



SAFETY DATA SHEET

according to 29 CFR 1910.1200 and ANSI standard Z400.1-2010

Carbon dioxide

Material number 4042X/4068X/4092X

Revision date: 12/15/2022

Version: 14.0

Replaces version: 13.0

Language: en-US

Date of print: 1/2/2023

Page: 1 of 9

1. Product and company identification

Product identifier

Trade name: Carbon dioxide

This safety data sheet pertains to the following products:

40422040: 425 g bottle
40424000: 2 kg bottle
40423000: 2 kg bottle
40422000: 4 x 425 g Bottle
40423024: 24 x 2 kg Bottle
40423063: 63 x 2 kg Bottle
40424024: 24 x 2 kg Bottle
40424063: 63 x 2 kg Bottle
40651000: 1 x 425 g Bottle
40687000: 4 x 425 g Bottle
40920000: 18 x 425 g Bottle
40920018: 18 x 425 g Bottle
40921000: 18 x 425 g Bottle

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

General use: Propellant for food and beverages (E290)
Food Additive

Details of the supplier of the safety data sheet

Company name: Grohe AG
Street/POB-No.: Industriepark Edelburg
Postal Code, city: DE-58675 Hemer
WWW: www.grohe.com
E-mail: info@grohe.com
Telephone: +49 (0)2372 93-0
Telefax: +49 (0)2372 93-1322

Department responsible for information:
Telephone: +49 (0)2372 93-2037
sustainability@grohe.com

Additional information: Corporate headquarters:
Grohe AG
Feldmühleplatz 15
40545 Düsseldorf
Telephone: +49 (0)211 9130 3000

Emergency phone number

GIZ-Nord, Göttingen, Germany,
Telephone: +49 551-19240

2. Hazards identification

Emergency overview

Appearance: Form: gaseous
Color: colorless
Odor: odorless
Classification: Liquefied Gas.



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Page: 2 of 9

Hazard symbols:



Signal word:

Warning

Hazard statements:

Contains gas under pressure; may explode if heated.

Precautionary statements:

Keep out of reach of children.

Protect from sunlight. Store in a well-ventilated place.

Regulatory status

This material is considered hazardous by the U.S. OSHA Hazard Communication Standard (29 CFR 1910.1200).

Hazards not otherwise classified

Asphyxiant in high concentrations.

Contact with the product can cause cold burns or frostbite.

see section 11: Toxicological information

3. Composition / Information on ingredients

| | |
|----------------------------|---------------------------------------------------------------|
| Chemical characterization: | CO ₂ Carbon dioxide (Compressed, liquefied gas) |
| CAS-Number: | 124-38-9 |
| RTECS-Number: | FF6400000 |

4. First aid measures

| | |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| In case of inhalation: | Move victim to fresh air wearing a self contained breathing apparatus. Make sure he/she is warm and comfortable. Seek medical attention. If breathing has stopped, give artificial respiration immediately. |
| Following skin contact: | In the event of cold burns, wash with water for at least 15 minutes. Cover frostbitten skin with sterile tissue. Seek medical attention. |
| After eye contact: | Immediately flush eyes with plenty of flowing water for 10 to 15 minutes holding eyelids apart. In case of troubles or persistent symptoms, consult an ophthalmologist. |
| After swallowing: | Swallowing is not regarded as a possible way of exposition. |

Most important symptoms/effects, acute and delayed

In high concentrations may cause asphyxiation. Symptoms may include loss of mobility and consciousness. Victim may not be aware of asphyxiation.

Low concentrations of carbon dioxide cause accelerated breathing and headaches.

Contact with the product can cause cold burns or frostbite.

Information to physician

Treat symptomatically.

5. Fire fighting measures

| | |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Flash point/flash point range: | not applicable |
| Auto-ignition temperature: | No data available |
| Suitable extinguishing media: | Product is non-combustible. Extinguishing materials should therefore be selected according to surroundings. |
| Extinguishing media which must not be used for safety reasons: | Full water jet |



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Page: 3 of 9

Specific hazards arising from the chemical

Not combustible. In case of surrounding fires: May form dangerous gases and vapors in case of fire.

Protective equipment and precautions for firefighters:

Wear self-contained positive pressure breathing apparatus and full firefighting protective clothing.

Additional information:

Exposure to fire may cause containers to rupture/explode.

If possible, stop flow of product. Move container away or cool with water from a protected position.

6. Accidental release measures

Personal precautions:

Evacuate area. Provide adequate ventilation. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Prevent access to canalization, cellars, work pits or other locations where the gathering could be dangerous. Wear appropriate protective equipment. Keep unprotected people away.

Environmental precautions:

If possible, stop flow of product.

Methods for clean-up:

Vapors are invisible, heavier than air and will travel at floor level. Vapors are suffocating. Air the room.

Additional information:

Build up of static electricity may occur at increased flow rates and may ignite any explosive mixtures present.

7. Handling and storage

Handling

Advices on safe handling:

Make sure there is sufficient air exchange and / or that working rooms are air suctioned. Prevent water access and back-flow into the gas vessel. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact supplier if guidance is required. Refer to gas supplier's handling instructions.

Precautions against fire and explosion:

Build up of static electricity may occur at increased flow rates and may ignite any explosive mixtures present.

Storage

Requirements for storerooms and containers:

Keep container in a well-ventilated place.
Protect from direct exposure to sunlight and temperatures exceeding 122 °F.
Store containers in upright position. Do not drop, drag or bang the container.
Secure gas cylinders before transport. For transport, screw tightly protective caps and dummy nuts.
Transport always in closed, upright and safe containers
Keep the product and the empty containers away from heat and ignition sources.

Hints on joint storage:

Keep away from combustible material.



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Date of print: 1/2/2023

Page: 4 of 9

8. Exposure controls / personal protection

Exposure guidelines

Occupational exposure limit values:

| Type | Limit value |
|------------------|-------------------------------------|
| USA: ACGIH: STEL | 54000 mg/m ³ ; 30000 ppm |
| USA: ACGIH: TWA | 9000 mg/m ³ ; 5000 ppm |
| USA: IDLH: TWA | 40000 ppm |
| USA: NIOSH: STEL | 54000 mg/m ³ ; 30000 ppm |
| USA: NIOSH: TWA | 9000 mg/m ³ ; 5000 ppm |
| USA: OSHA: TWA | 9000 mg/m ³ ; 5000 ppm |

Engineering controls

Transfer and handle product only in closed systems.
Provide good ventilation and/or an exhaust system in the work area.
See also information in chapter 7, section storage.

Personal protection equipment (PPE)

Eye/face protection: Tightly sealed goggles according to OSHA Standard - 29 CFR: 1910.133 or ANSI Z87.1-2010.

Skin protection: Wear suitable protective clothing.
When handling gas flasks/containers, wear suitable safety shoes.

Wear gloves in accordance with EN 388 as a protection against mechanical risks.
Protective gloves against coldness according to EN 511 (Glove material: Leather).
Observe glove manufacturer's instructions concerning penetrability and breakthrough time.

Respiratory protection: Respiratory protection must be worn whenever the TLV (WEL) levels have been exceeded.
The following applies to carbon dioxide in general:
If the concentration is exceeded, closed-circuit breathing apparatus must be used!

General hygiene considerations: When using do not eat, drink or smoke.
Wash hands before breaks and after work.
Do not breathe gas/fume/vapor/spray.

Environmental exposure controls

Refer to 6.: Section "Environmental precautions".

9. Physical and chemical properties

Information on basic physical and chemical properties

| | |
|------------------------------------------|-------------------------------------------|
| Appearance: | Form: gaseous Color: colorless |
| Odor: | odorless |
| Odor threshold: | No data available |
| pH: | No data available |
| Melting point/freezing point: | -69.88 °F (5,2 bar) |
| Initial boiling point and boiling range: | -109.3 °F |
| Flash point/flash point range: | not applicable |
| Evaporation rate: | No data available |
| Flammability: | No data available |
| Explosion limits: | No data available |
| Vapor pressure: | at 68 °F: 57300 hPa |
| Vapor density: | No data available |
| Density: | at 68 °F: (gas) 0.00197 g/cm ³ |



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Date of print: 1/2/2023

Page: 5 of 9

| | |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Water solubility: | 1.5 - 2 g/L |
| Partition coefficient: n-octanol/water: | 0.83 log P(o/w) Based on the n-octanol/water partition coefficient accumulation in organisms is not expected. |
| Auto-ignition temperature: | No data available |
| Thermal decomposition: | > 3632 °F |
| Explosive properties: | Product is not explosive. |
| Oxidizing characteristics: | none |
| Additional information: | Molar mass: 44.01 g/mol Relative vapor density at 68 °F (air=1): 1.52 Critical temperature: 87.8 °F Sublimation point: -109.3 °F Relative density, liquid (water = 1): 1.03 |

10. Stability and reactivity

| | |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Reactivity: | Gases/vapors are heavier than air and can accumulate in closed spaces, particularly on the ground/in lower lying areas. Build up of static electricity may occur at increased flow rates and may ignite any explosive mixtures present. |
| Chemical stability: | Stable under recommended storage conditions. |
| Possibility of hazardous reactions: | Danger of explosion with: Potassium, Sodium peroxide, metal powder. Danger of polymerisation with: Acrylaldehyde, 2-Methylaziridine. |
| Conditions to avoid: | Keep away from heat sources, sparks and open flames. |
| Incompatible materials: | Amines, Ammonia, Strong bases, Water, Barium peroxide, Caesium oxides, Aluminium lithium hydride, Lithium, Sodium |
| Hazardous decomposition products: | No dangerous substances are released. |
| Thermal decomposition: | > 3632 °F |

11. Toxicological information

Toxicological tests

| | | |
|-----------------|----------------------------------------------------------|---------------|
| Acute toxicity: | Lowest published toxic concentration Rat, inhalative: | 6 pph/24h/10d |
| | Lowest published lethal concentration human, inhalative: | 9 pph/5min |



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Page: 6 of 9

Toxicological effects:

- Acute toxicity (oral): Lack of data.
- Acute toxicity (dermal): Lack of data.
- Acute toxicity (inhalative): Lack of data.
- Skin corrosion/irritation: Lack of data.
- Serious eye damage/irritation: Lack of data.
- Sensitisation to the respiratory tract: Lack of data.
- Skin sensitisation: Lack of data.
- Germ cell mutagenicity/Genotoxicity: Lack of data.
- Carcinogenicity: Lack of data.
- Reproductive toxicity: Lack of data.
- Effects on or via lactation: Lack of data.
- Specific target organ toxicity (single exposure): Lack of data.
- Specific target organ toxicity (repeated exposure): Lack of data.
- Aspiration hazard: Lack of data.

Symptoms

Contact with the product can cause cold burns or frostbite.
Asphyxiant in high concentrations. Risk of heart circulatory collapse. risk of unconsciousness, death.
Symptoms: headache, dizziness, tinnitus, Accelerated respiration and heart rate, nausea, states of excitation, fatigue, unconsciousness, spasms.

12. Ecological information

Ecotoxicity

Further details: Global Warming potential (GWP): 1

Mobility in soil

not applicable

Persistence and degradability

Further details: No data available

Additional ecological information

Volatile organic compounds (VOC):

0 % by weight

General information: Do not allow to enter into ground-water, surface water or drains.

13. Disposal considerations

Product

Recommendation: Blow-off to atmosphere in a well ventilated place. Do not release large quantities into the atmosphere.
Do not discharge into any place where its accumulation could be dangerous.

Package

Recommendation: Dispose of waste according to applicable legislation.
Return to the gas supplier.



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Date of print: 1/2/2023

Page: 7 of 9

14. Transport information

14.2 UN proper shipping name

ADR/RID, IMDG, IATA-DGR: UN 1013, CARBON DIOXIDE

Transport hazard class(es)

ADR/RID: Class 2, Code: 2A

IMDG: Class 2.2, Subrisk -

IATA-DGR: Class 2.2



Packing group

ADR/RID, IATA-DGR: not applicable

IMDG: -

Environmental hazards

Marine pollutant: no

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

No data available

USA: Department of Transportation (DOT)

Identification number: UN1013
Proper shipping name: UN 1013, CARBON DIOXIDE
Hazard class or Division: 2.2
Labels: 2.2
Packaging – Exceptions: 306
Packaging – Non-bulk: 302, 304
Packaging – Bulk: 302, 314, 315
Quantity limitations – Passenger aircraft / rail: 75 kg
Quantity limitations – Cargo only: 150 kg
Vessel stowage – Location: A



Sea transport (IMDG)

UN number: UN 1013
Proper shipping name: UN 1013, CARBON DIOXIDE
Class or division, Subsidiary risk: Class 2.2, Subrisk -
Packing Group: -
EmS: F-C, S-V
Special Provisions: 378 392
Limited quantities: 120 mL
Excepted quantities: E1
Package - Instructions: P200
Package - Provisions: -
IBC - Instructions: -
IBC - Provisions: -
Tank instructions - IMO: -
Tank instructions - UN: -
Tank instructions - Provisions: -
Stowage and handling: Category A.
Properties and observations: Liquefied, non-flammable gas. Heavier than air (1,5). Cannot remain in the liquid state above 31°C.
Marine pollutant: no
Segregation group: none



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Replaces version: 13.0

Language: en-US

Date of print: 1/2/2023

Page: 8 of 9

Air transport (IATA)

| | |
|-----------------------------------------|--------------------------------------------|
| UN/ID number: | UN 1013 |
| Proper shipping name: | UN 1013, CARBON DIOXIDE |
| Class or division, Subsidiary risk: | Class 2.2 |
| Hazard label: | Non-flamm. gas |
| Excepted Quantity Code: | E1 |
| Passenger and Cargo Aircraft: Ltd.Qty.: | Forbidden |
| Passenger and Cargo Aircraft: | Pack.Instr. 200 - Max. Net Qty/Pkg. 75 kg |
| Cargo Aircraft only: | Pack.Instr. 200 - Max. Net Qty/Pkg. 150 kg |
| Special Provisions: | A202 |
| Emergency Response Guide-Code (ERG): | 2L |

Further 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.
Secure gas cylinders before transport. Cylinder valve must be closed and leak-proof. Valve outlet cap nut or plug (where provided) must be correctly fitted. Valve protection device (where provide) must be correctly fitted.
Ensure adequate ventilation of the storage area.
Consider compliance with applicable regulations.

15. Regulatory information

National regulations - U.S. Federal Regulations

TSCA Inventory: listed
TSCA HPVC: not listed
NIOSH Recommendations:
Occupational Health Guideline: 0103*

National regulations - U.S. State Regulations

California Proposition 65 code: not listed
Massachusetts Haz. Substance codes: 2,4
Minnesota Haz. Substance:
Codes: ANO - Ratings: --
Pennsylvania Haz. Substance code: -
Washington Air Contaminant:
TWA: 5000 ppm - 9000 mg - STEL: 30000 ppm - 54000 mg

16. Other information

Take care of the national and local legal and statutory regulations.
The risk of suffocation is often overlooked and must be specifically highlighted when instructing the employees.

Text for labeling: Contains 100 % Carbon dioxide. Safety data sheet available on request.
Asphyxiant in high concentrations.

Hazard rating systems:
NFPA Hazard Rating:
Health: 2 (Moderate)
Fire: 0 (Minimal)
Reactivity: 0 (Minimal)



HMIS Version III Rating:
Health: 2 (Moderate)
Flammability: 0 (Minimal)
Physical Hazard: 0 (Minimal)
Personal Protection: X = Consult your supervisor

| | |
|-----------------|---|
| HEALTH | 2 |
| FLAMMABILITY | 0 |
| PHYSICAL HAZARD | 0 |
| | X |



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Page: 9 of 9

Abbreviations and acronyms: ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
AS/NZS: Australian Standards/New Zealand Standards
CAS: Chemical Abstracts Service
CFR: Code of Federal Regulations
CLP: Classification, Labelling and Packaging
DMEL: Derived minimal effect level
DNEL: Derived no-effect level
EC: European Community
EN: European Standard
EQ: Excepted quantities
GWP: Global warming potential
IATA: International Air Transport Association
IATA-DGR: International Air Transport Association – Dangerous Goods Regulations
IBC Code: International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk
IMDG Code: International Maritime Dangerous Goods Code
log P(o/w): Partition coefficient: octanol/water
MARPOL: Maritime Pollution: The International Convention for the Prevention of Pollution from Ships
OEL: Occupational Exposure Limit Value
OSHA: Occupational Safety and Health Administration
PBT: Persistent, bioaccumulative and toxic
PNEC: Predicted no-effect concentration
RID: Regulations Concerning the International Carriage of Dangerous Goods by Rail
TLV: Threshold Limit Value
TRGS: Technical Rules for Hazardous Substances
UN: United Nations
vPvB: Very persistent and very bioaccumulative
WEL: Workplace Exposure Limit

Reason of change: Changes in section 1: Address
General revision

Date of first version: 5/19/2014

Department issuing data sheet

Contact person: see section 1: Department responsible for information

The information in this data sheet has been established to our best knowledge and was up-to-date at time of revision. It does not represent a guarantee for the properties of the product described in terms of the legal warranty regulations.