

1. Identification of the Substance/Preparation and the Company

Product Identifier:

- **Product Name:** R744
- **Chemical Name:** Carbon Dioxide
- **Synonyms:** CO₂, Refrigerant R744
- **CAS Number:** 124-38-9
- **EC Number:** 204-696-9
- **REACH Registration Number:** Exempt

Relevant Identified Uses of the Substance:

- Refrigerant gas for air conditioning and refrigeration systems.
- Used in food processing, beverage carbonation, and fire suppression.

Details of the Supplier of the SDS:

- **Company Name:** Gaslogic B.V.
- **Address:** Overschiesweg 105, 3044 EH, Rotterdam.
- **Telephone Number:** +31 103 22 09 94
- **Email Address:** info@gaslogic.nl

Emergency Telephone Number:

- +44 344 892 0111 (Available 24 hours)

2. Hazards Identification

2.1 Classification of the Substance

According to Regulation (EC) No 1272/2008 (CLP):

- **Physical Hazards:**
 - Gases Under Pressure – Compressed Gas (H280)
- **Health Hazards:**
 - Not classified as hazardous.
- **Environmental Hazards:**
 - Not classified as hazardous.

2.2 Label Elements

- **Pictogram:**



- **Signal Word:** Warning
- **Hazard Statements:**
 - **H280:** Contains gas under pressure; may explode if heated.
- **Precautionary Statements:**
 - **P410 + P403:** Protect from sunlight. Store in a well-ventilated place.

2.3 Other Hazards

- **Asphyxiation risk:** High concentrations of CO₂ can displace oxygen, leading to suffocation in confined spaces.
- **Frostbite risk:** Contact with liquid CO₂ can cause cold burns and frostbite.

3. Composition / Information on Ingredients

Substance	CAS Number	EC Number	Concentration (%)
Carbon Dioxide (CO ₂)	124-38-9	204-696-9	100%

4. First Aid Measures

4.1 Description of First Aid Measures

- **Inhalation:**
 - Remove the person to fresh air immediately.
 - Administer oxygen if breathing is difficult.
 - Seek medical attention if symptoms such as dizziness, headache, or nausea persist.
- **Skin Contact:**
 - In case of exposure to liquid CO₂, flush the area with lukewarm water.
 - Do not rub the skin; seek medical attention for frostbite or cold burns.
- **Eye Contact:**
 - Flush eyes with lukewarm water for at least 15 minutes.
 - Seek medical attention if irritation persists.
- **Ingestion:**
 - Ingestion is not considered a likely route of exposure due to the gaseous state.

4.2 Most Important Symptoms and Effects

- **Acute effects:** Dizziness, headache, and confusion from inhalation of high concentrations.
- **Skin exposure:** Frostbite or cold burns from contact with liquid CO₂.

4.3 Indication of Immediate Medical Attention

- Immediate medical attention is required for frostbite or if asphyxiation symptoms occur.
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5. Fire-Fighting Measures

5.1 Extinguishing Media

- **Suitable Extinguishing Media:** CO₂ itself is a fire suppressant, used in extinguishers.
- **Unsuitable Extinguishing Media:** None known.

5.2 Special Hazards Arising from the Substance

- **Explosion risk:** Containers may explode when heated.
- **Asphyxiation risk:** CO₂ can displace oxygen in confined spaces, causing suffocation.

5.3 Advice for Firefighters

- Wear self-contained breathing apparatus (SCBA) in confined spaces.
 - Cool containers with water spray to prevent pressure build-up.
 - Evacuate personnel to a safe area.
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6. Accidental Release Measures

6.1 Personal Precautions, Protective Equipment, and Emergency Procedures

- Evacuate the area and ensure proper ventilation.
- Use personal protective equipment (PPE), such as gloves and goggles.
- Eliminate ignition sources.

6.2 Environmental Precautions

- Avoid discharge into the environment.
- Ventilate the area to disperse any gas.

6.3 Methods and Material for Containment and Cleaning Up

- Stop the release if safe to do so.
 - Allow gas to dissipate in a well-ventilated area.
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7. Handling and Storage

7.1 Precautions for Safe Handling

- Avoid inhalation of gas in confined spaces.
- Ensure proper ventilation.
- Avoid contact with liquid CO₂.

7.2 Conditions for Safe Storage

- Store in a well-ventilated area, away from heat or direct sunlight.
- Keep cylinders upright and secure.

8. Exposure Controls / Personal Protection**8.1 Control Parameters****Substance Occupational Exposure Limits (OELs)**

Carbon Dioxide (CO₂) 5,000 ppm (TWA)

8.2 Exposure Controls**Engineering Controls:**

- Ensure proper ventilation, especially in confined areas.
- Use gas detection systems to monitor CO₂ levels.

Personal Protective Equipment:

- **Respiratory Protection:** Use an approved respirator in confined spaces or if exposure limits are exceeded.
- **Hand Protection:** Wear cold-resistant gloves when handling liquid CO₂.
- **Eye Protection:** Use safety goggles or face shields when handling liquid CO₂.
- **Skin Protection:** Wear protective clothing to avoid exposure to liquid CO₂.

9. Physical and Chemical Properties

Property	Value
Physical State	Gas at ambient temperature
Appearance	Colorless gas
Odor	Odorless
Melting Point	-56.6°C (at 5.2 bar)
Boiling Point	-78.5°C
Flash Point	Not applicable
Vapor Pressure	5,730 kPa at 20°C
Vapor Density	1.53 (air = 1)
Solubility in Water	1.45 g/L (at 25°C)
Auto-ignition Temperature	Not applicable
Decomposition Temperature	Not applicable
Critical Temperature	31°C

10. Stability and Reactivity**10.1 Reactivity**

- Stable under normal conditions.

10.2 Chemical Stability

- Stable under normal use and storage conditions.

10.3 Possibility of Hazardous Reactions

- No hazardous reactions under normal use.

10.4 Conditions to Avoid

- Avoid exposure to heat, sparks, and direct sunlight.

10.5 Incompatible Materials

- Reactive metals, such as alkali metals and magnesium.

10.6 Hazardous Decomposition Products

- None under normal conditions.

11. Toxicological Information**11.1 Information on Toxicological Effects****Acute Toxicity:**

- **Inhalation:** May cause dizziness, drowsiness, or unconsciousness at high concentrations.
- **Skin and Eye Contact:** Frostbite or cold burns may occur on contact with liquid CO₂.

Skin Corrosion/Irritation:

- Contact with liquid CO₂ may cause severe frostbite.

Serious Eye Damage/Irritation:

- Direct exposure to liquid CO₂ may cause severe eye damage.

Respiratory or Skin Sensitization:

- Not classified as a sensitizer.

Carcinogenicity:

- Not classified as carcinogenic by IARC, NTP, or OSHA.

Germ Cell Mutagenicity:

- Not classified as mutagenic.

Reproductive Toxicity:

- Not classified as toxic to reproduction.

STOT – Single Exposure:

- May cause dizziness or asphyxiation in confined spaces.
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12. Ecological Information**12.1 Toxicity**

- CO₂ is naturally occurring and not harmful to aquatic or terrestrial organisms under normal conditions.
 - **LC50 (Fish, 96h):** Not applicable.

12.2 Persistence and Degradability

- CO₂ is part of the natural carbon cycle and is recycled in the atmosphere.

12.3 Bioaccumulative Potential

- Not bioaccumulative.

12.4 Mobility in Soil

- Highly volatile and will partition to the atmosphere.

12.5 Results of PBT and vPvB Assessment

- Not classified as Persistent, Bioaccumulative, and Toxic (PBT) or very Persistent and very Bioaccumulative (vPvB).
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13. Disposal Considerations**13.1 Waste Treatment Methods**

- **Product Disposal:** Vent to the atmosphere in a well-ventilated area. Do not release into confined spaces.
 - **Packaging Disposal:** Return cylinders to the supplier for recycling. Dispose of empty cylinders according to local regulations.
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14. Transport Information (Extended Chapter)**14.1 UN Number**

- **UN 1013**

14.2 UN Proper Shipping Name

- **Carbon Dioxide**

14.3 Transport Hazard Class(es)

- **Class 2.2 (Non-flammable, Non-toxic Gas)**

14.4 Packing Group

- Not applicable (gases do not require packing groups).

14.5 Environmental Hazards

- **Not a marine pollutant:** CO₂ is not classified as environmentally hazardous under IMDG.

14.6 Special Precautions for User

- Ensure proper ventilation during transport, especially in enclosed or confined spaces.
- Cylinders must be secured to prevent movement and should be transported upright.
- Use only approved gas cylinders for transport and ensure they are properly labeled with the UN number, hazard class, and correct shipping name.

14.7 Transport in Bulk According to Annex II of MARPOL and the IBC Code

- Not applicable, as CO₂ is transported in cylinders and not in bulk.

14.8 Additional Transport Information**Transport by Road/Rail (ADR/RID):**

- **Classification Code:** 2A
- **Tunnel Restriction Code:** (C/E) – Prohibited in tunnels of category C when transported in bulk.

Transport by Sea (IMDG):

- **EMS Code:** F-C, S-V
- **Stowage:** Keep away from heat sources and store in well-ventilated areas. Ensure proper stowage away from combustibles.

Transport by Air (IATA):

- **Packing Instruction:** 200
- **Passenger Aircraft:** Limited to smaller quantities.
- **Cargo Aircraft Only:** Larger quantities are allowed, but ensure that ventilation is adequate.

Special Handling Instructions:

- Ensure that personnel involved in the transport of CO₂ are trained in the handling of compressed gases and are aware of emergency procedures in case of leaks or exposure.
- Inspect cylinders for any potential leaks or damage before transport. Ensure they are equipped with pressure relief devices where applicable.
- Ensure compliance with all local and international regulations governing the transport of compressed gases.

15. Regulatory Information**15.1 Safety, Health, and Environmental Regulations/Legislation Specific for the Substance**

- **EU Regulations:**
 - **REACH Regulation (EC) No 1907/2006:** CO₂ is exempt from registration.
 - **CLP Regulation (EC) No 1272/2008:** Classified and labeled according to the CLP regulation.

15.2 Chemical Safety Assessment

- A chemical safety assessment has not been conducted for this substance.
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16. Other Information**Key Abbreviations:**

- **PBT:** Persistent, Bioaccumulative, and Toxic
- **vPvB:** Very Persistent, Very Bioaccumulative
- **LC50:** Lethal Concentration for 50% of organisms
- **TWA:** Time-Weighted Average

Training Advice:

- Personnel handling CO₂ should be trained in proper handling, transport, and emergency procedures, especially for confined space work.

Disclaimer:

- This information is based on the current state of knowledge and is intended to describe the product in terms of health, safety, and environmental requirements only. It should not be interpreted as a guarantee of any specific properties.