C2H4O 15 %;CO2 85 %

Safety Data Sheet

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878
Issue date: 11/06/2015 Revision date: 17/09/2025 Supersedes version of: 05/08/2015 Version: 1.1

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

1.1. Product identifier

Product form : Mixture
Name : C2H4O 15 %;CO2 85 %
Trade name : Gasart 386 Sterilisiergas 15 % Ethylenoxid, Rest Kohlendioxid

Product code : 000010024735

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

1.2.1. Relevant identified uses

Relevant identified uses : Industrial and professional use for chemical analysis, calibration, (routine) quality control, laboratory use, under controlled conditions.
Perform risk assessment prior to use.

1.2.2. Uses advised against

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

Linde Gas GmbH
Carl-von-Linde-Platz 1
A-4651 Stadl-Paura
Austria
T +43 50 4273
office@at.linde-gas.com

1.4. Emergency telephone number

Emergency number : UMCO/NCEC: +44 1865 407333 (English); +49 89 220 61012 (German)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Physical hazards	Flammable gases, Category 1A	H220
	Gases under pressure : Compressed gas	H280
Health hazards	Acute toxicity (inhalation:gas) Category 4	H332
	Skin corrosion/irritation, Category 1, Sub-Category 1A	H314
	Serious eye damage/eye irritation, Category 1	H318
	Germ cell mutagenicity, Category 1B	H340
	Carcinogenicity, Category 1B	H350
	Reproductive toxicity, Category 1B	H360Fd
	Specific target organ toxicity – Single exposure, Category 3, Respiratory tract irritation	H335
	Specific target organ toxicity – Repeated exposure, Category 1	H372

Full text of H- and EUH-statements: see section 16

Adverse physicochemical, human health and environmental effects

No additional information available

2.2. Label elements

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

Hazard pictograms (CLP) :

GHS02 GHS04 GHS05 GHS07 GHS08

Signal word (CLP) : Danger

Contains : Ethylene Oxide

Hazard statements (CLP) : H220 - Extremely flammable gas.
H280 - Contains gas under pressure; may explode if heated.
H314 - Causes severe skin burns and eye damage.
H332 - Harmful if inhaled.
H340 - May cause genetic defects.
H350 - May cause cancer.
H360Fd - May damage fertility. Suspected of damaging the unborn child.
H372 - Causes damage to organs through prolonged or repeated exposure.

EUH-statements : EUH071 - Corrosive to the respiratory tract.

EUH071 supersedes H335 when assigned in the classification.

Precautionary statements (CLP)

- Prevention : P260 - Do not breathe gas, vapours.
P280 - Wear protective gloves, protective clothing, eye protection, face protection.
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P202 - Do not handle until all safety precautions have been read and understood.

- Response : P303+P361+P353+P315 - IF ON SKIN : (or hair) Take off immediately all contaminated clothing. Rinse skin with water or shower. Get immediate medical advice.
P304+P340+P315 - IF INHALED : Remove person to fresh air and keep comfortable for breathing. Get immediate medical advice.
P305+P351+P338+P315 - IF IN EYES : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice.
P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 - In case of leakage, eliminate all ignition sources.
P308+P313 - IF exposed or concerned: Get medical advice/attention.

- Storage : P405 - Store locked up.
P403 - Store in a well-ventilated place.

Supplemental information : Restricted to professional users.

2.3. Other hazards

Other hazards : Not classified as PBT or vPvB. The substance/mixture has no endocrine disrupting properties. The substance/mixture has no endocrine disrupting properties.

Contains no PBT and/or vPvB substances ≥ 0.1% assessed in accordance with REACH Annex XIII

The mixture does not contain substance(s) included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or substance(s) are not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at a concentration equal to or greater than 0,1 %

Component	
Ethylene Oxide (75-21-8)	The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP] ATE, EUH-statements, M-Factors
Carbon dioxide (Main constituent)	CAS-No.: 124-38-9 EC-No.: 204-696-9 REACH-no: *1	85	Press. Gas (Liq.), H280
Ethylene Oxide (Component)	CAS-No.: 75-21-8 EC-No.: 200-849-9 EC Index-No.: 603-023-00-X REACH-no: 01-2119432402-53	15	Flam. Gas 1A, H220 Chem. Unst. Gas A, H230 Press. Gas (Liq.), H280 Acute Tox. 3 (Oral), H301 (ATE=100 mg/kg bodyweight) Acute Tox. 3 (Inhalation), H331 (ATE=700 ppmv/4h) Skin Corr. 1A, H314 Eye Dam. 1, H318 Muta. 1B, H340 Carc. 1B, H350 Repr. 1B, H360Fd STOT SE 3, H336 STOT SE 3, H335 STOT RE 1, H372 EUH071

Specific concentration limits:		
Name	**Product identifier**	**Specific concentration limits**
Ethylene Oxide (Component)	CAS-No.: 75-21-8 EC-No.: 200-849-9 EC Index-No.: 603-023-00-X REACH-no: 01-2119432402-53	(1 ≤ C ≤ 100) STOT SE 3; H335

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.*

Full text of H- and EUH-statements: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after 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.

First-aid measures after skin contact : Remove contaminated clothing. Drench affected area with water for at least 15 minutes.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

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

Most important symptoms and effects, both acute and delayed

May cause severe chemical burns to skin and cornea. Suitable first-aid treatment should be immediately available. Seek medical advice before using product.
Material is destructive to tissue of the mucuous membranes and upper respiratory tract.
Cough, shortness of breath, headache, nausea.
See section 11.

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

Obtain medical assistance. Treat with corticosteroid spray as soon as possible after inhalation.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Shutting off the source of the gas is the preferred method of control.

Unsuitable extinguishing media : Do not use water jet to extinguish.

5.2. Special hazards arising from the substance or mixture

Reactivity in case of fire : No reactivity hazard other than the effects described in sub-sections below.

Specific hazards : Exposure to fire may cause containers to rupture/explode.

Hazardous combustion products : Carbon monoxide.

5.3. Advice for firefighters

Specific methods : Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire.
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 : Wear gas tight chemically protective clothing in combination with self contained breathing apparatus.
Standard EN 943-2: Protective clothing against liquid and gaseous chemicals, aerosols and solid particles. Gas-tight chemical protective suits for emergency teams.
Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures : Act in accordance with local emergency plan. Try to stop release. Evacuate area. Ensure adequate air ventilation. Eliminate ignition sources. 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.

6.1.2. For emergency responders

Emergency procedures	:	Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Use chemically protective clothing. Monitor concentration of released product. Consider the risk of potentially explosive atmospheres. See section 5.3 of the SDS for more information.

6.2. Environmental precautions

Reduce vapour with fog or fine water spray. Try to stop release.

6.3. Methods and material for containment and cleaning up

Methods and material for containment and cleaning up	:	Hose down area with water. Wash contaminated equipment or sites of leaks with copious quantities of water.

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	:	Installation of a cross purge assembly between the container and the regulator is recommended. Purge system with dry inert gas (e.g. helium or nitrogen) before gas is introduced and when system is placed out of service. Assess the risk of potentially explosive atmospheres and the need for explosion-proof equipment. Purge air from system before introducing gas. Take precautionary measures against static discharge. Keep away from ignition sources (including static discharges). Consider the use of only non-sparking tools. Ensure equipment is adequately earthed. Avoid exposure, obtain special instructions before use. 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 regularily) 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. Do not breathe gas. Avoid release of product into work area.

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, when provided, 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

Conditions for safe storage, including any incompatibilities	:	Store locked up. Segregate from oxidant gases and other oxidants in store. All electrical equipment in the storage areas should be compatible with the risk of a potentially explosive atmosphere. 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, when provided, 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

8.1.1 National occupational exposure and biological limit values

Carbon dioxide (124-38-9)	
EU - Indicative Occupational Exposure Limit (IOEL)	
Local name	Carbon dioxide
IOEL TWA	9000 mg/m³
	5000 ppm
Regulatory reference	COMMISSION DIRECTIVE 2006/15/EC
Austria - Occupational Exposure Limits	
Local name	Kohlenstoffdioxid
MAK (OEL TWA)	9000 mg/m³
	5000 ppm

Carbon dioxide (124-38-9)	
MAK (OEL STEL)	18000 mg/m³ (3x 60(Mow) min)
	10000 ppm (3x 60(Mow) min)
Regulatory reference	BGBl. II Nr. 330/2024

Ethylene Oxide (75-21-8)	
EU - Binding Occupational Exposure Limit (BOEL)	
Local name	Ethylene oxide
BOEL TWA	1.8 mg/m³
	1 ppm
Notes	Skin (Substantial contribution to the total body burden via dermal exposure possible)
Regulatory reference	DIRECTIVE (EU) 2019/130 (amending Directive 2004/37/EC)
Austria - Occupational Exposure Limits	
Local name	Ethylenoxid (Oxiran)
TRK (OEL TWA)	1.8 mg/m³
	1 ppm
TRK (OEL STEL)	7.2 mg/m³ (4x 15(Miw) min)
	4 ppm (4x 15(Miw) min)
Remark	H. Krebserzeugend: III A2
Regulatory reference	BGBl. II Nr. 330/2024

8.1.2. Recommended monitoring procedures

No additional information available

8.1.3. Air contaminants formed

No additional information available

8.1.4. DNEL and PNEC

No additional information available

8.1.5. Control banding

No additional information available

8.2. Exposure controls

Appropriate engineering controls

Appropriate engineering controls:

Provide adequate general and local exhaust ventilation. Consider the use of a work permit system e.g. for maintenance activities. Gas detectors should be used when toxic gases may be released. Product to be handled in a closed system and under strictly controlled conditions. Preferably use permanent leak-tight installations (e.g. welded pipes). Systems under pressure should be regularly checked for leakages. Ensure exposure is below occupational exposure limits (where available).

Personal protection equipment

Personal protective equipment:

A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered: PPE compliant to the recommended EN/ISO standards should be selected.

Personal protective equipment symbol(s):

Eye and face protection

Eye protection:
Wear goggles and a face shield when transfilling or breaking transfer connections. Provide readily accessible eye wash stations and safety showers. Standard EN 166 - Personal eye-protection - specifications

Skin protection

Hand protection:
Wear chemically resistant protective gloves. Standard EN 374 - Protective gloves against chemicals. Consult glove manufacturer´s product information on material suitability and material thickness. The breakthrough time of the selected gloves must be greater than the intended use period. Wear working gloves when handling gas containers. Standard EN 388 - Protective gloves against mechanical risks, performance level 1 or higher. Recommended types include wrist gloves from leather or synthetic material with equivalent performance, fabric gloves, fabric gloves with leather palms.

Respiratory protection

Respiratory protection:
Self contained breathing apparatus is recommended, where unknown exposure may be expected, e.g. during maintenance activities on installation systems. Consult respiratory device supplier´s product information for the selection of the appropriate device. Keep self contained breathing apparatus readily available for emergency use. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask. When indicated by a risk assessment, Respiratory Protective Equipment must be used. The selection of the Respiratory Protective Device (RPD) must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected RPD.

Thermal hazards

Thermal hazard protection:
None in addition to the above sections.

Environmental exposure controls

Environmental exposure controls:
Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.
Other information:
Keep suitable chemically resistant protective clothing readily available for emergency use. Standard EN943-1 - Full protective suits against liquid, solid and gaseous chemicals. Consider the use of flame resistant anti-static safety clothing. Standard EN ISO 14116 - Limited flame spread materials. Standard EN 1149-5 - Protective clothing: Electrostatic properties. Wear safety shoes while handling containers. Standard EN ISO 20345 - Personal protective equipment - Safety footwear.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance		
Physical state	:	Gas
Colour	:	Colourless.
Form	:	Compressed gas
Odour	:	Odour threshold is subjective and inadequate to warn of overexposure. Mixture contains one or more component(s) which have the following odour: Ethereal.
Odour threshold	:	Odour threshold is subjective and inadequate to warn of overexposure.
Melting point	:	Not applicable for gases and gas mixtures.
Freezing point	:	Not applicable
Boiling point	:	Not applicable for gas mixtures. It is technically not possible to determine the boiling point or range of this mixture. Component with lowest boiling point: Carbon dioxide -56.6 °C
Flammability	:	Extremely flammable gas.
Oxidising properties	:	No oxidising properties.
Explosive limits	:	Lower Explosion Limit is based on ISO10156 calculation.
Lower explosion limit	:	Calculated value: 18.64%
Upper explosion limit	:	No test data or calculation method available.
Flash point	:	Not applicable for gases and gas mixtures.
Auto-ignition temperature	:	Non flammable. Auto ignition temperature for mixtures is not available. Component with lowest auto-ignition temperature: Ethylene Oxide 435 °C
Decomposition temperature	:	Not applicable.
pH	:	Not applicable for gases and gas mixtures.

Viscosity, kinematic	:	Not applicable for gases and gas mixtures.
Viscosity, dynamic	:	Not applicable for gases and gas mixtures.
Solubility in water	:	Not known.
Partition coefficient n-octanol/water (Log Kow)	:	Not available
Partition coefficient n-octanol/water (Log Pow)	:	Not applicable for gas mixtures.
Vapour pressure	:	Not applicable for compressed gases and gas mixtures.
Vapour pressure at 50°C	:	Not applicable for compressed gases and gas mixtures.
Density	:	Not applicable
Relative density	:	Not applicable
Relative vapour density at 20°C	:	Not applicable for gases and gas mixtures.
Relative gas density	:	Heavier than air.
Particle characteristics	:	Not applicable Not applicable for gases and gas mixtures.

9.2. Other information

9.2.1. Information with regard to physical hazard classes

No additional information available

9.2.2. Other safety characteristics

Gas group	:	Compressed gas
Additional information	:	Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

SECTION 10: Stability and reactivity

10.1. Reactivity

Data for mixtures are not available.
This mixture contains components with the following reactivity : Can form explosive mixture with air. May react violently with oxidants.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Can form explosive mixture with air. May react violently with oxidants.

10.4. Conditions to avoid

Keep away from heat/sparks/open flames/hot surfaces. – No smoking. Avoid moisture in installation systems.

10.5. Incompatible materials

Air, Oxidisers. For additional information on compatibility refer to ISO 11114.

10.6. Hazardous decomposition products

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

SECTION 11: Toxicological information

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

Acute toxicity	:	Harmful if inhaled.
Acute toxicity (oral)	:	Not classified
Acute toxicity (dermal)	:	Not classified
Acute toxicity (inhalation)	:	Inhalation:gas: Harmful if inhaled.

C2H4O 15 %;CO2 85 %	
ATE CLP (gases)	4666.667 ppmv/4h

Ethylene Oxide (75-21-8)	
LC50 Inhalation - Rat [ppm]	2900 ppm/1h (ADR) 700 ppm/4h (CLP)

Skin corrosion/irritation : Causes severe skin burns and eye damage.
pH: Not applicable for gases and gas mixtures.

Carbon dioxide (124-38-9)	
pH	Not applicable for gases and gas mixtures.

Ethylene Oxide (75-21-8)	
pH	Not applicable for gases and gas mixtures.

Serious eye damage/irritation : Causes serious eye damage.
pH: Not applicable for gases and gas mixtures.

Carbon dioxide (124-38-9)	
pH	Not applicable for gases and gas mixtures.

Ethylene Oxide (75-21-8)	
pH	Not applicable for gases and gas mixtures.

Respiratory or skin sensitisation : No known effects from this product.

Germ cell mutagenicity : May cause genetic defects.

Carcinogenicity : May cause cancer.

Reproductive toxicity : May damage fertility. Suspected of damaging the unborn child.

Toxic for reproduction : Fertility : No known effects from this product.

Toxic for reproduction : unborn child : No known effects from this product.

STOT-single exposure : Severe corrosion to the respiratory tract at high concentrations.

STOT-repeated exposure : Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard : Not applicable for gases and gas mixtures.

C2H4O 15 %;CO2 85 %	
Viscosity, kinematic	Not applicable for gases and gas mixtures.

Carbon dioxide (124-38-9)	
Viscosity, kinematic	Not applicable for gases and gas mixtures.

Ethylene Oxide (75-21-8)	
Viscosity, kinematic	No reliable data available

11.2. Information on other hazards

11.2.1. Endocrine disrupting properties

Adverse health effects caused by endocrine disrupting properties : The substance/mixture has no endocrine disrupting properties.

11.2.2. Other information

No additional information available

SECTION 12: Ecological information

12.1. Toxicity

Assessment : Classification criteria are not met.

Hazardous to the aquatic environment, short–term (acute) : Not classified

Hazardous to the aquatic environment, long–term (chronic) : Not classified

Not rapidly degradable

C2H4O 15 %;CO2 85 %	
LC50 96 h - Fish [mg/l]	No data available.
EC50 48h - Daphnia magna [mg/l]	No data available.
EC50 72h - Algae [mg/l]	No data available.

Carbon dioxide (124-38-9)	
LC50 96 h - Fish [mg/l]	No data available.
EC50 48h - Daphnia magna [mg/l]	No data available.
EC50 72h - Algae [mg/l]	No data available.

Ethylene Oxide (75-21-8)	
LC50 96 h - Fish [mg/l]	84 mg/l
EC50 48h - Daphnia magna [mg/l]	137 - 300 mg/l
EC50 72h - Algae [mg/l]	240 mg/l

12.2. Persistence and degradability

C2H4O 15 %;CO2 85 %	
Assessment	No data available.

Carbon dioxide (124-38-9)	
Assessment	No ecological damage caused by this product.

Ethylene Oxide (75-21-8)	
Assessment	The substance is readily biodegradable. Unlikely to persist.

12.3. Bioaccumulative potential

C2H4O 15 %;CO2 85 %	
Partition coefficient n-octanol/water (Log Pow)	Not applicable for gas mixtures.
Assessment	No data available.

Carbon dioxide (124-38-9)	
Partition coefficient n-octanol/water (Log Pow)	0.83
Partition coefficient n-octanol/water (Log Kow)	0.83
	No ecological damage caused by this product. Not expected to bioaccumulate due to the low log Kow (log Kow < 4). See section 9.

Ethylene Oxide (75-21-8)	
Partition coefficient n-octanol/water (Log Pow)	Not applicable for gas mixtures.
Partition coefficient n-octanol/water (Log Kow)	-0.3

12.4. Mobility in soil

C2H4O 15 %;CO2 85 %	
Assessment	Because of its high volatility, the product is unlikely to cause ground or water pollution. Partition into soil is unlikely.

Carbon dioxide (124-38-9)	
Ecology - soil	No ecological damage caused by this product.

Ethylene Oxide (75-21-8)	
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution. Partition into soil is unlikely.

12.5. Results of PBT and vPvB assessment

Assessment : Not classified as PBT or vPvB.

12.6. Endocrine disrupting properties

Other adverse effects : May cause pH changes in aqueous ecological systems.
Assessment : The substance/mixture has no endocrine disrupting properties.
Adverse effects on the environment caused by endocrine disrupting properties : The substance/mixture has no endocrine disrupting properties.

12.7. Other adverse effects

Other adverse effects : May cause pH changes in aqueous ecological systems.

Effect on the ozone layer : No effect on the ozone layer.
Effect on global warming : Contains greenhouse gas(es).

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Contact supplier if guidance is required. Must not be discharged to atmosphere. Ensure that the emission levels from local regulations or operating permits are not exceeded. Refer to the EIGA code of practice Doc.30 "Disposal of Gases", downloadable at http://www.eiga.eu for more guidance on suitable disposal methods. Return unused product in original container to supplier.

List of hazardous waste codes (from Commission Decision 2000/532/EC as amended) : 16 05 04 *: Gases in pressure containers (including halons) containing hazardous substances.

HP Code : HP5 - “Specific Target Organ Toxicity (STOT)/Aspiration Toxicity:” waste which can cause specific target organ toxicity either from a single or repeated exposure, or which cause acute toxic effects following aspiration.
HP6 - “Acute Toxicity:” waste which can cause acute toxic effects following oral or dermal administration, or inhalation exposure.
HP7 - “Carcinogenic:” waste which induces cancer or increases its incidence
HP8 - “Corrosive:” waste which on application can cause skin corrosion.
HP11 - “Mutagenic:” waste which may cause a mutation, that is a permanent change in the amount or structure of the genetic material in a cell.

13.2. Additional information

External treatment and disposal of waste should comply with applicable local and/or national regulations.

SECTION 14: Transport information

In accordance with ADR / IMDG / IATA / ADN / RID

ADR	IMDG	IATA	ADN	RID
14.1. UN number or ID number				
UN 1041	UN 1041	UN 1041	UN 1041	UN 1041

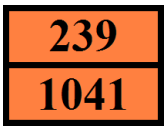
ADR	IMDG	IATA	ADN	RID
14.2. UN proper shipping name				
ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE	Ethylene oxide and carbon dioxide mixture	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE	ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE
Transport document description				
UN 1041 ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE, 2.1, (B/D)	UN 1041 ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE, 2.1	UN 1041 Ethylene oxide and carbon dioxide mixture, 2.1	UN 1041 ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE, 2.1	UN 1041 ETHYLENE OXIDE AND CARBON DIOXIDE MIXTURE, 2.1
14.3. Transport hazard class(es)				
2.1	2.1	2.1	2.1	2.1
				
14.4. Packing group				
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
14.5. Environmental hazards				
Dangerous for the environment: No	Dangerous for the environment: No Marine pollutant: No	Dangerous for the environment: No	Dangerous for the environment: No	Dangerous for the environment: No
No supplementary information available				

14.6. Special precautions for user

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.

Overland transport

Classification code (ADR) : 2F
Limited quantities (ADR) : 0
Excepted quantities (ADR) : E0
Packing instructions (ADR) : P200
Vehicle for tank carriage : FL
Transport category (ADR) : 2
Hazard identification number (Kemler No.) : 239
Orange plates :



Tunnel restriction code (ADR) : B/D

Transport by sea

Limited quantities (IMDG) : 0
Excepted quantities (IMDG) : E0
Packing instructions (IMDG) : P200
Tank instructions (IMDG) : T50
EmS-No. (Fire) : F-D

EmS-No. (Spillage)	:	S-U
Stowage category (IMDG)	:	B
Properties and observations (IMDG)	:	Liquefied, flammable gas with an ether-like odour. Heavier than air (1.5).

Air transport

PCA Excepted quantities (IATA)	:	E0
PCA Limited quantities (IATA)	:	FORBIDDEN
PCA limited quantity max net quantity (IATA)	:	FORBIDDEN
PCA packing instructions (IATA)	:	FORBIDDEN
PCA max net quantity (IATA)	:	FORBIDDEN
CAO packing instructions (IATA)	:	200
CAO max net quantity (IATA)	:	25kg
Special provisions (IATA)	:	A1
ERG code (IATA)	:	10L

Inland waterway transport

Classification code (ADN)	:	2F
Special provisions (ADN)	:	662
Limited quantities (ADN)	:	0
Excepted quantities (ADN)	:	E0
Equipment required (ADN)	:	PP, EX, A
Ventilation (ADN)	:	VE01
Number of blue cones/lights (ADN)	:	1

Rail transport

Classification code (RID)	:	2F
Special provisions (RID)	:	662
Limited quantities (RID)	:	0
Excepted quantities (RID)	:	E0
Packing instructions (RID)	:	P200
Mixed packing provisions (RID)	:	MP9
Portable tank and bulk container instructions (RID)	:	T50(M)
Tank codes for RID tanks (RID)	:	PxBN(M)
Special provisions for RID tanks (RID)	:	TU38, TE22, TA4, TT9, TM6
Transport category (RID)	:	2
Special provisions for carriage - Loading, unloading and handling (RID)	:	CW9, CW10, CW36
Colis express (express parcels) (RID)	:	CE3
Hazard identification number (RID)	:	239

14.7. Maritime transport in bulk according to IMO instruments

IBC code : Not applicable.

SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

REACH Annex XVII (Restriction List)

EU restriction list (REACH Annex XVII)

Reference code	Applicable on	Entry title or description
28.	Ethylene Oxide	Substances which are classified as carcinogen category 1A or 1B in Part 3 of Annex VI to Regulation (EC) No 1272/2008 and are listed in Appendix 1 or Appendix 2, respectively.
29.	Ethylene Oxide	Substances which are classified as germ cell mutagen category 1A or 1B in Part 3 of Annex VI to Regulation (EC) No 1272/2008 and are listed in Appendix 3 or Appendix 4, respectively.

EU restriction list (REACH Annex XVII)		
Reference code	**Applicable on**	**Entry title or description**
30.	Ethylene Oxide	Substances which are classified as reproductive toxicant category 1A or 1B in Part 3 of Annex VI to Regulation (EC) No 1272/2008 and are listed in Appendix 5 or Appendix 6, respectively.

REACH Annex XIV (Authorisation List)

Contains no substance(s) listed on REACH Annex XIV (Authorisation List)

REACH Candidate List (SVHC)

Contains no substance(s) listed on the REACH Candidate List

PIC Regulation (Prior Informed Consent)

Contains substance(s) listed on the PIC list (Regulation EU 649/2012 concerning the export and import of hazardous chemicals): Ethylene Oxide (75-21-8)

POP Regulation (Persistent Organic Pollutants)

Contains no substance(s) listed on the POP list (Regulation EU 2019/1021 on persistent organic pollutants)

Ozone Regulation (1005/2009)

Contains no substance(s) listed on the Ozone Depletion list (Regulation EU 2024/590 on substances that deplete the ozone layer)

VOC Directive (2004/42)

Restrictions on use : Restricted to professional users (Annex XVII REACH).

Seveso Directive (Disaster Risk Reduction)

Seveso Directive : 2012/18/EU (Seveso III) : Covered.

Seveso III Part I (Categories of dangerous substances)	Qualifying quantity (tonnes)	
	Lower-tier	**Upper-tier**
P2 FLAMMABLE GASES Flammable gases, Category 1 or 2	10	50

Explosives Precursors Regulation (EU 2019/1148)

Contains no substance(s) listed on the Explosives Precursors list (Regulation EU 2019/1148 on the marketing and use of explosives precursors)

Drug Precursors Regulation (EC 273/2004)

Contains no substance(s) listed on the Drug Precursors list (Regulation EC 273/2004 on the manufacture and the placing on market of certain substances used in the illicit manufacture of narcotic drugs and psychotropic substances)

15.1.2. National regulations

Ensure all national/local regulations are observed.
Safety data sheet in accordance with commission regulation (EU) No 2020/878.
Council Directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work
Directive 2016/425/EEC on personal protective equipment
Directive 2014/34/EU on equipment and protective systems intended for use in potentially explosive atmospheres (ATEX)
Only products that comply with the food regulations (EC) No. 1333/2008 and (EU) No. 231/2012 and are labelled as such may be used as food additives.
This Safety Data Sheet has been produced to comply with Regulation (EU) 2015/830.

15.2. Chemical safety assessment

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

For the following substances of this mixture a chemical safety assessment has been carried out:
Ethylene Oxide

SECTION 16: Other information

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

Abbreviations and acronyms:	
ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE	Acute Toxicity Estimate
BLV	Biological limit value
BOD	Biochemical oxygen demand (BOD)
CAO	Cargo Aircraft only / Cargo Aircraft only
CLP	Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
CAS-No.	Chemical Abstract Service number
COD	Chemical oxygen demand (COD)
DMEL	Derived Minimal Effect level
DNEL	Derived-No Effect Level
EC50	Median effective concentration
EC	European Inventory of Existing Commercial Chemical Substances
ED	Endocrine disruptor
EN	European Standard
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
IOELV	Indicative Occupational Exposure Limit Value
LC50	Median lethal concentration
LD50	Median lethal dose
LOAEL	Lowest Observed Adverse Effect Level
NOAEC	No-Observed Adverse Effect Concentration
NOAEL	No-Observed Adverse Effect Level
NOEC	No-Observed Effect Concentration
N.O.S.	Not Otherwise Specified
OECD	Organisation for Economic Co-operation and Development
OEL	Occupational Exposure Limit
PBT	Persistent Bioaccumulative Toxic
PCA	Passenger and Cargo Aircraft / Passenger and Cargo Aircraft
PNEC	Predicted No-Effect Concentration
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail
STP	Sewage treatment plant
ThOD	Theoretical oxygen demand (ThOD)
TLM	Median Tolerance Limit
TRGS	Technical Rules for Hazardous Substances
STOT-RE	Specific Target Organ Toxicity-Repeated Exposure

Abbreviations and acronyms:	
STOT-SE	Specific Target Organ Toxicity-Single Exposure
UFI	Unique Formula Identifier
VOC	Volatile Organic Compounds
vPvB	Very Persistent and Very Bioaccumulative
WGK	Water Hazard Class
MiM	Mixture in Mixture [MiM]
MAK	maximum workplace concentration
vPvM	Very persistent and very mobile
PMT	Persistent, mobile and toxic
IARC	International Agency for Research on Cancer
JArbSchG	Act on the Protection of Young People in Employment (JArbSchG)
MuSchG	Act on the Protection of Working Mothers (MuSchG)
TALuft	Technical Instructions on Air Quality Control (TA Luft)
VbF	Ordinance on Flammable Liquids (VbF)
TWA	Time Weighted Average
TLV	Threshold Limit Value
RMM	Risk Management Measures
ThOD	Theoretical oxygen demand (ThOD)
PPE	Personal protective equipment
EWC	European waste catalogue

Training advice : Users of breathing apparatus must be trained. Ensure operators understand the flammability hazard. Ensure operators understand the toxicity hazard.

Other information : Classification using data from databases maintained by the European Industrial Gases Association (EIGA). Data is maintained in EIGA doc 169 : 'Classification and Labelling Guide', downloadable at : http://www.eiga.eu. Classification in accordance with the procedures and calculation methods of Regulation (EC) 1272/2008 (CLP).

Full text of H- and EUH-statements:	
Acute Tox. 3 (Inhalation)	Acute toxicity (inhal.), Category 3
Acute Tox. 3 (Oral)	Acute toxicity (oral), Category 3
Acute Tox. 4 (Inhalation:gas)	Acute toxicity (inhalation:gas) Category 4
Carc. 1B	Carcinogenicity, Category 1B
Chem. Unst. Gas A	Chemically Unstable gases, Category A
Eye Dam. 1	Serious eye damage/eye irritation, Category 1
Flam. Gas 1A	Flammable gases, Category 1A
Muta. 1B	Germ cell mutagenicity, Category 1B
Press. Gas (Comp.)	Gases under pressure : Compressed gas
Press. Gas (Liq.)	Gases under pressure : Liquefied gas
Repr. 1B	Reproductive toxicity, Category 1B
Skin Corr. 1A	Skin corrosion/irritation, Category 1, Sub-Category 1A

Full text of H- and EUH-statements:	
STOT RE 1	Specific target organ toxicity – Repeated exposure, Category 1
STOT SE 3	Specific target organ toxicity – Single exposure, Category 3, Respiratory tract irritation
H220	Extremely flammable gas.
H230	May react explosively even in the absence of air.
H280	Contains gas under pressure; may explode if heated.
H301	Toxic if swallowed.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H331	Toxic if inhaled.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H340	May cause genetic defects.
H350	May cause cancer.
H360Fd	May damage fertility. Suspected of damaging the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
EUH071	Corrosive to the respiratory tract.

The classification complies with : ATP 12

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.

Safety Data Sheet (SDS), EU AT

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

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