

## carbon dioxide, liquefied, deeply refrigerated

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

#### 1.1. Product identifier

|                           |   |
|---------------------------|---|
| Product name              | : carbon dioxide, liquefied, deeply refrigerated                                    |
| Synonyms                  | : carbon dioxide; E290  |
| Registration number REACH | : Exempted from registration under REACH in Annex IV (Regulation (EC) No 1907/2006) |
| Product type REACH        | : Substance/mono-constituent  |
| CAS number                | : 124-38-9  |
| EC number                 | : 204-696-9   |
| Molecular mass            | : 44.01 g/mol   |
| Formula                   | : CO <sub>2</sub>   |

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

##### 1.2.1 Relevant identified uses

Refrigerant gas  
Food industry: additive  
Food industry: component  
Food industry: auxiliary substance  
Water treatment  
Carbonisation of soft drinks  
Contact the supplier for special uses

##### 1.2.2 Uses advised against

No uses advised against known

#### 1.3. Details of the supplier of the safety data sheet

##### Supplier of the safety data sheet

ACP Belgium N.V./S.A.  
Dellestraat 5  
B-3550 Zolder  
☎ +32 13 53 03 03  
SHEQ@acpco2.com  
<http://www.acpco2.com>  
ACP Polska  
Toruńska 234  
PI-87-805 Włocławek  
+48 79 51 15 949

#### 1.4. Emergency telephone number

24h/24h:

+32 13 53 03 03 (ACP Belgium)

24h/24h:

+48 79 51 15 949 (ACP Polska)

### SECTION 2: Hazards identification

#### 2.1. Classification of the substance or mixture

Classified as dangerous according to the criteria of Regulation (EC) No 1272/2008

| Class      | Category                   | Hazard statements   |
|------------|----------------------------|---|
| Press. Gas | Refrigerated liquefied gas | H281: Contains refrigerated gas; may cause cryogenic burns or injury. |

#### 2.2. Label elements



Signal word

Warning

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## H-statements

H281 Contains refrigerated gas; may cause cryogenic burns or injury.

## P-statements

P282 Wear cold insulating gloves and either face shield or eye protection.

P403 Store in a well-ventilated place.

P336 + P315 Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention.

## 2.3. Other hazards

Large spills/in enclosed spaces: risk of oxygen deficiency

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

| Name<br>REACH Registration No | CAS No<br>EC No       | Conc. (C) | Classification according to CLP                  | Note   | Remark           |
|-------------------------------|-----------------------|-----------|--|--------|------------------|
| carbon dioxide                | 124-38-9<br>204-696-9 | C>99 %    | Press. Gas - Refrigerated<br>liquefied gas; H281 | (1)(2) | Mono-constituent |

(1) For H-statements in full: see heading 16

(2) Substance with a Community workplace exposure limit

### 3.2. Mixtures

Not applicable

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

#### General:

Check the vital functions. Unconscious: maintain adequate airway and respiration. Respiratory arrest: artificial respiration or oxygen. Cardiac arrest: perform resuscitation. Victim conscious with laboured breathing: half-seated. Victim in shock: on his back with legs slightly raised. Vomiting: prevent asphyxia/aspiration pneumonia. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain. Depending on the victim's condition: doctor/hospital.

#### After inhalation:

Remove the victim into fresh air. Respiratory problems: consult a doctor/medical service.

#### After skin contact:

Rinse with water. Take victim to a doctor if irritation persists. In case of frostbites: Wash immediately with lots of water (15 minutes)/shower. Do not apply (chemical) neutralizing agents. Remove clothing while washing. Do not remove clothing if it sticks to the skin. Cover wounds with sterile bandage. Consult a doctor/medical service. If burned surface > 10%: take victim to hospital.

#### After eye contact:

Rinse immediately with plenty of water for 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Do not apply neutralizing agents. Cover eyes aseptically. Take victim to an ophthalmologist.

#### After ingestion:

Not applicable.

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

#### 4.2.1 Acute symptoms

##### After inhalation:

EXPOSURE TO HIGH CONCENTRATIONS: Rapid respiration. Accelerated heart action. Headache. Nausea. Dizziness. Damp/clammy skin. Excited/restless. Visual disturbances. Ringing in the ears. Respiratory difficulties. Disturbances of consciousness. Cramps/uncontrolled muscular contractions.

##### After skin contact:

Frostbites.

##### After eye contact:

Frostbites.

##### After ingestion:

No effects known.

#### 4.2.2 Delayed symptoms

No effects known.

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

If applicable and available it will be listed below.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

#### 5.1.1 Suitable extinguishing media:

Adapt extinguishing media to the environment for surrounding fires.

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## 5.1.2 Unsuitable extinguishing media:

Not applicable.

## 5.2. Special hazards arising from the substance or mixture

## 5.3. Advice for firefighters

### 5.3.1 Instructions:

Cool tanks/drums with water spray/remove them into safety. Physical explosion risk: cool from behind cover. Do not move the load if exposed to heat. After cooling: persistent risk of physical explosion.

### 5.3.2 Special protective equipment for fire-fighters:

Insulating gloves. Protective clothing. Large spills/in enclosed spaces: compressed air apparatus. Heat/fire exposure: compressed air/oxygen apparatus.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

Keep upwind. Seal off low-lying areas. Close doors and windows of adjacent premises. No naked flames. Carry out specific temperature controls. Large spills/in confined spaces: consider evacuation.

#### 6.1.1 Protective equipment for non-emergency personnel

See heading 8.2

#### 6.1.2 Protective equipment for emergency responders

Insulating gloves. Protective clothing. Large spills/in enclosed spaces: compressed air apparatus.

#### Suitable protective clothing

See heading 8.2

### 6.2. Environmental precautions

Contain released product, pump into suitable containers. Plug the leak, cut off the supply. Tip the container on one side to stop the leakage.

### 6.3. Methods and material for containment and cleaning up

Damaged/cooled tanks must be emptied.

### 6.4. Reference to other sections

See heading 13.

## SECTION 7: Handling and storage

The information in this section is a general description. If applicable and available, exposure scenarios are attached in annex. Always use the relevant exposure scenarios that correspond to your identified use.

### 7.1. Precautions for safe handling

Keep away from naked flames/heat. Protect cylinders from physical damage; do not drag, roll, slide or drop.

Close container valve after each use and when empty, even if still connected to equipment.

Damaged valves should be reported immediately to the supplier.

Never attempt to transfer gases from one cylinder/container to another. Gas/vapour heavier than air at 20°C. Observe normal hygiene standards.

### 7.2. Conditions for safe storage, including any incompatibilities

#### 7.2.1 Safe storage requirements:

Storage temperature: < 50 °C. Store in a cool area. Store in a dry area. Ventilation at floor level. Secure cylinders tightly to prevent overturning. Keep only in the original container. Meet the legal requirements.

#### 7.2.2 Keep away from:

Heat sources, (strong) bases, metal powders.

#### 7.2.3 Suitable packaging material:

No data available

#### 7.2.4 Non suitable packaging material:

No data available

### 7.3. Specific end use(s)

If applicable and available, exposure scenarios are attached in annex. See information supplied by the manufacturer.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

#### 8.1.1 Occupational exposure

##### a) Occupational exposure limit values

If limit values are applicable and available these will be listed below.

EU

|                |   |          |
|----------------|---|----------|
| Carbon dioxide | Time-weighted average exposure limit 8 h (Indicative occupational exposure limit value) | 5000 ppm |
|----------------|---|----------|

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|                |   |                        |
|----------------|---|------------------------|
| Carbon dioxide | Time-weighted average exposure limit 8 h (Indicative occupational exposure limit value) | 9000 mg/m <sup>3</sup> |
|----------------|---|------------------------|

## b) National biological limit values

If limit values are applicable and available these will be listed below.

### 8.1.2 Sampling methods

| Product name   | Test  | Number |
|----------------|-------|--------|
| Carbon Dioxide | NIOSH | 6603   |
| Carbon Dioxide | OSHA  | ID 172 |

### 8.1.3 Applicable limit values when using the substance or mixture as intended

If limit values are applicable and available these will be listed below.

### 8.1.4 DNEL/PNEC values

If applicable and available it will be listed below.

### 8.1.5 Control banding

If applicable and available it will be listed below.

## 8.2. Exposure controls

The information in this section is a general description. If applicable and available, exposure scenarios are attached in annex. Always use the relevant exposure scenarios that correspond to your identified use.

### 8.2.1 Appropriate engineering controls

Keep away from naked flames/heat. Protect cylinders from physical damage; do not drag, roll, slide or drop.

Close container valve after each use and when empty, even if still connected to equipment.

Damaged valves should be reported immediately to the supplier.

Never attempt to transfer gases from one cylinder/container to another. Measure the oxygen concentration in the air. Carry operations in the open/under local exhaust/ventilation or with respiratory protection.

### 8.2.2 Individual protection measures, such as personal protective equipment

Observe normal hygiene standards. Do not eat, drink or smoke during work.

#### a) Respiratory protection:

High vapour/gas concentration: self-contained respirator.

#### b) Hand protection:

Protective gloves against cold (EN 511).

#### c) Eye protection:

Personal eye-protection (EN 166). In case of splash hazard: face shield.

#### d) Skin protection:

Protective clothing. Safety footwear (EN ISO 20345).

### 8.2.3 Environmental exposure controls:

See headings 6.2, 6.3 and 13

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

|                           |  |
|---------------------------|--|
| Physical form             | Refrigerated liquefied gas                             |
| Odour                     | Odourless  |
| Odour threshold           | Not applicable   |
| Colour                    | Colourless   |
| Particle size             | Not applicable (gas)                                   |
| Explosion limits          | No data available                                      |
| Flammability              | Non combustible  |
| Log Kow                   | 0.83 ; Experimental value                              |
| Dynamic viscosity         | 0.07 mPa.s ; 20 °C                                     |
| Kinematic viscosity       | No data available                                      |
| Melting point             | -57 °C ; 5000 hPa                                      |
| Boiling point             | Not applicable   |
| Evaporation rate          | No data available                                      |
| Relative vapour density   | 1.5  |
| Vapour pressure           | 58240 hPa ; 20 °C                                      |
| Solubility                | Water ; 0.29 g/100 ml                                  |
| Relative density          | 1.5 ; -79 °C   |
| Decomposition temperature | No data available                                      |
| Auto-ignition temperature | No data available                                      |
| Flash point               | Not applicable   |
| Explosive properties      | No chemical group associated with explosive properties |
| Oxidising properties      | No chemical group associated with oxidising properties |
| pH                        | 3.7  |

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## 9.2. Other information

|                         |                                 |
|-------------------------|---------------------------------|
| Critical temperature    | 31 °C                           |
| Critical pressure       | 73815 hPa                       |
| Absolute density        | 1560 kg/m <sup>3</sup> ; -79 °C |
| Sublimation temperature | -78.5 °C                        |

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

Substance has acid reaction.

### 10.2. Chemical stability

Stable under normal conditions.

### 10.3. Possibility of hazardous reactions

Violent to explosive reaction with (some) metal powders. Reacts with (some) bases: release of heat.

### 10.4. Conditions to avoid

#### Precautionary measures

Keep away from naked flames/heat. Protect cylinders from physical damage; do not drag, roll, slide or drop.

Close container valve after each use and when empty, even if still connected to equipment.

Damaged valves should be reported immediately to the supplier.

Never attempt to transfer gases from one cylinder/container to another.

### 10.5. Incompatible materials

(strong) bases, metal powders.

### 10.6. Hazardous decomposition products

No data available.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

#### 11.1.1 Test results

#### Acute toxicity

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No (test)data available

#### Conclusion

Not classified for acute toxicity

#### Corrosion/irritation

carbon dioxide, liquefied, deeply refrigerated

No (test)data available

#### Conclusion

Not classified as irritating to the skin

Not classified as irritating to the eyes

Not classified as irritating to the respiratory system

#### Respiratory or skin sensitisation

carbon dioxide, liquefied, deeply refrigerated

No (test)data available

#### Conclusion

Not classified as sensitizing for skin

Not classified as sensitizing for inhalation

#### Specific target organ toxicity

carbon dioxide, liquefied, deeply refrigerated

No (test)data available

#### Conclusion

Not classified for subchronic toxicity

#### Mutagenicity (in vitro)

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No (test)data available

## Mutagenicity (in vivo)

carbon dioxide, liquefied, deeply refrigerated

No (test)data available

### Conclusion

Not classified for mutagenic or genotoxic toxicity

## Carcinogenicity

carbon dioxide, liquefied, deeply refrigerated

No (test)data available

### Conclusion

Not classified for carcinogenicity

## Reproductive toxicity

carbon dioxide, liquefied, deeply refrigerated

No (test)data available

### Conclusion

Not classified for reprotoxic or developmental toxicity

## Toxicity other effects

carbon dioxide, liquefied, deeply refrigerated

No (test)data available

## Chronic effects from short and long-term exposure

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ON CONTINUOUS/REPEATED EXPOSURE/CONTACT: Change in the haemogramme/blood composition. Low arterial pressure.

## SECTION 12: Ecological information

### 12.1. Toxicity

carbon dioxide, liquefied, deeply refrigerated

|                       | Parameter | Method | Value   | Duration | Species         | Test design | Fresh/salt water | Value determination      |
|-----------------------|-----------|--------|---------|----------|-----------------|-------------|------------------|--------------------------|
| Acute toxicity fishes | LC50      |        | 35 mg/l | 96 h     | Salmo gairdneri |             |                  | Literature study; Lethal |

### Conclusion

Not classified as dangerous for the environment according to the criteria of Regulation (EC) No 1272/2008

### 12.2. Persistence and degradability

carbon dioxide, liquefied, deeply refrigerated

#### Half-life soil (t1/2 soil)

| Method | Value                | Primary degradation/mineralisation | Value determination |
|--------|----------------------|------------------------------------|---------------------|
|        | Not applicable (gas) |                                    |                     |

### Conclusion

Biodegradability: not applicable

### 12.3. Bioaccumulative potential

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#### Log Kow

| Method | Remark | Value | Temperature | Value determination |
|--------|--------|-------|-------------|---------------------|
|        |        | 0.83  |             | Experimental value  |

### Conclusion

Low potential for bioaccumulation (Log Kow < 4)

### 12.4. Mobility in soil

Not applicable (gas)

### 12.5. Results of PBT and vPvB assessment

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The criteria of PBT and vPvB as listed in Annex XIII of Regulation (EC) No 1907/2006 do not apply to inorganic substances.

## 12.6. Other adverse effects

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### Fluorinated greenhouse gases (Regulation (EU) No 517/2014)

Not included in the list of fluorinated greenhouse gases (Regulation (EU) No 517/2014)

Included in the list of substances which may contribute to the greenhouse effect (IPCC)

### Ozone-depleting potential (ODP)

Not classified as dangerous for the ozone layer (Regulation (EC) No 1005/2009)

## SECTION 13: Disposal considerations

The information in this section is a general description. If applicable and available, exposure scenarios are attached in annex. Always use the relevant exposure scenarios that correspond to your identified use.

### 13.1. Waste treatment methods

#### 13.1.1 Provisions relating to waste

##### European Union

Can be considered as non hazardous waste according to Directive 2008/98/EC, as amended by Regulation (EU) No 1357/2014 and Regulation (EU) No 2017/997.

Waste material code (Directive 2008/98/EC, Decision 2000/0532/EC).

16 05 05 (gases in pressure containers and discarded chemicals: gases in pressure containers other than those mentioned in 16 05 04). The waste code must be assigned by the user, preferably in consultation with the (environmental) authorities concerned.

#### 13.1.2 Disposal methods

Refer to manufacturer/supplier for information on recovery/ recycling. Remove waste in accordance with local and/or national regulations.

#### 13.1.3 Packaging/Container

##### European Union

Waste material code packaging (Directive 2008/98/EC).

15 01 04 (metallic packaging).

## SECTION 14: Transport information

### Road (ADR)

#### 14.1. UN number

|           |      |
|-----------|------|
| UN number | 2187 |
|-----------|------|

#### 14.2. UN proper shipping name

|                      |                                     |
|----------------------|-------------------------------------|
| Proper shipping name | Carbon dioxide, refrigerated liquid |
|----------------------|-------------------------------------|

#### 14.3. Transport hazard class(es)

|                              |    |
|------------------------------|----|
| Hazard identification number | 22 |
| Class                        | 2  |
| Classification code          | 3A |

#### 14.4. Packing group

|               |     |
|---------------|-----|
| Packing group |     |
| Labels        | 2.2 |

#### 14.5. Environmental hazards

|  |    |
|--|----|
| Environmentally hazardous substance mark | no |
|--|----|

#### 14.6. Special precautions for user

|                    |   |
|--------------------|---|
| Special provisions |   |
| Limited quantities | Combination packagings: not more than 120 ml per inner packaging for liquids. A package shall not weigh more than 30 kg. (gross mass) |

### Rail (RID)

#### 14.1. UN number

|           |      |
|-----------|------|
| UN number | 2187 |
|-----------|------|

#### 14.2. UN proper shipping name

|                      |                                     |
|----------------------|-------------------------------------|
| Proper shipping name | Carbon dioxide, refrigerated liquid |
|----------------------|-------------------------------------|

#### 14.3. Transport hazard class(es)

|                              |    |
|------------------------------|----|
| Hazard identification number | 22 |
| Class                        | 2  |
| Classification code          | 3A |

#### 14.4. Packing group

|               |           |
|---------------|-----------|
| Packing group |           |
| Labels        | 2.2 (+13) |

#### 14.5. Environmental hazards

|  |    |
|--|----|
| Environmentally hazardous substance mark | no |
|--|----|

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## 14.6. Special precautions for user

|                    |   |
|--------------------|---|
| Special provisions |   |
| Limited quantities | Combination packagings: not more than 120 ml per inner packaging for liquids. A package shall not weigh more than 30 kg. (gross mass) |

## Inland waterways (ADN)

### 14.1. UN number

|           |      |
|-----------|------|
| UN number | 2187 |
|-----------|------|

### 14.2. UN proper shipping name

|                      |                                     |
|----------------------|-------------------------------------|
| Proper shipping name | Carbon dioxide, refrigerated liquid |
|----------------------|-------------------------------------|

### 14.3. Transport hazard class(es)

|                     |    |
|---------------------|----|
| Class               | 2  |
| Classification code | 3A |

### 14.4. Packing group

|               |     |
|---------------|-----|
| Packing group |     |
| Labels        | 2.2 |

### 14.5. Environmental hazards

|  |    |
|--|----|
| Environmentally hazardous substance mark | no |
|--|----|

## 14.6. Special precautions for user

|                    |   |
|--------------------|---|
| Special provisions |   |
| Limited quantities | Combination packagings: not more than 120 ml per inner packaging for liquids. A package shall not weigh more than 30 kg. (gross mass) |

## Sea (IMDG/IMSBC)

### 14.1. UN number

|           |      |
|-----------|------|
| UN number | 2187 |
|-----------|------|

### 14.2. UN proper shipping name

|                      |                                     |
|----------------------|-------------------------------------|
| Proper shipping name | Carbon dioxide, refrigerated liquid |
|----------------------|-------------------------------------|

### 14.3. Transport hazard class(es)

|       |     |
|-------|-----|
| Class | 2.2 |
|-------|-----|

### 14.4. Packing group

|               |     |
|---------------|-----|
| Packing group |     |
| Labels        | 2.2 |

### 14.5. Environmental hazards

|  |    |
|--|----|
| Marine pollutant                         | -  |
| Environmentally hazardous substance mark | no |

## 14.6. Special precautions for user

|                    |   |
|--------------------|---|
| Special provisions |   |
| Limited quantities | Combination packagings: not more than 120 ml per inner packaging for liquids. A package shall not weigh more than 30 kg. (gross mass) |

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

|                          |                |
|--------------------------|----------------|
| Annex II of MARPOL 73/78 | Not applicable |
|--------------------------|----------------|

## Air (ICAO-TI/IATA-DGR)

### 14.1. UN number

|           |      |
|-----------|------|
| UN number | 2187 |
|-----------|------|

### 14.2. UN proper shipping name

|                      |                                     |
|----------------------|-------------------------------------|
| Proper shipping name | Carbon dioxide, refrigerated liquid |
|----------------------|-------------------------------------|

### 14.3. Transport hazard class(es)

|       |     |
|-------|-----|
| Class | 2.2 |
|-------|-----|

### 14.4. Packing group

|               |     |
|---------------|-----|
| Packing group |     |
| Labels        | 2.2 |

### 14.5. Environmental hazards

|  |    |
|--|----|
| Environmentally hazardous substance mark | no |
|--|----|

## 14.6. Special precautions for user

|  |           |
|--|-----------|
| Special provisions                                     |           |
| Limited quantities: maximum net quantity per packaging | Forbidden |



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## SECTION 15: Regulatory information

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

#### European legislation:

VOC content Directive 2010/75/EU

| VOC content | Remark                     |
|-------------|----------------------------|
|             | Not applicable (inorganic) |

Plant protection products

Included in implementing Regulation (EU) No 540/2011, annex part A

### 15.2. Chemical safety assessment

No chemical safety assessment has been conducted.

## SECTION 16: Other information

#### Full text of any H-statements referred to under heading 3:

H281 Contains refrigerated gas; may cause cryogenic burns or injury.

|              |  |
|--------------|--|
| (*)          | INTERNAL CLASSIFICATION BY BIG   |
| CLP (EU-GHS) | Classification, labelling and packaging (Globally Harmonised System in Europe) |
| DMEL         | Derived Minimal Effect Level   |
| DNEL         | Derived No Effect Level  |
| EC50         | Effect Concentration 50 %  |
| ErC50        | EC50 in terms of reduction of growth rate                                      |
| LC50         | Lethal Concentration 50 %  |
| LD50         | Lethal Dose 50 %   |
| NOAEL        | No Observed Adverse Effect Level   |
| NOEC         | No Observed Effect Concentration   |
| OECD         | Organisation for Economic Co-operation and Development                         |
| PBT          | Persistent, Bioaccumulative & Toxic  |
| PNEC         | Predicted No Effect Concentration  |
| STP          | Sludge Treatment Process   |
| vPvB         | very Persistent & very Bioaccumulative   |

The information in this safety data sheet is based on data and samples provided to BIG. The sheet was written to the best of our ability and according to the state of knowledge at that time. The safety data sheet only constitutes a guideline for the safe handling, use, consumption, storage, transport and disposal of the substances/preparations/mixtures mentioned under point 1. New safety data sheets are written from time to time. Only the most recent versions may be used. Old versions must be destroyed. Unless indicated otherwise word for word on the safety data sheet, the information does not apply to substances/preparations/mixtures in purer form, mixed with other substances or in processes. The safety data sheet offers no quality specification for the substances/preparations/mixtures in question. Compliance with the instructions in this safety data sheet does not release the user from the obligation to take all measures dictated by common sense, regulations and recommendations or which are necessary and/or useful based on the real applicable circumstances. BIG does not guarantee the accuracy or exhaustiveness of the information provided and cannot be held liable for any changes by third parties. This safety data sheet is only to be used within the European Union, Switzerland, Iceland, Norway and Liechtenstein. Any use outside of this area is at your own risk. Use of this safety data sheet is subject to the licence and liability limiting conditions as stated in your BIG licence agreement or when this is failing the general conditions of BIG. All intellectual property rights to this sheet are the property of BIG and its distribution and reproduction are limited. Consult the mentioned agreement/conditions for details.

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