

Material Safety Data Sheet



MOYNE ROBERTS

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name:	Carbon dioxide
Additional identification	
Chemical name:	Carbon dioxide
Chemical formula:	CO ₂
INDEX No.	-
CAS-No.	124-38-9
EC No.	204-696-9
REACH Registration No.	Listed in Annex IV/V of Regulation (EC) No 1907/2006 (REACH), exempted from registration.

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

Uses:	As fire extinguishing agent
Uses advised against	Industrial grade unsuitable for medical and/or food applications or inhalation.

1.3 Details of the supplier of the safety data sheet

Moyne Roberts (Ireland Limited, Moynehall, Cavan, Ireland.
Telephone: +353 (0)49 4332477
E-mail: irl@moyneroberts.com
Emergency telephone UK: 01772 693777

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Directive 67/548/EEC or 1999/45/EC as amended.
Not classified

Classification according to Regulation (EC) No 1272/2008 as amended.

Physical Hazards

Gases under pressure	Liquefied gas	H280: Contains gas under pressure; may explode if heated.
----------------------	---------------	---

2.2 Label Elements

Material Safety Data Sheet



Signal Words:	Warning
Hazard Statement(s):	H280: Contains gas under pressure; may explode if heated.
Precautionary Statement	
Prevention:	None.
Response:	None.
Storage:	P403: Store in a well-ventilated place.
Disposal:	None.
Supplemental label information	EIGA-As: Asphyxiant in high concentrations.

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name	Carbon dioxide
INDEX No.:	-
CAS-No.:	124-38-9
EC No.:	204-696-9
REACH Registration No.:	Listed in Annex IV/V of Regulation (EC) No 1907/2006 (REACH), exempted from registration.
Purity:	100% The purity of the substance in this section is used for classification only, and does not represent the actual purity of the substance as supplied, for which other documentation should be consulted.
Trade name:	Carbon Dioxide Food Grade, R744

SECTION 4: First Aid Measures

General: In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

4.1 Description of first aid measures

Inhalation: In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped. Low concentrations of CO₂ cause increased respiration and headache.

Eye contact: Rinse the eye with water immediately. Remove contact lenses, if present and easy to do. Continue rinsing. Flush thoroughly with water for at least 15 minutes. Get immediate medical assistance. If medical assistance is not immediately available, flush an additional 15 minutes.

Skin Contact: Contact with evaporating liquid may cause frostbite or freezing of skin.

Ingestion: Ingestion is not considered a potential route of exposure.

Material Safety Data Sheet

4.2 Most important symptoms and effects, both acute and delayed: Respiratory arrest. Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling.

4.3 Indication of any immediate medical attention and special treatment needed

Hazards: Respiratory arrest. Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling.

Treatment: Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention.

SECTION 5: Firefighting Measures

General Fire Hazards: Heat may cause the cylinders to explode.

5.1 Extinguishing media

Suitable extinguishing media: Material will not burn. In case of fire in the surroundings: use appropriate extinguishing agent.

Unsuitable extinguishing media: None.

5.2 Advice for firefighters

Special fire fighting procedures:

In case of fire: Stop leak if safe to do so. Continue water spray from protected position until container stays cool. Use extinguishants to contain the fire. Isolate the source of the fire or let it burn out.

Special protective equipment for firefighters:

Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. Guideline: EN 469 Protective clothing for firefighters. Performance requirements for protective clothing for firefighting. EN 15090 Footwear for firefighters. EN 659 Protective gloves for firefighters. EN 443 Helmets for fire fighting in buildings and other structures. EN 137 Respiratory protective devices - Self-contained open- circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking.

SECTION 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures:

Evacuate area. Provide adequate ventilation. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. EN 137 Respiratory protective devices - Self-contained open- circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking.

6.2 Environmental Precautions: Prevent further leakage or spillage if safe to do so.

6.3 Methods and material for containment and cleaning up: Provide adequate ventilation.

6.4 Reference to other sections: Refer to sections 8 and 13.

Material Safety Data Sheet

SECTION 7: Handling and Storage:

7.1 Precautions for safe handling: Only experienced and properly instructed persons should handle gases under pressure. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Refer to supplier's handling instructions. The substance must be handled in accordance with good industrial hygiene and safety procedures. Protect containers from physical damage; do not drag, roll, slide or drop. Do not remove or deface labels provided by the supplier for the identification of the container contents. Keep cylinder below 60°C. Observe all regulations and local requirements regarding storage of containers. When using do not eat, drink or smoke. Keep cylinder valve outlets clean and free from contaminants particularly oil and water. Never attempt to transfer gases from one cylinder to another. Depressurisation of liquid CO2 below approximately 5 bar can create solid CO2 within the cylinder.

7.2 Conditions for safe storage, including any incompatibilities:

Cylinders should not be stored in conditions likely to encourage corrosion. Stored cylinders should be periodically checked for general conditions and leakage. Store cylinders in location free from fire risk and away from sources of heat and ignition. Keep away from combustible material.

7.3 Specific end use(s): None.

SECTION 8: Exposure Controls/Personal Protection

8.1 Control Parameters

Occupational Exposure Limits

Chemical name	type	Exposure Limit Values	Source
Carbon dioxide	TWA	5,000 ppm 9,000 mg/m3	Ireland. Occupational Exposure Limits (2011)
	STEL	15,000 ppm 27,000 mg/m3	Ireland. Occupational Exposure Limits (2011)
	TWA	5,000 ppm 9,000 mg/m3	EU. Indicative Exposure Limit Values in Directives 91/322/EEC, 2000/39/EC, 2006/15/EC, 2009/161/EU (12 2009)

8.2 Exposure controls

Eye/face protection: Safety eyewear, goggles or face-shield to EN166 should be used to avoid exposure to liquid splashes. Wear eye protection to EN 166 when using gases. Guideline: EN 166 Personal Eye Protection.

Skin protection

Hand Protection:

Wear working gloves while handling containers
Guideline: EN 388 Protective gloves against mechanical risks.

Body protection:

No special precautions.

Other:

Wear safety shoes while handling containers
Guideline: ISO 20345 Personal protective equipment - Safety footwear.

Respiratory Protection:

Not required.

Thermal hazards:

No precautionary measures are necessary.

Material Safety Data Sheet

Hygiene measures: Specific risk management measures are not required beyond good industrial hygiene and safety procedures. Do not eat, drink or smoke when using the product.

SECTION 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state:	Gas
Form:	Liquefied gas
Colour:	Colorless
Odour:	Odorless
Odour Threshold:	Odour threshold is subjective and is inadequate to warn of over exposure.
pH:	3.2 - 3.7 The pH of saturated CO ₂ solutions varies from 3.7 at 101 kPa (1 atm) to 3.2 at 2370 kPa (23.4 atm)
Melting Point:	-56.6 °C
Boiling Point:	-78.5 °C
Sublimation Point:	-78.5 °C
Critical Temp. (°C):	31.0 °C
Flash Point:	Not applicable to gases and gas mixtures.
Evaporation Rate:	Not applicable to gases and gas mixtures.
Flammability (solid, gas):	Nonflammable Gas
Flammability limit - upper (%):	not applicable.
Flammability limit - lower(%):	not applicable.
Vapour pressure:	45.1 bar (10 °C)
Vapour density (air=1):	1.522 (21 °C)
Relative density:	1.512
Solubility(ies)	
Solubility in Water:	2.900 mg/l (25 °C)
Partition coefficient (n-octanol/water):	0.83
Autoignition Temperature:	not applicable.
Decomposition Temperature:	Not known.
Viscosity	
Kinematic viscosity:	No data available.
Dynamic viscosity:	0.07 mPa.s (20 °C)
Explosive properties:	Not applicable.
Oxidising Properties:	not applicable.
9.2 Other information:	Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.
Molecular weight:	44.01 g/mol (CO ₂)

Material Safety Data Sheet

SECTION 10: Stability and Reactivity

10.1 Reactivity:	No reactivity hazard other than the effects described in sub-section below.
10.2 Chemical Stability:	Stable under normal conditions.
10.3 Possibility of Hazardous Reactions:	None.
10.4 Conditions to Avoid:	None.
10.5 Incompatible Materials:	No reaction with any common materials in dry or wet conditions.
10.6 Hazardous Decomposition Products:	

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological Information

General information:	In high concentrations may cause rapid circulatory deterioration even at normal levels of oxygen concentration. Symptoms are headache, nausea and vomiting, which may lead to unconsciousness and even death.
-----------------------------	---

11.1 Information on toxicological effects

Acute toxicity - Oral	
Product	Based on available data, the classification criteria are not met.
Acute toxicity - Dermal	
Product	Based on available data, the classification criteria are not met.
Acute toxicity - Inhalation	
Product	Based on available data, the classification criteria are not met.
Skin Corrosion/Irritation	
Product	Based on available data, the classification criteria are not met.
Serious Eye Damage/Eye Irritation	
Product	Based on available data, the classification criteria are not met.
Respiratory or Skin Sensitisation	
Product	Based on available data, the classification criteria are not met.
Germ Cell Mutagenicity	
Product	Based on available data, the classification criteria are not met.
Carcinogenicity	
Product	Based on available data, the classification criteria are not met.
Reproductive toxicity	
Product	Based on available data, the classification criteria are not met.
Specific Target Organ Toxicity - Single Exposure	
Product	Based on available data, the classification criteria are not met.
Specific Target Organ Toxicity - Repeated Exposure	
Product	Based on available data, the classification criteria are not met.
Aspiration Hazard	
Product	Not applicable to gases and gas mixtures.

SECTION 12: Ecological Information

12.1 Toxicity

Material Safety Data Sheet

Acute toxicity Product	No ecological damage caused by this product.
12.2 Persistence and Degradability Product	Not applicable to gases and gas mixtures..
12.3 Bioaccumulative Potential Product	The product is expected to biodegrade and is not expected to persist for long periods in an aquatic environment.
12.4 Mobility in Soil Product	Because of its high volatility, the product is unlikely to cause ground or water pollution.
12.5 Results of PBT and vPvB assessment Product	Not classified as PBT or vPvB.
12.6 Other Adverse Effects:	

Global Warming Potential

Global warming potential: 1
When discharged in large quantities may contribute to the greenhouse effect.

Carbon dioxide [UN / IPCC. Greenhouse Gas Global Warming Potentials \(IPCC Fourth Assessment Report, Climate Change, Table TS.2](#)
- Global warming potential: 1 100-yr

SECTION 13: Disposal Considerations

13.1 Waste treatment methods

General information: Do not discharge into any place where its accumulation could be dangerous. Vent to atmosphere in a well ventilated place.

Disposal methods: Refer to the EIGA code of practice (Doc.30 "Disposal of Gases", downloadable at <http://www.eiga.org>) for more guidance on suitable disposal methods. Dispose of container via supplier only. Discharge, treatment, or disposal may be subject to national, state, or local laws.

European Waste Codes

Container: 16 05 05: Gases in pressure containers other than those mentioned in 16 05 04.

SECTION 14: Transport Information

ADR

14.1 UN Number:	UN 1013
14.2 UN Proper Shipping Name:	CARBON DIOXIDE
14.3 Transport Hazard Class(es)	
Class:	2
Label(s):	2.2
Hazard No. (ADR):	20
Tunnel restriction code:	(C/E)
14.4 Packing Group:	-

Material Safety Data Sheet

14.5 Environmental hazards: not applicable
14.6 Special precautions for user: -

RID

14.1 UN Number: UN 1013
14.2 UN Proper Shipping Name: CARBON DIOXIDE
14.3 Transport Hazard Class(es)
Class: 2
Label(s): 2.2
14.4 Packing Group: -
14.5 Environmental hazards: not applicable
14.6 Special precautions for user: -

IMDG

14.1 UN Number: UN 1013
14.2 UN Proper Shipping Name: CARBON DIOXIDE
14.3 Transport Hazard Class(es)
Class: 2.2
Label(s): 2.2
EmS No.: F-C, S-V
14.3 Packing Group: -
14.5 Environmental hazards: not applicable
14.6 Special precautions for user: -

IATA

14.1 UN Number: UN 1013
14.2 Proper Shipping Name: Carbon dioxide
14.3 Transport Hazard Class(es)
Class: 2.2
Label(s): 2.2
14.4 Packing Group: -
14.5 Environmental hazards: not applicable
14.6 Special precautions for user: -

Other information

Passenger and cargo aircraft: Allowed.
Cargo aircraft only: Allowed.

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: not applicable

Additional identification:

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 cylinders ensure that they are firmly secured. Ensure that the cylinder valve is closed and not leaking. Ensure adequate air ventilation. Transport in original packaging.

SECTION 15: Regulatory information

Material Safety Data Sheet

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture:

EU Regulations

Directive 96/61/EC: concerning integrated pollution prevention and control (IPPC): Article 15, European Pollution Emission Registry (EPER):

Chemical name	CAS-No.	Concentration
Carbon dioxide	124-38-9	100%

National Regulations

Council Directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work Directive 89/686/EEC on personal protective equipment Only products that comply with the food regulations (EC) No. 1333/2008 and (EU) No. 231/2012 and are labelled as such may be used as food additives.

This Safety Data Sheet has been produced to comply with Regulation (EU) 453/2010.

15.2 Chemical safety assessment: No Chemical Safety Assessment has been carried out.

SECTION 16: Other Information

Revision Information: Not relevant.

Key literature references and sources for data:

Various sources of data have been used in the compilation of this SDS, they include but are not exclusive to:

Agency for Toxic Substances and Diseases Registry (ATSDR)

(<http://www.atsdr.cdc.gov/>).

European Chemical Agency: Guidance on the Compilation of Safety Data Sheets. European Chemical Agency: Information on Registered Substances <http://apps.echa.europa.eu/registered/registered-sub.aspx#search>
European Industrial Gases Association (EIGA) Doc. 169 Classification and Labelling guide.

International Programme on Chemical Safety (<http://www.inchem.org/>)

ISO 10156:2010 Gases and gas mixtures - Determination of fire potential and oxidizing ability for the selection of cylinder valve outlets.

Matheson Gas Data Book, 7th Edition.

National Institute for Standards and Technology (NIST) Standard Reference Database Number 69.

The ESIS (European chemical Substances Information System) platform of the former European Chemicals Bureau (ECB) ESIS

(<http://ecb.jrc.ec.europa.eu/esis/>). The European Chemical Industry Council (CEFIC) ERICards.

United States of America's National Library of Medicine's toxicology data network

TOXNET (<http://toxnet.nlm.nih.gov/index.html>)

Threshold Limit Values (TLV) from the American Conference of Governmental Industrial Hygienists (ACGIH).

Substance specific information from suppliers.

Details given in this document are believed to be correct at the time of publication.

2011 Code of Practice for the Safety, Health and Welfare at Work (S.I. No. 619 of 2001)

Material Safety Data Sheet

Wording of the R-phrases and H-statements in sections 2 and 3

H280 Contains gas under pressure; may explode if heated.

Training information:

Users of breathing apparatus must be trained. The hazard of asphyxiation is often overlooked and must be stressed during operator training. Ensure operators understand the hazards.

Classification according to Regulation (EC) No 1272/2008 as amended.

Press. Gas Liq. Gas, H280

Other information:

Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out. Ensure adequate air ventilation. Ensure all national/local regulations are observed. 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. Note: When the Product Name appears in the SDS header the decimal sign and its position comply with rules for the structure and drafting of international standards, and is a comma on the line. As an example 2,000 is two (to three decimal places) and not two thousand, whilst 1.000 is one thousand and not one (to three decimal places).

Last revised date:

08.07.2017

Disclaimer:

This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.