

**Carbon dioxide (refrigerated)****NOAL\_0018B**

Country : NO / Language : EN

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

Trade name : Carbon dioxide (refrigerated), Aligal 2 liquide, Aligal 2 LGC, Aligal Drink 2 liquide, Aligal freeze 2 liquide, Phargalis 2 liquide

SDS no : NOAL\_0018B

Other means of identification : Carbon dioxide (refrigerated)  
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 : CO<sub>2</sub>

**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.  
Use for manufacture of electronic/photovoltaic components.  
Shield gas for welding processes.  
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 NORWAY AS  
Drammensveien 64 B  
3050 Mjøndalen - NORWAY  
T + 47 32 27 41 40  
[info.norway@airliquide.com](mailto:info.norway@airliquide.com)


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

**1.4. Emergency telephone number**

Emergency telephone number : 112 / Giftinformasjon: + 47 22 59 13 00  
Availability  
(24 / 7)

**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 : Refrigerated liquefied gas      H281

	<b>SAFETY DATA SHEET</b>	Page : 2/20
		Revised edition no : 5.0
		Revision date : 2023-01-19
		Supersedes version of : 2021-06-17
<b>Carbon dioxide (refrigerated)</b>		<b>NOAL_0018B</b>
		Country : NO / Language : EN

## 2.2. Label elements

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

Hazard pictograms (CLP) :



GHS04

Signal word (CLP) :

Warning

Hazard statements (CLP) :

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

Precautionary statements (CLP)

- Prevention

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

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

- Response

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

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

- Storage

P403 - Store in a well-ventilated place.

## 2.3. Other hazards

Asphyxiant in high concentrations.

In high concentrations CO<sub>2</sub> 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 (refrigerated)	CAS-No.: 124-38-9 EC-No.: 204-696-9 EC Index-No.: --- REACH registration No: *1	100	Press. Gas (Ref. Liq.), H281

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.

	<b>SAFETY DATA SHEET</b>	Page : 3/20
		Revised edition no : 5.0
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<b>Carbon dioxide (refrigerated)</b>		<b>NOAL_0018B</b>
		Country : NO / Language : EN

- 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.  
If leaking do not spray water onto container. Water surrounding area (from protected position) to contain fire.  
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.  
Use protective clothing.  
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.

**Carbon dioxide (refrigerated)****NOAL\_0018B**

Country : NO / Language : EN

**6.2. Environmental precautions**

Try to stop release.  
Liquid spillages can cause embrittlement of structural materials.

**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.  
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 CO<sub>2</sub> 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.

## Carbon dioxide (refrigerated)

### NOAL\_0018B

Country : NO / Language : EN

### 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.

### 7.3. Specific end use(s)

None.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

Carbon dioxide (refrigerated) (124-38-9)	
<b>EU - Indicative Occupational Exposure Limit (IOEL)</b>	
Local name	Carbon dioxide
IOEL TWA	9000 mg/m <sup>3</sup>
IOEL TWA [ppm]	5000 ppm
<b>Austria - Occupational Exposure Limits</b>	
Local name	Kohlenstoffdioxid
MAK (mg/m <sup>3</sup> )	9000 mg/m <sup>3</sup>
MAK (OEL TWA) [ppm]	5000 ppm
MAK (OEL STEL)	18000 mg/m <sup>3</sup>
MAK (OEL STEL) [ppm]	10000 ppm
<b>Belgium - Occupational Exposure Limits</b>	
Local name	Carbone (dioxyde de) # Koolstofdioxide
OEL TWA	9131 mg/m <sup>3</sup>
OEL TWA [ppm]	5000 ppm
OEL STEL	54784 mg/m <sup>3</sup>
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.

## Carbon dioxide (refrigerated)

### NOAL\_0018B

Country : NO / Language : EN

#### Bulgaria - Occupational Exposure Limits

Local name	Въглероден диоксид
OEL TWA	9000 mg/m <sup>3</sup>
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/m <sup>3</sup>
GVI (OEL TWA) [2]	5000 ppm
Remark	EU**

#### Czech Republic - Occupational Exposure Limits

Local name	Oxid uhli itý
PEL (OEL TWA)	9000 mg/m <sup>3</sup>
PEL (OEL TWA) [ppm]	5000 ppm
NPK-P (OEL C)	45000 mg/m <sup>3</sup>
NPK-P (OEL C) [ppm]	25020 ppm

#### Denmark - Occupational Exposure Limits

Local name	Carbondioxid (Kuldioxid; Kulsyre)
OEL TWA [1]	9000 mg/m <sup>3</sup>
OEL TWA [2]	5000 ppm

#### Estonia - Occupational Exposure Limits

Local name	Süsinikdioksiid
OEL TWA	9000 mg/m <sup>3</sup>
OEL TWA [ppm]	5000 ppm

#### Finland - Occupational Exposure Limits

Local name	Hilidioksiidi
HTP (OEL TWA) [1]	9100 mg/m <sup>3</sup>
HTP (OEL TWA) [2]	5000 ppm

#### France - Occupational Exposure Limits

Local name	Dioxyde de carbone
VME (OEL TWA)	9000 mg/m <sup>3</sup>
VME (OEL TWA) [ppm]	5000 ppm
Remark	Valeurs réglementaires indicatives

#### Germany - Occupational Exposure Limits (TRGS 900)

Local name	Kohlenstoffdioxid
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## Carbon dioxide (refrigerated)

### NOAL\_0018B

Country : NO / Language : EN

AGW (OEL TWA) [1]	9100 mg/m <sup>3</sup>
AGW (OEL TWA) [2]	5000 ppm
Remark	DFG,EU
<b>Greece - Occupational Exposure Limits</b>	
OEL TWA	9000 mg/m <sup>3</sup>
OEL TWA [ppm]	5000 ppm
OEL STEL	54000 mg/m <sup>3</sup>
<b>Hungary - Occupational Exposure Limits</b>	
Local name	SZÉN-DIOXID
AK (OEL TWA)	9000 mg/m <sup>3</sup>
<b>Ireland - Occupational Exposure Limits</b>	
Local name	Carbon dioxide
OEL TWA [1]	9000 mg/m <sup>3</sup>
OEL TWA [2]	5000 ppm
OEL STEL	27000 mg/m <sup>3</sup>
OEL STEL [ppm]	15000 ppm
<b>Italy - Occupational Exposure Limits</b>	
Local name	Anidride carbonica
OEL TWA	9000 mg/m <sup>3</sup>
OEL TWA [ppm]	5000 ppm
<b>Latvia - Occupational Exposure Limits</b>	
Local name	Oglekļadioksīds
OEL TWA	9000 mg/m <sup>3</sup>
OEL TWA [ppm]	5000 ppm
<b>Lithuania - Occupational Exposure Limits</b>	
Local name	Anglies dioksidas
IPRV (OEL TWA)	9000 mg/m <sup>3</sup>
IPRV (OEL TWA) [ppm]	5000 ppm
<b>Luxembourg - Occupational Exposure Limits</b>	
Local name	Dioxyde de carbone
OEL TWA	9000 mg/m <sup>3</sup>
OEL TWA [ppm]	5000 ppm
<b>Malta - Occupational Exposure Limits</b>	
Local name	Carbondioxide
OEL TWA	9000 mg/m <sup>3</sup>

## Carbon dioxide (refrigerated)

### NOAL\_0018B

Country : NO / Language : EN

OEL TWA [ppm]	5000 ppm
<b>Netherlands - Occupational Exposure Limits</b>	
Local name	Kooldioxide
TGG-8u (OEL TWA)	9000 mg/m <sup>3</sup>
<b>Poland - Occupational Exposure Limits</b>	
Local name	Ditlenek węgla 7
NDS (OEL TWA)	9000 mg/m <sup>3</sup>
NDSch (OEL STEL)	27000 mg/m <sup>3</sup>
<b>Portugal - Occupational Exposure Limits</b>	
Local name	Dióxido de carbono
OEL TWA [ppm]	5000 ppm
OEL STEL [ppm]	30000 ppm
<b>Romania - Occupational Exposure Limits</b>	
Local name	Bioxid de carbon
OEL TWA	9000 mg/m <sup>3</sup>
OEL TWA [ppm]	5000 ppm
<b>Slovenia - Occupational Exposure Limits</b>	
Local name	ogljikov dioksid
OEL TWA	9000 mg/m <sup>3</sup>
OEL TWA [ppm]	5000 ppm
<b>Spain - Occupational Exposure Limits</b>	
Local name	Dióxido de carbono
VLA-ED (OEL TWA) [1]	9150 mg/m <sup>3</sup>
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).
<b>Sweden - Occupational Exposure Limits</b>	
Local name	Koldioxid
NGV (OEL TWA)	9000 mg/m <sup>3</sup>
NGV (OEL TWA) [ppm]	5000 ppm
KTV (OEL STEL)	18000 mg/m <sup>3</sup>
KTV (OEL STEL) [ppm]	10000 ppm



**Carbon dioxide (refrigerated)****NOAL\_0018B**

Country : NO / Language : EN

**United Kingdom - Occupational Exposure Limits**

Local name	Carbon dioxide
WEL TWA (OEL TWA) [1]	9150 mg/m <sup>3</sup>
WEL TWA (OEL TWA) [2]	5000 ppm
WEL STEL (OEL STEL)	27400 mg/m <sup>3</sup>
WEL STEL (OEL STEL) [ppm]	15000 ppm

**Iceland - Occupational Exposure Limits**

Local name	Koldíoxíð (koltvísýringur, kolsýra)
OEL TWA	9000 mg/m <sup>3</sup>
OEL TWA [ppm]	5000 ppm

**Norway - Occupational Exposure Limits**

Local name	Karbondioksid
Grenseverdi (OEL TWA) [1]	9000 mg/m <sup>3</sup>
Grenseverdi (OEL TWA) [2]	5000 ppm

**Switzerland - Occupational Exposure Limits**

Local name	Kohlendioxid
MAK (OEL TWA) [1]	9000 mg/m <sup>3</sup>
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 (refrigerated) (124-38-9)****EU - Indicative Occupational Exposure Limit (IOEL)**

Local name	Carbon dioxide
IOEL TWA	9000 mg/m <sup>3</sup>
IOEL TWA [ppm]	5000 ppm

**Austria - Occupational Exposure Limits**

Local name	Kohlenstoffdioxid
MAK (mg/m <sup>3</sup> )	9000 mg/m <sup>3</sup>
MAK (OEL TWA) [ppm]	5000 ppm
MAK (OEL STEL)	18000 mg/m <sup>3</sup>
MAK (OEL STEL) [ppm]	10000 ppm

**Carbon dioxide (refrigerated)****NOAL\_0018B**

Country : NO / Language : EN

**Belgium - Occupational Exposure Limits**

Local name	Carbone (dioxyde de) # Koolstofdioxide
OEL TWA	9131 mg/m <sup>3</sup>
OEL TWA [ppm]	5000 ppm
OEL STEL	54784 mg/m <sup>3</sup>
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/m <sup>3</sup>
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/m <sup>3</sup>
GVI (OEL TWA) [2]	5000 ppm
Remark	EU**

**Czech Republic - Occupational Exposure Limits**

Local name	Oxid uhli itý
PEL (OEL TWA)	9000 mg/m <sup>3</sup>
PEL (OEL TWA) [ppm]	5000 ppm
NPK-P (OEL C)	45000 mg/m <sup>3</sup>
NPK-P (OEL C) [ppm]	25020 ppm

**Denmark - Occupational Exposure Limits**

Local name	Carbondioxid (Kuldioxid; Kulsyre)
OEL TWA [1]	9000 mg/m <sup>3</sup>
OEL TWA [2]	5000 ppm

**Estonia - Occupational Exposure Limits**

Local name	Süsinikdioksiid
OEL TWA	9000 mg/m <sup>3</sup>

## Carbon dioxide (refrigerated)

### NOAL\_0018B

Country : NO / Language : EN

OEL TWA [ppm]	5000 ppm
<b>Finland - Occupational Exposure Limits</b>	
Local name	Hilidioksidi
HTP (OEL TWA) [1]	9100 mg/m <sup>3</sup>
HTP (OEL TWA) [2]	5000 ppm
<b>France - Occupational Exposure Limits</b>	
Local name	Dioxyde de carbone
VME (OEL TWA)	9000 mg/m <sup>3</sup>
VME (OEL TWA) [ppm]	5000 ppm
Remark	Valeurs réglementaires indicatives
<b>Germany - Occupational Exposure Limits (TRGS 900)</b>	
Local name	Kohlenstoffdioxid
AGW (OEL TWA) [1]	9100 mg/m <sup>3</sup>
AGW (OEL TWA) [2]	5000 ppm
Remark	DFG,EU
<b>Greece - Occupational Exposure Limits</b>	
OEL TWA	9000 mg/m <sup>3</sup>
OEL TWA [ppm]	5000 ppm
OEL STEL	54000 mg/m <sup>3</sup>
<b>Hungary - Occupational Exposure Limits</b>	
Local name	SZÉN-DIOXID
AK (OEL TWA)	9000 mg/m <sup>3</sup>
<b>Ireland - Occupational Exposure Limits</b>	
Local name	Carbon dioxide
OEL TWA [1]	9000 mg/m <sup>3</sup>
OEL TWA [2]	5000 ppm
OEL STEL	27000 mg/m <sup>3</sup>
OEL STEL [ppm]	15000 ppm
<b>Italy - Occupational Exposure Limits</b>	
Local name	Anidride carbonica
OEL TWA	9000 mg/m <sup>3</sup>
OEL TWA [ppm]	5000 ppm
<b>Latvia - Occupational Exposure Limits</b>	
Local name	Oglekļadioksīds
OEL TWA	9000 mg/m <sup>3</sup>

## Carbon dioxide (refrigerated)

### NOAL\_0018B

Country : NO / Language : EN


OEL TWA [ppm]	5000 ppm
<b>Lithuania - Occupational Exposure Limits</b>	
Local name	Anglies dioksidas
IPRV (OEL TWA)	9000 mg/m <sup>3</sup>
IPRV (OEL TWA) [ppm]	5000 ppm
<b>Luxembourg - Occupational Exposure Limits</b>	
Local name	Dioxyde de carbone
OEL TWA	9000 mg/m <sup>3</sup>
OEL TWA [ppm]	5000 ppm
<b>Malta - Occupational Exposure Limits</b>	
Local name	Carbondioxide
OEL TWA	9000 mg/m <sup>3</sup>
OEL TWA [ppm]	5000 ppm
<b>Netherlands - Occupational Exposure Limits</b>	
Local name	Kooldioxide
TGG-8u (OEL TWA)	9000 mg/m <sup>3</sup>
<b>Poland - Occupational Exposure Limits</b>	
Local name	Ditlenek węgla 7
NDS (OEL TWA)	9000 mg/m <sup>3</sup>
NDSch (OEL STEL)	27000 mg/m <sup>3</sup>
<b>Portugal - Occupational Exposure Limits</b>	
Local name	Dióxido de carbono
OEL TWA [ppm]	5000 ppm
OEL STEL [ppm]	30000 ppm
<b>Romania - Occupational Exposure Limits</b>	
Local name	Bioxid de carbon
OEL TWA	9000 mg/m <sup>3</sup>
OEL TWA [ppm]	5000 ppm
<b>Slovenia - Occupational Exposure Limits</b>	
Local name	ogljikov dioksid
OEL TWA	9000 mg/m <sup>3</sup>
OEL TWA [ppm]	5000 ppm
<b>Spain - Occupational Exposure Limits</b>	
Local name	Dióxido de carbono
VLA-ED (OEL TWA) [1]	9150 mg/m <sup>3</sup>

## Carbon dioxide (refrigerated)

### NOAL\_0018B

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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).
<b>Sweden - Occupational Exposure Limits</b>	
Local name	Koldioxid
NGV (OEL TWA)	9000 mg/m <sup>3</sup>
NGV (OEL TWA) [ppm]	5000 ppm
KTV (OEL STEL)	18000 mg/m <sup>3</sup>
KTV (OEL STEL) [ppm]	10000 ppm
<b>United Kingdom - Occupational Exposure Limits</b>	
Local name	Carbon dioxide
WEL TWA (OEL TWA) [1]	9150 mg/m <sup>3</sup>
WEL TWA (OEL TWA) [2]	5000 ppm
WEL STEL (OEL STEL)	27400 mg/m <sup>3</sup>
WEL STEL (OEL STEL) [ppm]	15000 ppm
<b>Iceland - Occupational Exposure Limits</b>	
Local name	Koldíoxíð (koltvísýringur, kolsýra)
OEL TWA	9000 mg/m <sup>3</sup>
OEL TWA [ppm]	5000 ppm
<b>Norway - Occupational Exposure Limits</b>	
Local name	Karbondioksid
Grenseverdi (OEL TWA) [1]	9000 mg/m <sup>3</sup>
Grenseverdi (OEL TWA) [2]	5000 ppm
<b>Switzerland - Occupational Exposure Limits</b>	
Local name	Kohlendioxid
MAK (OEL TWA) [1]	9000 mg/m <sup>3</sup>
MAK (OEL TWA) [2]	5000 ppm
Remark	Asphyxie - NIOSH
<b>USA - ACGIH - Occupational Exposure Limits</b>	
Local name	Carbon dioxide
ACGIH OEL TWA [ppm]	5000 ppm
ACGIH OEL STEL [ppm]	30000 ppm
Remark (ACGIH)	Asphyxia

	<b>SAFETY DATA SHEET</b>	Page : 14/20
		Revised edition no : 5.0
		Revision date : 2023-01-19
		Supersedes version of : 2021-06-17
<b>Carbon dioxide (refrigerated)</b>		<b>NOAL_0018B</b>
		Country : NO / Language : EN

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.  
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

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:

- Eye/face protection : Wear goggles and a face shield 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.

**Carbon dioxide (refrigerated)****NOAL\_0018B**

Country : NO / Language : EN

Lower explosion limit	: Not available
Upper explosion limit	: Not available
Vapour pressure [20°C]	: 57.3 bar(a)
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 (Ref. 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**

Reactivity	: None.
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**10.4. Conditions to avoid**None under recommended storage and handling conditions (see section 7).  
Avoid moisture in installation systems.**10.5. Incompatible materials**

For additional information on compatibility refer to ISO 11114.

**10.6. Hazardous decomposition products**

None.

**Carbon dioxide (refrigerated)****NOAL\_0018B**

Country : NO / Language : EN

**SECTION 11: Toxicological information****11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008**

<b>Acute toxicity</b>	: Unlike simple asphyxiants, carbon dioxide has the ability to cause death even when normal oxygen levels (20-21%) are maintained. 5% CO <sub>2</sub> has been found to act synergistically to increase the toxicity of certain other gases (CO, NO <sub>2</sub> ). CO <sub>2</sub> 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 <a href="http://www.eiga.eu">www.eiga.eu</a> .
<b>Skin corrosion/irritation</b>	: No known effects from this product.
<b>Serious eye damage/irritation</b>	: No known effects from this product.
<b>Respiratory or skin sensitisation</b>	: No known effects from this product.
<b>Germ cell mutagenicity</b>	: No known effects from this product.
<b>Carcinogenicity</b>	: No known effects from this product.
<b>Toxic for reproduction : Fertility</b>	: No known effects from this product.
<b>Toxic for reproduction : unborn child</b>	: No known effects from this product.
<b>STOT-single exposure</b>	: No known effects from this product.
<b>STOT-repeated exposure</b>	: No known effects from this product.
<b>Aspiration hazard</b>	: 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 <a href="http://www.eiga.eu">www.eiga.eu</a> . Unlike simple asphyxiants, carbon dioxide has the ability to cause death even when normal oxygen levels (20-21%) are maintained. 5% CO <sub>2</sub> has been found to act synergistically to increase the toxicity of certain other gases (CO, NO <sub>2</sub> ). CO <sub>2</sub> 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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**Carbon dioxide (refrigerated)****NOAL\_0018B**

Country : NO / Language : EN

**12.6. Endocrine disrupting properties**

The substance/mixture has no endocrine disrupting properties.

**12.7. Other adverse effects**

Other adverse effects : Can cause frost damage to vegetation.  
Effect on the ozone layer : None.  
Global warming potential [CO<sub>2</sub>=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**

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. : 2187

**14.2. UN proper shipping name**

**Transport by road/rail (ADR/RID)** : CARBON DIOXIDE, REFRIGERATED LIQUID  
**Transport by air (ICAO-TI / IATA-DGR)** : Carbon dioxide, refrigerated liquid  
**Transport by sea (IMDG)** : CARBON DIOXIDE, REFRIGERATED LIQUID

**14.3. Transport hazard class(es)****Labelling**

2.2 : Non-flammable, non-toxic gases.

**Transport by road/rail (ADR/RID)**

Class : 2  
Classification code : 3A  
Hazard identification number : 22  
Tunnel Restriction : 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)) : 2.2  
Emergency Schedule (EmS) - Fire : F-C  
Emergency Schedule (EmS) - Spillage : S-V

## Carbon dioxide (refrigerated)

### NOAL\_0018B

Country : NO / Language : EN

#### 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) : P203  
 Transport by air (ICAO-TI / IATA-DGR)  
     Passenger and Cargo Aircraft : 202.  
     Cargo Aircraft only : 202.  
 Transport by sea (IMDG) : P203

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."

	<b>SAFETY DATA SHEET</b>	Page : 19/20
		Revised edition no : 5.0
		Revision date : 2023-01-19
		Supersedes version of : 2021-06-17
<b>Carbon dioxide (refrigerated)</b>		<b>NOAL_0018B</b> Country : NO / Language : EN

**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

**Switzerland**

Storage class (LK) : LK 2 - Liquefied or pressurized gases

**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.


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**

H281	Contains refrigerated gas; may cause cryogenic burns or injury.
Press. Gas (Ref. Liq.)	Gases under pressure : Refrigerated liquefied gas

	<b>SAFETY DATA SHEET</b>	Page : 20/20
		Revised edition no : 5.0
		Revision date : 2023-01-19
		Supersedes version of : 2021-06-17
<b>Carbon dioxide (refrigerated)</b>		<b>NOAL_0018B</b>
		Country : NO / Language : EN

**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.

**End of document**