

Carbon dioxide (solid)**NOAL_0018C**

Country : DK / Language : EN

SECTION 1: Identification of the substance/mixture and of the company/undertaking**1.1. Product identifier**

Trade name : Carbon dioxide (solid)
SDS no : NOAL_0018C
Chemical description : Carbon dioxide (solid)
CAS-No. : 124-38-9
EC-No. : 204-696-9
EC Index-No. : ---
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.
Cooling (Food additive E290).
Blast cleaning.
Metal cooling.
Consumer use.
Contact supplier for more information on uses.

1.3. Details of the supplier of the safety data sheet**Company identification**

AIR LIQUIDE Denmark A/S
Høje Taastrupvej 42
2630 Taastrup - DENMARK
T +45 76 25 25 25
eunordic-sds@airliquide.com

E-Mail address (competent person) : eunordic-sds@airliquide.com

1.4. Emergency telephone number

Emergency telephone number : 112
Availability
(24 / 7)

SECTION 2: Hazards identification**2.1. Classification of the substance or mixture**

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

2.2. Label elements

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

EUH210 - Safety data sheet available on request.

Precautionary statements (CLP)

- Storage : P403 - Store in a well-ventilated place.

2.3. Other hazards

: Asphyxiant in high concentrations.
Refrigerated solidified gas. Contact with product may cause cold burns or frostbite.
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.

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SECTION 3: Composition/information on ingredients**3.1. Substances**

Name	Product identifier	Composition [V-%]:	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Carbon dioxide (solid)	(CAS-No.) 124-38-9 (EC-No.) 204-696-9 (EC Index-No.) --- (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 : Rinse cautiously with water for several minutes.
Get medical advice/attention.
- Ingestion : Get immediate medical attention.

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

- : In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation.
- Low concentrations of CO2 cause increased respiration and headache.
- Refer to 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 : The material does not burn. In case of an ambient fire: use suitable fire extinguishing agent.
- Unsuitable extinguishing media : Not applicable.

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 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.
Standard EN 469 - Protective clothing for firefighters. Standard - EN 659: Protective gloves for firefighters.

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SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- : Evacuate area.
- Ensure adequate air ventilation.
- Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.
- Act in accordance with local emergency plan.
- Stay upwind.

6.2. Environmental precautions

- : Try to stop release.

6.3. Methods and material for containment and cleaning up

- : 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 breathe gas.
- The product must be handled in accordance with good industrial hygiene and safety procedures.
- Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
- Do not enter closed rooms in which dry ice is stored (e.g. vehicle cargo compartments) until they have been properly ventilated.
- Contact with the product may cause cold burns or frostbite.

Safe handling of the gas receptacle

- : Refer to supplier's container handling instructions.
- 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 content of the container.

7.2. Conditions for safe storage, including any incompatibilities

- : Observe all regulations and local requirements regarding storage of containers.
- Containers should not be stored in conditions likely to encourage corrosion.
- Stored containers should be periodically checked for general condition and leakage.
- Keep container below 50°C in a well ventilated place.

7.3. Specific end use(s)

- : None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Carbon dioxide (solid) (124-38-9)	
EU - Occupational Exposure Limits	
Local name	Carbon dioxide
IOELV TWA (mg/m ³)	9000 mg/m ³
IOELV TWA (ppm)	5000 ppm
Denmark - Occupational Exposure Limits	
Local name	Carbondioxid (Kuldioxid; Kulsyre)
Grænseværdi (8 timer) (mg/m ³)	9000 mg/m ³
Grænseværdi (8 timer) (ppm)	5000 ppm
Anmærkninger (DK)	E (betyder, at stoffet har en EF-grænseværdi)

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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).
- 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.
- Skin protection
 - Hand protection : Wear cold insulating gloves when transfilling or breaking transfer connections.
Standard EN 511 - Cold insulating gloves.
 - Other : Wear safety shoes while handling containers.
Standard EN ISO 20345 - Personal protective equipment - Safety footwear.
- Respiratory protection : Self contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmospheres.
Standard EN 14387 - Gas filter(s), combined filter(s) and standard EN136, full face masks .
Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.
- Thermal hazards : Standard EN 511 - Cold insulating gloves.

8.2.3. Environmental exposure controls

- : Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

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 : Solid
- Colour : White.

Odour : No odour warning properties.

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Odour threshold	: Odour threshold is subjective and inadequate to warn of overexposure.
pH	: Not applicable for gases and gas mixtures.
Melting point / Freezing point	: 78.5 °C At atmospheric pressure dry ice sublimates into gaseous carbon dioxide.
Boiling point	: 56.6 °C
Flash point	: Not applicable for gases and gas mixtures.
Evaporation rate	: Not applicable for gases and gas mixtures.
Flammability (solid, gas)	: Non flammable.
Explosive limits	: Non flammable.
Vapour pressure [20°C]	: 57.3 bar(a)
Vapour pressure [50°C]	: Not applicable.
Vapour density	: Not applicable.
Relative density, liquid (water=1)	: 1.03
Relative density, gas (air=1)	: 1.52
Water solubility	: 2000 mg/l Completely soluble.
Partition coefficient n-octanol/water (Log Kow)	: 0.83
Auto-ignition temperature	: Non flammable.
Decomposition temperature	: Not applicable.
Viscosity	: No reliable data available.
Explosive properties	: Not applicable.
Oxidising properties	: Not applicable.
9.2. Other information	
Molar mass	: 44 g/mol
Critical temperature [°C]	: 30 °C
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

: Avoid moisture in installation systems.

10.5. Incompatible materials: None.
For additional information on compatibility refer to ISO 11114.**10.6. Hazardous decomposition products**

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

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SECTION 11: Toxicological information**11.1. Information on toxicological effects**

Acute toxicity	: 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 .
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.
Reproductive toxicity	:
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.
Potential adverse human health effects and symptoms	: Harmful if swallowed. May be harmful if inhaled. May be harmful in contact with skin.

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	: Because of its high volatility, the product is unlikely to cause ground or water pollution. Partition into soil is unlikely.
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12.5. Results of PBT and vPvB assessment

Assessment	: No data available. Not classified as PBT or vPvB.
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12.6. Other adverse effects

Other adverse effects	: No known effects from this product.
Effect on the ozone layer	: None.

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Global warming potential [CO2=1] : 1
Effect on global warming : Contains greenhouse gas(es).
When discharged in large quantities may contribute to the greenhouse effect.

SECTION 13: Disposal considerations**13.1. Waste treatment methods**

Contact supplier if guidance is required.
Discharge to atmosphere in large quantities should be avoided.
Do not discharge into any place where its accumulation could be dangerous.
Ensure that the emission levels from local regulations or operating permits are not exceeded.
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.
Return unused product in original container to supplier.

List of hazardous waste codes (from Commission Decision 2000/532/EC as amended) : 16 05 05 : Gases in pressure containers other than those mentioned in 16 05 04.

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**

UN-No. : 1845

14.2. UN proper shipping name

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

14.5. Environmental hazards

Transport by road/rail (ADR/RID) : 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.

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

: 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.

Seveso Directive : 2012/18/EU (Seveso III) : Not covered.

National regulations

National legislation : Ensure all national/local regulations are observed.

Denmark

Recommendations Danish Regulation : Pregnant/breastfeeding women working with the product must not be in direct contact with the product

15.2. Chemical safety assessment

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

SECTION 16: Other information

Indication of changes : Revised safety data sheet in accordance with commission regulation (EU) No 453/2010.

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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 - International 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

Training advice

: None.
The hazard of asphyxiation is often overlooked and must be stressed during operator training.

Full text of H- and EUH-statements

EUH210	Safety data sheet available on request.
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DISCLAIMER OF LIABILITY

: Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.
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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.