

Safety Data Sheet

Carbon dioxide (solid)

A safety data sheet is not required for this product under Article 31 of REACH. This Product Safety Information Sheet has been created on a voluntary basis

SDS Reference Number: EST-CO2-018C

Issue date: 3/23/2015 Revision date: 6/13/2025 Supersedes version of: 1/6/2023 Version: 6.0

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

1.1. Product identifier

Trade name : Carbon dioxide (solid)
 SDS no : EST-CO2-018C
 Other means of identification : Carbon dioxide (solid)
 CAS-No. : 124-38-9
 EC-No. : 204-696-9
 EC Index-No. : ---

REACH registration No : Listed in Annex IV / V REACH, exempted from registration.

Chemical formula : CO₂

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

Relevant identified uses : Industrial and professional uses. Perform risk assessment prior to use.
 Consumer use.
 Cooling (Food additive E290).
 Blast cleaning.
 Metal cooling.

Uses advised against : In beverage for fogging effect, because of the risk of ingestion.
 Uses other than those listed above are not supported, contact your supplier for more information on other uses.

1.3. Details of the supplier of the safety data sheet

Elme Messer Gaas AS
 Kopli 103
 11712 Tallinn
 Estonia
 T +372 6102001
info@elmemesser.ee, www.elmemesser.ee

1.4. Emergency telephone number

No additional information available

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Not regulated.

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Not applicable

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2.3. Other hazards

Refrigerated solidified gas. Contact with product may cause cold burns or frostbite.
Asphyxiant in high concentrations.
In high concentrations CO₂ causes rapid circulatory insufficiency even at normal levels of oxygen concentration. Symptoms are headache, nausea and vomiting, which may lead to unconsciousness and death.
Not classified as PBT or vPvB.
The substance/mixture has no endocrine disrupting properties.

SECTION 3: Composition/information on ingredients

3.1. Substances

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP] ATE, EUH-statements, M-Factors
Carbon dioxide (solid)	CAS-No.: 124-38-9 EC-No.: 204-696-9 EC Index-No.: --- REACH registration No: *1	100	Not classified

Contains no other components or impurities which will influence the classification of the product.

*1: Listed in Annex IV / V REACH, exempted from registration.

*3: Registration not required: Substance manufactured or imported < 1t/y.

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

- Inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Perform cardiopulmonary resuscitation if breathing stopped.
- Skin contact : In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance.
- Eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes.
- Ingestion : Get immediate medical attention.

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

Low concentrations of CO₂ cause increased respiration and headache.
See section 11.

4.3. Indication of any immediate medical attention and special treatment needed

None.

SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media : Water spray or fog.
Product does not burn, use fire control measures appropriate for the surrounding fire.
- Unsuitable extinguishing media : Do not use water jet to extinguish.

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5.2. Special hazards arising from the substance or mixture

Specific hazards : None.
Hazardous combustion products : None.

5.3. Advice for firefighters

Specific methods : Use fire control measures appropriate for the surrounding fire.
Special protective equipment for fire fighters : In confined space use self-contained breathing apparatus.
Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.
Standard EN 469 - Protective clothing for firefighters. Standard EN 659 - Protective gloves for firefighters.
Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : Act in accordance with local emergency plan.
Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.
Stay upwind.
See section 8 of the SDS for more information on personal protective equipment.
Ensure adequate air ventilation.
For emergency responders : Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.
Oxygen detectors should be used when asphyxiating gases may be released.
See section 5.3 of the SDS for more information.

6.2. Environmental precautions

None.

6.3. Methods and material for containment and cleaning up

Sweep up and collect in a suitable container .
Ventilate area.

6.4. Reference to other sections

See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Safe use of the product : Do not smoke while handling product.
The product must be handled in accordance with good industrial hygiene and safety procedures.
Do not breathe gas.
Avoid release of product into work area.
For more guidance on safe use, refer to the EIGA Doc.150 "Code of practice Dry Ice" downloadable at <http://www.eiga.eu>. and consult your supplier.
Safe handling of the gas receptacle : Refer to supplier's container handling instructions.

7.2. Conditions for safe storage, including any incompatibilities

Keep only in the original container.
Observe all regulations and local requirements regarding storage of containers.
Store containers in location free from fire risk and away from sources of heat and ignition.
Keep away from combustible materials.

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7.3. Specific end use(s)

None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Carbon dioxide (solid) (124-38-9)	
Estonia - Occupational Exposure Limits	
Local name	Süsinikdioksiid
OEL TWA	9000 mg/m ³
	5000 ppm
Remark	8 (Süsinikdioksiid on õhu saastatuse indikaator töökohtadel, kus õhk saastub töötajate suure füüsilise aktiivsuse tõttu)
Regulatory reference	Vabariigi Valitsuse 20. märtsi 2001. a määruse nr 105 (RT I, 02.04.2024, 13)

DNEL (Derived-No Effect Level) : None available.

PNEC (Predicted No-Effect Concentration) : None available.

8.2. Exposure controls

8.2.1. Appropriate engineering controls

Provide adequate general and local exhaust ventilation.
Ensure exposure is below occupational exposure limits (where available).
Oxygen detectors should be used when asphyxiating gases may be released.
Consider the use of a work permit system e.g. for maintenance activities.
CO2 detectors should be used when CO2 may be released.

8.2.2. Individual protection measures, e.g. personal protective equipment

A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered:

PPE compliant to the recommended EN/ISO standards should be selected.

• Eye/face protection

- : Wear safety glasses with side shields.
Standard EN 166 - Personal eye-protection - specifications.
Standard EN ISO 16321-1 - Eye and face protection for occupational use Part 1: General requirements.

• Skin protection

- Hand protection

- : Wear safety gloves.
Standard EN 511 - Cold insulating gloves, performance level 1 or higher. Recommended types include insulated gauntlets or gloves specifically selected to prevent liquid penetration and ingress of cryogenic liquids and to provide mechanical resistance.

- Other

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

• Respiratory protection

- : None necessary.

• Thermal hazards

- : None in addition to the above sections.

8.2.3. Environmental exposure controls

None necessary.

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SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	
- Physical state	: Refrigerated solidified gas.
- Physical state at 20°C / 101.3kPa	: Gas.
- Colour	: White.
Odour	: Odourless.
Melting point / Freezing point	: -78.5 °C Melting point at normal conditions does not exist. At atmospheric pressure solid carbon dioxide sublimates into gaseous carbon dioxide at -78.5°C
Boiling point	: -56.6 °C
Flammability	: Non flammable.
Lower explosion limit	: Not applicable.
Upper explosion limit	: Not applicable.
Flash point	: Not applicable for gases and gas mixtures.
Auto-ignition temperature	: Non flammable.
Decomposition temperature	: Not applicable.
pH	: Not applicable for gases and gas mixtures.
Viscosity, kinematic	: Not applicable for gases and gas mixtures.
Water solubility [20°C]	: 2000 mg/l
Partition coefficient n-octanol/water (Log Kow)	: 0.83
Vapour pressure [20°C]	: 57.3 bar(a)
Vapour pressure [50°C]	: Not applicable.
Density and/or relative density	: Not applicable for gases and gas mixtures.
Relative vapour density (air=1)	: 1.52
Particle characteristics	: Not applicable for gases and gas mixtures. Nanoforms are not relevant for gases and gas mixtures.

9.2. Other information

9.2.1. Information with regard to physical hazard classes

Flammability properties	: Not known.
Oxidising properties	: No oxidising properties.
Critical temperature [°C]	: 31 °C

9.2.2. Other safety characteristics

Molar mass	: 44 g/mol
Other data	: Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

SECTION 10: Stability and reactivity

10.1. Reactivity

No reactivity hazard other than the effects described in sub-sections 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

None.

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10.6. Hazardous decomposition products

None.

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity	: Toxicological effects not expected by inhalation from this product if occupational exposure limit values are not exceeded.
Skin corrosion/irritation	: No known effects from this product.
Serious eye damage/irritation	: No known effects from this product.
Respiratory or skin sensitisation	: No known effects from this product.
Germ cell 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 : unborn child	: No known effects from this product.
STOT-single exposure	: No known effects from this product.
STOT-repeated exposure	: No known effects from this product.
Aspiration hazard	: Not applicable for gases and gas mixtures.

11.2. Information on other hazards

Other information	: Unlike simple asphyxiants, carbon dioxide has the ability to cause death even when normal oxygen levels (20-21%) are maintained. 5% CO ₂ has been found to act synergistically to increase the toxicity of certain other gases (CO, NO ₂). CO ₂ has been shown to enhance the production of carboxy- or met-hemoglobin by these gases possibly due to carbon dioxide's stimulatory effects on the respiratory and circulatory systems. For more information, see 'EIGA Safety Info 24: Carbon Dioxide, Physiological Hazards' at www.eiga.eu . The substance/mixture has no endocrine disrupting properties.
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SECTION 12: Ecological information

12.1. Toxicity

Assessment	: No ecological damage caused by this product.
EC50 48h - Daphnia magna [mg/l]	: No data available.
EC50 72h - Algae [mg/l]	: No data available.
LC50 96 h - Fish [mg/l]	: No data available.

12.2. Persistence and degradability

Assessment	: No ecological damage caused by this product.
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12.3. Bioaccumulative potential

Assessment	: No ecological damage caused by this product.
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12.4. Mobility in soil

Assessment	: No ecological damage caused by this product.
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12.5. Results of PBT and vPvB assessment

Assessment	: Not classified as PBT or vPvB.
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12.6. Endocrine disrupting properties

Assessment	: The substance/mixture has no endocrine disrupting properties.
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12.7. Other adverse effects

Other adverse effects	: No known effects from this product.
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Effect on the ozone layer	: No effect on the ozone layer.
Global warming potential [CO ₂ =1]	: 1
Effect on global warming	: When discharged in large quantities may contribute to the greenhouse effect. Contains greenhouse gas(es).

SECTION 13: Disposal considerations

13.1. Waste treatment methods

	Discharge to atmosphere in large quantities should be avoided. Do not discharge into any place where its accumulation could be dangerous. Return unused product in original container to supplier.
List of hazardous waste codes (from Commission Decision 2000/532/EC as amended)	: None.

13.2. Additional information

External treatment and disposal of waste should comply with applicable local and/or national regulations.

SECTION 14: Transport information

14.1. UN number or ID number

In accordance with ADR / RID / IMDG / IATA / ADN	
UN-No.	: 1845

14.2. UN proper shipping name

Transport by road/rail/inland waterways (ADR/RID/ADN)	: Carbon dioxide, solid (Dry ice)
Transport by air (ICAO-TI / IATA-DGR)	: Carbon dioxide, solid
Transport by sea (IMDG)	: CARBON DIOXIDE, SOLID (DRY ICE)

14.3. Transport hazard class(es)

Transport by road/rail/inland waterways (ADR/RID/ADN)	
Class	: 9
Classification code	: M11
Transport by air (ICAO-TI / IATA-DGR)	
Class / Div. (Sub. risk(s))	: 9
Transport by sea (IMDG)	
Class / Div. (Sub. risk(s))	: 9
Emergency Schedule (EmS) - Fire	: F-C
Emergency Schedule (EmS) - Spillage	: S-V

14.4. Packing group

Transport by road/rail/inland waterways (ADR/RID/ADN)	: Not applicable.
Transport by air (ICAO-TI / IATA-DGR)	: Not applicable.
Transport by sea (IMDG)	: Not applicable.

14.5. Environmental hazards

Transport by road/rail/inland waterways (ADR/RID/ADN)	: None.
Transport by air (ICAO-TI / IATA-DGR)	: None.
Transport by sea (IMDG)	: None.

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14.6. Special precautions for user

Packing Instruction(s)

Transport by air (ICAO-TI / IATA-DGR)

- | | |
|------------------------------|---------|
| Passenger and Cargo Aircraft | : 954. |
| Cargo Aircraft only | : 954. |
| Transport by sea (IMDG) | : P003. |

Special transport precautions

- : 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 product containers:
 - Ensure there is adequate ventilation.
 - Ensure that containers are firmly secured.
 - Ensure 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.

14.7. Maritime transport in bulk according to IMO instruments

Not applicable.

SECTION 15: Regulatory information

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

EU-Regulations

- | | |
|--|---|
| Restrictions on use | : None. |
| Other information, restriction and prohibition regulations | : Not listed on the PIC list (Regulation EU 649/2012).
Not listed on the POP list (Regulation EU 2019/1021). |
| Seveso Directive : 2012/18/EU (Seveso III) | : Not covered. |

National regulations

- | | |
|----------------------|---|
| Regulatory reference | : Ensure all national/local regulations are observed. |
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15.2. Chemical safety assessment

A CSA does not need to be carried out for this product.

SECTION 16: Other information

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| Indication of changes | : Revised safety data sheet in accordance with commission regulation (EU) No 2020/878. |
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Abbreviations and acronyms

: ATE - Acute Toxicity Estimate.
CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008.
REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006.
EINECS - European Inventory of Existing Commercial Chemical Substances.
CAS# - Chemical Abstract Service number.
PPE - Personal Protection Equipment.
LC50 - Lethal Concentration to 50 % of a test population.
RMM - Risk Management Measures.
PBT - Persistent, Bioaccumulative and Toxic.
vPvB - Very Persistent and Very Bioaccumulative.
STOT- SE : Specific Target Organ Toxicity - Single Exposure.
CSA - Chemical Safety Assessment.
EN - European Standard.
UN - United Nations.
ADR - Agreement concerning the International Carriage of Dangerous Goods by Road.
IATA - International Air Transport Association.
IMDG code - International Maritime Dangerous Goods.
RID - Regulations concerning the International Carriage of Dangerous Goods by Rail.
WGK - Water Hazard Class.
STOT - RE : Specific Target Organ Toxicity - Repeated Exposure.
UFI : Unique Formula Identifier.
EIGA – European Industrial Gases Association.
ADN -International Carriage of Dangerous Goods by Inland Waterways.

Training advice

: The hazard of asphyxiation is often overlooked and must be stressed during operator training.
For more guidance, refer to EIGA SL 01 “Dangers of Asphyxiation”, downloadable at <http://www.eiga.eu..>

Further information

: Key literature references and sources of data are maintained in EIGA doc 169 : 'Classification and Labelling Guide', downloadable at <http://www.Eiga.eu> .

DISCLAIMER OF LIABILITY

: Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.
Details given in this document are believed to be correct at the time of going to press.
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.

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