

propylene oxide

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

1.1. Product identifier

Product name	: propylene oxide
Synonyms	: 1,2-epoxypropane; 1,2-propylene oxide; 2,3-epoxypropane; AD 6 (suspending agent); AD 6 (Suspending agent); A13-07541; Caswell No 713A; EPA Pesticide Chemical Code 042501; epoxypropane; ethylene oxide, methyl-; methyl ethylene oxide; methyl oxirane; methyloxacyclopropane; methyloxirane; NCI-C50099; oxirane, methyl-; oxyde de propylene; Pesticide Code: 042501; propane, 1,2-epoxy-; propane, epoxy-; propene oxide; propylene epoxide; propyleneoxide
Registration number REACH	: 01-2119480483-35-0044
Product type REACH	: Substance/mono-constituent
CAS number	: 75-56-9
EC index number	: 603-055-00-4
EC number	: 200-879-2
Molecular mass	: 58.09 g/mol
Formula	: C3H6O

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

1.2.1 Relevant identified uses

Chemical intermediate
Chemical raw material
Disinfectant

1.2.2 Uses advised against

No uses advised against

1.3. Details of the supplier of the safety data sheet

Supplier of the safety data sheet

CHEMOGAS NV
Westvaartdijk 85
B-1850 Grimbergen Belgium
☎ +32 2 251 60 87
☎ +32 2 252 17 51
info@chemogas.com

Distributor of the product

CHEMOGAS NV
Westvaartdijk 85
B-1850 Grimbergen Belgium
☎ +32 2 251 60 87
☎ +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

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

Class	Category	Hazard statements
Flam. Liq.	category 1	H224: Extremely flammable liquid and vapour.
Carc.	category 1B	H350: May cause cancer.
Muta.	category 1B	H340: May cause genetic defects.
Acute Tox.	category 3	H331: Toxic if inhaled.
Acute Tox.	category 3	H311: Toxic in contact with skin.
Acute Tox.	category 4	H302: Harmful if swallowed.
Eye Irrit.	category 2	H319: Causes serious eye irritation.

propylene oxide

STOT SE category 3 H335: May cause respiratory irritation.

2.2. Label elements



Signal word

Danger

H-statements

H224 Extremely flammable liquid and vapour.
H350 May cause cancer.
H340 May cause genetic defects.
H311 + H331 Toxic in contact with skin or if inhaled.
H302 Harmful if swallowed.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.

P-statements

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P280 Wear protective gloves, protective clothing and eye protection/face protection.
P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P361 + P353 Take off immediately all contaminated clothing and wash it before reuse.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Supplemental information

Restricted to professional users.

2.3. Other hazards

May build up electrostatic charges: risk of ignition
Gas/vapour spreads at floor level: ignition hazard
Odour threshold is well above the exposure limit
Caution! Substance is absorbed through the skin

SECTION 3: Composition/information on ingredients

3.1. Substances

Name REACH Registration No	CAS No EC No	Conc. (C)	Classification according to CLP	Note	Remark
propylene oxide 01-2119480483-35	75-56-9 200-879-2	C>=99.9 %	Flam. Liq. 1; H224 Carc. 1B; H350 Muta. 1B; H340 Acute Tox. 3; H331 Acute Tox. 3; H311 Acute Tox. 4; H302 Eye Irrit. 2; H319 STOT SE 3; H335	(1)(2)(10)(4)	Mono-constituent

(2) Substance with a Community workplace exposure limit

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

(4) Enumerated in candidate list of substances of very high concern (SVHC) for authorisation (Article 59 of Regulation (EC) No. 1907/2006)

(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. Alcohol consumption increases the toxicity.

After inhalation:

Remove the victim into fresh air. Immediately consult a doctor/medical service.

After skin contact:

Reason for revision: 7.2.1

Publication date: 2015-06-01

Date of revision: 2017-09-05

Reference number: 3600

Revision number: 0101

Product number: 10235

2 / 14

propylene oxide

Wash immediately with lots of water. Soap may be used. Do not apply (chemical) neutralizing agents. Consult a doctor/medical service.

After eye contact:

Rinse immediately with plenty of water. Remove contact lenses, if present and easy to do. Continue rinsing. Do not apply neutralizing agents. Take victim to an ophthalmologist if irritation persists.

After ingestion:

Rinse mouth with water. Immediately after ingestion: give lots of water to drink. Do not induce vomiting. Give activated charcoal. Consult a doctor/medical service if you feel unwell.

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

4.2.1 Acute symptoms

After inhalation:

Dry/sore throat. Coughing. Irritation of the respiratory tract. Irritation of the nasal mucous membranes. EXPOSURE TO HIGH CONCENTRATIONS: Central nervous system depression. Dizziness. Mental confusion. Headache. Coordination disorders. Drunkenness. Feeling of weakness. FOLLOWING SYMPTOMS MAY APPEAR LATER: Blue/grey discolouration of the skin. Disturbances of consciousness. Risk of lung oedema. Respiratory difficulties.

After skin contact:

ON CONTINUOUS EXPOSURE/CONTACT: Eczem door huidcontact.

After eye contact:

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

After ingestion:

Irritation of the gastric/intestinal mucosa. Nausea. Vomiting. Risk of aspiration pneumonia. AFTER INGESTION OF HIGH QUANTITIES: Symptoms similar to those listed under inhalation.

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:

Small fire: Quick-acting ABC powder extinguisher, Quick-acting BC powder extinguisher, Quick-acting class B foam extinguisher, Quick-acting CO2 extinguisher. Major fire: Class B foam (alcohol-resistant), Water spray if puddle cannot expand.

5.1.2 Unsuitable extinguishing media:

Small fire: Water (quick-acting extinguisher, reel); risk of puddle expansion. Major fire: Water; risk of puddle expansion.

5.2. Special hazards arising from the substance or mixture

Upon combustion: CO and CO2 are formed. Polymerizes on exposure to temperature rise: release of heat.

5.3. Advice for firefighters

5.3.1 Instructions:

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:

Gas-tight suit. 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. Keep containers closed.

6.1.1 Protective equipment for non-emergency personnel

See heading 8.2

6.1.2 Protective equipment for emergency responders

Gas-tight suit.

Suitable protective clothing

See heading 8.2

6.2. Environmental precautions

Contain released product, pump into suitable containers. Plug the leak, cut off the supply. Dam up the liquid spill. Try to reduce evaporation. Prevent soil and water pollution. Prevent spreading in sewers.

6.3. Methods and material for containment and cleaning up

propylene oxide

Take up liquid spill into absorbent material, e.g.: sand, earth, vermiculite kieselguhr, powdered limestone. Do not take up in combustible material such as: saw dust. 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. 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. Take precautions against electrostatic charges. Keep away from naked flames/heat. Keep away from ignition sources/sparks. Gas/vapour heavier than air at 20°C. Observe strict hygiene. Keep container tightly closed. Remove contaminated clothing immediately. Cool before opening. Do not discharge the waste into the drain.

7.2. Conditions for safe storage, including any incompatibilities

7.2.1 Safe storage requirements:

Storage temperature: < 50 °C. Ventilation at floor level. Fireproof storeroom. Keep locked up. Provide for an automatic sprinkler system. Provide for a tub to collect spills. Provide the tank with earthing. Unauthorized persons are not admitted. May be stored under nitrogen. Meet the legal requirements.

7.2.2 Keep away from:

Heat sources, ignition sources, combustible materials, oxidizing agents, (strong) acids, (strong) bases, amines, peroxides.

7.2.3 Suitable packaging material:

Steel, stainless steel, carbon steel, aluminium, iron, glass.

7.2.4 Non suitable packaging material:

Copper, plastics.

7.3. Specific end use(s)

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

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

8.1.1 Occupational exposure

a) Occupational exposure limit values

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

Belgium

Oxyde de propylène	Time-weighted average exposure limit 8 h	2 ppm
	Time-weighted average exposure limit 8 h	5 mg/m ³

The Netherlands

1,2-Epoxypropan	Time-weighted average exposure limit 8 h (Public occupational exposure limit value)	2.5 ppm
	Time-weighted average exposure limit 8 h (Public occupational exposure limit value)	6 mg/m ³

France

Oxyde de propylène	Time-weighted average exposure limit 8 h (VL: Valeur non réglementaire indicative)	20 ppm
	Time-weighted average exposure limit 8 h (VL: Valeur non réglementaire indicative)	50 mg/m ³

Germany

Propylenoxid	Time-weighted average exposure limit 8 h (TRGS 900)	2 ppm
	Time-weighted average exposure limit 8 h (TRGS 900)	4.8 mg/m ³

UK

Propylene oxide	Time-weighted average exposure limit 8 h (Workplace exposure limit (EH40/2005))	5 ppm
	Time-weighted average exposure limit 8 h (Workplace exposure limit (EH40/2005))	12 mg/m ³

USA (TLV-ACGIH)

Propylene oxide	Time-weighted average exposure limit 8 h (TLV - Adopted Value)	2 ppm
-----------------	--	-------

b) National biological limit values

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

Reason for revision: 7.2.1

Publication date: 2015-06-01

Date of revision: 2017-09-05

Reference number: 3600

Revision number: 0101

Product number: 10235

4 / 14

propylene oxide

Germany

Propylenoxid (1,2-Epoxypropan) (N-(2-Hydroxypropyl)valin)	Erythrozytenfraktion des Vollblutes: keine beschränkung	2500 pmol/g Globin	05/2015 Ständige Senatskommission zur Prüfung gesundheitsschädlicher Arbeitsstoffe der DFG
---	---	--------------------	--

8.1.2 Sampling methods

Product name	Test	Number
Propylene Oxide	NIOSH	1612
Propylene Oxide	OSHA	88

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

DNEL/DMEL - Workers

propylene oxide

Effect level (DNEL/DMEL)	Type	Value	Remark
DNEL	Long-term local effects inhalation	5 mg/m ³	
	Acute local effects inhalation	170 mg/m ³	

DNEL/DMEL - General population

propylene oxide

Effect level (DNEL/DMEL)	Type	Value	Remark
DNEL	Long-term local effects inhalation	1.7 mg/m ³	
	Acute local effects inhalation	170 mg/m ³	

PNEC

propylene oxide

Compartments	Value	Remark
Fresh water	0.052 mg/l	
Marine water	0.005 mg/l	
Aqua (intermittent releases)	0.52 mg/l	
STP	10 mg/l	
Fresh water sediment	0.245 mg/kg sediment dw	
Marine water sediment	0.025 mg/kg sediment dw	
Soil	0.019 mg/kg soil dw	

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. Take precautions against electrostatic charges. Keep away from naked flames/heat. Keep away from ignition sources/sparks. Before use: check for peroxides and eliminate them. Measure the concentration in the air regularly. Work under local exhaust/ventilation.

8.2.2 Individual protection measures, such as personal protective equipment

Observe strict hygiene. Keep container tightly closed. 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 > 1 vol %.

b) Hand protection:

Gloves.

Materials	Breakthrough time	Thickness
butyl rubber	> 240 minutes	0.6 mm

- materials (good resistance)

Butyl rubber.

- materials (less resistance)

Neoprene, natural rubber.

- materials (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

propylene oxide

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical form	Liquid
Odour	Sweet odour
	Ether-like odour
Odour threshold	35 - 200 ppm
	8.4 - 480 mg/m ³
Colour	Colourless
Particle size	Not applicable (liquid)
Explosion limits	1.9 - 39 vol %
	45 - 580 g/m ³
Flammability	Extremely flammable liquid and vapour.
Log Kow	< 1 ; Experimental value ; OECD 117 ; 20 °C
Dynamic viscosity	0.58 mPa.s ; 20 °C
Kinematic viscosity	0.374 mm ² /s ; 20 °C ; OECD 114
	0.447 mm ² /s ; 0 °C ; OECD 114
Melting point	-112 °C ; 1013 hPa
Boiling point	35 °C ; 1033 hPa - 1041 hPa ; EU Method A.2
Flash point	-38 °C ; 1007 hPa ; EU Method A.9
Evaporation rate	34 ; Butyl acetate
Relative vapour density	2.0
Vapour pressure	740 hPa ; 25 °C ; EU Method A.4
Solubility	Water ; 42.5 g/100 ml - 45 g/100 ml ; 20 °C ; EU Method A.6
	Ethanol ; complete
	Ether ; complete
Relative density	0.83 ; 20 °C ; EU Method A.3
Decomposition temperature	No data available
Auto-ignition temperature	> 400 °C ; 1005 hPa - 1018 hPa ; EU Method A.15
Explosive properties	No chemical group associated with explosive properties
Oxidising properties	No chemical group associated with oxidising properties
pH	No data available

9.2. Other information

Minimum ignition energy	0.13 mJ
Critical temperature	209 °C
Critical pressure	49000 hPa
Surface tension	71.5 mN/m ; 21 °C ; 1.06 g/l ; EU Method A.5
Relative density saturated vapour/air mixture	1.6
Saturation concentration	1405 g/m ³
Dissociation constant	Data waiving

SECTION 10: Stability and reactivity

10.1. Reactivity

May build up electrostatic charges: risk of ignition. 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.

10.3. Possibility of hazardous reactions

May form peroxides. Polymerizes on exposure to some compounds e.g. (some) acids/bases. Reacts violently with many compounds e.g.: with (strong) oxidizers: (increased) risk of fire/explosion. Reacts violently with many compounds e.g.: with (strong) oxidizers: (increased) risk of fire/explosion.

10.4. Conditions to avoid

Precautionary measures

Use spark-/explosionproof appliances and lighting system. Take precautions against electrostatic charges. Keep away from naked flames/heat. Keep away from ignition sources/sparks.

10.5. Incompatible materials

Combustible materials, oxidizing agents, (strong) acids, (strong) bases, amines, peroxides.

10.6. Hazardous decomposition products

Reason for revision: 7.2.1

Publication date: 2015-06-01

Date of revision: 2017-09-05

Reference number: 3600

Revision number: 0101

Product number: 10235

6 / 14

propylene oxide

Upon combustion: CO and CO₂ are formed.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

11.1.1 Test results

Acute toxicity

propylene oxide

Route of exposure	Parameter	Method	Value	Exposure time	Species	Value determination	Remark
Oral	LD50	Equivalent to OECD 401	382 mg/kg bw - 587 mg/kg bw		Rat (male/female)	Experimental value	
Dermal	LD50	Single skin penetration LD50 rabbits	960 mg/kg bw	4 h	Rabbit	Experimental value	
Inhalation (vapours)	LC50	Equivalent to OECD 403	9.95 mg/l	4 h	Rat (male/female)	Experimental value	

Conclusion

Harmful if swallowed.

Toxic in contact with skin.

Toxic if inhaled.

Corrosion/irritation

propylene oxide

Route of exposure	Result	Method	Exposure time	Time point	Species	Value determination	Remark
Eye	Irritating			24 hours	Rabbit	No reliable data available	Single exposure
Skin	Not irritating	OECD 404	4 h	1; 24; 48; 72 hours	Rabbit	Experimental value	
Not applicable (in vitro test)	Not corrosive	OECD 431	4 h		Reconstructed human epidermis	Experimental value	
Inhalation	Irritating	Human observation					

Conclusion

Causes serious eye irritation.

May cause respiratory irritation.

Not classified as irritating to the skin

Respiratory or skin sensitisation

propylene oxide

Route of exposure	Result	Method	Exposure time	Observation time point	Species	Value determination	Remark
Skin	Not sensitizing	Equivalent to method of Maguire (1973)	48 h	24; 48 hours	Guinea pig (male)	Experimental value	

Conclusion

Not classified as sensitizing for skin

Not classified as sensitizing for inhalation

Specific target organ toxicity

propylene oxide

Route of exposure	Parameter	Method	Value	Organ	Effect	Exposure time	Species	Value determination
Oral								Data waiving
Dermal								Data waiving
Inhalation (vapours)	NOAEC	Equivalent to OECD 453	30 ppm		No adverse systemic effects	123 weeks (6h/day, 5 days/week) - 124 weeks (6h/day, 5 days/week)	Rat (male/female)	Experimental value
Inhalation (vapours)	LOAEC	Equivalent to OECD 451	200 ppm	Nose	Irritation	103 weeks (6h/day, 5 days/week)	Rat (male/female)	Experimental value

Conclusion

Reason for revision: 7.2.1

Publication date: 2015-06-01

Date of revision: 2017-09-05

Reference number: 3600

Revision number: 0101

Product number: 10235

7 / 14

propylene oxide

Not classified for subchronic toxicity

Mutagenicity (in vitro)

propylene oxide

Result	Method	Test substrate	Effect	Value determination
Negative with metabolic activation, negative without metabolic activation	Equivalent to OECD 471	Bacteria (<i>S.typhimurium</i>)		Experimental value
Positive without metabolic activation	Equivalent to OECD 476	Mouse (lymphoma L5178Y cells)		Experimental value

Mutagenicity (in vivo)

propylene oxide

Result	Method	Exposure time	Test substrate	Organ	Value determination
Negative	Equivalent to OECD 475	4 weeks (6h/day, 5 days/week)	Rat (male)	Blood	Experimental value
Negative	Equivalent to OECD 474	4 weeks (6h/day, 5 days/week)	Rat (male)	Blood	Experimental value
Positive	<i>Drosophila</i> SLRL test (gene mutation)	24 h	<i>Drosophila melanogaster</i> (male)		Experimental value

Conclusion

May cause genetic defects.

Carcinogenicity

propylene oxide

Route of exposure	Parameter	Method	Value	Exposure time	Species	Effect	Organ	Value determination
Inhalation (vapours)	NOAEC	Equivalent to OECD 451	200 ppm	103 weeks (6h/day, 5 days/week)	Rat (male/female)	No carcinogenic effect		Experimental value
Inhalation (vapours)	NOAEC	Equivalent to OECD 453	100 ppm	124 weeks (6h/day, 5 days/week)	Rat (male/female)	No carcinogenic effect		Experimental value
Oral	LOAEL	Carcinogenic toxicity study	15 mg/kg bw	150 weeks (2 times/week)	Rat (female)	Neoplastic effects		Experimental value

Conclusion

May cause cancer.

Reproductive toxicity

propylene oxide

	Parameter	Method	Value	Exposure time	Species	Effect	Organ	Value determination
Developmental toxicity	NOEC	US EPA	300 ppm	10 days (gestation, daily)	Rat	No effect		Experimental value
Maternal toxicity	NOAEC	US EPA	300 ppm	10 days (gestation, daily)	Rat	No effect		Experimental value
Effects on fertility	NOAEC	Equivalent to OECD 416	> 300 ppm		Rat (male/female)	No effect		Experimental value

Conclusion

Not classified for reprotoxic or developmental toxicity

Toxicity other effects

propylene oxide

No (test) data available

Chronic effects from short and long-term exposure

propylene oxide

Skin rash/inflammation. Change in the haemogramme/blood composition.

propylene oxide

SECTION 12: Ecological information

12.1. Toxicity

propylene oxide

	Parameter	Method	Value	Duration	Species	Test design	Fresh/salt water	Value determination
Acute toxicity fishes	LC50	EPA 660/3 - 75/009	52 mg/l	96 h	Oncorhynchus mykiss	Static system	Fresh water	Experimental value; GLP
Acute toxicity crustacea	EC50	EPA 660/3 - 75/009	350 mg/l	48 h	Daphnia magna	Static system	Fresh water	Experimental value; GLP
Toxicity algae and other aquatic plants	ErC50	EPA 660/3 - 75/009	240 mg/l	96 h	Pseudokirchneria lla subcapitata	Static system	Fresh water	Experimental value; GLP
Long-term toxicity fish								Data waiving
Long-term toxicity aquatic crustacea								Data waiving
Toxicity aquatic micro-organisms	NOEC	OECD 301C	100 mg/l	28 day(s)	Activated sludge			Experimental value
Toxicity sediment organisms								Data waiving

	Parameter	Method	Value	Duration	Species	Value determination
Toxicity soil macro-organisms						Data waiving
Toxicity soil micro-organisms						Data waiving
Toxicity terrestrial plants						Data waiving
Toxicity other terrestrial organisms						Data waiving
Toxicity birds						Data waiving

Conclusion

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

12.2. Persistence and degradability

propylene oxide

Biodegradation water

Method	Value	Duration	Value determination
OECD 301C: Modified MITI Test (I)	86 %	28 day(s)	Experimental value

Phototransformation air (DT50 air)

Method	Value	Conc. OH-radicals	Value determination
Other	32 day(s)		Literature

Biodegradation soil

Method	Value	Duration	Value determination
			Data waiving

Half-life water (t1/2 water)

Method	Value	Primary degradation/mineralisation	Value determination
	12.9 day(s); Fresh water	Primary degradation	Experimental value
	2.4 day(s); Salt water	Primary degradation	Experimental value

Conclusion

Readily biodegradable in water

12.3. Bioaccumulative potential

propylene oxide

BCF fishes

Parameter	Method	Value	Duration	Species	Value determination
					Data waiving

Log Kow

Method	Remark	Value	Temperature	Value determination
OECD 117		< 1	20 °C	Experimental value

Conclusion

Low potential for bioaccumulation (Log Kow < 4)

12.4. Mobility in soil

propylene oxide

Reason for revision: 7.2.1

Publication date: 2015-06-01

Date of revision: 2017-09-05

Reference number: 3600

Revision number: 0101

Product number: 10235

9 / 14

propylene oxide

(log) Koc

Parameter	Method	Value	Value determination
			Not determined, exemption according to REACH

Conclusion

Low potential for adsorption in soil

12.5. Results of PBT and vPvB assessment

Substance does not meet the criteria of PBT, nor the criteria of vPvB according to Annex XIII of Regulation (EC) No 1907/2006, so is neither PBT nor vPvB.

12.6. Other adverse effects

propylene oxide

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

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

Ozone-depleting potential (ODP)

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

Groundwater

Groundwater pollutant

SECTION 13: Disposal considerations

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

13.1. Waste treatment methods

13.1.1 Provisions relating to waste

European Union

Hazardous waste according to Directive 2008/98/EC, as amended by Regulation (EU) No 1357/2014 and Regulation (EU) No 2017/997.

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

07 01 01* (wastes from the manufacture, formulation, supply and use (MFSU) of basic organic chemicals: aqueous washing liquids and mother liquors).

Depending on branch of industry and production process, also other waste codes may be applicable.

13.1.2 Disposal methods

Recycle/reuse. Incinerate under surveillance with energy recovery. 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. May be discharged to wastewater treatment installation. Do not discharge into drains or the environment.

13.1.3 Packaging/Container

European Union

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	1280
-----------	------

14.2. UN proper shipping name

Proper shipping name	Propylene oxide
----------------------	-----------------

14.3. Transport hazard class(es)

Hazard identification number	33
Class	3
Classification code	F1

14.4. Packing group

Packing group	I
Labels	3

14.5. Environmental hazards

Environmentally hazardous substance mark	no
--	----

14.6. Special precautions for user

Special provisions	
Limited quantities	none.

Rail (RID)

Reason for revision: 7.2.1

Publication date: 2015-06-01

Date of revision: 2017-09-05

Reference number: 3600

Revision number: 0101

Product number: 10235

10 / 14

propylene oxide

14.1. UN number

UN number	1280
-----------	------

14.2. UN proper shipping name

Proper shipping name	Propylene oxide
----------------------	-----------------

14.3. Transport hazard class(es)

Hazard identification number	33
Class	3
Classification code	F1

14.4. Packing group

Packing group	I
Labels	3

14.5. Environmental hazards

Environmentally hazardous substance mark	no
--	----

14.6. Special precautions for user

Special provisions	
Limited quantities	none.

Inland waterways (ADN)

14.1. UN number

UN number	1280
-----------	------

14.2. UN proper shipping name

Proper shipping name	Propylene oxide
----------------------	-----------------

14.3. Transport hazard class(es)

Class	3
Classification code	F1

14.4. Packing group

Packing group	I
Labels	3

14.5. Environmental hazards

Environmentally hazardous substance mark	no
--	----

14.6. Special precautions for user

Special provisions	
Limited quantities	none.

Sea (IMDG/IMSBC)

14.1. UN number

UN number	1280
-----------	------

14.2. UN proper shipping name

Proper shipping name	Propylene oxide
----------------------	-----------------

14.3. Transport hazard class(es)

Class	3
-------	---

14.4. Packing group

Packing group	I
Labels	3

14.5. Environmental hazards

Marine pollutant	-
Environmentally hazardous substance mark	no

14.6. Special precautions for user

Special provisions	
Limited quantities	none.

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

Annex II of MARPOL 73/78	Not applicable, based on available data
--------------------------	---

Air (ICAO-TI/IATA-DGR)

14.1. UN number

UN number	1280
-----------	------

14.2. UN proper shipping name

Proper shipping name	Propylene oxide
----------------------	-----------------

14.3. Transport hazard class(es)

Class	3
-------	---

14.4. Packing group

Packing group	I
Labels	3

Reason for revision: 7.2.1

Publication date: 2015-06-01

Date of revision: 2017-09-05

Reference number: 3600

Product number: 10235

Revision number: 0101

11 / 14

propylene oxide

14.5. Environmental hazards

Environmentally hazardous substance mark	no
--	----

14.6. Special precautions for user

Special provisions	
Limited quantities: maximum net quantity per packaging	Forbidden

SECTION 15: Regulatory information

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

European legislation:

VOC content Directive 2010/75/EU

VOC content	Remark
100 %	

REACH Candidate list

Enumerated in candidate list of substances of very high concern (SVHC) for authorisation (Article 59 of Regulation (EC) No 1907/2006)

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
propylene oxide	Liquid substances or mixtures which are regarded as dangerous in accordance with Directive 1999/45/EC or are fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: (a) hazard classes 2.1 to 2.4, 2.6 and 2.7, 2.8 types A and B, 2.9, 2.10, 2.12, 2.13 categories 1 and 2, 2.14 categories 1 and 2, 2.15 types A to F; (b) hazard classes 3.1 to 3.6, 3.7 adverse effects on sexual function and fertility or on development, 3.8 effects other than narcotic effects, 3.9 and 3.10; (c) hazard class 4.1; (d) hazard class 5.1.	1. Shall not be used in: — ornamental articles intended to produce light or colour effects by means of different phases, for example in ornamental lamps and ashtrays, — tricks and jokes, — games for one or more participants, or any article intended to be used as such, even with ornamental aspects, 2. Articles not complying with paragraph 1 shall not be placed on the market. 3. Shall not be placed on the market if they contain a colouring agent, unless required for fiscal reasons, or perfume, or both, if they: — can be used as fuel in decorative oil lamps for supply to the general public, and, — present an aspiration hazard and are labelled with R65 or H304, 4. Decorative oil lamps for supply to the general public shall not be placed on the market unless they conform to the European Standard on Decorative oil lamps (EN 14059) adopted by the European Committee for Standardisation (CEN). 5. Without prejudice to the implementation of other Community provisions relating to the classification, packaging and labelling of dangerous substances and mixtures, suppliers shall ensure, before the placing on the market, that the following requirements are met: a) lamp oils, labelled with R65 or H304, intended for supply to the general public are visibly, legibly and indelibly marked as follows: "Keep lamps filled with this liquid out of the reach of children"; and, by 1 December 2010, "Just a sip of lamp oil — or even sucking the wick of lamps — may lead to life-threatening lung damage"; b) grill lighter fluids, labelled with R65 or H304, intended for supply to the general public are legibly and indelibly marked by 1 December 2010 as follows: "Just a sip of grill lighter may lead to life threatening lung damage"; c) lamp oils and grill lighters, labelled with R65 or H304, intended for supply to the general public are packaged in black opaque containers not exceeding 1 litre by 1 December 2010. 6. No later than 1 June 2014, the Commission shall request the European Chemicals Agency to prepare a dossier, in accordance with Article 69 of the present Regulation with a view to ban, if appropriate, grill lighter fluids and fuel for decorative lamps, labelled R65 or H304, intended for supply to the general public. 7. Natural or legal persons placing on the market for the first time lamp oils and grill lighter fluids, labelled with R65 or H304, shall by 1 December 2011, and annually thereafter, provide data on alternatives to lamp oils and grill lighter fluids labelled R65 or H304 to the competent authority in the Member State concerned. Member States shall make those data available to the Commission.
propylene 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;

Reason for revision: 7.2.1

Publication date: 2015-06-01

Date of revision: 2017-09-05

Reference number: 3600

Revision number: 0101

Product number: 10235

12 / 14

propylene oxide

		<p>(c) the following fuels and oil products:</p> <ul style="list-style-type: none"> — 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); <p>(d) artists' paints covered by Directive 1999/45/EC;</p> <p>(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.</p>
propylene 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	<p>Without prejudice to the other parts of this Annex the following shall apply to entries 28 to 30:</p> <p>1. Shall not be placed on the market, or used,</p> <ul style="list-style-type: none"> — as substances, — as constituents of other substances, or, — in mixtures, <p>for supply to the general public when the individual concentration in the substance or mixture is equal to or greater than:</p> <ul style="list-style-type: none"> — 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. <p>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".</p> <p>2. By way of derogation, paragraph 1 shall not apply to:</p> <p>(a) medicinal or veterinary products as defined by Directive 2001/82/EC and Directive 2001/83/EC;</p> <p>(b) cosmetic products as defined by Directive 76/768/EEC;</p> <p>(c) the following fuels and oil products:</p> <ul style="list-style-type: none"> — 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); <p>(d) artists' paints covered by Directive 1999/45/EC;</p> <p>(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.</p>
propylene 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.	<p>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:</p> <ul style="list-style-type: none"> — metallic glitter intended mainly for decoration, — artificial snow and frost, — "whoopie" cushions, — silly string aerosols, — imitation excrement, — horns for parties, — decorative flakes and foams, — artificial cobwebs, — stink bombs. <p>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:</p> <p>"For professional users only".</p> <p>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.</p> <p>4. The aerosol dispensers referred to in paragraphs 1 and 2 shall not be placed on the market unless they conform to the requirements indicated.</p>

National legislation Belgium

Additional classification	Oxyde de propylène; 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.
---------------------------	---

National legislation The Netherlands

Waterbezwaarlijkheid	Z (2)
SZW - Lijst van kankerverwekkende stoffen	propyleenoxide; Listed in SZW-list of carcinogenic substances
SZW - Lijst van mutagene stoffen	propyleenoxide; Listed in SZW-list of mutagenic substances

National legislation France

Catégorie cancérogène	Oxyde de propylène
Catégorie mutagène	Oxyde de propylène; M1B

National legislation Germany

WGK	3; Classification water polluting based on advice from the Kommission Bewertung wassergefährdender Stoffe (KBwS)
TA-Luft	5.2.7.1.1; III
TRGS900 - Risiko der Fruchtschädigung	Propylenoxid; Y; Risiko der Fruchtschädigung braucht bei Einhaltung des Arbeitsplatzgrenzwertes und des biologischen Grenzwertes nicht befürchtet zu werden

Reason for revision: 7.2.1

Publication date: 2015-06-01

Date of revision: 2017-09-05

Reference number: 3600

Revision number: 0101

Product number: 10235

13 / 14

propylene oxide

Sensibilisierende Stoffe	Propylenoxid; Sh; Hautsensibilisierende Stoffe
TRGS900 - Kanzerogener Stoff	Propylenoxid

National legislation United Kingdom

Carcinogen	Propylene oxide; Carc
------------	-----------------------

Other relevant data

Skin Sensitisation	Propylene oxide; SEN; Sensitization
TLV - Carcinogen	Propylene oxide; A3
IARC - classification	2B; Propylene oxide

15.2. Chemical safety assessment

A chemical safety assessment has been performed.

SECTION 16: Other information

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

- H224 Extremely flammable liquid and vapour.
- H302 Harmful if swallowed.
- H311 Toxic in contact with skin.
- 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
CLP (EU-GHS)	Classification, labelling and packaging (Globally Harmonised System in Europe)
DMEL	Derived Minimal Effect Level
DNEL	Derived No Effect Level
EC50	Effect Concentration 50 %
EC50	EC50 in terms of reduction of growth rate
LC50	Lethal Concentration 50 %
LD50	Lethal Dose 50 %
NOAEL	No Observed Adverse Effect Level
NOEC	No Observed Effect Concentration
OECD	Organisation for Economic Co-operation and Development
PBT	Persistent, Bioaccumulative & Toxic
PNEC	Predicted No Effect Concentration
STP	Sludge Treatment Process
vPvB	very Persistent & very Bioaccumulative

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

Reason for revision: 7.2.1

Publication date: 2015-06-01

Date of revision: 2017-09-05

Reference number: 3600

Revision number: 0101

Product number: 10235

14 / 14