

Material Safety Data Sheet

MEDICAL CARBON DIOXIDE - Compressed (CO2)

Infosafe™ 6ACE1 **Issue Date** October 2005 **Status** ISSUED by BS: 1.9.40
No. AIRLIQH

Not classified as hazardous

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

Product Name MEDICAL CARBON DIOXIDE - Compressed (CO2)
Company Name Air Liquide Healthcare Pty Limited (ABN 41002 653045)
Address Unit 5, 476 Gardeners Road Alexandria
NSW 2015
Emergency Tel. (AH) 1800 812 588
Telephone Tel: (02) 9364 7474
Number/Fax Fax: (02) 8338 9797
Other Names Not Available

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients	Name	CAS	Proportion
	Carbon Dioxide	124-38-9	100 %

3. HAZARDS IDENTIFICATION

Chronic Effects Prolonged exposure to an oxygen deficient atmosphere (below 19.5% oxygen in air) may affect the heart and nervous system.

Inhalation

Carbon dioxide is an asphyxiant.
Effects of oxygen deficiency are:
12-16%; breathing and pulse rate increased, muscular co-ordination slightly disturbed.
10-14%; emotional upset, abnormal fatigue, disturbed respiration.
6-10%; nausea and vomiting, collapse or loss of consciousness.

<6%; convulsive movements, possible respiratory collapse and death.

Ingestion	Not applicable to gases; unlikely route of exposure.
Skin	May cause frostbite injuries in contact with skin.
Eye	May cause frostbite injuries in contact with eyes or physical injury arising from sudden or uncontrolled gas release.
Other Information	Carbon dioxide is a simple asphyxiant. Whilst being non-toxic as supplied, the release of large amounts of mixture either through accident or poor work practice, could displace atmospheric oxygen to hazardous levels, or lead to a build up of carbon monoxide in confined and/or poorly ventilated spaces to hazardous levels. Due caution must be exercised and all exposure standards for components rigorously observed, and atmospheric oxygen levels maintained at 19.5%.

4. FIRST AID MEASURES

Inhalation	Prompt medical attention is mandatory in all cases of overexposure to asphyxiant containing substances. Remove the source of contamination or move the victim to fresh air. Ensure airways are clear and have qualified person give oxygen through a face mask if breathing is difficult. Apply artificial respiration if not breathing. Seek medical attention. N.B. Rescuers should not enter an oxygen deficient atmosphere without using self-contained full face positive pressure breathing equipment.
Ingestion	Ingestion is not considered a potential route of exposure.
Skin	Rinse affected skin areas with lukewarm, running water. Seek medical attention if effects persist.
Eye	Should frostbite occur from escaping gas, immediately flush with tepid water in large quantities, or with sterile saline solution. Hold eyelids apart and irrigate with gentle flow for 15 minutes bathing entire eyeball. Seek immediate medical attention.
First Aid Facilities	Eyewash station, safety shower and normal washroom facilities.
Advice to Doctor	Treat symptomatically.

5. FIRE FIGHTING MEASURES

Extinguishing Media	Use extinguishing agents suitable for the surrounding environment. Cool cylinders with water if possible.
Specific Methods	Stop discharge of gas if it can be done safely. Move containers from fire area if it can be done safely. Use water spray to keep containers cool. Do not direct water at source of leak or at venting safety devices. Pressurized containers may explode in fire and release irritating gas. Consider evacuation if cylinders cannot be kept cool.
Precautions in connection with Fire	Fire-fighters should wear full protective clothing and self contained breathing apparatus (SCBA) operated in positive pressure mode.
Flash Point	Not applicable
Flammability	Non flammable gas.

6. ACCIDENTAL RELEASE MEASURES

Evacuate the spill area of unnecessary personnel. In enclosed areas rescue personnel should wear AS 1715/1716 approved self contained breathing apparatus. Allow gas to escape to the external atmosphere, or preferably in a fume cupboard or well ventilated, remote area. Do not touch any spilled material. Prevent mixture from entering confined spaces. Leak checking may be done by pressure drop test or by using soapy water on joints and outlets. Shut cylinder valve to stop gas leaks from equipment if possible and safe to do so. If cylinder or cylinder valve is leaking then put on personal protective equipment, shut the cylinder valve, depressurise the equipment, disconnect cylinder from equipment and move the cylinder to a well ventilated area, preferably outdoors, and position to allow gas, rather than liquid to escape. If not possible, allow any liquid to vapourize. Use of a flammable gas monitor will warn of gas build-up in locality. Notify all relevant local, state and federal government occupational and environmental authorities. If possible, repair the leak or allow the cylinder to vent in external atmosphere. Mark empty cylinders 'defective'. Return all faulty cylinders to supplier/manufacturer.

7. HANDLING AND STORAGE

Handling

Use only in well-ventilated areas. Transport cylinders by hand truck or cart designed for that purpose. Do not lift cylinders by their caps and do not handle them with oily hands. Secure cylinders in place, in an upright position at all times. Do not roll, slide or drop cylinders or permit them to strike each other. Leave valve cap on until cylinder is secured and ready for use, and avoid contact of oil or grease with the valve. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. Close all valves securely when not in use.

Be aware of any signs of dizziness or fatigue, especially when work is done in a poorly-ventilated area; exposures to fatal concentrations of this product could occur without any significant warning symptoms, due to oxygen deficiency. Do not attempt to repair, adjust, or in any other way modify the cylinders containing the gas mixture. If there is a malfunction or another type of operational problem, contact nearest distributor immediately.

Storage

Storage of compressed gas cylinders shall be in compliance with State or Territory regulations. Cylinders shall be stored in a cool, dry, well ventilated area out of direct sunlight and away from heat and ignition sources. No part of cylinders shall be exposed to temperatures above 55°C. Outside or detached storage is preferred. Cylinders shall be stored upright on a level, fireproof floor, secure in position and protected from damage. Keep cylinder valve cover on. Label empty cylinders and store them separate from empty ones. Cylinders should be moved by hand-truck or cart designed for that purpose. Inspect periodically for deficiencies such as damage or leaks. Consider leak detection and alarm systems, as required. Restrict access to storage area and post warning signs. Have fire extinguishers available near the storage area. Avoid any contact with oil or grease particularly to the cylinder valve.

Other Information

Equipment to handle Carbon Dioxide must be constructed of suitable materials for the low temperature encountered. Ascertain the identity of the gas before using it. Colour codes should not be the only criteria used. Do not decant to other cylinders. Know and understand the properties and hazards associated with each gas before using it. Before using compressed gases, establish plans to cover any emergency

situations that might arise. Before connecting the cylinder for use ensure that back feed from the system into the cylinder is prevented. Before connecting cylinder, check the complete gas system for suitability particularly for pressure rating and materials. Only experienced and properly instructed persons should handle compressed gases. Do not remove or deface labels provided by the supplier for the identification of the cylinder contents. When doubt exists as to the correct handling procedure for a particular gas contact the supplier. Ascertain that an adequate supply of water is available for first aid, fire fighting, or dilution of corrosive material in the event of leakage. Employ suitable pressure regulating devices on all cylinders when the gas is being emitted to systems with a lower pressure rating than that of the cylinder.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

National Exposure Standards	Name	STEL (mgm3)	STEL (ppm)	TWA (mgm3)	TWA (ppm)	FootNote
	Carbon Dioxide	54000	30000	9000	5000	
Other Exposure Information	<p>No exposure standards have been established for this product by the Australian National Occupational Health And Safety Commission (NOHSC), however, the exposure limits for individual ingredients are listed above.</p> <p>Carbon dioxide is a simple asphyxiant having no exposure standard, but the oxygen concentration at 19.5% by volume, must be maintained. Atmospheres at less concentrations of oxygen do not provide sufficient sensory indications of deficiency, and can rapidly become life threatening.</p>					
Respiratory Protection	<p>If engineering controls and work practices are not effective in controlling exposure to carbon monoxide component, then wear suitable AS1715/1716 approved respiratory protective equipment. Have appropriate personal protective equipment available for use in emergencies such as leaks or fire. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance, inspection, cleaning, and evaluation. A leak detector and alarm system should be considered as supplementary control system.</p>					
Eye Protection	<p>The use of chemical goggles or safety glasses with side shield protection complying with AS/NZS 1337 is recommended.</p>					
Hand Protection	<p>Chemical resistant (Leather, PVC or Teflon) gloves complying with AS/NZS 2161 is recommended.</p>					
Footwear	<p>Personnel engaged in the movement of gas cylinders shall be provided with safety footwear.</p>					
Body Protection	<p>Overalls or similar protective apparel.</p>					
Eng. Controls	<p>Use only in a well ventilated area. Provide adequate general and local exhaust ventilation to prevent workplace atmospheres from becoming oxygen deficient. Provide supplied air or self-contained breathing apparatus for emergency or non routine situations where gas level is excessive.</p>					

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Colourless gas, sharp odour.
Solubility in	

Water	1.716m3/kg
Specific Gravity (H2O=1)	Not available
Vapour Pressure	(15°C) 5090 kPa
Vapour Density (Air=1)	(0°C, 101.3kPa:Air=1) 1.53
Odour Threshold	None
Specific Properties or Risk	Gas mixture is colourless and odourless, and must be detected with analytical monitors.
Flash Point	Not applicable
Flammability	Non flammable gas.
Other Information	Density of Gas (15°C, 101.3kPa) 1.87 kg/m3 Critical Temperature: 31.06°C

10. STABILITY AND REACTIVITY

Stability	Stable
Hazardous Polymerization	Will not occur.
Hazardous Reaction	Dry Carbon Dioxide is non-corrosive hence common materials are acceptable, e.g. steel, iron, copper, brass, plastic. Moist Carbon Dioxide is slightly corrosive, hence acid resistant materials are required.
Conditions to Avoid	Extreme temperature

11. TOXICOLOGICAL INFORMATION

Toxicology Information	Carbon Dioxide is the body's regulator of the breathing function. It is normally present in the air at a concentration of 340ppm by volume. An increase above this level will cause accelerated breathing and heart rate. Concentrations in the order of 10% can cause respiratory paralysis. Symptoms: Increased rate of breathing which may lead to choking feeling, confusion, exhaustion or unconsciousness. TLV is 5000 ppm. Dangerous to respiration in high concentrations.
Inhalation	Carbon dioxide is an asphyxiant. Effects of oxygen deficiency are: 12-16%; breathing and pulse rate increased, muscular co-ordination slightly disturbed. 10-14%; emotional upset, abnormal fatigue, disturbed respiration. 6-10%; nausea and vomiting, collapse or loss of consciousness. <6%; convulsive movements, possible respiratory collapse and death.
Ingestion	Not applicable to gases; unlikely route of exposure.
Skin	May cause frostbite injuries in contact with skin.
Eye	May cause frostbite injuries in contact with eyes or physical injury arising from sudden or uncontrolled gas release.

Chronic Effects Prolonged exposure to an oxygen deficient atmosphere (below 19.5% oxygen in air) may affect the heart and nervous system.

12. ECOLOGICAL INFORMATION

Mobility Not available

Persistence / Degradability Not available

Bioaccumulation Not available

Ecotoxicity Not available

13. DISPOSAL CONSIDERATIONS

Waste disposal procedures must be performed by trained, experienced personnel with appropriate protective equipment in approved treatment facilities, and in accordance with all federal, state and local government requirements. Reuse or recycling may also be possible and should be investigated. Alternately, return properly labelled cylinders to the supplier with all valve outlet plugs, caps and protection caps secured, for proper disposal.

14. TRANSPORT INFORMATION

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

Dangerous Goods of Class 2.2 (Non-flammable Non-toxic Gas) are incompatible in a placard load with any of the following:

- Class 1, Explosive
- Class 4.2, Spontaneously Combustible Substance
- Class 5.2, Organic Peroxide

U.N. Number 1013

Proper Shipping Name CARBON DIOXIDE

DG Class 2.2

Hazchem Code 2RE

Packaging Method 3.8.2

Packing Group

EPG Number 2C1

IERG Number 09

15. REGULATORY INFORMATION

Risk Phrase

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

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**Manufacturers
Advice**

Carbon dioxide is supplied in high pressure cylinders.

Cylinder colour: AS 2700 N32 Green Grey

Cylinder valve outlet:

Industrial: AS 2473 Type 30

Medical: AS 2472 Figure 9

References

- L'Air Liquide Gas Encyclopedia - Elsevier Scientific Publishing Co. Amsterdam

- Australian Code for the Transport of Dangerous Goods by Road and Rail; 6th Edition

- List of Designated Hazardous Substances [NOHSC:10005(1994)]

- Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC:3008(1995) and NOHSC:1003(1995)]

- Approved Criteria for Classifying Hazardous Substances [NOHSC:1008 (2004)]

- SAA Safe Storage and Handling Information Cards

- SAA Emergency Procedure Cards

- Matheson Gas Data Book, 6th Edition, Matheson 1980

- Canadian Liquid Air Montreal, Canada - Gas Products Safety Data Sheets

- Tomes Database, Micromedev

SDS History

MSDS Review: October 2005
Supersedes: October 2000

Poisons Schedule Not Scheduled

End of MSDS

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