

Safety Data Sheet – Carbon Dioxide

WARNING




Safety Data Sheet (SDS)

Carbon Dioxide Compressed and Liquefied Gas

1 PRODUCT AND COMPANY DETAILS	
1.1 Product Identifier	
Product Name	Carbon Dioxide,
Proper Shipping Name	Carbon Dioxide
Chemical Formula	CO ₂
1.2 Recommended use and restrictions on use	
Use(s)	Industrial and professional. Perform risk assessment prior to use. Test gas/Calibration gas. Purge gas, diluting gas, inerting gas. Purging. Shield gas for welding processes. Use for manufacture of electronic/photovoltaic components. Laboratory use. Food applications. Contact supplier for more information on uses.
Restrictions	Consumer use.
1.3 Supplier details	
Supply Company	Agas National PTY Ltd. PO Box 6063 Riverview Qld 4303
General Enquiries	TEL (07) 3282 5783

Safety Data Sheet – Carbon Dioxide

Technical Enquiries Specific to product		Agasnational.com.au 0732825783	
Emergency Telephone 0449252427 all hours			
2 HAZARDS IDENTIFICATION			
2.1 Classification of the substance or mixture			
Classification according to WHS Regulation Physical hazards Gases under pressure : Liquified gas H280			
2.2 Label Elements			
Signal word	Danger		
Pictogram	 GHS04		
Hazard statement(s)	H280 - Contains gas under pressure; may explode if heated.		
Storage statement	Storage : P403 - Store in a well-ventilated place.		
Labelling according to Directive 67/548/EEC or 1999/45/EC No labelling applicable			
2.3 Other Hazards			
Asphyxiant in high concentrations. Contact with liquid may cause cold burns/frostbite. In high concentrations CO2 cause rapid circulatory insufficiency. Symptoms are headache, nausea and vomiting, which may lead to unconsciousness.			
3 COMPOSITION AND INFORMATION ON INGREDIENTS			
3.1 Substances			
Name	Product Identifier	%	Classification according to WHS Regulation

Safety Data Sheet – Carbon Dioxide

Carbon Dioxide Compressed and Liquified Gas	(CAS-No.) 124-38-9 (EC-No.) 204-696-9 (EC Index-No.) --- (Registration-No.) *1	100	Press. Gas, H280
<p><i>Contains no other components or impurities which will influence the classification of the product.</i></p> <p><i>*1: Listed in Annex IV / V REACH, exempted from registration.</i></p> <p><i>*2: Registration deadline not expired.</i></p> <p><i>*3: Registration not required: Substance manufactured or imported < 1t/y.</i></p> <p>Full text of R-phrases see section 16. Full text of H-statements see section 16.</p>			
3.2 Mixtures			
Not applicable			
4 FIRST AID			
4.1 Description of first aid measures			
Eye	Immediately flush eyes thoroughly with water for at least 15 minutes.		
Inhalation	Remove victim to uncontaminated area wearing self-contained breathing apparatus. Keep victim warm and rested. Call a doctor. Perform cardiopulmonary resuscitation if breathing stopped.		
Skin	In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance.		
Ingestion	Ingestion is not considered a potential route of exposure.		
4.2 Most important symptoms and effects, both acute and delayed			
<p>In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation.</p> <p>Low concentrations of CO2 cause increased respiration and headache.</p> <p>Refer to section 11.</p>			
4.3 Indication of any immediate medical attention and special treatment needed			
None			
5 FIRE FIGHTING MEASURES			
5.1 Extinguishing media			
- Suitable extinguishing media - Unsuitable extinguishing media	Water spray or fog. Do not use water jet to extinguish.		
5.2 Special hazards arising from the substance or mixture			

Safety Data Sheet – Carbon Dioxide

Specific hazards	Exposure to fire may cause containers to rupture/explode.
Hazardous combustion products	None
5.3 Advice for fire-fighters	
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. Move containers away from the fire area if this can be done without risk.
Special protective equipment for fire fighters	In confined space use self-contained breathing apparatus. Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask. Standard EN 469 - Protective clothing for firefighters. Standard - EN 659: Protective gloves for firefighters.
5.4 Hazchem code	2T
6 ACCIDENTAL RELEASE MEASURES	
6.1 Personal precautions, protective equipment and emergency procedures	
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. Act in accordance with local emergency plan. Stay upwind. Oxygen detectors should be used when asphyxiating gases may be released.	
6.2 Environmental precautions	
Try to stop release.	
6.3 Methods and material for containment and cleaning up	
Keep area evacuated and free from ignition sources until any spilled liquid has evaporated. (ground free from frost).	
6.4 Reference to other sections	

Safety Data Sheet – Carbon Dioxide

See sections 8 and 13 for exposure controls and disposal.

7 HANDLING AND STORAGE

7.1 Precautions for safe handling

7.1.1 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.

Do not breathe gas.

Avoid release of product into atmosphere.

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.

7.1.2 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.

Suck back of water into the container must be prevented.

Open valve slowly to avoid pressure shock..

7.2 Conditions for safe storage, including any incompatibilities

Safety Data Sheet – Carbon Dioxide

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.

7.3 Specific end use(s)

No information provided.

8 EXPOSURE CONTROLS AND PERSONAL PROTECTION

8.1 Control parameters

Carbon dioxide (124-38-9)

OEL (Occupational Exposure Limits) :		
Australia	TWA (mg/m ³)	22500 mg/m ³
	TWA (ppm)	12500 ppm
	STEL (mg/m ³)	54000 mg/m ³
	STEL (ppm)	30000 ppm
DNEL (Derived-No Effect Level) : No data available.		
PNEC (Predicted No-Effect Concentration) : No data available.		

8.2 Exposure Controls

8.2.1. 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. CO2 detectors should be used when CO2 may be released.

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: PPE compliant to the recommended EN/ISO standards should be selected.

Body	Wear safety shoes while handling containers. Standard EN ISO 20345 - Personal protective equipment - Safety footwear.
Thermal hazards	None in addition to the other sections
Eye / Face	Wear goggles when transfilling or breaking transfer connections. Standard EN 166 - Personal eye-protection - specifications

Safety Data Sheet – Carbon Dioxide

Hands	Wear working gloves when handling gas containers. Standard EN 388 - Protective gloves against mechanical risk. Wear cold insulating gloves when transfilling or breaking transfer connections. Standard EN 511 - Cold insulating gloves.	
Respiratory protection	Gas filters may be used if all surrounding conditions e.g. type and concentration of the contaminant(s) and duration of use are known. Use gas filters with full face mask, where exposure limits may be exceeded for a short-term period, e.g. connecting or disconnecting containers. Gas filters do not protect against oxygen deficiency. Self-contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmospheres. Standard EN 14387 - Gas filter(s), combined filter(s) and full face mask - EN 136. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.	
8.2.3. Environmental exposure controls None necessary.		
9 PHYSICAL AND CHEMICAL PROPERTIES		
9.1 Physical Description/Properties		
Appearance	Physical state at 20 °C / 101.3kPa Colourless gas.	
Odour	No odour warning properties.	
Flammability	Non-flammable.	
Boiling Point = -56.6 °C	Flash Point = Not applicable for gases and gas mixtures.	
Melting Point = -78.5 °C	Auto Ignition Temperature = 305 °C	
Critical Temperature 30 °C	pH: Not applicable	
Specific Gravity Liquid: Not applicable	Relative Vapour Density = 0.82.	
Solubility (water): 2000 mg/l Completely soluble.		
Vapour Pressure (at 50°C) Not applicable	Vapour Pressure (at 20°C) = 57.3 bar(a)	
Decomposition temperature = 635 °C	Viscosity: Not available	
Oxidising properties: None	Molar mass = 44 g/mol	
Explosive properties: Not applicable		
Partition coefficient n-octanol/water [log Kow] : 0.83		
9.2 Other Information		


Safety Data Sheet – Carbon Dioxide

Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.	
10 STABILITY AND REACTIVITY	
10.1 Reactivity	
No reactivity hazard other than the effects described in sub-sections below.	
10.2 Chemical stability	
Stable under normal conditions.	
10.3 Possibility of hazardous reactions	
None.	
10.4 Conditions to avoid	
Avoid moisture in installation systems.	
10.5 Incompatible materials	
None. For additional information on compatibility refer to ISO 11114.	
10.6 Hazardous decomposition products	
Under normal conditions of storage and use, hazardous decomposition products should not be produced.	
11 TOXICOLOGICAL INFORMATION	
11.1 Information on toxicological effects	
Acute toxicity	Unlike simple asphyxiants, carbon dioxide has the ability to cause death even when normal oxygen levels (20-21%) are maintained. 5% CO ₂ has been found to act synergistically to increase the toxicity of certain other gases (CO, NO ₂). CO ₂ has been shown to enhance the production of carboxy- or met-hemoglobin by these gases possibly due to carbon dioxide's stimulatory effects on the respiratory and circulatory systems. For more information, see 'EIGA Safety Info 24: Carbon Dioxide, Physiological Hazards' at www.eiga.eu .
Skin corrosion/irritation	No known toxicological effects form this product.
Serious eye damage/irritation	No known toxicological effects form this product.
Respiratory or skin sensitisation	No known toxicological effects form this product.

Safety Data Sheet – Carbon Dioxide

Germ cell mutagenicity	No known toxicological effects form this product.
Carcinogenicity	No known toxicological effects form this product.
Toxic for reproduction : Fertility	No known toxicological effects form this product.
Toxic for reproduction : unborn child	No known toxicological effects form this product.
STOT - single exposure	No known toxicological effects form this product.
STOT - repeated exposure	No known toxicological effects form this product.
Aspiration hazard	Not applicable for gases and gas mixtures.
12 ECOLOGICAL INFORMATION	
12.1 Toxicity	
No ecological damage caused by this product.	
12.2 Persistence and degradability	
No ecological damage caused by this product.	
12.3 Bio-accumulative potential	
No ecological damage caused by this product.	
12.4 Mobility in soil	
Because of its high volatility, the product is unlikely to cause ground or water pollution. Partition into soil is unlikely.	
12.5. Results of PBT and vPvB assessment	
No data available. Not classified as PBT or vPvB.	
12.5 Other adverse effects	
No known effects from this product. Effect on the ozone layer : None. Global warming potential [CO ₂ =1] : 1 Effect on global warming : Contains greenhouse gas(es). When discharged in large quantities may contribute to the greenhouse effect.	
13 DISPOSAL CONSIDERATIONS	

Safety Data Sheet – Carbon Dioxide

13.1 Waste treatment methods	
Waste disposal	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. Return unused product in original cylinder to supplier.
Legislation	16 05 05 : Gases in pressure containers other than those mentioned in 16 05 04.
13.2. Additional information	
External treatment and disposal of waste should comply with applicable local and/or national regulations	
14 TRANSPORT INFORMATION	
14.1. UN number	10
14.2. UN proper shipping name	
Transport by road/rail (ADG) :	Carbon Dioxide
Transport by air (ICAO-TI / IATA-DGR) :	Carbon Dioxide
Transport by sea (IMDG)	Carbon Dioxide
14.3. Transport hazard class(es)	
Labelling	
	
2.2 : Non-flammable, non-toxic gases	
Transport by road/rail (ADG)	
Class : 2	
Hazchem code : 2T	
Hazard identification number : 20	
C/E - Tank carriage : Passage forbidden through tunnels of category C, D and E. Other carriage : Passage forbidden through tunnels of category E	
Transport by air (ICAO-TI / IATA-DGR)	
Class / Div. (Sub. risk(s)) : 2.2	
Transport by sea (IMDG)	
Class / Div. (Sub. risk(s)) : 2.2	
Emergency Schedule (EmS) - Fire : F-C	
Emergency Schedule (EmS) - Spillage : S-V	
14.4. Packing group	
Transport by road/rail (ADR/RID) :	Not applicable
Transport by air (ICAO-TI / IATA-DGR) :	Not applicable
Transport by sea (IMDG) :	Not applicable

Safety Data Sheet – Carbon Dioxide

14.5 Environmental hazards	
Transport by road/rail (ADR/RID) :	None.
Transport by air (ICAO-TI / IATA-DGR) :	None.
Transport by sea (IMDG) :	None.
14.6 Special precautions for user	
Hazchem Code	2T.
Packing Instruction(s)	Transport by road/rail (ADR/RID) : P200 Transport by air (ICAO-TI / IATA-DGR) Passenger and Cargo Aircraft : 200 Cargo Aircraft only : 200 Transport by sea (IMDG) : P200
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: <ul style="list-style-type: none"> - 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.
14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.	
15 REGULATORY INFORMATION	
15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture	
National regulations Ensure all national/local regulations are observed.	
15.2. Chemical safety assessment	
A CSA does not need to be carried out for this product.	
16 OTHER INFORMATION	
Indication of changes Revised safety data sheet in accordance with commission regulation (EU) No 453/2010	

Safety Data Sheet – Carbon Dioxide

Abbreviations and acronyms

ATE - Acute Toxicity Estimate. CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008. REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006. EINECS - European Inventory of Existing Commercial Chemical Substances. CAS# - Chemical Abstract Service number. PPE - Personal Protection Equipment. LC50 - Lethal Concentration to 50 % of a test population. RMM - Risk Management Measures. PBT - Persistent, Bioaccumulative and Toxic. vPvB - Very Persistent and Very Bioaccumulative. STOT- SE : Specific Target Organ Toxicity - Single Exposure. CSA - Chemical Safety Assessment. EN - European Standard. UN - United Nations. ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road. IATA - International Air Transport Association. IMDG code - International Maritime Dangerous Goods. RID - Regulations concerning the International Carriage of Dangerous Goods by Rail. WGK - Water Hazard Class. STOT - RE : Specific Target Organ Toxicity - Repeated Exposure.

Training advice

The hazard of asphyxiation is often overlooked and must be stressed during operator training.

Full text of H-statements

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

DISCLAIMER OF LIABILITY

Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

Details given in this document are believed to be correct at the time of going to press. 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.

Safety Data Sheet – Carbon Dioxide

Safety Data Sheet Receipt Form

I hereby acknowledge that I have been provided with a copy of the
AGas National Pty Ltd, Safety Data Sheet for Carbon Dioxide

Issue 1 dated March 2018.

To be returned to Agas National Pty Ltd. at

7 Monigold Place, Dinmore, Qld, 4303

Name	
Title	
Company	
Signed	Dated