

# Carbon dioxide

PRODUCT: CARBON DIOXIDE MSDS NR: 300-00-0005 BOC VERSION: 1.06: DATE: 17/08/06 PAGE: 1/1

## I IDENTIFICATION OF THE SUBSTANCE/ PREPARATION AND OF THE COMPANY

**Product name** Carbon dioxide  
**Chemical formula** CO<sub>2</sub>  
**Company identification** see footer  
**Emergency phone Nos** see footer

## 2 COMPOSITION/INFORMATION ON INGREDIENTS

**Substance/Preparation** Substance  
**Components/Impurities** Contains no other components or impurities which will influence the classification of the product.  
**CAS Nr** 124-38-9  
**EEC Nr (from EINECS)** 204-696-9  
**Specification** 99.8%  
 Conforms to BS 4105 part 1.

## 3 HAZARDS IDENTIFICATION

Liquefied gas under pressure. In high concentrations may cause asphyxiation. When liquid carbon dioxide under pressure is released to atmosphere, the discharge consists of gaseous and solid carbon dioxide only. Slightly corrosive in the presence of moisture. Solid carbon dioxide is white and when in direct contact with the skin will cause acute cold damage to skin – "cold burn". One volume of liquid or solid will give about 500 or 900 volumes of gas, respectively, at ambient conditions.

## 4 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 CO<sub>2</sub> 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** Immediately flush eyes thoroughly with water for at least 15 minutes. 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.

## 5 FIRE FIGHTING MEASURES

**Specific hazards** Exposure to fire may cause containers to rupture/explode. Non flammable. Inform Fire Brigade.

**Hazardous combustion products** None

**Suitable extinguishing media** All known extinguishants can be used.

**Specific methods** If possible, stop flow of product. Move away from container and cool with water from a protected position. Inform emergency services of the nature of the product and the possibility of bursting disc rupture (the cylinder is fitted with a bursting disc which will rupture and allow the contents to completely discharge if heat causes the carbon dioxide pressure to exceed the maximum permissible service level). Notify BOC to collect any cylinder(s) involved in a fire. Ensure such cylinders are clearly labelled.

## Special protective equipment for fire fighters

In confined space use self-contained breathing apparatus.

## 6 ACCIDENTAL RELEASE MEASURES

**Personal precautions** Evacuate area. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe: check using a carbon dioxide measuring device. Ensure adequate air ventilation. Post warning notices.

## Environmental precautions

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

**Clean up methods** Ventilate area.

## 7 HANDLING AND STORAGE

Suck back of water into the container must be prevented. Do not allow backfeed into the container. Normal materials of construction are suitable for dry gas of ambient temperature. Below -30°C only use low temperature carbon steel, austenitic stainless steels, aluminium, copper and their alloys. If carbon dioxide is dissolved in water, particularly at elevated pressures and in the presence of oxygen, use materials resistant to carbonic acid, eg. stainless steel or Monel. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact BOC if in doubt. Refer to BOC container handling instructions. Keep container below 50°C in a well ventilated place. Do not heat cylinder.

## 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

**Exposure limits** Carbon dioxide Occupational Exposure Standard (OES):  
 Long Term Exposure Limit (LTLEL) 5000ppm  
 Short Term Exposure Limit (STEL) 15000ppm

**Personal protection** Ensure adequate ventilation. Carbon dioxide monitoring is recommended if used or stored in a confined space.

## 9 PHYSICAL AND CHEMICAL PROPERTIES

**Molecular weight** 44  
**Melting point** -56.6°C  
**Sublimation point** -78.5°C  
**Critical temperature** 30°C  
**Relative density, gas** 1.52 (air=1)  
**Relative density, liquid** 0.82 (water=1)  
**Vapour Pressure 20°C** 57.3 bar  
**Solubility mg/l water** 2000 mg/l  
**Appearance/Colour** Colourless gas  
**Odour** In high concentrations, a sharp smell may become apparent  
**Other data** Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

## 10 STABILITY AND REACTIVITY

**Stability and reactivity** Stable under normal conditions.

## 11 TOXICOLOGICAL INFORMATION

**General** High concentrations cause rapid circulatory insufficiency. Symptoms are headache, nausea and vomiting, which may lead to unconsciousness. Carbon dioxide is mildly toxic, with no cumulative effects.

# SAFETY DATA SHEET

## 12 ECOLOGICAL INFORMATION

<b>General</b>	When discharged in large quantities may contribute to the greenhouse effect.
<b>Global warming factor</b>	1

## 13 DISPOSAL CONSIDERATIONS

### General

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

## 14 TRANSPORT INFORMATION

### PROPER SHIPPING

<b>NAME</b>	Carbon Dioxide
<b>UN Nr</b>	1013
<b>Class/Div</b>	2
<b>ADR/RID</b>	
<b>Classification Code</b>	2A
<b>ADR/RID Hazard Nr</b>	20
<b>Labelling ADR</b>	Label 2.2: non flammable non toxic gas.

### 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 they are firmly secured and:

- cylinder valve is closed and not leaking.
- valve outlet cap nut or plug (where provided) is correctly fitted.
- valve protection device (where provided) is correctly fitted.
- adequate ventilation.
- compliance with applicable regulations.

## 15 REGULATORY INFORMATION

<b>Number in Annex I of Dir 67/548</b>	Not included in Annex I.
<b>EC Classification</b>	Not classified as dangerous substance.
<b>Labelling of cylinders – Symbols</b>	Label 2.2: non flammable non toxic gas.

## 16 OTHER INFORMATION

Ensure all national/local regulations are observed.

Asphyxiant in high concentrations.

Keep container in well ventilated place.

Do not breathe the gas.

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

Contact with liquid may cause cold burns and/or frostbite

This Safety Data Sheet has been established in accordance with the applicable European Directives and applies to all countries that have translated the Directives in their national laws.

Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out. Do not use any other gas as a substitute for carbon dioxide. Always leak check cylinders when first collected, delivered or used, using an approved leak detection fluid.

Keep container in well ventilated place.

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.

For further safety information please refer to "Safe Under Pressure" and "Safe handling, storage and transport of industrial gas cylinders", both of which are available from your local BOC outlet.

## NOTES

1. Cylinder sizes VB, VK and WV are for vapour withdrawal, LB, LK and WL are for liquid withdrawal. Not all cylinders are available from all locations.

2. This is the outlet connection of the cylinder valve fitted to each cylinder, and which is designed primarily to receive the gas pressure regulator.

3. Each cylinder valve incorporates a bursting disc safety device, designed to rupture at 180-200 bar. Do not tamper with this disc.

\* Offshore customer use only.

## CYLINDER CHARACTERISTICS

Cylinder size	Maximum Filled Pressure at 15°C (bar)	Approx. Dimensions incl. valve and guard where supplied (mm)	Approx. Full Cylinder weight (kg)	Manifolded Cylinder Pallets (MCP's)	Maximum Filled Pressure at 15°C (bar)	Approx. Dimensions incl. cylinders (mm)	Max. Gross Weight (kg)
VB/LB	50	9400 x 140	22	WV/WL	50	1280 x 1710 x 830	1700
LR/VR	50	8700 x 200	44	(15 x LK/VK)			
VK/LK	50	2300 x 150	99	ZK*	50	1090x1330x2080	2590

**OUTLET CONNECTION:** Right hand 0.860 in x 14 TPI male.



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All BOC Safety Data Sheets are available online at [www.boc.com/uk/sds](http://www.boc.com/uk/sds)

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