BOC GASES

SAFETY DATA SHEET

Liquid Carbon Dioxide

1 IDENTIFICATION OF THE SUBSTANCE/ PREPARATION AND OF THE COMPANY

Product name	Liquid Carbon Dioxide
Chemical formula	CO_2
Company identification	see heading and/or footer
Emergency phone Nos	see heading and/or 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	100124-38-9
EEC Nr (from EINECS)	2046969

3 HAZARDS IDENTIFICATION

Hazards identification	Refrigerated liquefied gas. Contact with product may cause cold burns or frostbite. In high concentrations may cause asphyxiation.

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
Hazardous combustion products	None
Suitable extinguishing media	All known extinguishants can be used.
Specific methods	If possible, stop flow of product. Move container away or cool with water from a protected position.
Special protective equipment for fire fighters	In confined space use self-contained breathing apparatus.

6 ACCIDENTAL RELEASE MEASURES

Personal precautions	Evacuate area. Use protective clothing. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Ensure adequate air ventilation.
Environmental precautions	Try to stop release. 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

Handling and storage	Suck back of water into the container must be prevented. Do not allow backfeed into the container. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Refer to supplier's container handling instructions. Keep container below 50°C in a well ventilated place.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limit value	5000ppm
Personal protection	Ensure adequate ventilation. Protect eyes, face and skin from liquid splashes.

9 PHYSICAL AND CHEMICAL PROPERTIES

Molecular weight	44
Melting point	-56.6°C
Boiling point	-78.5(s)°C
Critical temperature	30°C
Relative density, gas	1.52 (air=1)
Relative density, liquid	1.03 (water=1)
Vapour Pressure 20°C	57.3 bar
Solubility mg/l water	2000 mg/l
Appearance/Colour	Colourless liquid
Odour	No odour warning properties
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. Liquid spillages can cause embrittlement of structural materials.

11 TOXICOLOGICAL INFORMATION

General	Low concentrations cause rapid circulatory insufficiency. Symptoms are headache, nausea and vomiting, which may lead to unconsciousness.

SAFETY DATA SHEET

12 ECOLOGICAL INFORMATION

General

When discharged in large quantities may contribute to the greenhouse effect. Can cause frost damage to vegetation.

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 supplier if guidance is required.

14 TRANSPORT INFORMATION

UN Nr	2187
Class/Div	2.2
ADR/RID Item Nr	2,7a
ADR/RID Hazard Nr	220
Tremcard Nr	11
Groupcard Nr	20g22
Labelling ADR	Label 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: - adequate ventilation. - compliance with applicable regulations.

15 REGULATORY INFORMATION

Number in Annex I of Dir 67/548	Not included in Annex 1.
EC Classification	Proposed by the industry Not classified as dangerous substance.

Labelling of cylinders

- Symbols	Road transport symbols are used and selected according to the most stringent product classification - EC or ADR . Label 2: non flammable non toxic gas.
- Risk phrases	RAs Asphyxiant in high concentrations. RFb May cause frostbite.
- Safety phrases	S9 Keep container in well ventilated place. S23 Do not breathe the gas. S36A Use suitable protective equipment.

16 OTHER INFORMATION

Ensure all national/local regulations are observed.

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

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.

17 PRODUCT SPECIFICATION

	Specification	Typical Analysis
Carbon Dioxide	99.95%	99.99%
Carbon Monoxide	<10 vpm	<1 vpm
Sulphur	<5 ppm	<1 ppm
Moisture	<10 vpm	<10 vpm
Oxygen	<20 vpm	<2 vpm
Oil	<2 ppm	<1.3 ppm
Hydrocarbons	<10 vpm	<1 vpm
Ammonia	<1 vpm	<1 vpm
Nitrous Oxide	<1 vpm	<1 vpm
Residual Gases	<0.025%	0.006%

BOC GASES

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