

## ethylene oxide, liquefied, under pressure

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

## 1.1 Product identifier:

Product name	: ethylene oxide, liquefied, under pressure
Synonyms	: ethylene oxide; oxirane; sterilizing gas ethylene oxide, liquefied, under pressure; sterigas p, liquefied, under pressure; mepol, liquefied, under pressure; oxide of ethylene, liquefied, under pressure; FEMA No.2433, liquefied, under pressure; EPA pesticide chemical code 042301, liquefied, under pressure; alpha,beta-oxidoethane, liquefied, under pressure; ethox, liquefied, under pressure; oxidoethane, liquefied, under pressure; E O, liquefied, under pressure; amprolene, liquefied, under pressure; oxyfume 12, liquefied, under pressure; oxyfume, liquefied, under pressure; AI3-26263, liquefied, under pressure; ethene oxide, liquefied, under pressure; dimethylene oxide, liquefied, under pressure; ENT-26263, liquefied, under pressure; oxacyclopropane, liquefied, under pressure; 1,2-epoxyethane, liquefied, under pressure; anprolene, liquefied, under pressure; anproline, liquefied, under pressure; dihydrooxyrene, liquefied, under pressure; epoxyethane, liquefied, under pressure; caswell no 443, liquefied, under pressure; oxane, liquefied, under pressure; mepal, liquefied, under pressure; melgas, liquefied, under pressure
Registration number REACH	:
Product type REACH	: Substance/mono-constituent
CAS number	: 75-21-8
EC index number	: 603-023-00-X
EC number	: 200-849-9
RTECS number	: KX2450000
Molecular mass	: 44.05 g/mol
Formula	: C2H4O

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

1.2.1 Relevant identified uses

Industrial use  
Chemical raw material  
Biocide

1.2.2 Uses advised against

See heading 15.1: Reach Annex XVII - Restriction

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

Supplier of the safety data sheet

CHEMOGAS NV  
Westvaardijk 85  
B-1850 Grimbergen Belgium  
Tel: +32 2 251 60 87  
Fax: +32 2 252 17 51  
info@chemogas.com

Distributor of the product

CHEMOGAS NV  
Westvaardijk 85  
B-1850 Grimbergen Belgium  
Tel: +32 2 251 60 87  
Fax: +32 2 252 17 51  
info@chemogas.com

## 1.4 Emergency telephone number:

24h/24h (Telephone advice: English, French, German, Dutch):  
+32 14 58 45 45 (BIG)

## SECTION 2: Hazards identification

## 2.1 Classification of the substance or mixture:

2.1.1 Classification according to Regulation EC No 1272/2008

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

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Class	Category	Hazard statements
Flam. Gas	category 1	H220: Extremely flammable gas.
Press. Gas	Liquefied gas	H280: Contains gas under pressure; may explode if heated.
Carc.	category 1B	H350: May cause cancer.
Muta.	category 1B	H340: May cause genetic defects.
Acute Tox.	category 3	H331: Toxic if inhaled.
Eye Irrit.	category 2	H319: Causes serious eye irritation.
STOT SE	category 3	H335: May cause respiratory irritation.
Skin Irrit.	category 2	H315: Causes skin irritation.

## 2.1.2 Classification according to Directive 67/548/EEC-1999/45/EC

Classified as dangerous in accordance with the criteria of Directives 67/548/EEC and 1999/45/EC

F+; R12 - Extremely flammable.

Carc. Cat. 2; R45 - May cause cancer.

Muta. Cat. 2; R46 - May cause heritable genetic damage.

T; R23 - Toxic by inhalation.

Xi; R36/37/38 - Irritating to eyes, respiratory system and skin.

R6 - Explosive with or without contact with air.

## 2.2 Label elements:

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



#### Signal word

Danger

#### H-statements

H220	Extremely flammable gas.
H280	Contains gas under pressure; may explode if heated.
H350	May cause cancer.
H340	May cause genetic defects.
H331	Toxic if inhaled.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H315	Causes skin irritation.

#### P-statements

P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P280	Wear protective gloves and eye protection/face protection.
P261	Avoid breathing gas.
P311	Call a POISON CENTER or doctor/physician.
P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.

#### Supplemental information

Restricted to professional users.

## 2.3 Other hazards:

### CLP

May be ignited by sparks  
Gas/vapour spreads at floor level: ignition hazard  
Heat may cause pressure rise in tanks/drums: explosion risk  
Odour threshold is well above the exposure limit  
Produces effects on the nervous system  
May cause frostbites  
Caution! Substance is absorbed through the skin  
Causes damage to the central nervous system  
Harmful to fishes

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## SECTION 3: Composition/information on ingredients

### 3.1 Substances:

Name (REACH Registration No)	CAS No EC No	Conc. (C)	Classification according to DSD/DPD	Classification according to CLP	Note	Remark
ethylene oxide (-)	75-21-8 200-849-9		F+; R12 Carc. Cat. 2; R45 Muta. Cat. 2; R46 T; R23 Xi; R36/37/38 R6	Flam. Gas 1; H220 Press. Gas - Liquefied gas; H280 Carc. 1B; H350 Muta. 1B; H340 Acute Tox. 3; H331 Eye Irrit. 2; H319 STOT SE 3; H335 Skin Irrit. 2; H315	(1)(2)(10)	Mono-constituent

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

(2) Substance with a Community workplace exposure limit

(10) Subject to restrictions of Annex XVII of Regulation (EC) No. 1907/2006

### 3.2 Mixtures:

Not applicable

## SECTION 4: First aid measures

### 4.1 Description of first aid measures:

#### General:

Check the vital functions. Unconscious: maintain adequate airway and respiration. Respiratory arrest: artificial respiration or oxygen. Cardiac arrest: perform resuscitation. Victim conscious with laboured breathing: half-seated. Victim in shock: on his back with legs slightly raised. Vomiting: prevent asphyxia/aspiration pneumonia. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain. Depending on the victim's condition: doctor/hospital. Never give alcohol to drink.

#### After inhalation:

Remove the victim into fresh air. Immediately consult a doctor/medical service. Do not apply mouth-to-mouth resuscitation.

#### After skin contact:

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

#### After eye contact:

Rinse immediately with plenty of water for 15 minutes. Do not apply neutralizing agents. Take victim to an ophthalmologist.

#### After ingestion:

Not applicable.

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

#### 4.2.1 Acute symptoms

##### After inhalation:

Dry/sore throat. Irritation of the respiratory tract. Irritation of the nasal mucous membranes. Central nervous system depression. Nausea. Vomiting. Headache. Dizziness. Disturbances of consciousness. EXPOSURE TO HIGH CONCENTRATIONS: Disturbances of heart rate. Respiratory difficulties. FOLLOWING SYMPTOMS MAY APPEAR LATER: Cramps/uncontrolled muscular contractions. Risk of lung oedema.

##### After skin contact:

Tingling/irritation of the skin. FOLLOWING SYMPTOMS MAY APPEAR LATER: Swelling of the skin. Red skin. Blisters. May stain the skin. AFTER CONTACT WITH WATER: Caustic burns/corrosion of the skin.

##### After eye contact:

Irritation of the eye tissue. ON CONTINUOUS EXPOSURE/CONTACT: Corrosion of the eye tissue.

##### After ingestion:

Not applicable.

#### 4.2.2 Delayed symptoms

No effects known.

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

If applicable and available it will be listed below.

## SECTION 5: Firefighting measures

### 5.1 Extinguishing media:

#### 5.1.1 Suitable extinguishing media:

Water spray. Alcohol-resistant foam. BC powder. Carbon dioxide.

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Revision number: 0001

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## 5.1.2 Unsuitable extinguishing media:

Solid water jet ineffective as extinguishing medium.

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

Upon combustion: CO and CO<sub>2</sub> are formed. On heating: explosive decomposition. Polymerizes on exposure to temperature rise, on exposure to impurities, on exposure to light, on exposure to (some) metals and on exposure to (strong) acids/bases with heat release resulting in increased fire or explosion risk. Reacts slowly on exposure to water (moisture): heat release resulting in increased fire or explosion risk.

## 5.3 Advice for firefighters:

### 5.3.1 Instructions:

If no hazard for/from the surroundings: controlled burning. If hazardous substances are nearby: consider extinguishment. Extinguish only if gas supply/leak can be shut afterwards. Cool tanks/drums with water spray/remove them into safety. Physical explosion risk: extinguish/cool from behind cover. Do not move the load if exposed to heat. After cooling: persistent risk of physical explosion. Take account of toxic fire-fighting water. Use water moderately and if possible collect or contain it.

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

Insulating gloves. Protective goggles. Head/neck protection. Protective clothing. Compressed air/oxygen apparatus.

## SECTION 6: Accidental release measures

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

Keep upwind. Seal off low-lying areas. Close doors and windows of adjacent premises. Stop engines and no smoking. No naked flames or sparks. Spark- and explosionproof appliances and lighting equipment. Protect substance against light. Avoid ingress of water in the containers.

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

See heading 8.2

#### 6.1.2 Protective equipment for emergency responders

Insulating gloves. Protective goggles. Head/neck protection. Protective clothing.

Suitable protective clothing

See heading 8.2

### 6.2 Environmental precautions:

Contain released substance, pump into suitable containers. Plug the leak, cut off the supply. Dam up the liquid spill. Tip the container on one side to stop the leakage. Try to reduce evaporation. Take account of toxic/corrosive precipitation water. Prevent soil and water pollution. Prevent spreading in sewers.

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

Take up liquid spill into inert absorbent material. Scoop absorbed substance into closing containers. Carefully collect the spill/leftovers. Damaged/cooled tanks must be emptied. Do not use compressed air for pumping over spills. Prevent evaporation by covering with: foam. Clean contaminated surfaces with an excess of water. Take collected spill to manufacturer/competent authority. Wash clothing and equipment after handling.

### 6.4 Reference to other sections:

See heading 13.

## SECTION 7: Handling and storage

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

### 7.1 Precautions for safe handling:

Use spark-/explosionproof appliances and lighting system. Use earthed equipment. Keep away from naked flames/heat. Keep away from ignition sources/sparks. Gas/vapour heavier than air at 20°C. Observe strict hygiene. Remove contaminated clothing immediately.

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

#### 7.2.1 Safe storage requirements:

Storage temperature: <50 °C. Store in a cool area. Store in a dark area. Ventilation at floor level. Fireproof storeroom. Provide for an automatic sprinkler system. Provide for a tub to collect spills. Provide the tank with earthing. Unauthorized persons are not admitted. Under a shelter/in the open. Detached building. Keep only in the original container. Limited time of storage. May be stored under inert gas. Meet the legal requirements. Max. storage time: 60 day (s).

#### 7.2.2 Keep away from:

Heat sources, ignition sources, combustible materials, oxidizing agents, (strong) acids, (strong) bases, highly flammable materials, metals, halogens, alcohols, amines, water/moisture.

#### 7.2.3 Suitable packaging material:

Stainless steel, carbon steel, polypropylene.

#### 7.2.4 Non suitable packaging material:

Aluminium, iron, copper, tin.

### 7.3 Specific end use(s):

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

## SECTION 8: Exposure controls/personal protection

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## 8.1 Control parameters:

### 8.1.1 Occupational exposure

#### a) Occupational exposure limit values

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

#### The Netherlands

Ethyleenoxide	Time-weighted average exposure limit 8 h	0.46 ppm 0.84 mg/m <sup>3</sup>	Public occupational exposure limit value
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#### Belgium

Oxyde d'éthylène	Time-weighted average exposure limit 8 h	1 ppm 1.8 mg/m <sup>3</sup>	
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#### USA (TLV-ACGIH)

Ethylene oxide	Time-weighted average exposure limit 8 h	1 ppm	TLV - Adopted Value
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#### France

Oxyde d'éthylène	Short time value	5 ppm	VL: Valeur non réglementaire indicative
	Time-weighted average exposure limit 8 h	1 ppm	VL: Valeur non réglementaire indicative

#### UK

Ethylene oxide	Time-weighted average exposure limit 8 h	5 ppm 9.2 mg/m <sup>3</sup>	Workplace exposure limit (EH40/2005)
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#### b) National biological limit values

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

### 8.1.2 Sampling methods

Product name	Test	Number
Ethylene Oxide	NIOSH	1614
Ethylene Oxide	NIOSH	3702
Ethylene Oxide	OSHA	50
Ethylene oxide (organic and inorganic gases by Extractive FT	NIOSH	3800
Ethylene Oxide (Qazi-Ketcham)	NON	14

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

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

### 8.1.4 DNEL/PNEC values

If applicable and available it will be listed below.

### 8.1.5 Control banding

If applicable and available it will be listed below.

## 8.2 Exposure controls:

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

### 8.2.1 Appropriate engineering controls

Use spark-/explosionproof appliances and lighting system. Use earthed equipment. Keep away from naked flames/heat. Keep away from ignition sources/sparks. Measure the concentration in the air regularly. Work under local exhaust/ventilation. Exhaust gas must be neutralised.

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

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

#### a) Respiratory protection:

Gas mask with filter type AX at conc. in air > exposure limit. Self-contained breathing apparatus if conc. in air > 5 ppm.

#### b) Hand protection:

Insulated gloves.

- materials for protective clothing (good resistance)

Butyl rubber.

- materials for protective clothing (less resistance)

Neoprene, natural rubber.

- materials for protective clothing (poor resistance)

Polyethylene, PVC, nitrile rubber, leather.

#### c) Eye protection:

Protective goggles.

#### d) Skin protection:

Head/neck protection. Protective clothing.

### 8.2.3 Environmental exposure controls:

See headings 6.2, 6.3 and 13

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## SECTION 9: Physical and chemical properties

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

Physical form	Liquefied gas
Odour	Sweet odour
	Ether-like odour
Odour threshold	257 - 690 ppm
	470 - 1263 mg/m <sup>3</sup>
Colour	Colourless
Particle size	Not applicable (gas)
Explosion limits	3 - > 99 vol %
	47 - 1820 g/m <sup>3</sup>
Flammability	Extremely flammable gas.
Log Kow	-0.30 ; Test data
Dynamic viscosity	0.0003 Pa.s ; 0 °C
Kinematic viscosity	No data available
Melting point	-112 °C
Boiling point	11 °C
Flash point	No data available
Evaporation rate	72 ; butyl acetate
Vapour pressure	1458 hPa ; 20 °C
	3950 hPa ; 50 °C
Relative vapour density	1.5
Solubility	water ; Complete
	ethanol ; Complete
	ether ; Complete
Relative density	0.9 ; 10 °C
Decomposition temperature	> 500 °C
Auto-ignition temperature	429 °C
Explosive properties	Explosive with or without contact with air. ; No chemical group associated with explosive properties
Oxidising properties	No chemical group associated with oxidising properties
pH	7 ; 10 %

#### Physical hazards

Flammable liquid  
Gas under pressure

### 9.2 Other information:

Minimum ignition energy	0.065 mJ
Specific conductivity	4 µS/m
Critical temperature	196 °C
Critical pressure	71900 hPa
Surface tension	0.028 N/m ; 0 °C
Absolute density	887 kg/m <sup>3</sup> ; 10 °C

## SECTION 10: Stability and reactivity

### 10.1 Reactivity:

May be ignited by sparks. Gas/vapour spreads at floor level: ignition hazard. Substance has neutral reaction.

### 10.2 Chemical stability:

Unstable on exposure to heat. Unstable on exposure to light. Unstable on exposure to air.

### 10.3 Possibility of hazardous reactions:

Reacts slowly on exposure to water (moisture): heat release resulting in increased fire or explosion risk. Reacts violently with many compounds e.g.: with (strong) oxidizers: (increased) risk of fire/explosion. Prolonged storage: polymerizes slowly.

### 10.4 Conditions to avoid:

Use spark-/explosionproof appliances and lighting system. Use earthed equipment. Keep away from naked flames/heat. Keep away from ignition sources/sparks.

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## 10.5 Incompatible materials:

Combustible materials, oxidizing agents, (strong) acids, (strong) bases, highly flammable materials, metals, halogens, alcohols, amines, water/moisture, aluminium, iron, copper, tin.

## 10.6 Hazardous decomposition products:

Upon combustion: CO and CO<sub>2</sub> are formed.

## SECTION 11: Toxicological information

### 11.1 Information on toxicological effects:

#### 11.1.1 Test results

#### Acute toxicity

##### ethylene oxide, liquefied, under pressure

Route of exposure	Parameter	Method	Value	Exposure time	Species	Gender	Value determination
Oral	LD50	Other	330 mg/kg bw		Rat	Male	Experimental value
Dermal							Not relevant, expert judgement
Inhalation	LC50	Other	2.63 mg/l air	4 h	Rat	Male	Experimental value

#### Conclusion

Low acute toxicity by the oral route  
Toxic if inhaled.

#### Corrosion/irritation

##### ethylene oxide, liquefied, under pressure

Route of exposure	Result	Method	Exposure time	Time point	Species	Value determination
Eye	Irritating	OECD 405		24; 48 hours	Rabbit	Experimental value
Skin	Irritating	Other	>= 6 minutes		Rabbit	Experimental value

Insufficient data available. Classification according to Regulation (EC) No 1272/2008 - Annex VI

#### Conclusion

Causes serious eye irritation.  
Causes skin irritation.  
May cause respiratory irritation.  
Specific target organ toxicity, single exposure: classified as irritant to respiratory organs

#### Respiratory or skin sensitisation

##### ethylene oxide, liquefied, under pressure

Route of exposure	Result	Method	Exposure time	Observation time point	Species	Gender	Value determination
Skin							Not relevant, expert judgement

#### Conclusion

No respiratory sensitization data available

#### Specific target organ toxicity

##### ethylene oxide, liquefied, under pressure

Route of exposure	Parameter	Method	Value	Organ	Effect	Exposure time	Species	Gender	Value determination
Dermal									Not relevant, expert judgement
Inhalation	NOAEC	OECD 453	10 ppm		No effect	2 weeks (daily, 5 days/week)	Rat	Male/female	Experimental value
Inhalation	NOAEC	Other	10 ppm		No effect	10 weeks (daily, 5 days/week)	Mouse	Male/female	Experimental value

#### Conclusion

Low sub-chronic toxicity by inhalation route

#### Mutagenicity (in vitro)

##### ethylene oxide, liquefied, under pressure

Result	Method	Test substrate	Effect	Value determination
Positive	OECD 471	Bacteria (S.typhimurium)		Experimental value

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Positive	Other	Chinese hamster lung fibroblasts		Experimental value
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## Mutagenicity (in vivo)

### ethylene oxide, liquefied, under pressure

Result	Method	Exposure time	Test substrate	Gender	Organ	Value determination
Positive	Other		Rat	Male/female		Experimental value

## Carcinogenicity

### ethylene oxide, liquefied, under pressure

Route of exposure	Parameter	Method	Value	Exposure time	Species	Gender	Value determination	Organ	Effect
Inhalation (gases)	NOAEC	Equivalent to OECD 422	10 ppm	102 weeks (daily, 5 days/week)	Rat	Male/female	Literature		No neoplastic effects

## Reproductive toxicity

### ethylene oxide, liquefied, under pressure

	Parameter	Method	Value	Exposure time	Species	Gender	Effect	Organ	Value determination
Developmental toxicity	NOAEC	Equivalent to OECD 414	0.18 mg/l air	6-15 days (gestation, daily)	Rat	Female	No effect		Experimental value
Effects on fertility	NOAEC (P)	Equivalent to OECD 415	0.054 mg/l air	14 weeks (daily, 5 days/week)	Rat	Male/female	No effect		Experimental value

### Conclusion CMR

- May cause genetic defects.
- May cause cancer.
- Not classified for reprotoxic or developmental toxicity

## Toxicity other effects

### ethylene oxide, liquefied, under pressure

No (test) data available

## Chronic effects from short and long-term exposure

### ethylene oxide, liquefied, under pressure

ON CONTINUOUS/REPEATED EXPOSURE/CONTACT: Dry skin. Red skin. Itching. Inflammation/damage of the eye tissue. Nausea. Vomiting. Sensorial disturbances. Headache. Impairment of the nervous system. Movement disturbances. Impairment of the blood forming system. Coordination disorders. Myasthenia. Change in the haemogramme/blood composition. Degeneration of heart tissue. Tumours of the gastrointestinal tract. Possible bladder tumours. Brain affection. Possible premature birth.

## SECTION 12: Ecological information

### 12.1 Toxicity:

#### ethylene oxide, liquefied, under pressure

	Parameter	Method	Value	Duration	Species	Test design	Fresh/salt water	Value determination
Acute toxicity fishes	LC50	EPA 660/3-75/009	84 mg/l	96 h	Pimephales promelas	Static system	Fresh water	Experimental value
Acute toxicity invertebrates	LC50	EPA 660/3-75/009	137-300 mg/l	48 h	Daphnia magna			Experimental value
Toxicity aquatic micro-organisms	EC50	OECD 209	>3000 mg/l	3 h	Bacteria			Experimental value; Activated sludge

### Conclusion

- Harmful to fishes
- Slightly harmful to invertebrates (Daphnia)
- Not harmful to activated sludge
- Classification concerning the environment: not applicable

### 12.2 Persistence and degradability:

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## Biodegradation water

Method	Value	Duration	Value determination
	69 %	20 day(s)	Experimental value
OECD 301C: Modified MITI Test (I)	96 %	28 day(s)	Experimental value

## Phototransformation air (DT50 air)

Method	Value	Conc. OH-radicals	Value determination
	57 day(s)	500000 /cm <sup>3</sup>	Literature

## Conclusion

Readily biodegradable in water

## 12.3 Bioaccumulative potential:

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### BCF fishes

Parameter	Method	Value	Duration	Species	Value determination
BCF		0.35		Pisces	Literature

### Log Kow

Method	Remark	Value	Temperature	Value determination
		-0.30		Test data

## Conclusion

Low potential for bioaccumulation (BCF < 500)

## 12.4 Mobility in soil:

No (test)data on mobility of the substance available

## 12.5 Results of PBT and vPvB assessment:

Substance does not meet the screening criteria for persistency nor bioaccumulation so is neither PBT nor vPvB.

## 12.6 Other adverse effects:

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### Ozone-depleting potential (ODP)

Not classified as dangerous for the ozone layer (Regulation (EC) No. 1272/2008 and 1005/2009)

## SECTION 13: Disposal considerations

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

### 13.1 Waste treatment methods:

#### 13.1.1 Provisions relating to waste

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

16 05 04\* (gases in pressure containers (including halons) containing dangerous substances). Hazardous waste according to Directive 2008/98/EC.

#### 13.1.2 Disposal methods

Refer to manufacturer/supplier for information on recovery/ recycling. Remove waste in accordance with local and/or national regulations. Hazardous waste shall not be mixed together with other waste. Different types of hazardous waste shall not be mixed together if this may entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. All entities that store, transport or handle hazardous waste shall take the necessary measures to prevent risks of pollution or damage to people or animals.

#### 13.1.3 Packaging/Container

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

15 01 10\* (packaging containing residues of or contaminated by dangerous substances).

## SECTION 14: Transport information

### Road (ADR)

#### 14.1 UN number:

UN number	1040
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#### 14.2 UN proper shipping name:

Proper shipping name	Ethylene oxide
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#### 14.3 Transport hazard class(es):

Hazard identification number	263
Class	2
Classification code	2TF

#### 14.4 Packing group:

Packing group	
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Labels	2.3+2.1
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## 14.5 Environmental hazards:

Environmentally hazardous substance mark	no
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## 14.6 Special precautions for user:

Special provisions	342
Limited quantities	none.

## Rail (RID)

### 14.1 UN number:

UN number	1040
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### 14.2 UN proper shipping name:

Proper shipping name	Ethylene oxide
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### 14.3 Transport hazard class(es):

Hazard identification number	263
Class	2
Classification code	2TF

### 14.4 Packing group:

Packing group	
Labels	2.3+2.1 (+13)

### 14.5 Environmental hazards:

Environmentally hazardous substance mark	no
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### 14.6 Special precautions for user:

Special provisions	342
Limited quantities	none.

## Inland waterways (ADN)

### 14.1 UN number:

UN number	1040
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### 14.2 UN proper shipping name:

Proper shipping name	Ethylene oxide
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### 14.3 Transport hazard class(es):

Class	2
Classification code	2TF

### 14.4 Packing group:

Packing group	
Labels	2.3+2.1

### 14.5 Environmental hazards:

Environmentally hazardous substance mark	no
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### 14.6 Special precautions for user:

Special provisions	342
Limited quantities	none.

## Sea (IMDG)

### 14.1 UN number:

UN number	1040
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### 14.2 UN proper shipping name:

Proper shipping name	Ethylene oxide
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### 14.3 Transport hazard class(es):

Class	2.3
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### 14.4 Packing group:

Packing group	
Labels	2.3 + 2.1

### 14.5 Environmental hazards:

Marine pollutant	-
Environmentally hazardous substance mark	no

### 14.6 Special precautions for user:

Special provisions	342
Limited quantities	none.

### 14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:

Annex II of MARPOL 73/78	Not applicable, based on available data
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## Air (ICAO-TI/IATA-DGR)

### 14.1 UN number:

Reason for revision: 7.2

Revision number: 0001

Publication date: 2011-11-21

Date of revision: 2013-07-17

Reference number: 001400

Product number: 13930

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# ethylene oxide, liquefied, under pressure

Transport	Forbidden
UN number	1040
14.2 UN proper shipping name:	
Proper shipping name	Ethylene oxide
14.3 Transport hazard class(es):	
Class	2.3
14.4 Packing group:	
Packing group	
Labels	
14.5 Environmental hazards:	
Environmentally hazardous substance mark	no
14.6 Special precautions for user:	
Special provisions	A2
Special provisions	A131
Passenger and cargo transport: limited quantities: maximum net quantity per packaging	Forbidden

## SECTION 15: Regulatory information

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

#### European legislation:

REACH Annex XVII - Restriction

Subject to restrictions of Annex XVII of Regulation (EC) No. 1907/2006: restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles.

	Designation of the substance, of the group of substances or of the mixture	Conditions of restriction
ethylene oxide	Substances which appear in Part 3 of Annex VI to Regulation (EC) No 1272/2008 classified as carcinogen category 1A or 1B (Table 3.1) or carcinogen category 1 or 2 (Table 3.2) and listed as follows: - Carcinogen category 1A (Table 3.1)/carcinogen category 1 (Table 3.2) listed in Appendix 1 - Carcinogen category 1B (Table 3.1)/carcinogen category 2 (Table 3.2) listed in Appendix 2	Without prejudice to the other parts of this Annex the following shall apply to entries 28 to 30:1. Shall not be placed on the market, or used, — as substances, — as constituents of other substances, or, — in mixtures, for supply to the general public when the individual concentration in the substance or mixture is equal to or greater than: — either the relevant specific concentration limit specified in Part 3 of Annex VI to Regulation (EC) No 1272/2008, or, — the relevant concentration specified in Directive 1999/45/EC where no specific concentration limit is set out in Part 3 of Annex VI to Regulation (EC) No 1272/2008. Without prejudice to the implementation of other Community provisions relating to the classification, packaging and labelling of substances and mixtures, suppliers shall ensure before the placing on the market that the packaging of such substances and mixtures is marked visibly, legibly and indelibly as follows: "Restricted to professional users".2. By way of derogation, paragraph 1 shall not apply to: (a) medicinal or veterinary products as defined by Directive 2001/82/EC and Directive 2001/83/EC; (b) cosmetic products as defined by Directive 76/768/EEC; (c) the following fuels and oil products: — motor fuels which are covered by Directive 98/70/EC, — mineral oil products intended for use as fuel in mobile or fixed combustion plants, — fuels sold in closed systems (e.g. liquid gas bottles); (d) artists' paints covered by Directive 1999/45/EC; (e) the substances listed in Appendix 11, column 1, for the applications or uses listed in Appendix 11, column 2. Where a date is specified in column 2 of Appendix 11, the derogation shall apply until the said date.
ethylene oxide	Substances which appear in Part 3 of Annex VI to Regulation (EC) No 1272/2008 classified as germ cell mutagen category 1A or 1B (Table 3.1) or mutagen category 1 or 2 (Table 3.2) and listed as follows: - Mutagen category 1A (Table 3.1)/mutagen category 1 (Table 3.2) listed in Appendix 3 - Mutagen category 1B (Table 3.1)/mutagen category 2 (Table 3.2) listed in Appendix 4	Without prejudice to the other parts of this Annex the following shall apply to entries 28 to 30:1. Shall not be placed on the market, or used, — as substances, — as constituents of other substances, or, — in mixtures, for supply to the general public when the individual concentration in the substance or mixture is equal to or greater than: — either the relevant specific concentration limit specified in Part 3 of Annex VI to Regulation (EC) No 1272/2008, or, — the relevant concentration specified in Directive 1999/45/EC where no specific concentration limit is set out in Part 3 of Annex VI to Regulation (EC) No 1272/2008. Without prejudice to the implementation of other Community provisions relating to the classification, packaging and labelling of substances and mixtures, suppliers shall ensure before the placing on the market that the packaging of such substances and mixtures is marked visibly, legibly and indelibly as follows: "Restricted to professional users".2. By way of derogation, paragraph 1 shall not apply to: (a) medicinal or veterinary products as defined by Directive 2001/82/EC and Directive 2001/83/EC; (b) cosmetic products as defined by Directive 76/768/EEC; (c) the following fuels and oil products: — motor fuels which are covered by Directive 98/70/EC, — mineral oil products intended for use as fuel in mobile or fixed combustion plants, — fuels sold in closed systems (e.g. liquid gas bottles); (d) artists' paints covered by Directive 1999/45/EC; (e) the substances listed in Appendix 11, column 1, for the applications or uses listed in Appendix 11, column 2. Where a date is specified in column 2 of Appendix 11, the derogation shall apply until the said date.
ethylene oxide	Substances classified as flammable gases category 1 or 2, flammable liquids categories 1, 2 or 3, flammable solids category 1 or 2, substances and mixtures which, in contact with water, emit flammable gases, category 1, 2 or 3, pyrophoric liquids category 1 or pyrophoric solids category 1, regardless of whether they appear in Part 3 of Annex VI to that Regulation or not.	1. Shall not be used, as substance or as mixtures in aerosol dispensers where these aerosol dispensers are intended for supply to the general public for entertainment and decorative purposes such as the following: — metallic glitter intended mainly for decoration, — artificial snow and frost, — "whoopee" cushions, — silly string aerosols, — imitation excrement, — horns for parties, — decorative flakes and foams, — artificial cobwebs, — stink bombs.2. Without prejudice to the application of other Community provisions on the classification, packaging and labelling of substances, suppliers shall ensure before the placing on the market that the packaging of aerosol dispensers referred to above is marked visibly, legibly and indelibly with: "For professional users only".3. By way of derogation, paragraphs 1 and 2 shall not apply to the aerosol dispensers referred to Article 8 (1a) of Council Directive 75/324/EEC.4. The aerosol dispensers referred to in paragraphs 1 and 2 shall not

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be placed on the market unless they conform to the requirements indicated.

Volatile organic compounds (VOC)

100 %

## National legislation The Netherlands

Waste identification (the Netherlands)	LWCA (the Netherlands): KGA category 06
Waterbezwaarlijkheid	2

## National legislation Germany

MAK - Krebserzeugend Kategorie	2
MAK - Keimzellmutagen Kategorie	2
TA-Luft	TA-Luft Klasse 5.2.7.1.1/II
WGK	2; Classification water polluting in compliance with Verwaltungsvorschrift wassergefährdender Stoffe (VwVwS) of 27 July 2005 (Anhang 2)

## National legislation France

Catégorie cancérogène	C1B
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## National legislation Belgium

Additional classification	C; La mention "C" signifie que l'agent en question relève du champ d'application de l'arrêté royal du 2 décembre 1993 concernant la protection des travailleurs contre les risques liés à l'exposition à des agents cancérogènes et mutagènes au travail.
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## National legislation Denmark

Kræftfremkaldende	Stof	Kræftfremkaldende	Bemærkning
	Ethylenoxid	K	

## National legislation Finland

No data available

## National legislation Norway

GRW NO - Carcinogenic	productname	carcinogenic	remark
	Etylenoksid	Kjemikalier som skal betraktes som kreftfremkallende.	

## National legislation Switzerland

Krebserzeugende Arbeitsstoffe	Stoff	Krebserzeugende Arbeitsstoffe	Bemerkungen
	oxyde d'éthylène	Substances devant être assimilées à des substances cancérogènes pour l'homme.	

Erbgutverändernde Arbeitsstoffe	Stoff	Erbgutverändernde Arbeitsstoffe	Bemerkungen
	oxyde d'éthylène	Substances devant être assimilées à des substances mutagènes pour l'homme.	

## National legislation other countries

TLV - Carcinogen	Ethylene oxide; A2
IARC - classification	1; Ethylene oxide

## 15.2 Chemical safety assessment:

No chemical safety assessment has been conducted.

## SECTION 16: Other information

### Labelling according to Directive 67/548/EEC-1999/45/EC (DSD/DPD)

Labelling according to Directive 2009/2/EC (31th adaptation of Directive 67/548/EEC)

#### Labels



Extremely flammable



Toxic

#### R-phrases

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45	May cause cancer
46	May cause heritable genetic damage
06	Explosive with or without contact with air
12	Extremely flammable
23	Also toxic by inhalation
36/37/38	Irritating to eyes, respiratory system and skin

## S-phrases

53	Avoid exposure - obtain special instructions before use
45	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)

## Additional recommendations

Restricted to professional users.

### Full text of any R-phrases referred to under headings 2 and 3:

R06	Explosive with or without contact with air
R12	Extremely flammable
R23	Toxic by inhalation
R36/37/38	Irritating to eyes, respiratory system and skin
R45	May cause cancer
R46	May cause heritable genetic damage

### Full text of any H-statements referred to under headings 2 and 3:

H220	Extremely flammable gas.
H280	Contains gas under pressure; may explode if heated.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H331	Toxic if inhaled.
H335	May cause respiratory irritation.
H340	May cause genetic defects.
H350	May cause cancer.

(\*) = INTERNAL CLASSIFICATION BY BIG

PBT-substances = persistent, bioaccumulative and toxic substances

DSD	Dangerous Substance Directive
DPD	Dangerous Preparation Directive
CLP (EU-GHS)	Classification, labelling and packaging (Globally Harmonised System in Europe)

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