TENNANTS DISTRIBUTION LIMITED
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PRODUCT SPECIFICATION

Product Name	Ethoxy Propyl Acetate (EPA)
Alternative Name	(1-ethoxy-2-propyl acetate)
Product Grade	
Specification Reference	EPA/7 (05/06(08/13))

SALES SPECIFICATION

Property	Units	Lower	Upper	Test Method
Appearance	Clear	-		ASTM D4176
Suspended Matter	Substantially free	-		ASTM D4176
Purity (sum of isomers)	% mass	99.0		GC Method
Water Content	% mass	-	0.05	ASTM E203
Acidity (as Acetic Acid)	% mass	-	0.02	ASTM D1613
Colour	Pt/Co	10	10	ASTM D4052

The product also meets the following which whilst not determined on a routine basis is guaranteed by process control

Property	Units	Lower	Upper	Test Method
Initial Boiling Point	ºC	156.0	-	ASTM D1078
Dry Point	ºC	-	162.0	ASTM D1078
Density at 20ºC	kg/l	0.940	0.944	ASTM D4052

PHYSICAL PROPERTIES

PROPERTY	CONDITIONS	UNIT	VALUE
Molecular mass			146
Density	20°C	kg/litre	0.941
Coefficient of Cubical expansion	20°C	per °C	$1.14°10^{-3}$
Litres per Tonne	20°C	litres/T	1063
Melting point		°C	-89
Boiling point	1.013 bar	°C	158
Vapour pressure	20°C	mbar	2.27
Flammable limits in air			
Upper	20°C	% volume	9.8
Lower	20°C	% volume	1.0
Flash point	Open cup	°C	54
Auto ignition temperature		°C	325
Specific heat (liquid)	20°C	kj/kg°C	2.1
Latent heat (of vaporisation)	at boiling point	kj/kg	310
Volume Resistivity	25°C	ohm.m	$20°10^{4}$
Refractive index	20°C	n^{20}_{D}	1.405
Absolute viscosity	20°C	cP	1.40
Solubility			
in water	20°C	g/kg	9.5
water in solvent	20°C	g/kg	0.05
Evaporation rate	20°C		0.24
Relative to n-BuAc = 1			
Surface tension	25C	mN/m	28.1
Solubility parameter			
Delta H			2.8
Delta P			2.0
Delta D			7.5

NOTE

Exclusion of Liability

Information contained in this publication is accurate to the best of the knowledge and belief of Tennants.

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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	2-ethoxy-1-methylethyl acetate
Chemical Formula	$C_7H_{14}O_3$
Synonyms	1-ethoxy-2-propyl acetate; 2-propanol, 1-ethoxy-, acetate; EPA; ethoxy propyl acetate; propylene glycol monoether
CAS Number	54839-24-6
EINECS Number	259-370-9
Tariff Number	29153900
REACH Registration Number	01-2119475116-39-XXXX
Product Type REACH	substance/mono-constituent

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

Exposure scenario title	Exposure scenario group	Sector of use	Use descriptors (PROC or PC)	Use descriptors (ERC)
ES1 Manufacture of substance	Industrial	SU 8	PROC 1, PROC 2, PROC 3, PROC 4, PROC 8a, PROC 8b, PROC 15	ERC 1
ES2 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
ES3 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, PROC 10, PROC 13, PROC 14, PROC 15	ERC 4
ES4 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, PROC 13, PROC 15, PROC 19	ERC 8a
	Professional		PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 8a, PROC 8b, PROC 10, PROC 11, PROC 13, PROC 15, PROC 19	ERC 8d
ES5 Consumer use in coatings (solvent-based)	Consumer		PC 9a, PC 18	ERC 8a
	Consumer		PC 9a, PC 18	ERC 8d

1.2.2 Uses advised against

Group	Uses advised against	Use descriptors (PC)	Environmental release category (ERC)	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

Tennants Distribution Limited
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M8 0GR
Tel: 44(0)161 205 4454
Fax: 44(0) 161 203 4298
Email: msds@tennantsdistribution.com

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)
Flam. Liq. category 3 H226: Flammable liquid and vapour.
STOT SE category 3 H336: May cause drowsiness or dizziness.

2.2 Label elements
2.2.1 According to Regulation (EC) No. 1272/2008 (CLP)
Hazard Pictogram

Signal word: Warning.
Hazard statement(s)
H226 Flammable liquid and vapour
H336 May cause drowsiness or dizziness
Precautionary statement(s)
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
P243 Take precautionary measures against static discharge
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.
P312 Call a POISON CENTER or doctor/physician if you feel unwell
2.3 Other hazards

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substances
2-ethoxy-1-methylethylacetate Mono-constituent

CAS Number	EINECS Number	REACH registration number	Conc.	Classification according to Regulation 1272/2008	Note
54839-24-6	259-370-9	01-2119475116-39-XXXX	>97%	Flam. Liq. 3; H226 STOT SE 3; H336	(1), (10), (2)

(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. Victim in shock: on his back with legs slightly raised. Vomiting: prevent Asphyxia/aspiration pneumonia. Prevent cooling by covering the victim (no warming up). Cardiac arrest: perform resuscitation. Victim conscious with labored breathing: half-seated. 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 with water. Do not apply neutralising agents. Take victim to an ophthalmologist if irritation persists.

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

4.2 Most import symptoms and effects, both acute and delayed
4.2.1Acute symptoms
After inhalation:
EXPOSURE TO HIGH CONCENTRATIONS: Irritation of the respiratory tract. Irritation of the nasal mucous membranes. Central nervous system depression.
After skin contact:
Slight irritation. ON CONTINUOUS EXPOSURE/CONTACT: Red skin. Dry skin. Itching. Cracking of the skin.

After eye contact:
Slight irritation.
After ingestion:
Irritation of the gastric/intestinal mucosa. Nausea. Vomiting. Diarrhoea. Risk of aspiration pneumonia. AFTER INGESTION OF HIGH QUANTITIES: Central nervous system depression.
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.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing Media
5.1.1 suitable extinguishing media:
Carbon dioxide. Water spray. Polyvalent foam. BC powder.
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_2 are formed.

5.3 Advice for fire-fighters
5.3.1 Instructions:
Cool tanks/drums with water spray/remove them into safety.
5.3.2 Special protective equipment for fire-fighters:
Gloves. Protective clothing. Heat/fire exposure: compressed air/oxygen apparatus

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Stop engines and no smoking. No naked flames or sparks. Spark- and explosion proof appliances and lighting equipment.
6.1.1 For non-emergency personnel
See heading 8.2
6.1.2 For emergency responders
Gloves. Protective clothing. Suitable protective clothing – See Section 8

6.2 Environmental precautions
Contain released substance, pump into suitable containers. Plug the leak, cut off the supply. Dam up the liquid spill. Prevent spreading in sewers.

6.3 Methods and material for containment and cleaning up
Take up liquid spill into a non-combustible material e.g.: sand/earth. 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
For personal protection see Section 13

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Use spark-/explosion proof appliances and lighting system. 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. Remove contaminated clothing immediately. Do not discharge the waste into the drain.

7.2 Conditions for safe storage, including any incompatibilities
7.2.1 Safe storage requirements:
Store in a dry area. Ventilation at floor level. Provide for a tub to collect spills. Keep out of direct sunlight. Meet the legal requirements.
7.2.2 Keep away from:
Heat sources, ignition sources, oxidising agents.
7.2.3 Suitable packaging material:
Steel, carbon steel, aluminum, polypropylene.
7.2.4 non suitable packaging material:
Copper.

7.3 Specific end use(s)
If applicable and available, exposure scenarios are attached in annex. See information supplied by the manufacturer.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters:

8.1.1 Occupational Exposure

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

a)Occupational exposure limit values

(Germany)

2-Ethoxy-l-methylethylacetat	Time-weighted average exposure limit	300 mg/m^3 50 ppm

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	Remarks	Sampling method
No data available				

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 value

Acute: systemic/local effects workers

Effect level (DNEL/DMEL)	Type	Value	Remark
DNEL	Acute systemic effects inhalation	608 mg/m^3	
	Long-term systemic effects dermal	103 mg/kg bw/day	
	Long-term systemic effects inhalation	302 mg/m^3	

Acute: systemic/local effects general population

Effect level (DNEL/DMEL)	Type	Value	Remark
DNEL	Acute systemic effects inhalation	365 mg/m^3 day	
	Long-term systemic effects dermal	62 mg/kg bw/day	
	Long-term systemic effects inhalation	181 mg/m^3	
	Long term -systemic effects oral	13.1 mg/kg bw/day	

PNEC

Compartments	Value	Remark
Fresh Water	2 mg/l	
Marine Water	0.2 mg/l	
Aqua (intermittent release)	2 mg/l	
Fresh water sediment	9.2 mg/kg sediment dw	
Marine water sediment	0.92 mg/kg sediment dw	
SOIL	0.67 mg/kg soil dw	
STP	62.5 mg/l	
Oral	117 mg/kg food	

8.1.5 control banding

If applicable and available it will be listed below.

8.2 Exposure controls

Use spark-/explosion proof appliances and lighting system. Keep away from naked flames/heat. Keep away from ignition sources/sparks. Measure the concentration in the air regularly. Carry operations in the open/under local exhaust/ventilation or with respiratory protection.

Appropriate engineering controls

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. Gas mask with filter type A.

Hand protection

Gloves. Material: PVC, rubber (good resistance)

Eye protection

Safety glasses

Skin protection

Protective clothing

Environmental exposure controls

See headings 6.2,6.3 and 13

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

Physical form	Liquid		
Odour	Mild odour		
	Characteristic odour		
	Sweet odour		
Odour threshold	No data available		
Colour	Colourless		
Particle size	Not applicable		
Explosion limits	No data available		
Flammability	Flammable		
Log Kow	0.76; EU Method A.8; 22ºC		
Dynamic viscosity	0.00133 Pa.s	20 °C	
Kinematic viscosity	Not determined		
Melting point	-70 °C		
Boiling point	155 °C		
Flash point	53 ºC	Test data	1013 hPa
Evaporation rate	Ether: No data available	Butyl Acetate: 0.24	
Vapour pressure	2.02 hPa	25 °C	Test data
Relative vapour density	5.1		
Solubility	water	6.96 g/100 ml; 18ºC	
Relative density	0.941	20°C	Test data
Decomposition temperature	Not applicable		
Auto-ignition temperature	325°C		1013 hPa
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

Surface tension	0.0391 N/m	20ºC
Absolute density	941 kg/m^3	

10. STABILITY AND REACTIVITY

10.1 Reactivity

May be ignited by sparks.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

No data available.

10.4 Conditions to avoid

Use spark-/explosion proof appliances and lighting system. Keep away from naked flames/heat. Keep away from ignition sources/sparks.

10.5 Incompatible materials

Oxidising agents

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

-Toxickinetics: summary

Basic toxicokinetics: There is no data on ethoxypropyl acetate itself. General considerations related to the metabolism of glycol ethers are well documented (Casarett & Doull's Toxicology, 2001; ECETOC 2005). Glycol ethers follow two main oxidative pathways of metabolism, either via alcohol dehydrogenase (ADH) or the microsomal CVP 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 (CO_2) via ethylene glycol

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 C02. 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 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). All acetate esters are rapidly hydrolysed in vitro and Glycol ether acetates are no exception, being 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, l-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.

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 acetate have been well studied (Domoradzki et al, 2003). Data demonstrates the rapid hydrolysis of the acetate in vivo to its parent glycol ether. 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 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.

The available information on glycol ether metabolism supports the use of the toxicological database for propylene glycol monomethyl ether as a surrogate for the systemic toxicity of propylene glycol monomethyl ether acetate. 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. Value used for CSA: no bioaccumulation potential.

Dermal absorption: There is no data available on ethoxypropyl acetate itself. However, dermal Absorption is an important exposure route for glycol ethers in general. Dugard et al. (1984) studied the absorption of eight glycol ethers through human skin in vitro. 2-methoxyethanol was most readily absorbed (mean steady rate of 2.82 mg/cm^2/hr), followed by l-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/cm^2/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 l-methoxypropan-2-ol in male rats following a single 6- hour dermal exposure and compared results to 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 l-methoxypropan-2-ol have also been conducted in human volunteers. Brooke et al (1998) exposed subjects at rest to 100 ppm l-methoxypropan-2-ol vapour with and without fresh-air fed half masks to compare skin-only and whole-body exposure, respectively, and measured uptake in 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 ± 1.7% based on urine samples. In a similar study, Devanthery et al, 2002 measured total and conjugated 1- methoxypropan-2-ol levels in urine, exhaled air, and blood of human volunteers exposed to l-methoxypropan-2-ol vapour, with and without respiratory protection, at levels up to 95 ppm for 6 hours. These investigators reported that l-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 ethoxypropyl acetate would be less than that of methoxypropanol, a structural analogue for which data is available. A measured value for methoxypropanol is 1.17mg/cm^2/hr whilst a calculated value is 0.19 mg/cm^2/hr. In the Dugard in vitro human skin penetration study, undiluted l-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
2-ethoxy-1-methylehylacetate

	Parameter	Method	Value	Exposure time	Species	Value determination
Acute toxicity: oral	LDL0	OECD 401	5000 mg/kg bw		Rat (Male/female)	Experimental value
Acute toxicity: dermal	LD50		13.42 ml/kg bw		Rabbit	Read-across
Acute toxicity: inhalation	LCL0	Equivalent or similar to OECD 403	6.99 mg/l	4 h	Rat (Male/female)	Experimental value

Corrosion/irritation
2-ethoxy-1-methylehylacetate

Route of exposure	Result	Method	Exposure time	Time point	Species	Value determination
Corrosion/irritation: eye	Not irritating	OECD 405: Acute Eye Irritation/ Corrosion		24; 48; 72 hours	Rabbit	Experimental value
Corrosion/irritation: skin	Not irritating	OECD 404: Acute Dermal Irritation/Corrosion		24; 48; 72 hours	Rabbit	Experimental value

Respiratory or skin sensitisation
2-ethoxy-1-methylehylacetate

Route of exposure	Result	Method	Exposure time	Observation time	Species	Value determination
Sensitisation: skin	Not sensitising	OECD 406: Skin Sensitisation		24; 48; 72 hours	Guinea pig (Female)	Experimental value
Sensitisation: inhalation	No data available					

Specific target organ toxicity
2-ethoxy-1-methylehylacetate

Route of exposure	Parameter	Method	Value	Organ	Effect	Exposure time	Species	Value determination
Specific target organ toxicity: oral	No relevant data available							
Specific target organ toxicity: dermal	NOAEL	OECD 411	2 mg/kg		Clinical signs; mortality; body weight; food consumption	90weeks (daily,5 days/week)	Rabbit (Male)	Read-across
Specific target organ toxicity: inhalation	NOAEC	Equivalent or similar to OECD 413	1.266 mg/l	Organ	Overall effects	13 week(s)	Rat (Male/ female)	Experimental value
	NOAEL	Equivalent or similar to OECD 412	>=1176 ppm		No effect	4weeks(daily, 5 days/week)	Rat (Male/ female)	Experimental value

Mutagenicity (in vitro)
2-ethoxy-1-methylehylacetate

Result	Method	Test substrate	Effect	Value determination
Negative	Equivalent or similar to OECD 471	Bacteria (S.typhimurium)		Experiment al value
Negative	Equivalent or similar to OECD 476	Chinese hamster ovary (CHO)		Read-across

Mutagenic (in vivo)

2-ethoxy-1-methylehylacetate

Result	Method	Exposure time	Test substrate	Organ	Value determination
Negative	Equivalent or similar to OECD 474		Mouse (Male/female)		Read-across

Carcinogenicity

2-ethoxy-1-methylehylacetate

No test data available

Reproductive toxicity

2-ethoxy-1-methylehylacetate

	Parameter	Method	Value	Exposure time	Species	Effect	Organ	Value determination
Effects on fertility	NOEC(P)	OECD 416	300 ppm		Rat(Female)			Read- across
	NOAEC(F1/F2)	OECD 416	1000 ppm		Rat (Female)			Read- across
Developmental toxicity	NOAEC	Equivalent or similar to OECD 414	> 2000 ppm	6 -15 days (gestation, daily)	Rat			Read- across
	NOAEC	OECD 414	> 2000 ppm	6 -18 days (gestation, daily)	Rabbit			Read- across

Conclusion CMR

No carcinogenicity data available

Not classified for mutagenic or genotoxic toxicity

Mutagenicity and genotoxicity are not likely to be manifest

Toxicity other effects

2-ethoxy-1-methylehylacetate

No test data available

Chronic effects from short and long-term exposure

2-ethoxy-1-methylehylacetate

No effects known

12. ECOLOGICAL INFORMATION

12.1 Toxicity

2-ethoxy-l-methylethyl acetate

	Parameter	Method	Value	Duration	Species	Test Desjgn	Fresh / Salt Water	Value Determination
Acute toxicity fish	LC50	OECD 203	140mg/l	96h	SALMO GAIRDNERI/ ONCORHYNCH US MYKISS	SEMI-STATIC	FRESH WATER	Experimental Value
Acute toxicity invertebrates	EC50	OECD 202	110 mg/l	48h	DAPHNIA MAGNA	STATIC SYSTEM	FRESH WATER	Experimental Value
Threshold limit algae	EC50	OECD 201	>100mg/l	72h	DESMONDESMUS SUBSPICATUS	STATIC SYSTEM	FRESH WATER	Experimental Value
Threshold limit algae	NOEC	OECD 201	>=100mg/l	72h	DESMONDESMUS SUBSPICATUS	STATIC SYSTEM	FRESH WATER	Experimental Value
Long-term toxicity fish	NOEC	OECD 204	47.5mg/l	96h	ORYZIAS LATIPES	FLOW-THROUGH SYSTEM	FRESH WATER	Read- across
Long-term toxicity aquatic invertebrates	NOEC	OECD 211	>=100mg/l	21 days	DAPHNIA MAGNA	SEMI-STATIC	FRESH WATER	Read- across
Toxicity aquatic micro-organisms	EC10	ISO 10712 Water Quality-Pseudomonas Putida growth	560 mg/l	16h	PSEUDOMONAS PUTIDA	STATIC SYSTEM	FRESH WATER	Experimental value

Conclusion

Not harmful to fishes

Not harmful to algae
Harmful to invertebrates
Slightly harmful to bacteria
In appropriate low concentrations inhibition of the degradation of activated sludge is not anticipated
Not classified as dangerous for the environment according to the criteria of Regulation (EC) No 1272/2008

12.2 Persistence and degradability

Biodegradation water

Method	Value	Duration	Value determination
OECD 301D: Closed Bottle Test	100 %	28 days	Experimental value

Photo transformation air (DT50air)

Method	Value	Conc. OH- radicals	Value determination
AOPWIN vl.92	7.459 h		QSAR

Conclusion
Readily biodegradable in water

12.3 Bio accumulative potential

BCF fishes

Parameter	Method	Value	Duration	Species	Value determination
BCF		3.162			Calculated value

Log Koc

Parameter	Method	Value	Value determination
Log Koc	0.76	22°C	

Conclusion
Low potential for bioaccumulation (BCF <500)

12.4 Mobility in soil

Log Koc

Parameter	Method	Value	Value determination
log Koc	OECD draft TGP94/75	1	Experimental value

Volatility (Henry's Law constant H)

Value	Method	Temperature	Value determination
0.000004 atm m^3 /mol	SRC HENRVWIN V3. 10	25 °C	Calculated value

Percent distribution

Method	Fraction air	Fraction biota	Fraction sediment	Fraction soil	Fraction water	Reference
Mackay Level III	24.3 %	0%	0%	0%	75.6 %	QSAR
Mackay level 1	49.6 %	0%	0.33 %	23.9 %	26.1 %	QSAR

Conclusion
Low potential for absorption 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
Global Warming Potential (GWP): No data available
Ozone-depleting potential (ODP): No data available

13. DISPOSAL CONSIDERATIONS

The information in this section is a general description. Always use the relevant exposure scenarios that correspond to your identified use. For relevant identified uses, see exposure scenarios attached in annex.

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 Regulation (EU) No 1357/2014.

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

ADR	
14.1 UN Number	
UN Number	3272
14.2 Proper Shipping Name	
Proper Shipping Name	Esters,n.o.s
Techn./chem.. name ADR	2-ethoxy-1 methylethyl acetate
14.3 Transport hazard class	
Hazard identification number	30
Class/Classification code	3/F1
14.4 Packing group	
Packaging group	III
Labels	3
14.5 Environmental	
Environmentally hazardous substance mark	no
14.6 Special precautions for users	
Special provisions	223
Special provisions	274
Limited quantities	Not more than 5 litres per inner packaging including liquids. A package shall not weigh more than 30kg. (gross mass)
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	
Not applicable, based in available data	
RID	
14.1 UN Number	
UN Number	3272
14.2 Proper Shipping Name	
Proper Shipping Name	Esters, n.o.s
Techn./chem.. name RID	2-ethoxy-1 methylethyl acetate
14.3 Transport hazard class	
Hazard identification number	30
Class	3
Classification code	F1
14.4 Packing group	
Packaging group	III
Labels	3
14.5 Environmental	
Environmentally hazardous substance mark	no
14.6 Special precautions for users	
Special provisions	274
Special provisions	601
Limited quantities	Not more than 5 litres per inner packaging including liquids. A package shall not weigh more than 30kg. (gross mass)
ADN	
14.1 UN Number	
UN Number	3272
14.2 Proper Shipping Name	
Proper Shipping Name	Esters,n.o.s
Techn./chem.. name RID	2-ethoxy-1 methylethyl acetate
14.3 Transport hazard class	
Class	3
Classification code	F1
14.4 Packing group	
Packaging group	III

Labels	3
14.5 Environmental	
Environmentally hazardous substance mark	no
14.6 Special precautions for users	
Special provisions	274,601
Limited quantities	Not more than 5 litres per inner packaging including liquids. A package shall not weigh more than 30kg. (gross mass)
IMDG	
14.1 UN Number	
UN Number	3272
14.2 Proper Shipping Name	
Proper Shipping Name	Esters,n.o.s
Techn./chem.. name IMO	2-ethoxy-1 methylethyl acetate
14.3 Transport hazard class	
Class	3
14.4 Packing group	
Packaging group	III
Labels	3
14.5 Environmental	
Environmentally hazardous substance mark	no
14.6 Special precautions for users	
Special provisions	223
Special provisions	274
Limited quantities	Combination packaging: not more than 5 litres per inner packaging for liquids. A package shall not weigh more than 30 kg. (gross mass)

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable, based in available data

ICAO-TI/IATA-DGR	
14.1 UN Number	
UN Number	3272
14.2 Proper Shipping Name	
Proper Shipping Name	Esters,n.o.s
Techn./chem.. name IMO	2-ethoxy-1 methylethyl acetate
14.3 Transport hazard class	
Class	3
14.4 Packing group	
Packaging group	III
Labels	3
14.5 Environmental	
Environmentally hazardous substance mark	no
14.6 Special precautions for users	
Special provisions	A3
Passenger and cargo transport: limited quantities: maximum net quantity per packaging	10L

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 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.

2-ethoxy-1-methylethyl acetate

Designation of the substance, of the group of substances or of the mixture	Conditions of restriction
Liquid substances or mixtures which are regarded as dangerous in accordance with Directive 1999/45/EC or are fulfilling the criteria	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,

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	— 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.’
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
No further relevant information
Other relevant data
No data available

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:
H226 Flammable liquid and vapour.
H336 May cause drowsiness or dizziness.

Source of key data used to compile the data sheet
Supplier information

Modifications from last revision
The Safety Data Sheet has been revised throughout in accordance with current requirements
Date: 16/08/18