TENNANTS DISTRIBUTION LIMITED
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PRODUCT SPECIFICATION

Product Name	Ethoxy Propanol (EP)
Alternative Name	
Product Grade	(1-ethoxy-2-propanol)
Specification Reference	EP412/6 (02/96)

SALES SPECIFICATION

PROPERTY	UNITS	VALUE	TEST
Purity	% mass	99.0 min	BP Chemicals GC method
Relative Density	@ 20°C/20°C	0.892 min 0.907 max	ASTM D4052-91
Water Content	% mass	0.10 max	ASTM E203-92
Acidity as acetic acid	% mass	0.02 max	ASTM D1613-91
Colour	Hazen units	10 max	ASTM D1209-84 (R1988) E1

PHYSICAL PROPERTIES

PROPERTY	CONDITIONS	UNIT	VALUE
Molecular mass			104
Density	20°C	kg/litre	0.896
Coefficient of Cubical expansion	20°C	per °C	$1.072°10^{-3}$
Litres per Tonne	20°C	litres/T	1116
Boiling point	1.013 bar	°C	132
Vapour pressure	20°C	mbar	10
Flammable limits			
Upper	20 °C	% volume	12.0
Lower	20 °C	% volume	1.3
Flash point	Closed cup	°C	40
Specific heat (liquid)	20°C	kj/kg°C	2.36
Latent heat (of vaporisation)	at boiling point	kj/kg	412
Absolute viscosity	20°C	cP	2.08
Solubility			
in water	20°C	g/kg	Complete
water in solvent	20°C	g/kg	Complete
Evaporation rate	20°C		0.5
Relative to n-BuAc = 1			
Surface tension	25C	mN/m	25.9
Hansen Solubility parameter			
Delta H			6.3
Delta P			3.7
Delta D			7.5

NOTES

Exclusion of Liability

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Health and Safety

A Material Safety Data Sheet has been issued describing the health, safety and environmental properties of this product, identifying the potential hazards and giving advice on the handling precautions and emergency procedures. This must be consulted fully before handling, storage and use.

SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY

1.1 Product Identifier

Product Name	Ethoxy propanol
Synonyms	1-ethoxy-2-propanol 1-ethoxypropan-2-ol 2PG1EE Propylene glycol monoethyl ether 2-propanol, 1-ethoxy
CAS Number	1569-02-4
EC Index Number	603-177-00-8
EINECS Number	216-374-5
HMRC Tariff Number	290949000
EU REACH Registration Number	01-2119462792-32-XXXX
Product Type REACH	Substance/mono-constituent
Chemical compound	Organic
Molecular Mass	104.15 g/mol
Formula	$C_5H_{12}0_2$

Relevant identified uses

Exposure scenario title	Exposure scenario group	Sector of use	Use descriptors (PROC or PC)	Use descriptors (ERC)
ES01 Manufacture of substance	Industrial	SU 8	PROC 1, PROC 2, PROC 3, PROC 4, PROC 8a, PROC 8b, PROC 15	ERC 1
	Industrial	SU 9	PROC 1, PROC 2, PROC 3, PROC 4, PROC 8a, PROC 8b, PROC 15	ERC 1
ES02 Use as an intermediate	Industrial	SU 8	PROC 1, PROC 2, PROC 3, PROC 4, PROC 8a, PROC 8b, PROC 15	ERC 6a
	Industrial	SU 9	PROC 1, PROC 2, PROC 3, PROC 4, PROC 8a, PROC 8b, PROC 15	ERC 6a
ES03 Formulation & (re)packing of substances and mixtures	Industrial	SU 10	PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 8a, PROC 8b, PROC 9, PROC 15	ERC 2
ES04 Industrial use in coatings (solvent-based)	Industrial		PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 7, PROC 8a, PROC 8b, PROC 9,	ERC 4
ES05 Industrial use in coatings (water-based)	Industrial		PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 7, PROC 8a, PROC 8b, PROC 9,	ERC 4
ES06 Professional use in coatings (solvent-based)	Professional		PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 8a, PROC 8b, PROC 10, PROC 11,	ERC 8a
	Professional		PROC 1, PROC 2, PROC 2, PROC 4, PROC 5, PROC 8a, PROC 8b, PROC 10, PROC 11,	ERC 8d
ES07 Professional use in coatings (water-based)	Professional		PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 8a, PROC 8b, PROC 10, PROC 11,	ERC 8a
	Professional		PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 8a, PROC 8b, PROC 10, PROC 11,	ERC 8d
ES08 Consumer use in coatings (water-based)	Consumer		PC 9a, PC 9c	ERC 8a
	Consumer		PC 9a, PC 9c	ERC 8d
ES09 Consumer use in coatings (solvent-based)	Consumer		PC 9a, PC 9c, PC 18	ERC 8a
	Consumer		PC 9a, PC 9c, PC 18	ERC 8d

Uses advised against

Group		Use descriptor	Environmental release category (ERCI
Consumer	No uses advised against		
Industrial	No uses advised against		
Professional	No uses advised against		

Group	Use advice against	Use descriptor	Article (AC)
Consumer	No uses advised against		

Industrial	No uses advised against		
Professional	No uses advised against		

1.3 Details of the supplier of the safety data sheet

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1.4 Emergency telephone number

Tel: 44(0)844 335 0001 (24 hours)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

2.1.1 Regulation 1272/2008 (CLP)

Class	Category	Hazard statement code(s)
Flam. Liq.	category 3	Flammable liquid and vapour.
STOT SE	category 3	May cause drowsiness or dizziness.
Eye Irrit.	category 2	Causes serious eye irritation.

2.2 Label elements

According to Regulation (EC) No. 1272/2008 (CLP).
Hazard Pictogram

Signal word(s) Warning

Hazard statement(s)

H226: Flammable liquid and vapour
H336: May cause drowsiness or dizziness
H319: Causes serious eye irritation.

Precautionary statement(s)

P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P280: Wear protective gloves 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/shower.
P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312: Call a POISON CENTER/doctor if you feel unwell.

2.3 Other hazards

No further information given

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substances

Name	CAS No.	EINECS/ ELINCS No.	Conc.	Classification according to Regulation 1272/2008	Note	Remark
1-ethoxy-2-propanol 01-2119462792-32-XXXX	1569-02-4	216-374-5	>97%	Flam. Liq. 3; H226 STOT SE 3; H336 Eye Irrit. 2; H319	(1)(10)(2)	Mono-constituent

(1) For 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

4. FIRST AID MEASURES

4.1 Description of first aid measures

General Advice
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.

Inhalation
Remove the victim into fresh air. Respiratory problems: consult a doctor/medical service.

Skin contact
Rinse with water. Soap may be used. Take victim to a doctor if irritation persists.

Eye contact
Rinse immediately with plenty of water. Do not apply neutralizing agents. Take victim to an ophthalmologist if irritation persists..

Ingestion
Rinse mouth with water. Do not induce vomiting. Consult a doctor/medical service if you feel unwell.

4.2 Most import symptoms and effects, both acute and delayed
4.2.1 Acute symptoms
After inhalation:
EXPOSURE TO HIGH CONCENTRATIONS: Irritation of the respiratory tract. Irritation of the nasal mucous membranes. Central nervous system depression. Dizziness. Headache. Narcosis. Coordination disorders. Disturbances of consciousness.
After skin contact:
Slight irritation.
After eye contact:
Irritation of the eye tissue.
After ingestion:
Nausea.
4.2.2 Delayed symptoms
If applicable and available it will be listed below.

4.3 Indication of any immediate medical attention and special treatment needed
If applicable and available it will be listed below.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing Media
Suitable extinguishing media: BC powder. Carbon dioxide. Sand/earth. MAJOR FIRE: Water spray. Alcohol-resistant foam.
Unsuitable extinguishing media: Solid water jet ineffective as extinguishing medium.

5.2 Special hazards arising from the substance or mixture
Upon combustion CO and $C0_2$ are formed

5.3 Advice for fire-fighters
Instructions: Cool tanks/drums with water spray/remove them into safety. Do not move the load if exposed to heat.
Special protective equipment for fire-fighters: Gloves. Protective goggles. Protective clothing. Large spills/in enclosed spaces: compressed air apparatus. Heat/fire exposure: compressed air/ oxygen apparatus.

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 explosion proof appliances and lighting equipment. Keep containers closed. Large spills/in confined spaces: consider evacuation.
6.1.1 Protective equipment for non-emergency personnel
See heading 8.2
6.1.2 Protective equipment for emergency responders
Gloves. Protective goggles. Protective clothing. Large spills/in enclosed spaces: compressed air apparatus. 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. Try to reduce evaporation. Prevent spreading in sewers

6.3 Methods and material for containment and cleaning up
Take up liquid spill into inert absorbent material, e.g.: dry sand/earth. Scoop absorbed substance into closing containers. Spill must not return in its original container Carefully collect the spill/leftovers. Damaged/cooled tanks must be emptied. Do not use compressed air for pumping over spills. Take collected spill to manufacturer/competent authority. Clean contaminated surfaces with an excess of water. Wash clothing and equipment after handling.

6.4 Reference to other sections
See Section 13

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Use spark-/explosion proof 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 normal hygiene standards. Keep container tightly closed. 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: room temperature. Store in a dry area. Ventilation at floor level. Fireproof storeroom. Provide for a tub to collect spills. Provide the tank with earthing. Aboveground. Keep out of direct sunlight. Store at ambient temperature. Meet the legal requirements.
7.2.2 Keep away from:
Heat sources, ignition sources, combustible materials, oxidizing agents, (strong) acids, (strong) bases, water/moisture.
7.2.3 Suitable packaging material:
Stainless steel, steel, glass.
7.2.4 Non suitable packaging material:
Aluminium, copper, synthetic material.

7.3 Specific end use(s)
No further information given by supplier

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
If limit values are applicable they will be listed below
TRGS 900 (Germany)

l-Ethoxypropan-2-ol	Time-weighted average exposure limit 8hr	220 mg/m³ 50 ppm

National biological limit values
If limit values are applicable and available these will be listed below.
Sampling methods
If applicable and available it will be listed below
Applicable limit values when using the substance or mixture as intended
If limit values are applicable and available these will be listed below.

DNEL/PNEC values
DNEL Workers
1-ethoxy-2-propanol

Effect level (DNEL/DMEL)	Type	Value	Remark
DNEL	Long-term systemic effects inhalation	211 mg/m³	
DNEL	Acute systemic effects inhalation	500 mg/m³	
	Long-term systemic effects dermal	74 mg/kg bw/day	

DNEL - General population

1-ethoxy-2-propanol

Effect level (DNEL/DMEL)	Type	Value	Remark
DNEL	Long-term systemic effects inhalation	127 mg/m³	
	Acute systemic effects inhalation	300 mg/kg bw/day	
	Long-term systemic effects dermal	44.3 mg/m³	
	Long-term systemic effects oral	14 mg/kg bw/day	

PNEC
1-ethoxy-2-propanol

Compartments	Value	Remark
Fresh water	10 mg/l	
Marine water	1 mg/l	
Aqua (intermittent releases)	19 mg/l	
Fresh water sediment	37.6 mg/kg sediment dw	
Marine water sediment	3.76 mg/kg sediment dw	
Fresh water	1250 mg/l	
Soil	1.97 mg/kg soil dw	
Oral	142 mg/kg food	

8.1.5 Control banding
If applicable and available it will be listed below.

8.2 Exposure controls

Appropriate engineering controls

Use spark-/explosion proof appliances and lighting system. Take precautions against electrostatic charges. Keep away from naked flames/heat. Keep away from ignition sources/sparks. Measure the concentration in the air regularly. Work under local exhaust/ventilation.

Individual protection measures, such as personal protective equipment

Observe normal hygiene standards. Keep container tightly closed. Do not eat, drink or smoke during work.

Respiratory protection

High gas/vapour concentration: gas mask with filter type A

Hand protection

Gloves.
- Materials (good resistance) Butyl rubber.
- Materials (less resistance) Natural rubber, PVC.
- Materials (poor resistance) Nitrile rubber.

Eye protection

Protective goggles

Skin protection

Protective clothing

Hygiene Measures

Avoid contact with the skin and the eyes
Use barrier cream regularly
Provide adequate ventilation
Wear suitable gloves and eye/face protection

Protective Measures

General industrial hygiene practice

Environmental exposure controls

See also sections 6 and 13

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Physical form	Liquid
Odour	Mild odour
	Sweet odour
Odour threshold	No data available
Colour	Colourless
Particle size	No data available
Explosion limits	No data available
Flammability	Combustible
Log Kow	0 ; QSAR ; 20 °C
Dynamic viscosity	0.0022 Pa.s ; 20 °C
Kinematic viscosity	Not determined
Melting point	-70 °C
Boiling point	132 °C
Flash point	40 °C ; Closed cup
Evaporation rate	No data available ; ether
	0.5 ; butyl acetate
Relative vapour density	3.6
Vapour pressure	10 hPa ; 25 °C
Solubility	water ; Complete
Relative density	0.897 ; 20 °C
Decomposition temperature	No data available
Auto-ignition temperature	255 °C
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	Not applicable
Surface tension	0.0057 N/m
Saturation concentration	46 g/m³
Absolute density	910 kg/m³

10. STABILITY AND REACTIVITY

10.1 Reactivity
May be ignited by sparks

10.2 Chemical stability
Unstable on exposure to air. Hygroscopic

10.3 Possibility of hazardous reactions
Oxidizes slowly on exposure to air. Reacts with (strong) oxidizers: (increased) risk of fire/explosion. Decomposes on exposure to (strong) acids. Prolonged storage: on exposure to air: peroxidation resulting in increased fire or explosion risk.

10.4 Conditions to avoid
Use spark-/explosion proof 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, water/moisture.

10.6 Hazardous decomposition products
Upon combustion CO and $C0_2$ are formed.

11 TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects:
11.1.1 Test results
- Toxicokinetics: summary
Basic toxicokinetics: General considerations related to the metabolism of glycol ethers are well documented (Casarett & Doull's Toxicology, 2001; ECETOC Technical Report). Glycol ethers follow two main oxidative pathways of metabolism, either via alcohol dehydrogenase (ADH) or the microsomal CYP mixed function oxidase (MFO) (O-demethylation or O-dealkylation). The first pathway gives rise to the formation and excretion of alkoxyacetic acids. The second mainly leads to the production and exhalation of carbon dioxide (CO2) via ethylene glycol (MEG) or propylene glycol, which enter intermediary metabolism via the tricarboxylic acid (TCA) cycle. Glycol ethers may also be conjugated with glucuronide or sulfate, but this is thought to occur mainly after saturation of the other metabolic pathways. According to their pathways of metabolism, the glycol ethers may be divided into three groups: - ethylene glycol mono- and di-alkyl ethers and their acetates; - diethylene glycol mono- and di-alkyl ethers and their acetates;- propylene glycol ethers. Monoethylene glycol ethers bearing a primary OH-group (alkoxyethanols) are primary alcohols that are oxidised via ADH and aldehyde dehydrogenase (ALDH) to their corresponding alkoxyacetic acids.Monopropylene glycol mono-alkyl ethers with a primary OH function (n-alkoxypropanols) follow similar pathways yielding alkoxypropionic acid. In addition to ADH-mediated oxidation of glycol ethers bearing a primary alcohol function, microsomal oxidation (catalysed by CYP MFO: O-demethylation or O-dealkylation) may also occur, but this pathway has relatively lower capacity.Monopropylene glycol mono-alkyl ethers etherified at the primary carbon (sec-alkoxypropanols) are secondary alcohols that cannot be metabolised to alkoxypropionic acids. These compounds are either renally excreted after conjugation or, to some extent may form ketones that may enter the intermediary metabolism via the TCA cycle and eventually expired as CO_2. Monopropylene glycol mono-alkyl ethers etherified at the seconday carbon (n-alkoxypropanols) are primary alcohols, that can be oxidised via ADH to their corresponding alkoxypropionic acids. The metabolism of glycol ethers is considered a pre-requisite for their systemic toxicity, as the alkoxyacetic acids and perhaps their acetaldehyde precursors are regarded as the ultimate toxicants. Evidence of this comes from: protection of toxicity afforded by inhibition of alcohol and aldehyde dehydrogenases; similar toxicity profiles of ethylene glycol ethers and their alkoxyacetic acid metabolites; and the differential toxicities of those glycol ethers metabolized via the oxidative and O-dealkylase pathways (Miller et al, 1984; Ghanayem et al, 1987)Glycol ether acetates are rapidly hydrolysed in vivo to the parent glycol ethers by plasma esterases; and are thus likely to exhibit the same systemic toxicity profile as the parent glycol ether. The toxicity of the propylene glycol ethers with the alkoxy group at the primary position is quite different from that of the ethylene glycol ethers, presumably because these propylene glycol ethers are not metabolised to their corresponding alkoxypropionic acids. Miller et al (1984) reported remarkable differences in the toxicological properties of ethylene glycol monomethyl ether (EGME, 2-methoxyethanol, a primary alcohol), and propylene glycol monomethyl ether (PGME, 1-methoxy-2-propanol, a secondary alcohol). The differences in toxicity were attributed to differences in metabolism, characterized by EGME being primarily oxidized to methoxyacetic acid, and PGME undergoing O-demethylation to form propylene glycol. In the case of propylene glycol methyl ether, developmental effects have been reported when the primary position is occupied by a hydroxyl group.There is no information available on the metabolism of ethoxypropoxypropanol (DPGEE) but the closely related substance methoxypropoxypropanol (dipropylene glycol methyl ether – DPGME) has been studied and results from this can be extrapolated. In this case, the metabolic routes for the main isomer (secondary/secondary) were followed (equivalent to 85% of the DPGEE composition). Three main metabolic routes were identified for DPGME. Microsomal O- dealkylation is a significant route of biotransformation since dipropylene glycol (DPG) is observed in the urine. This in turn is believed to enter into intermediate metabolism, as does PG. The second major route of biotransformation is hydrolysis of the ether linkage to form s-PGME secondary propylene glycol methyl ether) and propylene glycol (PG). The metabolites seen are consistent with the s-PGME formed metabolising as indicated by the study with s- PGME itself, that is

primarily to PG. Rates of elimination of metabolites were consistent between studies. Due to overlapping peaks in the gas chromatogram in the reported study, it was not possible to quantify these two routes. However, the data on s-PGME alone suggests that the major route of metabolism will b to PG and therefore that the unresolved peak is substantially DPG. The third and least important route of elimination is conjugation with sulphate and glucuronic acid followed by urinary excretion. The overlap in the metabolic paths between the mono and dipropylene glycols indicates that data from dipropylene glycol ethyl ether would be suitable for read across to predict the toxicity of propylene glycol ethyl ether.
The following information is taken into account for any hazard / risk assessment: There is no specific toxicokinetic information available for this substance. Of the monopropylene glycols in general, the metabolism of propylene glycol monomethyl ether and its parent acetate have been well studied (Domoradzki et al, 2003). Half-lives of acetate elimination following iv administration to rats were calculated to be on the order of 2 minutes. Once hydrolyzed, the kinetics for the glycol ether derived from the acetate are identical to that observed following administration of the glycol ether. The toxicological databases for systemic effects for the glycol ether and its acetate are essentially toxicologically equivalent, with the exception that lesions of the nasal mucosa are observed in rat inhalation studies with the acetate and not with the glycol ether. Hydrolysis of the acetate in nasal tissues has been demonstrated (Stott and McKenna, 1985) and inhalation of acetic acid vapor has been shown to cause similar nasal lesions. The toxicological equivalence of these two compounds is consistent with the demonstration of rapid hydrolysis of the glycol ether acetate to the glycol ether and acetic acid in vivo, and subsequent metabolism of the glycol ether via common metabolic pathways. Based on the high level of understanding of metabolism of glycol ethers and their acetates, it is reasonable to expect relationships to exist for propylene glycol monoethyl ether and propylene glycol monoethyl ether acetate that are similar to those described for the monomethyl analogues.
Dermal absorption: Dermal Absorption is an important exposure route for glycol ethers. Dugard et al (1984) studied the absorption of eight glycol ethersthrough human skin in vitro. 2-methoxyethanol was most readily absorbed (mean steady rate of 2.82 mg/cm2/hr), followed by 1-methoxypropan-2-ol (1.17 mg/cm2/hr). There was a trend of reducing absorption rate with increasing molecular weight for monoethylene glycol ethers (2-methoxyethanol, 2.82 mg/cm2/hr; 2-ethoxyethanol, 0.796 mg/cm2/hr; 2-butoxyethanol, 0.198 mg/cm2/hr). The rate of absorption of 2- ethoxyethanol was similar to that of the parent acetate.
Sumner (1999) studied the blood pharmacokinetics of 1-methoxypropan-2-ol in male rats following a single 6- hour dermal exposure and compared result those obtained in a similar experiment of the parent acetate. The efficiency of dermal absorption for the parent acetate was found to be approximately 30 of that for 1- methoxypropan-2-ol.
Dermal uptake studies of 1-methoxypropan-2-ol have also been conducted in human volunteers. Brooke et al (1998) exposed subjects at rest to 100 ppmmethoxypropan-2-ol vapour with and without fresh-air fed half masks to compare skin-only and whole-body exposure, respectively, and measured uptake blood, breath and urine samples. Dermal uptake was calculated to be 9.6 ± 6.5% based on breath samples, 8.0 ± 5.7% based on blood samples, and 4.2 ± 1 based on urine samples. In a similar study, Devanthéry et al, 2002 measured total and conjugated 1-methoxypropan-2-ol levels in urine, exhaled air, and b of human volunteers exposed to 1-methoxypropan-2-ol vapour, with and without respiratory protection, at levels up to 95 ppm for 6 hours. These investigators reported that 1-methoxypropan-2-ol was not detected in breath, blood or urine following dermal-only exposure.
The following information is taken into account for any hazard / risk assessment: Based on relative molecular weight and physicochemical properties the dermal uptake of ethoxypropanol would be less than that of methoxypropanol, a structural analogue for which data is available. A measured value for methoxypropanol is 1.17 mg/cm2/hr whilst a calculated value is 0.19 mg/cm2/hr. In the Dugard in vitro human skin penetration study, undiluted 1- methoxypropan-2-ol applied to the outer surface of abdominal epidermis for 8 hours revealed an absorption rate of 1.17 mg/cm2/hr and a permeability constant of 12.5 mg/h x 104.

Acute toxicity

1-ethoxy-2-propanol

Route of exposure	Parameter	Method	Value	Exposure time	Species	Value determination	Remark
Oral	LD50	Equivalent to OECD 401	> 2 ml/kg bw		Rat (male/female)	Experimental value	
Dermal	LD50	Equivalent to OECD 402	> 2000 mg/kg bw	24 h	Rat (male/female)	Read-across	
Inhalation	LC50	Equivalent to OECD 403	> 9.59 mg/l	4 h	Rat (male/female)	Experimental value	

Conclusion

Not classified for acute toxicity

Corrosion/irritation

1-ethoxy-2-propanol

Route of exposure	Result	Method	Exposure time	Time point	Species	Value determination	Remark

Respiratory or skin sensitisation

1-ethoxy-2-propanol

Route of exposure	Result	Method	Exposure time	Observation time point	Species	Value determination	Remark
Dermal	Not sensitizing	Equivalent to OECD 406		24; 48; 72 hours	Guinea pig (male/female)	Read-across	

Conclusion

Not classified as sensitizing for skin

No respiratory sensitization data available

Specific target organ toxicity

1-ethoxy-2-propanol

Route of exposure	Parameter	Method	Value	Organ	Effect	Exposure time	Species	Value determination
Oral	NOAEL	OECD 408	1000 mg/kg bw/day		No effect	90 day(s)	Rat (male/female)	Read-across
Dermal	NOAEL	Equivalent to OECD 411	1838 mg/kg bw/day			90 day(s)	Rabbit (male)	Read-across
Dermal	LOAEL	Equivalent to OECD 411	3676 mg/kg bw/day			90 day(s)	Rabbit (male)	Read-across
Inhalation	NOAEC	Equivalent to OECD 413	1.266 mg/l				Rat (male/female)	Experimental value

Conclusion

Not classified for subchronic toxicity

Mutagenicity (in vitro)

1-ethoxy-2-propanol

Result	Method	Test substrate	Effect	Value determination
Negative	OECD 471	Bacteria (S.typhimurium)		Experimental value
Negative	Equivalent to OECD 476	Chinese hamster lung fibroblasts		Experimental value
Negative	OECD 473	Human lymphocytes		Experimental value

Mutagenicity (in vivo)

1-ethoxy-2-propanol

No (test)data available

Carcinogenicity

1-ethoxy-2-propanol

No (test)data available

Reproductive toxicity

1-ethoxy-2-propanol

	Parameter	Method	Value	Exposure time	Species	Effect	Organ	Value determination
Developmental toxicity	NOAEC	OECD 414	> 2000 ppm	6-15 days (gestation, daily)	Rat (male/female)			Experimental value
Effects on fertility	NOAEL (P)	OECD 416	300 ppm		Rat (male/female)			Read-across
	NOAEL (F1)	OECD 416	1000 ppm		Rat (male/female)			Read-across
	NOAEL (F2)	OECD 416	1000 ppm		Rat (male/female)			Read-across

Conclusion CMR

No carcinogenicity data available

Not classified for mutagenic or genotoxic toxicity

Not classified for reprotoxic or developmental toxicity

Toxicity other effects

1-ethoxy-2-propanol

No (test)data available

Chronic effects from short and long-term exposure

1-ethoxy-2-propanol

ON CONTINUOUS/REPEATED EXPOSURE/CONTACT: Dry skin.

12. ECOLOGICAL INFORMATION

12.1 Toxicity:

1-ethoxy-2-propanol

	Parameter	Method	Value	Duration	Species	Test design	Fresh/salt water	Value determination
Acute toxicity fishes	LC0	OECD 203	> 200 mg/l	96 h	Brachydanio rerio	Flow-through system	Fresh water	Read-across
	LC50	DIN 38412-15	6812 mg/l	96 h	Leuciscus idus	Static system	Fresh water	Experimental value
Acute toxicity invertebrates	EC50	OECD 202	180 mg/l	48 h	Daphnia magna	Static system		Read-across

	LC50	ESR-ES-15	21100 mg/l	48 h	Daphnia magna	Static system	Fresh water	Experimental value
	LC50		1929 mg/l	48 h	Daphnia magna			QSAR
Toxicity algae and other aquatic plants	EC50	OECD 201	> 100 mg/l	72 h	Desmodesmus subspicatus	Static system	Fresh water	Experimental value
	EC50		384 mg/l	96 h				QSAR
	NOEC	OECD 201	384 mg/l	72 h	Desmodesmus subspicatus	Static system	Fresh water	Experimental value
	NOEC		105 mg/l	96 h				QSAR
Long-term toxicity fish	NOEC	Equivalent to OECD 204	> 200 mg/l	21 day(s)	Oncorhynchus mykiss	Flow-through system	Fresh water	Read-across
Long-term toxicity aquatic invertebrates	NOEC	Equivalent to OECD 202	> 180 mg/l	21 day(s)	Daphnia magna	Semi-static system	Fresh water	Read-across
Toxicity aquatic micro-organisms	EC10	ISO 10712	4600 mg/l	16 h	Pseudomonas putida			Experimental value

Conclusion

Not harmful to fishes

Not harmful to invertebrates (Daphnia)

Not harmful to algae

Not harmful to bacteria

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

12.2 Persistence and degradability:

1-ethoxy-2-propanol

Biodegradation water

Method	Value	Duration	Value determination
OECD 301D: Closed Bottle Test	68 %	28 day(s)	Experimental value
OECD 301F: Manometric Respirometry Test	78 %	28 day(s)	Experimental value

Conclusion

Readily biodegradable in water

12.3 Bioaccumulative potential:

1-ethoxy-2-propanol

Log Kow

Method	Remark	Value	Temperature	Value determination
		0	20 °C	QSAR

Conclusion

Low potential for bioaccumulation (Log Kow < 4)

12.4 Mobility in soil:

1-ethoxy-2-propanol

Percent distribution

Method	Fraction air	Fraction biota	Fraction sediment	Fraction soil	Fraction water	Value determination
Mackay level III	1.23 %	0 %	0.49 %	34.9 %	63.4 %	QSAR
Mackay level I	33.7 %	0 %	0 %	2.4 %	63.8 %	QSAR

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:

1-ethoxy-2-propanol

Global warming potential (GWP)

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

Ozone-depleting potential (ODP)

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

Ground water

Ground water pollutant

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods:

13.1.1 Provisions relating to waste

Waste material code (Directive 2008/98/EC, Decision 2000/0532/EC). 07 01 04* (wastes from the manufacture, formulation, supply and use (MFSU) of basic organic chemicals: other organic solvents, washing liquids and mother liquors). Depending on branch of industry and production process, also other waste codes may be applicable. Hazardous waste according to Directive 2008/98/EC.

13.1.2 Disposal methods

Recycle by distillation. 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. Do not discharge into surface water.

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).

14. TRANSPORT INFORMATION

14.1 ADR	
UN Number	1987
Proper Shipping Name	Alcohols, n.o.s.
Hazard identification number	30
Class	3
Classification code	F1
Packing group	III
Labels	3
Special provisions	274
Special provisions	601
Limited quantities	Combination packagings: not more than 5 litres per inner packaging for liquids. A package shall not weigh more than 30 kg (gross mass)
RID	
UN number	1987
Proper shipping name	Alcohols, n.o.s.
Hazard identification number	30
Class	3
Classification code	F1
Packing group	III
Labels	3
Special provisions	274
Special provisions	601
Limited quantities	Combination packagings: not more than 5 litres per inner packaging for liquids. A package shall not weigh more than 30 kg (gross mass)
ADN	
UN Number	1987
Class	3
Classification code	F1
Packing group	III
Labels	3
Special provisions	274, 601
Limited quantities	Not more than 5 litres per inner packaging for liquids. A package shall not weigh more than 30 kg (gross mass)
IMDG	
UN number	1987
Class	3
Packing group	III
Labels	3

Special provisions	223
Special provisions	274
ICAO-TI/IATA-DGR	
UN number	1987
Class	3
Packing group	III
Labels	3
Special provisions	A3, A180
Passenger and cargo transport: Limited quantities; maximum net quantity per packaging	10 L

15. REGULATORY INFORMATION

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

European legislation:

VOC content	Remark
100 %	

VOC content Directive 2010/75/EU
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
1-ethoxypropan-2-ol	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.’
1-ethoxypropan-2-ol	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 be placed on the market unless they conform to the requirements indicated.

National legislation The Netherlands

Waterbezwaarlijkheid 11

National legislation Germany

Schwangerschaft Gruppe C. WGK: 1; Classification water polluting based on the R-phrases in compliance with Verwaltungsvorschrift wassergefährdender Stoffe (VwVwS) of 27 July 2005 (Anhang 3)

15.2 Chemical safety assessment:

A chemical safety assessment has been performed.

16. OTHER INFORMATION

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

H Statements

H226: Flammable liquid and vapour

H336: May cause drowsiness and dizziness

H319: Causes serious eye irritation

Source of key data used to compile the data sheet

Supplier information

Modifications from last revision

Minor change in Section 1 of the Safety Data Sheet

Date: 23/09/2021