

Carbon dioxide

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

1 IDENTIFICATION OF THE SUBSTANCE/ PREPARATION AND OF THE COMPANY

Product name	Carbon dioxide
Chemical formula	CO ₂
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 ₂ 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 (LTTEL) 5000vpm Short Term Exposure Limit (STEL) 15000vpm
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

General	When discharged in large quantities may contribute to the greenhouse effect.
Global warming factor	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

NAME	Carbon Dioxide
UN Nr	1013
Class/Div	2
ADR/RID Classification Code	2A
ADR/RID Hazard Nr	20
Labelling ADR	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

Number in Annex I of Dir 67/548	Not included in Annex I.
EC Classification	Not classified as dangerous substance.
Labelling of cylinders - Symbols	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

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