalation: Carbon dioxide is non-toxic at normal temperature and pressure. By diluting the oxygen concentration in air below the level necessary to support life, it can act as an asphyxiant. Effects of oxygen deficiency are: 12-16%: breathing and pulse rate increased, muscular coordination slightly disturbed; 10-14%: emotional upset, abnormal fatigue, disturbed respiration; 6-10%: nausea and vomiting, collapse or loss of consciousness; below 6%: convulsive movements, possible respiratory collapse and death.

Ingestion:	Not applicable to gases.
Skin:	Can cause frostburn if brought into contact with the skin.
Eye:	Can cause frostburn if brought into contact with the eye.
Chronic Effects:	Long term exposure to carbon dioxide has no known health effects. Prolonged exposure to an oxygen deficient atmosphere (below 18% oxygen in air) may affect the heart and nervous system.

## 12. ECOLOGICAL INFORMATION

Environment Protection	Not applicable
Mobility	Not available
Persistence / Degradability	Not available
Ecotoxicity	Not available

## 13. DISPOSAL CONSIDERATIONS

Dispose of waste according to applicable local and national regulations.

## 14. TRANSPORT INFORMATION

This material is classified as a Class 2.2 (Non-flammable Non-toxic Gases) Dangerous Goods according to the Australian Code for the Transport of Dangerous Goods by Road and Rail.

Class 2.2 Dangerous Goods are incompatible in a placard load with any of the following:

- Class 1, Explosives
- Class 4.2, Spontaneously Combustible Substances
- Class 5.2, Organic Peroxides

U.N. Number	2187
Proper Shipping Name	CARBON DIOXIDE, REFRIGERATED LIQUID
DG Class	2.2
Hazchem Code	2T
Packaging Method	P203
Packing Group	
EPG Number	2C2
IERG Number	09

## 15. REGULATORY INFORMATION

Not classified as Hazardous according to criteria of National Occupational Health & Safety Commission (NOHSC), Australia.

Not classified as a Scheduled Poison according to the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).

### Risk Phrase

Poisons Schedule      Not Scheduled

### Packaging & Labelling

Portable liquid vessels:

COLOUR: Metallic silver on white with AS 2700 N32 green grey band.

OUTLET: Liquid CGA 320. Gas AS2743 Type 30.

## 16. OTHER INFORMATION

Contact Person/Point

24 HOUR EMERGENCY CONTACT: The Operator: 1800 812 588

Regional Offices: Victoria

40 Bunnett Street, North Sunshine 3020. Tel. (03) 9290 1100 Fax (03) 9290 1199

New South Wales

43-47 Pine Road, Fairfield 2165. Tel. (02) 9892 9777 Fax (02) 9892 1454

4 Kullara Close, Beresfield. 2322. Tel (02) 4949 1700 Fax (02) 4949 1750

Lot 5, Shellharbour Road, Port Kembla 2505. Tel. (02) 4274 4044 Fax (02) 4276 3879

South Australia

164 Philip Highway, Elizabeth 5112. Tel. (08) 8209 3600 Fax (08) 8255 9885

Queensland

759 Progress Road, Wacol 4076. Tel. (07) 3246 6363 Fax (07) 3271 2589

Ingham Road, Cnr. Dundee Street,  
Bohle, Townsville, 4818

Tel. (07) 4774 8276 Fax (07) 4774 8313

Featherstone Street, Parkhurst  
Rockhampton, 4702. Tel. (07) 4936 1066 Fax (07) 4936 1024  
68 Bunda Street, Cairns 4870. Tel. (07) 4031 1566 Fax (07) 4051  
4293

Tasmania  
11 Windsor Street, Invermay 7248. Tel. (03) 6334 9666 Fax (03) 6334  
9600

Air Liquide W.A. Pty Ltd  
A.B.N. 52 008 694 166  
Wesfarmers Energy Building, Campus Drive (off Murdoch Drive), Murdoch, WA 6150  
Tel. (08) 9312 9111 Fax (08) 9313 8108

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SDS History      Date Reviewed: May 2009  
Supersedes: July 2004

Poisons Schedule Not Scheduled

Molecular Weight 44.01

**End of MSDS**

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