



SAFETY DATA SHEET in accordance with REACH regulation 1907/2006/EC

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Revised edition no : 2 - 05

Date : 23 / 10 / 2015

Supersedes : 3 / 7 / 2015

Carbon dioxide (solid)**018C**

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

1.1. Product identifier

Trade name : Carbon dioxide (solid) , Carbon dioxid (Dry ice)
SDS no : 018C
Chemical description : Carbon dioxide (solid)
CAS No :124-38-9
EC No :204-696-9
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. Perform risk assessment prior to use.
Test gas / Calibration gas.
Contact supplier for more uses information.
Cooling (Food additive E290).
Blast cleaning. Metal cooling.

1.3. Details of the supplier of the safety data sheet

Company identification : AIR LIQUIDE Deutschland GmbH
Hans-Günther-Sohl-Straße 5
D-40235 Düsseldorf GERMANY
Telefon: +49 (0)211 6699-0 - Fax: +49 (0)211 6699-222
E-Mail address (competent person) : Info.SDB@AirLiquide.de

1.4. Emergency telephone number

Emergency telephone number : +49 (0)2151 398668
- Availability : (24 / 7)

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

Hazard Class and Category Code(s), Regulation (EC) No 1272/2008 (CLP)

Hazard Class and Category GHS (text only) : Not classified as dangerous substance / mixture.

2.2. Label elements

Labelling Regulation EC 1272/2008 (CLP)

: None.

2.3. Other hazards

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



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SECTION 3. Composition/information on ingredients

3.1. Substance / 3.2. Mixture

Substance.

| Substance name | Content [Vol-%] | CAS No EC No Index No Registration no. | Classification(DSD) | Classification(CLP) |
|------------------------|-----------------|---|---------------------|----------------------|
| Carbon dioxide (solid) | : 100 % | 124-38-9 204-696-9 ----- * 1 | | Not classified (GHS) |

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

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

* 2: Registration deadline not expired.

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

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. Apply artificial respiration 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 : Adverse effects not expected from this product.
- 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.

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

- : None.

SECTION 5. Fire-fighting measures

5.1. Extinguishing media

- Suitable extinguishing media : Water spray or fog.
- Unsuitable extinguishing media : Do not use water jet to extinguish.

5.2. Special hazards arising from the substance or mixture

- Specific hazards : None.
The product is not flammable.
- Hazardous combustion products : None.

5.3. Advice for firefighters

- Specific methods : Move containers away from the fire area if this can be done without risk.
Use water spray or fog to knock down fire fumes if possible.
- Special protective equipment for fire fighters : Use self-contained breathing apparatus.
Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.
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



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SECTION 5. Fire-fighting measures (continued)

firefighters.

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- : Act in accordance with local emergency plan.
- Stay upwind.
- Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.
- Use protective clothing.
- Ensure adequate air ventilation.
- Evacuate area.

6.2. Environmental precautions

- : Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

6.3. Methods and material for containment and cleaning up

- : Ventilate area.

6.4. Reference to other sections

- 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.
- Avoid release of product into atmosphere.
- Refer to supplier's container handling instructions.
- 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 smoke while handling product.
- The product must be handled in accordance with good industrial hygiene and safety procedures.

7.2. Conditions for safe storage, including any incompatibilities

- : Keep container below 50°C in a well ventilated place.
- Observe all regulations and local requirements regarding storage of containers.

7.3. Specific end use(s)

- : None.

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

- Occupational Exposure Limits
- Carbon dioxide (solid) : ILV (EU) - 8 H - [mg/m³] : 9000
- : ILV (EU) - 8 H - [ppm] : 5000
- : AGW (8h) - Germany [mg/m³] TRGS 900 : 9100
- : AGW (8h) - Germany [ppm] TRGS 900 : 5000
- DNEL: Derived no effect level (Workers)

Carbon dioxide (solid)**018C****SECTION 8. Exposure controls/personal protection (continued)**

PNEC: Predicted no effect concentration : No data available.

: No data 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 asphixiating gases 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.
 - **Skin protection**
 - **Hand protection** : Wear leather safety gloves.
Standard EN 388 - Protective gloves against mechanical risk.
 - **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 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.
 - **Thermal hazards** : Wear cold insulating gloves
Standard EN 511 - Cold insulating gloves.
- 8.2.3. Environmental exposure controls** : None necessary.

SECTION 9. Physical and chemical properties**9.1. Information on basic physical and chemical properties**

- Appearance**
- Physical state at 20°C / 101.3kPa** : Solid.
- Physical state** : Refrigerated solidified gas.
- Colour** : White.
- Odour** : No odour warning properties.
- Odour threshold** : Odour threshold is subjective and inadequate to warn for overexposure.
- pH value** : Not applicable.
- Molar mass [g/mol]** : 44
- Melting point [°C]** : -56.6
- Boiling point [°C]** : -78.5 (s)
-78.5 At atmospheric pressure dry ice sublimates into gaseous carbon dioxide.
- Critical temperature [°C]** : 30
- Flash point [°C]** : Not applicable for gases and gas-mixtures.
- Evaporation rate (ether=1)** : Not applicable for gases and gas-mixtures.
- Flammability range [vol% in air]** : Non flammable.
- Vapour pressure [20°C]** : 57.3 bar
- Relative density, gas (air=1)** : 1.52

Carbon dioxide (solid)**018C****SECTION 9. Physical and chemical properties (continued)**

| | |
|---|-------------------|
| Relative density, liquid (water=1) | : 1.03 |
| Solubility in water [mg/l] | : 2000 |
| Partition coefficient n-octanol/water [log Pow] | : 0.83 |
| Auto-ignition temperature [°C] | : Not applicable. |
| Viscosity at 20°C [mPa.s] | : Not applicable. |
| Explosive Properties | : Not applicable. |
| Oxidising properties | : None. |

9.2. Other information

| | |
|------------|--|
| 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**

: None.

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

: 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.

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

| | |
|-----------------------------------|---|
| Acute toxicity | : In high concentrations cause rapid circulatory insufficiency even at normal levels of oxygen concentration. Symptoms are headache, nausea and vomiting, which may lead to unconsciousness and death |
| Skin corrosion/irritation | : No effects from this product. |
| Serious eye damage/irritation | : No effects from this product. |
| Respiratory or skin sensitisation | : No effects from this product. |
| Carcinogenicity | : No effects from this product. |
| Germ cell mutagenicity | : No effects from this product. |
| Reproductive toxicity | : No effects from this product. |
| STOT-single exposure | : No effects from this product. |
| STOT-repeated exposure | : No effects from this product. |
| Aspiration hazard | : Not applicable for gases and gas-mixtures. |



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SECTION 11. Toxicological information (continued)

SECTION 12. Ecological information

12.1. Toxicity

Assessment : No ecological damage caused by this product.

12.2. Persistence and degradability

Assessment : No ecological damage caused by this product.

12.3. Bioaccumulative potential

Assessment : No ecological damage caused by this product.

12.4. Mobility in soil

Assessment : No ecological damage caused by this product.

12.5. Results of PBT and vPvB assessment

: Not classified as PBT or vPvB.

12.6. Other adverse effects

: Can cause frost damage to vegetation.
Effect on ozone layer : None.
Effect on the global warming : When discharged in large quantities may contribute to the greenhouse effect.
Contains Fluorinated greenhouse gases covered by the Kyoto protocol.
Global warming potential [CO₂=1] : 1

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.
Consult supplier for specific recommendations.
Refer to the code of practice of EIGA (Doc. 30/10 "Disposal of Gases, downloadable at <http://www.eiga.org>) for more guidance on suitable disposal methods
Ensure that the emission levels from local regulations or operating permits are not exceeded.

13.2. Additional information

: None.

SECTION 14. Transport information

14.1. UN number

UN number : 1845

14.2. UN proper shipping name

Transport by road/rail (ADR/RID) : Carbon dioxide, solid (Dry Ice), not subject to ADR
Transport by air (ICAO-TI / IATA-DGR) : CARBON DIOXIDE, SOLID (Dry ice)
Transport by sea (IMDG) : CARBON DIOXIDE, SOLID (Dry ice)

14.3. Transport hazard class(es)



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Transport by road/rail (ADR/RID)

Class : 9
Classification code : M11
H.I. nr : --

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

Transport by sea (IMDG)

Emergency Schedule (EmS) - Fire : F-C S-V

Emergency Schedule (EmS) - Spillage : S-V

14.4. Packing group

Transport by road/rail (ADR/RID) : 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 (ADR/RID) : None.

Transport by air (ICAO-TI / IATA-DGR) : None.

Transport by sea (IMDG) : No

14.6 Special precautions for user

Packing Instruction(s)

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

Passenger and Cargo Aircraft : Allowed.

Packing instruction - Passenger and
Cargo Aircraft : 904Packing instruction - Cargo Aircraft
only : 904

Transport by sea (IMDG) : P003

Special precautions for user : - Ensure there is adequate ventilation.
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 that containers are firmly secured.
Avoid transport on vehicles where the load space is not separated from the driver's compartment.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC CodeTransport in bulk according to Annex
II of MARPOL 73/78 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 legislation

Restrictions on use : None.

Seveso directive 96/82/EC : Not covered.

National legislation

: Ensure all national/local regulations are observed.

- 4. BImSchV (Germany)



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SECTION 15. Regulatory information (continued)

- Water hazard class (WGK) : WGK Germany: Not hazardous to waters.
- Other regulations and technical rules (not complete) : [German regulations]
BetriebssicherheitsV mit TRBSen insbesondere TRBS 3145 / TRGS 725 "Ortsbewegliche Druckgasbehälter", TRGS 2141, BGR Regel 500 Teil 2.33: "Umgang mit Gasen", GefahrstoffV mit Technischen Regeln Gefährliche Stoffe TRGS insbesondere TRGS 407 "Tätigkeiten mit Gasen - Gefährdungsbeurteilung", TRGS 400, 500, 510, 900.

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
- Training advice : The hazard of asphyxiation is often overlooked and must be stressed during operator training.
- Further information : This Safety Data Sheet has been established in accordance with the applicable European Union legislation.
- 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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