

## MATERIAL SAFETY DATA SHEET - CARBON DIOXIDE

### 1. Identification of product/substance and company

Product Identifier	Carbon Dioxide / CO <sub>2</sub>
Trade Name	
Chemical Description	Carbon Dioxide
Chemical Formula	CO <sub>2</sub>
Registration No.	Listed in Annex IV / V REACH, exempted from registration
Use	Fire extinguishing agent

### 2. Hazards Identification

Hazard Pictograms Code	GHS04
Signal Word	Warning
Hazard Statements	H280: Contains gas under pressure; may explode if heated
Precautionary Statements	P403: Store in a well-ventilated place
R-Phrases	None
S-Phrases	None
Inhalation	High concentrations cause asphyxiation
Skin	Frostbite and burns from frostbite may occur on contact
Eyes	Could cause damage to the eyes on contact

### 3. Composition & Information on Ingredients

Reach No.	CAS No.	Ingredients	%	EU Classification
204-696-9	124-38-9	Carbon Dioxide	100	Liq. Gas (H280)

### 4. First Aid Measures

Contact with Skin	Flush the area with water for a minimum of 15 minutes. Medical attention is advised.
Contact with Eyes	Flush the area with water for a minimum of 15 minutes. Medical attention is advised.
Inhalation	This product can cause asphyxiation. Symptoms include loss of mobility and consciousness. Remove casualty from exposure and call for professional medical help. Use breathing apparatus. If breathing has stopped begin artificial respiration. Keep casualty warm.
Ingestion	Ingestion is not considered a potential route of exposure.

### 5. Fire Fighting Measures

There is no fire risk with carbon dioxide but emergency services must be made aware of the presence of cryogenic gas cylinders as they could detonate if heated causing danger & destruction. Spray cylinders with water from a protected position and maintaining a safe distance to keep the cylinder and contents cool. In confined spaces use self-contained breathing apparatus.

## 6. Accidental Release Measures

Personal Precautions	If required wear self-contained breathing apparatus and suitable warm protective clothing. Evacuate area at all times
Environmental Precautions	If it is safe to do so, close the cylinder valve and transport to the open air. Accumulations of invisible CO <sub>2</sub> gas in low-lying areas such as pits, basements or sewers can be dangerous and these areas should not be entered without suitable breathing equipment until pronounced safe to do so.
Clean Up Methods	Ventilate area

## 7. Handling & Storage

Handling	Cylinders must only be handled by trained personnel. Do not lift or move the cylinder using the valve. Do not use force to open or close the valve. Cylinders must always be suitable for the gas(es) and must have the correct test and working pressure. Cylinders must be regularly inspected.
Storage	Store cylinders away from heat sources and preferably in a well-ventilated area. Larger cylinders should be kept out of doors, away from direct sunlight and in a well ventilated, safe compound. Identification labels and marks should always be clear and legible. Store in an upright position.

## 8. Personal Protection & Exposure Controls

Personal Protection	Ensure adequate ventilation
Eye Protection	Wear goggles to protect from ice particles
Respiratory Protection	Use breathing apparatus when there is any risk of exceeding the exposure limits
Skin Protection	Wear suitable protective clothing and avoid contact with the skin at all times
Hand Protection	Use suitable insulated gloves
Occupational Exposure Limits	
Carbon Dioxide: ILV (EU) - 8 H - [mg/m <sup>3</sup> ]: 9000	
Carbon Dioxide: ILV (EU) - 8 H - [ppm]: 5000	
Carbon Dioxide: TLV <sup>©</sup> - TWA [ppm]: 5000	
Carbon Dioxide: TLV <sup>©</sup> - STEL [ppm]: 30000	

## 9. Physical & Chemical Properties

Physical State at 20°C	Gas
Colour	Colourless
Odour	No odour warning properties
Molecular Weight	44
Melting Point	-56.6°C
Boiling Point	-78.5°C
Critical Temperature	30°C
Vapour Pressure [20°C]	57.3 bar
Relative Density, gas (air=1)	1.52
Relative Density, liquid (water=1)	0.82
Solubility in Water	2000mg/l
Flammability Range	Non-Flammable

## 10. Stability & Reactivity

Stability	Stable
Hazardous decomposition products	None
Materials to avoid	Rubber & PTFE. Will embrittle materials not designed or intended to be used at low temperatures

## 11. Toxicological Information

Increased respiration at low concentrations.	
Symptoms:	Headache, nausea and vomiting leading to unconsciousness.

## 12. Ecological Information

Cryogenic liquid escape can cause localised frost.  
Large discharges will contribute to the greenhouse effect.

## 13. Disposal Considerations

Avoid discharging large quantities into the atmosphere or where there is a danger of accumulations.

## 14. Transport Information

UN No.	1013	
Labelling	ADR, IMDG, IATA	
	2.2: Non-flammable, non-toxic gas	
Land Transport	ADR/RID	
	H.I. Nr	20
	UN Proper Shipping Name	CARBON DIOXIDE
	Transport Hazard Class	2
	ADR/RID Classification Code	2 A
	Packing Instructions – general	P200
	Tunnel Restriction	C/E Tank Carriage: Passage forbidden through tunnels of category C, D and E. Other carriage: Passage forbidden through tunnels of category E.
Sea Transport	IMO-IMDG Code	
	Proper Shipping Name	CARBON DIOXIDE
	Class	2.2
	IMO Packing Group	P200
	Emergency Schedule – Fire	F-C
	Emergency Schedule – Spillage	S-V
	Instructions – Packing	P200
Air Transport	ICAO/IATA	
	Proper Shipping Name	CARBON DIOXIDE
	Class	2.2
	Passenger and Cargo Aircraft Packing Instruction	200
	Cargo Aircraft Only Packing Instruction	200

## 15. Transport Information (cont'd)

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 emergency.

Before transporting product containers:

- Ensure that cylinders 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
- Ensure there is adequate ventilation
- Ensure compliance with applicable regulations

## 16. Regulatory Information

Safety Phrases	Cylinders / vessels to be kept in a well-ventilated area. Use P.P.E. Do not breathe gas.
Risk Phrases	High concentrations cause asphyxiation. Risk of frostbite.
EC Classification	Not classified as a dangerous substance

## 17. Other Information

### Employers' Responsibilities

It is the duty of employers to tell employees and others who may be affected of the hazards outlined in this sheet and the need to take precautions and adopt safety measures in a responsible manner.

### Data Information

The data and advice outlined in these sheets apply to the product when sold for the application detailed in paragraph 1. Other risks may apply when the product is used for other purposes. Do not use the product for other purposes without applying for written advice and guidance from the company listed in paragraph 1.

### Information Circulation

It is your duty to ensure that anyone handling the product (including those purchasing the product to supply it for third party use) are provided with the information contained in these sheets