

**Warning**



### SECTION 1. Identification of the substance/mixture and of the company/undertaking

#### 1.1 Product Identification

Commercial Name	:	Carbon Dioxide
SDS Nr.	:	018
Chemical Name	:	Carbon Dioxide
CAS Nr.	:	124-38-9
CE Nr.	:	204-696-9
Registration Nr.	:	Listed in Annex IV/V del REACH, exempt from registration
Chemical Formula	:	CO <sub>2</sub>

#### 1.2 Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	:	Production of carbonated drinks. Industrial and professional use: carry out a risk analysis before use. Gas for inerting. Use in the production of electronic / photovoltaic components. Laboratory use Fire gas. Cooling applications. Gas for packaging and food transport. Special effects for entertainment. Contact the supplier for more information.
Uses advised against	:	Feeding infants.

#### 1.3 Details of the Safety Data Sheet's supplier

Company details	:	GAS MARINE BV srl Piazza della Vittoria 9/6 16121 Genoa - Italy Tel: +39 010 7164 E-mail: info@gasmarine.it
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#### 1.4 Emergency telephone number

Emergency telephone number	:	+39 02 66101029 – Centro Antiveleni Osp. Niguarda
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### SECTION 2: dangers identification

#### 2.1 Classification of the substance or mixture

Classification according to (CE) n. 1272/2008 (CLP)

- **Physical dangers**  
Gas under pressure, liquefied gas: H280

#### 2.2 Label elements

Labeling according to (CE) Rule n. 1272/2008 (CLP)

Danger Pictograms



GSH04

- Warning : Be careful
- Warning indication : H280: It contains gas under pressure;it may explode if heated
- Precautionary advise
- Prevention : None.
  - Answer : None.
  - Storage : P403: Store in a well-ventilated place.
  - Disposal : None.
- Additional information on the label : EIGA-As: asphyxiating at high concentrations..

#### 2.3 Other dangers

- Other dangers : Asphyxiant in high concentrations (in high concentration carbon dioxide quickly causes respiratory failure. The symptoms are headache, nausea and vomiting which can lead to unconsciousness)  
Contact with liquid or solid (dry ice or carbon snow) in evaporation can cause frostbite burns.

### SECTION 3: composition/information on ingredients

#### 3.1 Substances

- Chemical name : Carbon Dioxide
- Product Identification
- CAS Nr : 124-38-9
  - CE Nr : 204-696-9
  - EU Nr : ---
  - Registration REACH Nr : Listed in the Annex IV/V del REACH, exempt from registration
- Purity : 100%  
*The purity of the substance in this section is used only for classification and it does not represent the actual purity of the substance as supplied, for which the test report is authentic. In the case of E290 purity is higher than 99%.*
- Commercial name : Carbon Dioxide

#### 3.2 Mixtures

Not applicable



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### SECTION 4: First Aid measures

#### 4.1 Description of first aid measures

- Inhalation : Move the victim to an uncontaminated area wearing self-contained breathing apparatus. Keep the patient relaxed and warm. Call a doctor. Proceed with cardiopulmonary breathing only if breathing stops.
- Eye contact : Rinse eyes immediately with water for at least 15 minutes. Remove any contact lenses if easy to do. Seek medical attention immediately. If medical care is not available, rinse for another 15 minutes.
- Skin contact : Contact with the liquid that evaporates (or the solid in sublimation) can cause freezing of the skin due to the rapid cooling of the exposed part. In case of freezing burns spray with water for at least 15 minutes. Then apply a sterile gauze, do not rub the affected part and consult a doctor.
- Ingestion : Ingestion is unlikely

#### 4.2 Most important symptoms and effects, both acute and delayed

In high concentration, it can cause asphyxiation and respiratory arrest. Symptoms may include loss of mobility and / or unconsciousness. Victims may not be aware of asphyxiation. Low concentrations of carbon dioxide cause increased respiratory rate and headaches.

Refer to section 11.

#### 4.3 Need Indication to consult a doctor and special treatments

Consult a doctor in case of asphyxiation, eye contact or frostbite burns.

### SECTION 5: fire-fighting measures

Heat can cause container explosion

#### 5.1 Fire-fighting

- Suitable Fire-Fighting : The material will not burn. In case of fire in the surrounding area, use the suitable fire fighting..
- NOT-suitable Fire-Fighting : None.

#### 5.2 Special warnings arising from the substance or mixture

- Specific Dangers : Heat can cause container explosion
- Hazardous combustion products : None

#### 5.3 Recommendations for firefighters

- Specific Methods : If possible, stop the spillage of the product and move the containers to an area away from the fire. Otherwise, cool the containers exposed to the risk of overheating with shower jets of water from a protected position. Use fire-fighting measures appropriate to the surrounding fire, use nebulized water to reduce the fumes and do not pour water contaminated by the fire into the sewer drains.
- Special protective equipment for firefighters : Use SCBA self-contained breathing apparatus in confined spaces. Use standard protective equipment, including fireproof suit, helmet with protective visor, gloves and rubber boots conforming to:
- EN469: protective clothing for firefighters - Performance requirements for protective clothing for the fight against fire.
  - EN15090: Footwear for firefighters.



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- EN659: Protective gloves for firefighter.
- EN443: Helmets for fighting fire in buildings and other structures.
- EN137: Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask - testing and marking required

### SECTION 6: accidental release measures

#### 6.1 Personal precautions, protective equipment and emergency procedures

Attempt to stop the spill.  
Evacuate the area.  
Use the self-contained breathing apparatus to enter the affected area if it is not proven that the atmosphere is breathable.  
Ensure adequate ventilation.  
Prevent the entry of the product into sewers, basements, excavations and areas where accumulation can be dangerous for third parties (risk transfer).  
Operate in accordance with the local emergency plan.  
If outdoors, stay upwind.  
Whenever release of asphyxiating gases is possible, oxygen detectors should be used.

#### 6.2 Environmental precautions

Attempt to stop the spill.  
Avoid spills and additional losses if possible

#### 6.3 Methods and materials for containment and cleaning up

Ensure adequate ventilation.

#### 6.4 Reference to other sections

See section 8 and 13.

### SECTION 7: handling and storage

#### 7.1 Precautions for Safe Handling

Safe use of the product

: **Do not breathe the gas.**

Only properly trained and experienced people can handle gas under pressure. The substance must be handled in accordance with good industrial hygiene and safety procedures. Use only specific equipment suitable for the product, the pressure and the temperature of use. Make sure that the entire gas distribution system has been (or is regularly) checked against leaks before use.

**Do not remove or damage the labels supplied by the manufacturer to identify the contents of the cylinders.**

When handling cylinders with a capacity greater than 4 kg, even for short distances, use suitable equipment for transport (pallet truck, cylinder trolley). Always fix the cylinders in vertical position and close the valves if not used. Ensure adequate ventilation and avoid release of product into the atmosphere.

**Avoid the return of water into the container** and do not allow the gas to flow back into the container. Avoid backflow of water, acids and alkalis.



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**Keep the containers at temperatures below 50 ° C, in cool and adequately ventilated / ventilated rooms. Keep the containers protected from direct exposure to sunlight.**

Comply with all local laws and regulations regarding the storage of containers. Do not eat, drink or smoke during use.

Do not use direct flames or electric heating devices to increase the pressure of the container.

In the case of cylinders greater than 1 kg, do not remove the valve protection cap until the container has been properly fixed (to a wall, in a basket or other) and is ready for use. Close the container valve after each use and when empty, even if still connected to the equipment. Reassemble the caps and / or caps of the valves and containers, where provided, as soon as the container is disconnected from the equipment.

Cylinders with damaged valve must be returned immediately to the supplier.

**Never attempt to repair or modify the valves or container safety devices.**

Keep the outlet of the container valve clean and free of contaminants, especially water and oil.

Open slowly the valve to avoid pressure strokes. If the user encounters any operational difficulty, close the cylinder valve and contact the supplier.

**Never attempt to transfer gas from one cylinder / container to another.**

Depressurization of liquid CO<sub>2</sub> below 5 bar can create solid CO<sub>2</sub> which can block protective devices, pipes and form dry ice in the container.

Containers that contain or have contained flammable or explosive substances must not be inerted using liquid carbon dioxide.

Safe handling of the gas container

: **Protect containers from physical damage: do not drag, do not roll, do not slide or fall.**

Containers should not be stored in conditions that can promote corrosion.

The stored containers must be periodically checked to evaluate the general conditions and the losses.

Store containers in rooms free from fire risk and away from sources of heat and ignition.

**Store the containers at temperatures below 50 ° C, in cool and adequately ventilated / ventilated rooms. Store the containers protected from direct exposure to sunlight.**

### 7.3 Specific end uses

None

## SECTION 8: exposure control/individual protection

### 8.1 Check parameters

#### Carbon Dioxide (124-38-9)

UE (Indicative Exposure limit values Dir. 91/322/CEE, 2000/39/CE, 2006/15/CE, 2009/161/UE (12 2009)

ILV (EU) – 8 h

5.000 ppm – 9.000 mg/m<sup>3</sup>

ACGIH

ACGIH TWA  
ACGIH STEL

5.000 ppm  
30.000 ppm

Italy

8 h occupational exposure limit values

5.000 ppm – 9.000 mg/m<sup>3</sup>

DNEL (No effect derived level)

: No data available

PNEC (Predictable no-effect concentrations)

: No data available

*Individual exposure limits may vary according to the regulations in force in countries other than Italy.*



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### 8.2 Exposure controls

- 8.2.1 Appropriate technical checks : Provide adequate ventilation of the drains at general and local level. Periodically check for leaks. Make sure that the exposure is well below the professional exposure limits. Ensure adequate ventilation also through a possible extraction system. Whenever carbon dioxide release is possible, oxygen and carbon dioxide detectors should be used. Consider using a work permit system, for example for maintenance activities.
- 8.2.2 Individual protection measures, e.g. personal protective equipment.
- General Information : A risk analysis must be conducted and documented in each work area, to assess the risk related to the use of the product and to identify PPE appropriate to the identified risks. The PPE selected, based on the task to be carried out and the risks involved, must comply with UNI / EN / ISO standards.
- Eye/Face protection : Wear goggles with side protection or face mask during the connection / disconnection of the cylinders from the systems. UNI EN 166 standard - Personal eye protection - specifications.
- Skin protection
- Hands protection : Wear work gloves when handling gas containers. Standard UNI EN 388 - Protective gloves against mechanical risks. Wear cryogenic gloves in case of danger of contact with liquid or solid carbon dioxide (dry ice). Standard UNI EN 511 - Protective gloves against cold.
  - Body protection : No special precautions.
  - Other : Wear safety shoes when handling containers. UNI EN ISO 20345 standard - Personal protective equipment - Safety shoes.
- Respiratory system protection : In under oxygenated environments, a self-contained breathing apparatus or a respirable air supply system with mask must be used. Filter masks do not protect against under oxygenated atmospheres but can be used when exposure limits can be exceeded for a very short period. Standard UNI EN 137: Respiratory protective devices - Self-contained open circuit compressed air breathing apparatus with full face mask.
- Thermal warnings : None other than the ones previously indicated
- Other : No specific risk management measures are required beyond good industrial practice and safety procedures: do not eat, drink or smoke while using the product.
- 8.2.3 Environmental exposure controls : None.

## SECTION 9: physical and chemical properties

### 9.1 Information on basic physical and chemical properties

- Appearance
- Physical state at 20 °C / 101.3 kPa : Gas
  - Color : Colorless
- Smell : Odorless
- Olfactory limit : The olfactory limit is personal and inadequate to warn overexposure.



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pH	:	Not applicable
Melting Pot/sublimation	:	-78,5 °C
Boiling Point	:	-56,6 °C
Critical temperature	:	31,0 °C
Inflammability Point	:	N.A.
Evaporation Speed	:	N.A.
Inflammability (solid, gas)	:	Not flammable
Inflammability limit or explosiveness	:	Not flammable
Vapor pressure (20 °C)	:	57,3 bar
Vapor pressure (50 °C)	:	N.A.
Liquid relative density (water = 1)	:	0,82
Gas relative density (aria = 1)	:	1,52
Water Solobility	:	2000 mg/l Completely soluble
Parttition coefficient n-octanol/water (log kow)	:	0,83
Auto-ignition temperature	:	N.A.
Decomposition temperature	:	Unknown
Viscosity	:	Unknown
Explosive properties	:	N.A.
Oxidising Properties	:	N.A.

## 9.2 Other information

Molecular weight	:	44,01 g/mol
Other info	:	Gas heavier than air. It can accumulate in closed spaces, particularly at or below ground leve.

## SECTION 10: stability and reactivity

### 10.1 Reactivity

No reactivity dangers other than those described in the following subsections.

### 10.2 Chemical stability

Stable under normal condition

### 10.3 Danger reactions possibilities

None

### 10.4 Conditions to avoid

Avoid humidty in the systems

### 10.5 Incompatible materials

None. Refer to ISO 11114 for additional info on materials compatibility.

### 10.6 Dangerous decomposition products

None



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### SECTION 11: toxicological information

#### 11.1 Information on toxicological effects

Severe toxicity	:	In high concentration it quickly causes respiratory failure. Symptoms are headache, nausea and vomiting which can lead to unconsciousness. Unlike simple asphyxiants, carbon dioxide has the ability to cause death even when normal oxygen levels are maintained (20-21%). It has been found that 5% of CO <sub>2</sub> contributes synergistically to the increase in toxicity of other gases (CO, NO <sub>2</sub> ). CO <sub>2</sub> has been shown to increase the production of carboxy or half hemoglobin by these gases probably due to its stimulatory effects on the respiratory and circulatory systems. For more information refer to the document "EIGA Safety Info 24: Carbon Dioxide, Physiological Hazards" available at <a href="http://www.eiga.eu">www.eiga.eu</a> .
Skin corrosion/irritation	:	No known effects from this product.
Sever eye damages/irritation	:	No known effects from this product
Respiratory or skin sensitization	:	No known effects from this product
Mutagenicity	:	No known effects from this product
Carcinogenicity	:	No known effects from this product
Toxic for reproduction: fertility	:	No known effects from this product
Toxic for reproduction: fetus	:	No known effects from this product
STOT: single exposure	:	No known effects from this product
STOT: repeted exposure	:	No known effects from this product
Inhalation dangers	:	Not applicable fro gas and mixture.

### SECTION 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 Bioaccumulative potential

No ecological damage caused by this product

#### 12.4 Mobility in soil

No ecological damage caused by this product

#### 12.5 PBT and vPvB results

Not classified as PBT or vPvB.

#### 12.6 Other negative effects

Other negative effects	:	No known effects from this product
Effects on ozone layer	:	None
Global Warming Potential (GWP) (CO <sub>2</sub> =1)	:	1
Effects on global warming	:	Contains greenhouse gases not regulated by Regulation 517/2014 / EU. If discharged in large quantities, it can contribute to the greenhouse effect.



### SECTION 13: disposal considerations

#### 13.1 Waste treatment methods

General information	:	It can be sent to the atmosphere in a well-ventilated area. Do not discharge where accumulation is dangerous
Disposal methods	:	Refer to the EIGA code of practice (Doc. 30 "Gas disposal", downloadable from <a href="http://www.eiga.org">http://www.eiga.org</a> ) for a guide to the available disposal methods. Avoid direct discharge of large quantities into the atmosphere. Return the unused product to the supplier in the original container. Return the container to the supplier.
Waste European Code	:	16.05.05: gas in container under pressure other than the one mentioned in 16.05.04*.

#### 13.2 Additional Information

None

### SECTION 14: Transport information

#### 14.1 UN Number

UN Number: UN1013

#### 14.2 UN Transport Rules

Transport by road/rail (ADR/RID)	:	Carbon Dioxide
Transport by air (ICAO-TI/IATA-DGR)	:	Carbon Dioxide
Transport by sea (IDGM)	:	Carbon Dioxide

#### 14.3 Danger transportation class

Labelling : 2.2 Gas non-flammable non-toxic



Transport by road/rail (ADR/RID)		
- Class	:	2
- Classification Code	:	2A
- Danger Identification Nr.	:	20
- Tunnel restriction	:	C/E
Transport by air (ICAO-TI/IATA-DGR)		
- Class / Division (subsidiary risk)	:	2.2
Transport by sea (IDGM)		
- Class / Division (subsidiary risk)	:	2.2
- Emergency Form (EmS) – Fire	:	F-C
- Emergency Form (EmS) - Spillage	:	S-V

#### 14.4 Packaging Group

Transport by road/rail (ADR/RID)	:	N.A.
Transport by air (ICAO-TI/IATA-DGR)	:	N.A.
Transport by sea (IDGM)	:	N.A.



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### 14.5 Environmental dangers

Transport by road/rail (ADR/RID)	:	None
Transport by air (ICAO-TI/IATA-DGR)	:	None
Transport by sea (IDGM)	:	None

### 14.6 Special precautions for users

#### Packaging Instructions

- Transport by road/rail (ADR/RID)	:	P200
- Transport by air (ICAO-TI/IATA-DGR)	:	
o Passengers and cargo Aircraft	:	200
o Cargo aircraft only	:	200
- Transport by sea (IDGM)	:	P200

#### Precaution measures for transport

: Avoid transport on vehicles where the loading area is not separated from the passenger compartment.

Make sure the driver is informed of the potential risk of the load and knows what to do in the event of an accident or emergency.

Before starting the transport:

- Make sure there is adequate ventilation.
- Make sure that the load is well secured.
- Make sure that the cylinder valve is closed and that it does not leak.
- Make sure that the blind plug of the valve, if supplied, is correctly assembled.
- Make sure that the handle, if supplied, is correctly assembled.

### 14.7 Bulk transport according to Annex II of MARPOL and the IBC code

N.A.

## SECTION 15: regulatory information

### 15.1 Health, safety and environmental regulations specific for the substances or mixture

#### UE Regulations

- Recommended restrictions	:	None
- Seveso Directive: 2012/18/UE (III)	:	Not included

#### National legislation

: Ensure compliance with all national and local regulations. It can be used as a food additive only if labeled as such and if the regulations 1333/2008 / CE and 2012/231 / UE are met

### 15.2 Chemical safety assessment

A chemical safety assessment (CSA) is not required for this product.



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### SECTION 16: other information

- Changes indications : Safety data sheet revised in accordance with Regulation 2015/830 / UE.
- Training advises : The risk of asphyxiation is often underestimated and must be clearly highlighted during operator training.
- Responsability limits : Before using this product in any new process or experiment, a thorough study must be conducted on the safety and compatibility of the product with the materials.
- The information contained in this document is believed to be correct at the time of issue and must be used to make an independent determination of the methods for protecting workers and the environment.
- The preparation of this document has been carried out with the necessary care, the company must not be held responsible for any damage or injury resulting from its use.