



SAFETY DATA SHEET

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Revised edition no : 7.0

Revision date : 2024-02-02

Supersedes version of : 2023-01-19

Carbon dioxide

NOAL_0018A

Country : SE / Language : EN

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

1.1. Product identifier

Trade name : Carbon dioxide, Aligal 2, Aligal 2D, Lasal 2, Medical carbon dioxide CO₂, Carbon dioxide N40, Carbon dioxide N45, Carbon dioxide N48, Phargalis 2, Carbon dioxide N40, Carbon dioxide for cooling, Carbon dioxide R744

SDS no : NOAL_0018A

Other means of identification : Carbon dioxide

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.
Test gas/Calibration gas.
Laboratory use.
Purge gas, diluting gas, inerting gas.
Purging.
Shield gas for welding processes.
Use for manufacture of electronic/photovoltaic components.
Food applications.
Contact supplier for more information on uses.

Uses advised against : Consumer use.
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

Company identification

Supplier

AIR LIQUIDE GAS AB
Pulpetgatan 20
215 37 Malmö - SWEDEN
T +46 40 38 10 00
info.sweden@airliquide.com

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

1.4. Emergency telephone number

Emergency telephone number : 112
Availability
(24 / 7)

Country	Organisation/Company	Address	Emergency number	Comment
Germany	Giftnotruf Erfurt Gemeinsames Giftinformationszentrum der Länder Mecklenburg-Vorpommern, Sachsen, Sachsen-Anhalt und Thüringen, c/o HELIOS Klinikum Erfurt	Nordhäuser Straße 74 99089 Erfurt	+49 (0) 361 730 730	

Carbon dioxide

NOAL 0018A

Country : SE / Language : EN

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Physical hazards	Gases under pressure : Liquefied gas	H280
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2.2. Label elements

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

Hazard pictograms (CLP)



GHS04

Signal word (CLP)

: Warning

Hazard statements (CLP)

: H280 - Contains gas under pressure; may explode if heated.

Precautionary statements (CLP)

- Storage

: P410+P403 - Protect from sunlight. Store in a well-ventilated place.

2.3. Other hazards

Asphyxiant in high concentrations.

Contact with liquid may cause cold burns/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.

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	Composition [V-%]:	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Carbon dioxide	CAS-No.: 124-38-9 EC-No.: 204-696-9 EC Index-No.: --- REACH registration No: *1	100	Press. Gas (Liq.), H280

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 established

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. |

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- Ingestion : Ingestion is not considered a potential route of exposure.

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.
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.

5.2. Special hazards arising from the substance or mixture

- Specific hazards : Exposure to fire may cause containers to rupture/explode.
- Hazardous combustion products : None.

5.3. Advice for firefighters

- Specific methods : Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems.
If possible, stop flow of product.
Use water spray or fog to knock down fire fumes if possible.
Move containers away from the fire area if this can be done without risk.
- 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.


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.
Try to stop release.
Evacuate area.
Ensure adequate air ventilation.
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
- 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

Try to stop release.

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6.3. Methods and material for containment and cleaning up

Keep area evacuated and free from ignition sources until any spilled liquid has evaporated (ground free from frost).

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.
 Avoid release of product into atmosphere.
 Containers, which contain or have contained flammable or explosive substances, must not be inerted with liquid carbon dioxide. Potential production of solid CO₂ particles must be ruled out. In order to rule out potential electrostatic discharge production, the system must be adequately grounded.
 The product must be handled in accordance with good industrial hygiene and safety procedures.
 Only experienced and properly instructed persons should handle gases under pressure.
 Consider pressure relief device(s) in gas installations.
 Ensure the complete gas system was (or is regularly) checked for leaks before use.
 Do not smoke while handling product.
 Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
 Avoid suck back of water, acid and alkalis.

Safe handling of the gas receptacle

: Refer to supplier's container handling instructions.
 Do not allow backfeed into the container.
 Protect containers from physical damage; do not drag, roll, slide or drop.
 When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders.
 Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use.
 If user experiences any difficulty operating valve discontinue use and contact supplier.
 Never attempt to repair or modify container valves or safety relief devices.
 Damaged valves should be reported immediately to the supplier.
 Keep container valve outlets clean and free from contaminants particularly oil and water.
 Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment.
 Close container valve after each use and when empty, even if still connected to equipment.
 Never attempt to transfer gases from one cylinder/container to another.
 Never use direct flame or electrical heating devices to raise the pressure of a container.
 Do not remove or deface labels provided by the supplier for the identification of the content of the container.
 Suck back of water into the container must be prevented.
 Open valve slowly to avoid pressure shock.

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.
 Container valve guards or caps should be in place.
 Containers should be stored in the vertical position and properly secured to prevent them from falling over.
 Stored containers should be periodically checked for general condition and leakage.
 Keep container below 50°C in a well ventilated place.
 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 (124-38-9)	
EU - Indicative Occupational Exposure Limit (IOEL)	
Local name	Carbon dioxide
IOEL TWA	9000 mg/m³
IOEL TWA [ppm]	5000 ppm
Austria - Occupational Exposure Limits	
Local name	Kohlenstoffdioxid
MAK (mg/m³)	9000 mg/m³
MAK (OEL TWA) [ppm]	5000 ppm
MAK (OEL STEL)	18000 mg/m³
MAK (OEL STEL) [ppm]	10000 ppm
Belgium - Occupational Exposure Limits	
Local name	Carbone (dioxyde de) # Koolstofdioxide
OEL TWA	9131 mg/m³
OEL TWA [ppm]	5000 ppm
OEL STEL	54784 mg/m³
OEL STEL [ppm]	30000 ppm
Remark	A: La mention A signifie que l'agent libère un gaz ou une vapeur qui n'ont en eux-mêmes aucun effet physiologique mais peuvent diminuer le taux d'oxygène dans l'air. Lorsque le taux d'oxygène descend en dessous de 17-18 % (vol/vol) le manque d'oxygène provoque des suffocations qu'aucun symptôme préalable n'annonce. # De vermelding A betekent dat dit agens gas of damp vrijgeeft dat of die op zich geen fysiologische werking heeft, maar het zuurstofgehalte in de lucht verlaagt. Wanneer het zuurstofgehalte daalt onder de 17-18 % (vol/vol), veroorzaakt het zuurstoftekort verstikking, die zich manifesteert zonder dat er een waarschuwing aan voorafgaat.
Bulgaria - Occupational Exposure Limits	
Local name	Въглероден диоксид
OEL TWA	9000 mg/m³
OEL TWA [ppm]	5000 ppm
Remark	• (Химични агенти, за които са определени гранични стойности във въздуха на работната среда за Европейската общност)
Croatia - Occupational Exposure Limits	
Local name	Ugljikov dioksid


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Carbon dioxide			NOAL_0018A
			Country : SE / Language : EN
GVI (OEL TWA) [1]		9000 mg/m³	
GVI (OEL TWA) [2]		5000 ppm	
Remark		EU**	
Czech Republic - Occupational Exposure Limits			
Local name		Oxid uhli itý	
PEL (OEL TWA)		9000 mg/m³	
PEL (OEL TWA) [ppm]		5000 ppm	
NPK-P (OEL C)		45000 mg/m³	
NPK-P (OEL C) [ppm]		25020 ppm	
Denmark - Occupational Exposure Limits			
Local name		Carbondioxid (Kuldioxid; Kulsyre)	
OEL TWA [1]		9000 mg/m³	
OEL TWA [2]		5000 ppm	
Estonia - Occupational Exposure Limits			
Local name		Süsinikdioksiid	
OEL TWA		9000 mg/m³	
OEL TWA [ppm]		5000 ppm	
Finland - Occupational Exposure Limits			
Local name		Hiilidioksidi	
HTP (OEL TWA) [1]		9100 mg/m³	
HTP (OEL TWA) [2]		5000 ppm	
France - Occupational Exposure Limits			
Local name		Dioxyde de carbone	
VME (OEL TWA)		9000 mg/m³	
VME (OEL TWA) [ppm]		5000 ppm	
Remark		Valeurs réglementaires indicatives	
Germany - Occupational Exposure Limits (TRGS 900)			
Local name		Kohlenstoffdioxid	
AGW (OEL TWA) [1]		9100 mg/m³	
AGW (OEL TWA) [2]		5000 ppm	
Remark		DFG,EU	
Greece - Occupational Exposure Limits			
OEL TWA		9000 mg/m³	
OEL TWA [ppm]		5000 ppm	
OEL STEL		54000 mg/m³	

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			Country : SE / Language : EN
Hungary - Occupational Exposure Limits			
Local name		SZÉN-DIOXID	
AK (OEL TWA)		9000 mg/m³	
Ireland - Occupational Exposure Limits			
Local name		Carbon dioxide	
OEL TWA [1]		9000 mg/m³	
OEL TWA [2]		5000 ppm	
OEL STEL		27000 mg/m³	
OEL STEL [ppm]		15000 ppm	
Italy - Occupational Exposure Limits			
Local name		Anidride carbonica	
OEL TWA		9000 mg/m³	
OEL TWA [ppm]		5000 ppm	
Latvia - Occupational Exposure Limits			
Local name		Oglekļadioksīds	
OEL TWA		9000 mg/m³	
OEL TWA [ppm]		5000 ppm	
Lithuania - Occupational Exposure Limits			
Local name		Anglies dioksidas	
IPRV (OEL TWA)		9000 mg/m³	
IPRV (OEL TWA) [ppm]		5000 ppm	
Luxembourg - Occupational Exposure Limits			
Local name		Dioxyde de carbone	
OEL TWA		9000 mg/m³	
OEL TWA [ppm]		5000 ppm	
Malta - Occupational Exposure Limits			
Local name		Carbondioxide	
OEL TWA		9000 mg/m³	
OEL TWA [ppm]		5000 ppm	
Netherlands - Occupational Exposure Limits			
Local name		Kooldioxide	
TGG-8u (OEL TWA)		9000 mg/m³	
Poland - Occupational Exposure Limits			
Local name		Ditlenek węgla 7	
NDS (OEL TWA)		9000 mg/m³	


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			Country : SE / Language : EN
NDSch (OEL STEL)		27000 mg/m³	
Portugal - Occupational Exposure Limits			
Local name		Dióxido de carbono	
OEL TWA [ppm]		5000 ppm	
OEL STEL [ppm]		30000 ppm	
Romania - Occupational Exposure Limits			
Local name		Bioxid de carbon	
OEL TWA		9000 mg/m³	
OEL TWA [ppm]		5000 ppm	
Slovenia - Occupational Exposure Limits			
Local name		ogljikov dioksid	
OEL TWA		9000 mg/m³	
OEL TWA [ppm]		5000 ppm	
Spain - Occupational Exposure Limits			
Local name		Dióxido de carbono	
VLA-ED (OEL TWA) [1]		9150 mg/m³	
VLA-ED (OEL TWA) [2]		5000 ppm	
Remark		VLI (Agente químico para el que la U.E. estableció en su día un valor límite indicativo. Todos estos agentes químicos figuran al menos en una de las directivas de valores límite indicativos publicadas hasta ahora (ver Anexo C. Bibliografía). Los estados miembros disponen de un tiempo fijado en dichas directivas para su transposición a los valores límites de cada país miembro. Una vez adoptados, estos valores tienen la misma validez que el resto de los valores adoptados por el país).	
Sweden - Occupational Exposure Limits			
Local name		Koldioxid	
NGV (OEL TWA)		9000 mg/m³	
NGV (OEL TWA) [ppm]		5000 ppm	
KTV (OEL STEL)		18000 mg/m³	
KTV (OEL STEL) [ppm]		10000 ppm	
United Kingdom - Occupational Exposure Limits			
Local name		Carbon dioxide	
WEL TWA (OEL TWA) [1]		9150 mg/m³	
WEL TWA (OEL TWA) [2]		5000 ppm	
WEL STEL (OEL STEL)		27400 mg/m³	
WEL STEL (OEL STEL) [ppm]		15000 ppm	
Iceland - Occupational Exposure Limits			
Local name		Koldíoxíð (koltvísýringur, kolsýra)	


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			Country : SE / Language : EN
OEL TWA		9000 mg/m³	
OEL TWA [ppm]		5000 ppm	
Norway - Occupational Exposure Limits			
Local name		Karbondioksid	
Grenseverdi (OEL TWA) [1]		9000 mg/m³	
Grenseverdi (OEL TWA) [2]		5000 ppm	
Switzerland - Occupational Exposure Limits			
Local name		Kohlendioxid	
MAK (OEL TWA) [1]		9000 mg/m³	
MAK (OEL TWA) [2]		5000 ppm	
Remark		Asphyxie - NIOSH	
USA - ACGIH - Occupational Exposure Limits			
Local name		Carbon dioxide	
ACGIH OEL TWA [ppm]		5000 ppm	
ACGIH OEL STEL [ppm]		30000 ppm	
Remark (ACGIH)		Asphyxia	
Carbon dioxide (124-38-9)			
EU - Indicative Occupational Exposure Limit (IOEL)			
Local name		Carbon dioxide	
IOEL TWA		9000 mg/m³	
IOEL TWA [ppm]		5000 ppm	
Austria - Occupational Exposure Limits			
Local name		Kohlenstoffdioxid	
MAK (mg/m³)		9000 mg/m³	
MAK (OEL TWA) [ppm]		5000 ppm	
MAK (OEL STEL)		18000 mg/m³	
MAK (OEL STEL) [ppm]		10000 ppm	
Belgium - Occupational Exposure Limits			
Local name		Carbone (dioxyde de) # Koolstofdiooxide	
OEL TWA		9131 mg/m³	
OEL TWA [ppm]		5000 ppm	
OEL STEL		54784 mg/m³	
OEL STEL [ppm]		30000 ppm	

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		Country : SE / Language : EN
Remark	A: La mention A signifie que l'agent libère un gaz ou une vapeur qui n'ont en eux-mêmes aucun effet physiologique mais peuvent diminuer le taux d'oxygène dans l'air. Lorsque le taux d'oxygène descend en dessous de 17-18 % (vol/vol) le manque d'oxygène provoque des suffocations qu'aucun symptôme préalable n'annonce. # De vermelding A betekent dat dit agens gas of damp vrijgeeft dat of die op zich geen fysiologische werking heeft, maar het zuurstofgehalte in de lucht verlaagt. Wanneer het zuurstofgehalte daalt onder de 17-18 % (vol/vol), veroorzaakt het zuurstoftekort verstikking, die zich manifesteert zonder dat er een waarschuwing aan voorafgaat.	
Bulgaria - Occupational Exposure Limits		
Local name	Въглероден диоксид	
OEL TWA	9000 mg/m³	
OEL TWA [ppm]	5000 ppm	
Remark	• (Химични агенти, за които са определени гранични стойности във въздуха на работната среда за Европейската общност)	
Croatia - Occupational Exposure Limits		
Local name	Ugljikov dioksid	
GVI (OEL TWA) [1]	9000 mg/m³	
GVI (OEL TWA) [2]	5000 ppm	
Remark	EU**	
Czech Republic - Occupational Exposure Limits		
Local name	Oxid uhli itý	
PEL (OEL TWA)	9000 mg/m³	
PEL (OEL TWA) [ppm]	5000 ppm	
NPK-P (OEL C)	45000 mg/m³	
NPK-P (OEL C) [ppm]	25020 ppm	
Denmark - Occupational Exposure Limits		
Local name	Carbondioxid (Kuldioxid; Kulsyre)	
OEL TWA [1]	9000 mg/m³	
OEL TWA [2]	5000 ppm	
Estonia - Occupational Exposure Limits		
Local name	Süsinikdioksiid	
OEL TWA	9000 mg/m³	
OEL TWA [ppm]	5000 ppm	
Finland - Occupational Exposure Limits		
Local name	Hiilidioksidi	
HTP (OEL TWA) [1]	9100 mg/m³	
HTP (OEL TWA) [2]	5000 ppm	

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France - Occupational Exposure Limits	
Local name	Dioxyde de carbone
VME (OEL TWA)	9000 mg/m³
VME (OEL TWA) [ppm]	5000 ppm
Remark	Valeurs règlementaires indicatives
Germany - Occupational Exposure Limits (TRGS 900)	
Local name	Kohlenstoffdioxid
AGW (OEL TWA) [1]	9100 mg/m³
AGW (OEL TWA) [2]	5000 ppm
Remark	DFG,EU
Greece - Occupational Exposure Limits	
OEL TWA	9000 mg/m³
OEL TWA [ppm]	5000 ppm
OEL STEL	54000 mg/m³
Hungary - Occupational Exposure Limits	
Local name	SZÉN-DIOXID
AK (OEL TWA)	9000 mg/m³
Ireland - Occupational Exposure Limits	
Local name	Carbon dioxide
OEL TWA [1]	9000 mg/m³
OEL TWA [2]	5000 ppm
OEL STEL	27000 mg/m³
OEL STEL [ppm]	15000 ppm
Italy - Occupational Exposure Limits	
Local name	Anidride carbonica
OEL TWA	9000 mg/m³
OEL TWA [ppm]	5000 ppm
Latvia - Occupational Exposure Limits	
Local name	Oglekļadioksīds
OEL TWA	9000 mg/m³
OEL TWA [ppm]	5000 ppm
Lithuania - Occupational Exposure Limits	
Local name	Anglies dioksidas
IPRV (OEL TWA)	9000 mg/m³
IPRV (OEL TWA) [ppm]	5000 ppm


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Luxembourg - Occupational Exposure Limits			
Local name		Dioxyde de carbone	
OEL TWA		9000 mg/m³	
OEL TWA [ppm]		5000 ppm	
Malta - Occupational Exposure Limits			
Local name		Carbondioxide	
OEL TWA		9000 mg/m³	
OEL TWA [ppm]		5000 ppm	
Netherlands - Occupational Exposure Limits			
Local name		Kooldioxide	
TGG-8u (OEL TWA)		9000 mg/m³	
Poland - Occupational Exposure Limits			
Local name		Ditlenek węgla 7	
NDS (OEL TWA)		9000 mg/m³	
NDSch (OEL STEL)		27000 mg/m³	
Portugal - Occupational Exposure Limits			
Local name		Dióxido de carbono	
OEL TWA [ppm]		5000 ppm	
OEL STEL [ppm]		30000 ppm	
Romania - Occupational Exposure Limits			
Local name		Bioxid de carbon	
OEL TWA		9000 mg/m³	
OEL TWA [ppm]		5000 ppm	
Slovenia - Occupational Exposure Limits			
Local name		ogljikov dioksid	
OEL TWA		9000 mg/m³	
OEL TWA [ppm]		5000 ppm	
Spain - Occupational Exposure Limits			
Local name		Dióxido de carbono	
VLA-ED (OEL TWA) [1]		9150 mg/m³	
VLA-ED (OEL TWA) [2]		5000 ppm	
Remark		VLI (Agente químico para el que la U.E. estableció en su día un valor límite indicativo. Todos estos agentes químicos figuran al menos en una de las directivas de valores límite indicativos publicadas hasta ahora (ver Anexo C. Bibliografía). Los estados miembros disponen de un tiempo fijado en dichas directivas para su transposición a los valores límites de cada país miembro. Una vez adoptados, estos valores tienen la misma validez que el resto de los valores adoptados por el país).	

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Sweden - Occupational Exposure Limits	
Local name	Koldioxid
NGV (OEL TWA)	9000 mg/m³
NGV (OEL TWA) [ppm]	5000 ppm
KTV (OEL STEL)	18000 mg/m³
KTV (OEL STEL) [ppm]	10000 ppm
United Kingdom - Occupational Exposure Limits	
Local name	Carbon dioxide
WEL TWA (OEL TWA) [1]	9150 mg/m³
WEL TWA (OEL TWA) [2]	5000 ppm
WEL STEL (OEL STEL)	27400 mg/m³
WEL STEL (OEL STEL) [ppm]	15000 ppm
Iceland - Occupational Exposure Limits	
Local name	Koldíoxíð (koltvísýringur, kolsýra)
OEL TWA	9000 mg/m³
OEL TWA [ppm]	5000 ppm
Norway - Occupational Exposure Limits	
Local name	Karbondioksid
Grenseverdi (OEL TWA) [1]	9000 mg/m³
Grenseverdi (OEL TWA) [2]	5000 ppm
Switzerland - Occupational Exposure Limits	
Local name	Kohlendioxid
MAK (OEL TWA) [1]	9000 mg/m³
MAK (OEL TWA) [2]	5000 ppm
Remark	Asphyxie - NIOSH
USA - ACGIH - Occupational Exposure Limits	
Local name	Carbon dioxide
ACGIH OEL TWA [ppm]	5000 ppm
ACGIH OEL STEL [ppm]	30000 ppm
Remark (ACGIH)	Asphyxia

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

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

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8.2. Exposure controls

8.2.1. Appropriate engineering controls

Provide adequate general and local exhaust ventilation.
Systems under pressure should be regularly checked for leakages.
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

- Eye/face protection
 - : Wear goggles when transfilling or breaking transfer connections.
 - Standard EN 166 - Personal eye-protection - specifications.
- Skin protection
 - Hand protection
 - : Wear working gloves when handling gas containers.
 - Standard EN 388 - Protective gloves against mechanical risk, performance level 1 or higher.
 - 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
 - : Gas filters may be used if all surrounding conditions e.g. type and concentration of the contaminant(s) and duration of use are known.
 - Use gas filters with full face mask, where exposure limits may be exceeded for a short-term period, e.g. connecting or disconnecting containers.
 - Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.
 - Gas filters do not protect against oxygen deficiency.
 - 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 .
 - Self contained breathing apparatus is recommended, where unknown exposure may be expected, e.g. during maintenance activities on installation systems.
- Thermal hazards
 - : None in addition to the above sections.


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	: Gas
- Colour	: Colourless.
Odour	: No odour warning properties.
	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.
Flammability	: Non flammable.
Explosive limits	: Non flammable.
Lower explosion limit	: Not available
Upper explosion limit	: Not available
Vapour pressure [20°C]	: 57.3 bar(a)

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Vapour pressure [50°C]	: Not applicable.
Density	: Not applicable
Vapour density	: Not applicable for gases and gas mixtures.
Relative density, liquid (water=1)	: 0.82
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, kinematic	: No reliable data available.
Particle characteristics	: Not applicable for gases and gas mixtures.

9.2. Other information

9.2.1. Information with regard to physical hazard classes

Explosive properties	: Not applicable.
Oxidising properties	: Not applicable.
Critical temperature [°C]	: 30 °C

9.2.2. Other safety characteristics

Molar mass	: 44 g/mol
Evaporation rate	: Not applicable for gases and gas mixtures.
Gas group	: Press. Gas (Liq.)
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.
	None under normal use.
Reactivity	: None.

10.4. Conditions to avoid


Avoid moisture in installation systems.

10.5. Incompatible materials

For additional information on compatibility refer to ISO 11114.

10.6. Hazardous decomposition products

None.

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SECTION 11: Toxicological information

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

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.
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	: For more information, see 'EIGA Safety Info 24: Carbon Dioxide, Physiological Hazards' at www.eiga.eu . 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. 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. Not expected to bioaccumulate due to the low log Kow (log Kow < 4). See section 9.
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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. Endocrine disrupting properties

The substance/mixture has no endocrine disrupting properties.

12.7. Other adverse effects

- Other adverse effects
- Effect on the ozone layer
- Global warming potential [CO2=1]
- Effect on global warming
- : No known effects from this product.
- : None.
- : 1
- : Contains greenhouse gas(es).
- When discharged in large quantities may contribute to the greenhouse effect.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

- May be vented to atmosphere in a well ventilated place.
- 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)
- : 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 or ID number

- In accordance with ADR / RID / IMDG / IATA / ADN
- UN-No.
- : 1013

14.2. UN proper shipping name

- Transport by road/rail (ADR/RID)
- Transport by air (ICAO-TI / IATA-DGR)
- Transport by sea (IMDG)
- : CARBON DIOXIDE
- : Carbon dioxide
- : CARBON DIOXIDE

14.3. Transport hazard class(es)

Labelling



2.2 : Non-flammable, non-toxic gases.

Transport by road/rail (ADR/RID)


- Class
- Classification code
- Hazard identification number
- Tunnel Restriction
- : 2
- : 2A
- : 20
- : C/E - Tank carriage: Passage forbidden through tunnels of category C, D and E. Other carriage: Passage forbidden through tunnels of category E

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

- Class / Div. (Sub. risk(s))
- : 2.2

Transport by sea (IMDG)

- Class / Div. (Sub. risk(s))
- Emergency Schedule (EmS) - Fire
- Emergency Schedule (EmS) - Spillage
- : 2.2
- : F-C
- : S-V

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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.

14.6. Special precautions for user

Packing Instruction(s)

Transport by road/rail (ADR/RID) : P200
Transport by air (ICAO-TI / IATA-DGR)
 Passenger and Cargo Aircraft : 200.
 Cargo Aircraft only : 200.
Transport by sea (IMDG) : P200

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.
National legislation : Ensure all national/local regulations are observed.
Seveso Directive : 2012/18/EU (Seveso III) : Not covered.


National regulations

Ensure all national/local regulations are observed.

France	
Occupational diseases	
Code	Description
RG 66	Occupational rhinitis and asthma

Germany

Water hazard class (WGK) : WGK nwg, Non-hazardous to water (Classification according to AwSV)
National Rules and Recommendations : [German regulations] BetriebssicherheitsV mit TRBSen insbesondere TRBS 3145 / TRGS 725 Ortsbewegliche Druckgasbehälter", TRBS 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."

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Netherlands

SZW-lijst van kankerverwekkende stoffen : The substance is not listed

SZW-lijst van mutagene stoffen : The substance is not listed

SZW-lijst van reprotoxische stoffen – Borstvoeding : The substance is not listed

SZW-lijst van reprotoxische stoffen – Vruchtbaarheid : The substance is not listed

SZW-lijst van reprotoxische stoffen – Ontwikkeling : The substance is not listed

15.2. Chemical safety assessment

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

SECTION 16: Other information

Indication of changes : Safety data sheet in accordance with commission regulation (EU) No 2020/878.

Section	Changed item	Change	Comments
1.3	Company	Modified	Version 7.0. New address in Sweden. (This change only applies to the Swedish (SE) version of this SDS)

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 - European 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


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 :

- Classification in accordance with the procedures and calculation methods of Regulation (EC) 1272/2008 (CLP).
- Key literature references and sources of data are maintained in EIGA doc 169 : 'Classification and Labelling Guide', downloadable at <http://www.Eiga.eu>.

Full text of H- and EUH-statements	
H280	Contains gas under pressure; may explode if heated.
Press. Gas (Liq.)	Gases under pressure : Liquefied gas

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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.
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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