

SECTION 1: Identification : Product identifier and chemical identity

1.1. Product identifier

Product form : Substance
Trade name : Carbon dioxide
CAS No : 124-38-9
Product code : 342
Formula : CO₂

1.2. Recommended uses and restrictions

Relevant identified uses : Industrial and professional. Perform risk assessment prior to use. Test gas/Calibration gas. Laboratory use. Purging. Shield gas for welding processes. Use for manufacture of electronic/photovoltaic components. Contact supplier for more information on uses.

1.3. Supplier information

CAC GAS & Instrumentation Pty Ltd
Unit 3 36 Holbeche Rd
2148 Arndell Park - AUSTRALIA
T +61 2 8676 6500
cac@cacgas.com.au - <http://www.cacgas.com.au/>
Emergency telephone number: 0400959760

SECTION 2: Hazards identification

2.1. Classification of the hazardous chemical

Classification (GHS-AU)

Press. Gas (Liq.) H280

2.2. Label elements

Hazard pictograms (GHS-AU) :



Hazard pictograms (GHS-AU) : GHS04
Signal word (GHS-AU) : Warning
Hazard statements (GHS-AU) : H280 - Contains gas under pressure; may explode if heated
Precautionary statements (GHS-AU) : P410+P403 - Protect from sunlight. Store in a well-ventilated place

2.3. Other hazards

Other hazards not contributing to the classification : Asphyxiant in high concentrations. Contact with liquid may cause cold burns/frostbite.

SECTION 3: Composition/information on ingredients

Name	CAS No	Compound type	%	Classification according to the United Nations GHS (Rev. 4, 2011)
342	124-38-9	Main constituent	100	Press. Gas (Liq.), H280

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after 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.
First-aid measures after skin contact : In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance.
First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes.
First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

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4.2. Symptoms caused by 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.

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

Other medical advice or treatment : None.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray or fog.
Unsuitable extinguishing media : Do not use water jet to extinguish.

5.2. Special hazards arising from the substance or mixture

General measures : Try to stop release. Evacuate area. 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.
Hazardous combustion products : None.

5.3. Special protective equipment and precautions for fire-fighters

Special protective equipment for fire fighters : Use self-contained breathing apparatus. Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters. Standard EN 469 - Protective clothing for firefighters. Standard - EN 659: Protective gloves for firefighters. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.
Specific methods : Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems. If possible, stop flow of product. Use water spray or fog to knock down fire fumes if possible.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Try to stop release. Evacuate area. 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.

6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Try to stop release.

6.3. Methods and material for containment and cleaning up

Methods and material for containment and cleaning up : Ventilate area.

SECTION 7: Handling and storage, including how the chemical may be safely used

7.1. Precautions for safe handling

Safe handling of the gas receptacle : Refer to supplier's container handling instructions. Do not allow backfeed into the container. Protect cylinders from physical damage; do not drag, roll, slide or drop. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. If user experiences any difficulty operating cylinder valve discontinue use and contact supplier. 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. 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. Do not remove or deface labels provided by the supplier for the identification of the cylinder contents.

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Safe use of the product : The product must be handled in accordance with good industrial hygiene and safety procedures. Only experienced and properly instructed persons should handle gases under pressure. Consider pressure relief device(s) in gas installations. Ensure the complete gas system was (or is regularly) checked for leaks before use. Do not smoke while handling product. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Avoid suck back of water, acid and alkalis.

7.2. Conditions for safe storage, including any incompatibilities

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

SECTION 8: Exposure controls/personal protection

8.1. Control parameters - exposure standards

No additional information available

Exposure limit values for the other components

No additional information available

8.2. Monitoring

No additional information available

8.3. Appropriate engineering controls

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

8.4. Personal protective equipment

Hand protection : Wear working gloves when handling gas containers. Standard EN 388 - Protective gloves against mechanical risk.

Eye protection : Wear safety glasses with side shields. Wear goggles when transfilling or breaking transfer connections. Standard EN 166 - Personal eye-protection - specifications

Respiratory protection : Self contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmospheres. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.

Thermal hazard protection : None necessary.

Environmental exposure controls : None necessary.

Other information : Wear safety shoes while handling containers. Standard EN ISO 20345 - Personal protective equipment - Safety footwear.

9.1. SECTION 9: Physical and chemical properties

Physical state : Gas

Appearance :

Molecular mass : 44 g/mol

Colour : Colourless.

Odour : No odour warning properties.

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

pH : Not applicable.

Relative evaporation rate (butylacetate=1) : No data available

Relative evaporation rate (ether=1) : Not applicable for gases and gas mixtures.

Melting point / Freezing point : Melting point : -78.5 °C
Freezing point : -56.6 °C

Boiling point : -57 °C @5.2 bar

Flash point : Not applicable for gases and gas mixtures.

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Critical temperature	: 31 °C
Auto-ignition temperature	: Not applicable.
Flammability (solid, gas)	: No data available
Vapour pressure	: Vapour pressure : 57.3 bar
Critical pressure	: 7375 kPa
Relative density	: Relative gas density : 1.52
Density	: Relative density : 0.82
Solubility	: Water: 2000 mg/l Completely soluble.
Log Pow	: 0.83
Viscosity	: Viscosity, kinematic : Not applicable. Viscosity, dynamic : Not applicable.
Explosive properties	: Not applicable.
Oxidising properties	: None.
Explosive limits	: Non flammable.
Minimum ignition energy	: No data available
Fat solubility	: No data available
Gas group	: Press. Gas (Liq.)
Additional information	: Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

10.1. SECTION 10: Stability and reactivity

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

11.1. SECTION 11: Toxicological information

Acute toxicity (oral)	: Not classified
Acute toxicity (dermal)	: Not classified
Acute toxicity (inhalation)	: Not classified
Skin corrosion/irritation	: Not classified pH: Not applicable.
Serious eye damage/irritation	: Not classified pH: Not applicable.
Respiratory or skin sensitisation	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
STOT-single exposure	: Not classified
STOT-repeated exposure	: Not classified
Aspiration hazard	: Not classified

Carbon dioxide (124-38-9)	
Viscosity, dynamic	Not applicable.
Viscosity, kinematic	Not applicable.

SECTION 12: Ecological information

According to the National Code of Practice for the Preparation of Material Safety Data Sheets , Environmental classification information is not mandatory . Information relevant for GHS classification is available on request

12.1. Ecotoxicity

Ecology - general	: No ecological damage caused by this product.
Acute aquatic toxicity	: Not classified
Chronic aquatic toxicity	: Not classified

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Carbon dioxide (124-38-9)	
Log Pow	0.83

12.2. Persistence and degradability

Carbon dioxide (124-38-9)	
Persistence and degradability	No ecological damage caused by this product.

12.3. Bioaccumulative potential

Carbon dioxide (124-38-9)	
Log Pow	See section 12.1 on ecotoxicology
Bioaccumulative potential	No ecological damage caused by this product.

12.4. Mobility in soil

Carbon dioxide (124-38-9)	
Ecology - soil	No ecological damage caused by this product.

12.5. Other adverse effects

Ozone : Not classified
Other adverse effects : No additional information available
Effect on the ozone layer : None.

Carbon dioxide (124-38-9)	
Effect on the ozone layer	None.
Effect on global warming	When discharged in large quantities may contribute to the greenhouse effect.
Fluorinated greenhouse gases	False
GWP 20 years	1
GWP 100 years	1
GWP 500 years	1

SECTION 13: Disposal considerations

Waste treatment methods : May be vented to atmosphere in a well ventilated place. Discharge to atmosphere in large quantities should be avoided. Do not discharge into any place where its accumulation could be dangerous.
Additional information : None.
List of hazardous waste codes (from Commission Decision 2001/118/EC) : 16 05 05 : Gases in pressure containers other than those mentioned in 16 05 04.

SECTION 14: Transport information

14.1. UN number

UN-No. (ADG) : 1013
UN-No. (IMDG) : 1013
UN-No. (IATA) : 1013

14.2. Proper Shipping Name - Addition

Proper Shipping Name (ADG) : CARBON DIOXIDE
Transport by air (ICAO-TI / IATA-DGR) : CARBON DIOXIDE
Transport by sea (IMDG) : CARBON DIOXIDE

14.3. Transport hazard class(es)

ADG

Transport hazard class(es) (ADG) : 2.2
Danger labels (ADG) : 2.2



IMDG

Transport hazard class(es) (IMDG) : 2.2
Danger labels (IMDG) : 2.2

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IATA

Transport hazard class(es) (IATA) : 2.2

Hazard labels (IATA) : 2.2



14.4. Packing group

Packing group (ADG) : Not applicable

Packing group (IMDG) : Not applicable

Packing group (IATA) : Not applicable

14.5. Environmental hazards

Marine pollutant : No

14.6. Special precautions for user

Specific storage requirement : No data available

Shock sensitivity : No data available

14.7. Additional information

Other information : No supplementary information available

Special transport precautions : 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.

Transport by road and rail

UN-No. (ADG) : 1013

Transport by sea

UN-No. (IMDG) : 1013

Limited quantities (IMDG) : 120 ml

Excepted quantities (IMDG) : E1

Packing instructions (IMDG) : P200

EmS-No. (Fire) : F-C - FIRE SCHEDULE Charlie - NON-FLAMMABLE GASES

EmS-No. (Spillage) : S-V - SPILLAGE SCHEDULE Victor - GASES (NON-FLAMMABLE, NON-TOXIC)

Stowage category (IMDG) : A

Properties and observations (IMDG) : Liquefied, non-flammable gas.Heavier than air (1.5). Cannot remain in the liquid state above 31°C.

MFAG-No : 120

Air transport

UN-No. (IATA) : 1013

PCA Excepted quantities (IATA) : E1

PCA Limited quantities (IATA) : Forbidden

PCA limited quantity max net quantity (IATA) : Forbidden

PCA packing instructions (IATA) : 200

PCA max net quantity (IATA) : 75kg

CAO packing instructions (IATA) : 200

CAO max net quantity (IATA) : 150kg

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ERG code (IATA) : 2L

14.8. Hazchem or Emergency Action Code

Hazchemcode : 2T

SECTION 15: Regulatory information

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

No additional information available

15.2. International agreements

No additional information available

SECTION 16: Any other relevant information

Revision date : 20/12/2016

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

Full text of H-statements:

Press. Gas (Liq.)	Gases under pressure : Liquefied gas
H280	Contains gas under pressure; may explode if heated

SDS_AU_STG

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product