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Safety data sheet according to Regulation (EC) No 1907/2006, Annex II
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Bremsflüssigkeit DOT 4

Safety data sheet according to Regulation (EC) No 1907/2006, Annex II

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

1.1 Product identifier

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

Relevant identified uses of the substance or mixture:

Hydraulic fluid

Sector of use [SU]:

SU 3 - Industrial uses: Uses of substances as such or in preparations at industrial sites

SU21 - Consumer uses: Private households (=general public = consumers)

SU22 - Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

Chemical product category [PC]:

PC16 - Heat transfer fluids

PC17 - Hydraulic fluids

Process category [PROC]:

PROC 1 - Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.

PROC 2 - Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions

PROC 8a - Transfer of substance or mixture (charging and discharging) at non-dedicated facilities

PROC 8b - Transfer of substance or mixture (charging and discharging) at dedicated facilities

PROC 9 - Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

PROC20 - Use of functional fluids in small devices

Article Categories [AC]:

AC99 - Not required.

Environmental Release Category [ERC]:

ERC 4 - Use of non-reactive processing aid at industrial site (no inclusion into or onto article)

ERC 7 - Use of functional fluid at industrial site

ERC 9a - Widespread use of functional fluid (indoor)

ERC 9b - Widespread use of functional fluid (outdoor)

Uses advised against:

No information available at present.

1.3 Details of the supplier of the safety data sheet

LIQUI MOLY GmbH

Jerg-Wieland-Str. 4

89081 Ulm-Lehr

Tel.: (+49) 0731-1420-0

Fax: (+49) 0731-1420-88

Qualified person's e-mail address: info@chemical-check.de, k.schnurbusch@chemical-check.de Please DO NOT use for requesting Safety Data Sheets.

1.4 Emergency telephone number

Emergency information services / official advisory body:

Telephone number of the company in case of emergencies:

+49 (0) 700 / 24 112 112 (LMR)

SECTION 2: Hazards identification

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2.1 Classification of the substance or mixture

Classification according to Regulation (EC) 1272/2008 (CLP)

Hazard class	Hazard category	Hazard statement
Eye Irrit.	2	H319-Causes serious eye irritation.

2.2 Label elements

Labeling according to Regulation (EC) 1272/2008 (CLP)



Warning

H319-Causes serious eye irritation.

P101-If medical advice is needed, have product container or label at hand. P102-Keep out of reach of children.
 P280-Wear eye protection.
 P337+P313-If eye irritation persists: Get medical advice / attention.

2.3 Other hazards

The mixture does not contain any vPvB substance (vPvB = very persistent, very bioaccumulative) or is not included under XIII of the regulation (EC) 1907/2006 (< 0,1 %).

The mixture does not contain any PBT substance (PBT = persistent, bioaccumulative, toxic) or is not included under XIII of the regulation (EC) 1907/2006 (< 0,1 %).

SECTION 3: Composition/information on ingredients

Glycol ether
 Polyglycols
 Corrosion inhibitor
 Glycol ether borate

3.1 Substances

n.a.

3.2 Mixtures

2-[2-(2-butoxyethoxy)ethoxy]ethanol	
Registration number (REACH)	---
Index	603-183-00-0
EINECS, ELINCS, NLP	205-592-6
CAS	143-22-6
content %	30-40
Classification according to Regulation (EC) 1272/2008 (CLP)	Eye Dam. 1, H318

3,6,9,12-tetraoxahexadecan-1-ol	
Registration number (REACH)	---
Index	---
EINECS, ELINCS, NLP	216-322-1
CAS	1559-34-8
content %	1-10

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Classification according to Regulation (EC) 1272/2008 (CLP)	Eye Irrit. 2, H319
Diethylene glycol	
Registration number (REACH)	01-2119457857-21-XXXX
Index	603-140-00-6
EINECS, ELINCS, NLP	203-872-2
CAS	111-46-6
content %	1-<10
Classification according to Regulation (EC) 1272/2008 (CLP)	Acute Tox. 4, H302 STOT RE 2, H373 (kidneys) (oral)
2-(2-butoxyethoxy)ethanol	Substance for which an EU exposure limit value applies.
Registration number (REACH)	01-2119475104-44-XXXX
Index	603-096-00-8
EINECS, ELINCS, NLP	203-961-6
CAS	112-34-5
content %	1-5
Classification according to Regulation (EC) 1272/2008 (CLP)	Eye Irrit. 2, H319
2-(2-methoxyethoxy)ethanol	Substance for which an EU exposure limit value applies.
Registration number (REACH)	01-2119475100-52-XXXX
Index	603-107-00-6
EINECS, ELINCS, NLP	203-906-6
CAS	111-77-3
content %	0,1-<1
Classification according to Regulation (EC) 1272/2008 (CLP)	Repr. 2, H361d

For the text of the H-phrases and classification codes (GHS/CLP), see Section 16.

The substances named in this section are given with their actual, appropriate classification!

For substances that are listed in appendix VI, table 3.1 of the regulation (EC) no. 1272/2008 (CLP regulation) this means that all notes that may be given here for the named classification have been taken into account.

SECTION 4: First aid measures

4.1 Description of first aid measures

First-aiders should ensure they are protected!

Never pour anything into the mouth of an unconscious person!

Inhalation

Remove person from danger area.

Supply person with fresh air and consult doctor according to symptoms.

Skin contact

Remove polluted, soaked clothing immediately, wash thoroughly with plenty of water and soap, in case of irritation of the skin (flare), consult a doctor.

Eye contact

Remove contact lenses.

Wash thoroughly for several minutes using copious water. Seek medical help if necessary.

Ingestion

Rinse the mouth thoroughly with water.

Do not induce vomiting - give copious water to drink. Consult doctor immediately.

4.2 Most important symptoms and effects, both acute and delayed

If applicable delayed symptoms and effects can be found in section 11 and the absorption route in section 4.1.

In certain cases, the symptoms of poisoning may only appear after an extended period / after several hours.

The following may occur:

Product removes fat.

Dermatitis (skin inflammation)

In aerosol misting:

Irritation of the respiratory tract

Ingestion of large quantities:

Kidney damage

Coma

Death

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4.3 Indication of any immediate medical attention and special treatment needed

Symptomatic treatment.
Antidote:
None known

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

Water jet spray / alcohol resistant foam / CO₂ / dry extinguisher.

Unsuitable extinguishing media

High volume water jet

5.2 Special hazards arising from the substance or mixture

In case of fire the following can develop:
Oxides of carbon
Toxic gases

5.3 Advice for firefighters

In case of fire and/or explosion do not breathe fumes.
Protective respirator with independent air supply.
Full protection, if necessary.
Cool container at risk with water.
Dispose of contaminated extinction water according to official regulations.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Ensure sufficient supply of air.
Avoid contact with eyes or skin.
If applicable, caution - risk of slipping.

6.2 Environmental precautions

If leakage occurs, dam up.
Resolve leaks if this possible without risk.
Prevent from entering drainage system.
Prevent surface and ground-water infiltration, as well as ground penetration.
If accidental entry into drainage system occurs, inform responsible authorities.

6.3 Methods and material for containment and cleaning up

Soak up with absorbent material (e.g. sand, earth) and dispose of according to Section 13.
Flush residue using copious water.

6.4 Reference to other sections

For personal protective equipment see Section 8 and for disposal instructions see Section 13.

SECTION 7: Handling and storage

In addition to information given in this section, relevant information can also be found in section 8 and 6.1.

7.1 Precautions for safe handling

7.1.1 General recommendations

Ensure good ventilation.
Avoid aerosol formation.
Avoid contact with eyes.
Avoid long lasting or intensive contact with skin.
Eating, drinking, smoking, as well as food-storage, is prohibited in work-room.
Observe directions on label and instructions for use.
Use working methods according to operating instructions.

7.1.2 Notes on general hygiene measures at the workplace

General hygiene measures for the handling of chemicals are applicable.
Wash hands before breaks and at end of work.
Keep away from food, drink and animal feedingstuffs.

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Remove contaminated clothing and protective equipment before entering areas in which food is consumed.

7.2 Conditions for safe storage, including any incompatibilities

Keep out of access to unauthorised individuals.
 Not to be stored in gangways or stair wells.
 Store product closed and only in original packing.
 Protect against moisture and store closed.
 Store in a well ventilated place.

7.3 Specific end use(s)

No information available at present.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Chemical Name	Diethylene glycol	Content %:1-<10
WEL-TWA: 23 ppm (101 mg/m ³)	WEL-STEL: ---	---
Monitoring procedures:	- Draeger - Alcohol 100/a (CH 29 701)	
BMGV: ---	Other information: ---	
Chemical Name	2-(2-butoxyethoxy)ethanol	Content %:1-5
WEL-TWA: 10 ppm (67,5 mg/m ³) (WEL, EU)	WEL-STEL: 15 ppm (101,2 mg/m ³) (WEL, EU)	---
Monitoring procedures:	---	
BMGV: ---	Other information: ---	
Chemical Name	2-(2-methoxyethoxy)ethanol	Content %:0,1-<1
WEL-TWA: 10 ppm (50,1 mg/m ³) (WEL, EU)	WEL-STEL: ---	---
Monitoring procedures:	---	
BMGV: ---	Other information: Sk (WEL, EU)	

2-[2-(2-butoxyethoxy)ethoxy]ethanol						
Area of application	Exposure route / Environmental compartment	Effect on health	Descriptor	Value	Unit	Note
	Environment - freshwater		PNEC	1,5	mg/l	
	Environment - marine		PNEC	0,15	mg/l	
	Environment - sediment, marine		PNEC	0,13	mg/kg dw	
	Environment - sediment, freshwater		PNEC	5,77	mg/kg dw	
	Environment - soil		PNEC	0,45	mg/kg dw	
	Environment - sewage treatment plant		PNEC	200	mg/l	
	Environment - water, sporadic (intermittent) release		PNEC	5	mg/l	
Consumer	Human - dermal	Long term, systemic effects	DNEL	25	mg/kg bw/day	
Consumer	Human - inhalation	Long term, systemic effects	DNEL	117	mg/m ³	
Consumer	Human - oral	Long term, systemic effects	DNEL	2,5	mg/kg bw/day	
Workers / employees	Human - dermal	Long term, systemic effects	DNEL	50	mg/kg bw/day	
Workers / employees	Human - inhalation	Long term, systemic effects	DNEL	195	mg/m ³	

Diethylene glycol						
Area of application	Exposure route / Environmental compartment	Effect on health	Descriptor	Value	Unit	Note
	Environment - freshwater		PNEC	10	mg/l	

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	Environment - marine		PNEC	1	mg/l	
	Environment - sediment, freshwater		PNEC	20,9	mg/kg	
	Environment - soil		PNEC	1,53	mg/kg	
	Environment - sewage treatment plant		PNEC	199,5	mg/l	
	Environment - water, sporadic (intermittent) release		PNEC	10	mg/l	
	Environment - sediment, marine		PNEC	2,09	mg/kg dry weight	
Consumer	Human - dermal	Long term, systemic effects	DNEL	21	mg/kg	
Consumer	Human - inhalation	Long term, systemic effects	DNEL	12	mg/m3	
Workers / employees	Human - dermal	Long term, systemic effects	DNEL	43	mg/kg	
Workers / employees	Human - inhalation	Long term, systemic effects	DNEL	44	mg/m3	

2-(2-butoxyethoxy)ethanol						
Area of application	Exposure route / Environmental compartment	Effect on health	Descriptor	Value	Unit	Note
	Environment - freshwater		PNEC	1,1	mg/l	
	Environment - marine		PNEC	0,11	mg/l	
	Environment - water, sporadic (intermittent) release		PNEC	11	mg/l	
	Environment - sediment, freshwater		PNEC	4,4	mg/kg	
	Environment - sediment, marine		PNEC	0,44	mg/kg	
	Environment - soil		PNEC	0,32	mg/kg	
	Environment - sewage treatment plant		PNEC	200	mg/l	
	Environment - oral (animal feed)		PNEC	56	mg/kg	
Consumer	Human - inhalation	Short term, local effects	DNEL	60,7	mg/m3	
Consumer	Human - dermal	Long term, systemic effects	DNEL	50	mg/kg bw/d	
Consumer	Human - inhalation	Long term, systemic effects	DNEL	40,5	mg/m3	
Consumer	Human - oral	Long term, systemic effects	DNEL	5	mg/kg bw/d	
Consumer	Human - inhalation	Long term, local effects	DNEL	40,5	mg/m3	
Workers / employees	Human - oral	Long term, local effects	DNEL	67,5	mg/m3	
Workers / employees	Human - dermal	Short term, systemic effects	DNEL	89	mg/kg bw/d	
Workers / employees	Human - dermal	Long term, systemic effects	DNEL	83	mg/kg bw/d	
Workers / employees	Human - inhalation	Short term, local effects	DNEL	101,2	mg/m3	
Workers / employees	Human - inhalation	Long term, systemic effects	DNEL	67,5	mg/m3	

2-(2-methoxyethoxy)ethanol						
Area of application	Exposure route / Environmental compartment	Effect on health	Descriptor	Value	Unit	Note
	Environment - freshwater		PNEC	12	mg/l	

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	Environment - marine		PNEC	1,2	mg/l	
	Environment - water, sporadic (intermittent) release		PNEC	12	mg/l	
	Environment - sediment, freshwater		PNEC	44,4	mg/kg dw	
	Environment - sediment, marine		PNEC	0,44	mg/l	
	Environment - soil		PNEC	2,1	mg/kg dw	
	Environment - sewage treatment plant		PNEC	10000	mg/l	
	Environment - oral (animal feed)		PNEC	0,09	g/kg feed	
Consumer	Human - dermal	Long term, systemic effects	DNEL	0,27	mg/kg bw/day	
Consumer	Human - inhalation	Long term, systemic effects	DNEL	25	mg/m ³	
Consumer	Human - oral	Long term, systemic effects	DNEL	1,5	mg/kg bw/day	
Workers / employees	Human - dermal	Long term, systemic effects	DNEL	0,53	mg/kg bw/day	
Workers / employees	Human - inhalation	Long term, systemic effects	DNEL	50,1	mg/m ³	

2,2'-(ethylenedioxy)diethanol

Area of application	Exposure route / Environmental compartment	Effect on health	Descriptor	Value	Unit	Note
	Environment - freshwater		PNEC	10	mg/l	
	Environment - marine		PNEC	1	mg/l	
	Environment - sediment, freshwater		PNEC	46	mg/kg dw	
	Environment - soil		PNEC	3,32	mg/kg dw	
	Environment - sewage treatment plant		PNEC	10	mg/l	
	Environment - water		PNEC	10	mg/l	
	Environment - sediment, marine		PNEC	4,6	mg/l	
Consumer	Human - dermal	Long term, systemic effects	DNEL	20	mg/kg bw/day	
Consumer	Human - inhalation	Long term, local effects	DNEL	25	mg/m ³	
Workers / employees	Human - dermal	Long term, systemic effects	DNEL	40	mg/kg bw/day	
Workers / employees	Human - inhalation	Long term, local effects	DNEL	50	mg/m ³	

2-(2-(2-methoxyethoxy)ethoxy)ethanol

Area of application	Exposure route / Environmental compartment	Effect on health	Descriptor	Value	Unit	Note
	Environment - freshwater		PNEC	10	mg/l	
	Environment - marine		PNEC	1	mg/l	
	Environment - water, sporadic (intermittent) release		PNEC	50	mg/l	
	Environment - sediment, freshwater		PNEC	36,6	mg/kg dw	
	Environment - marine		PNEC	0,8	mg/kg dw	
	Environment - soil		PNEC	1,73	mg/kg dw	
	Environment - sewage treatment plant		PNEC	200	mg/l	
	Environment - oral (animal feed)		PNEC	89	mg/kg feed	

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Consumer	Human - dermal	Long term, systemic effects	DNEL	20	mg/kg bw/d	
Consumer	Human - inhalation	Long term, systemic effects	DNEL	93	mg/m3	
Consumer	Human - oral	Long term, systemic effects	DNEL	2	mg/kg bw/d	
Workers / employees	Human - dermal	Long term, systemic effects	DNEL	40	mg/kg bw/d	
Workers / employees	Human - inhalation	Long term, systemic effects	DNEL	156	mg/m3	

WEL-TWA = Workplace Exposure Limit - Long-term exposure limit (8-hour TWA (= time weighted average) reference period) EH40. AGW = "Arbeitsplatzgrenzwert" (workplace limit value, Germany).
 (8) = Inhalable fraction (Directive 2017/164/EU, Directive 2004/37/CE). (9) = Respirable fraction (Directive 2017/164/EU, Directive 2004/37/CE).
 (11) = Inhalable fraction (Directive 2004/37/CE). (12) = Inhalable fraction. Respirable fraction in those Member States that implement, on the date of the entry into force of this Directive, a biomonitoring system with a biological limit value not exceeding 0,002 mg Cd/g creatinine in urine (Directive 2004/37/CE). | WEL-STEL = Workplace Exposure Limit - Short-term exposure limit (15-minute reference period).
 (8) = Inhalable fraction (2017/164/EU, 2017/2398/EU). (9) = Respirable fraction (2017/164/EU, 2017/2398/EU). (10) = Short-term exposure limit value in relation to a reference period of 1 minute (2017/164/EU). | BMGV = Biological monitoring guidance value EH40. BGW = "Biologischer Grenzwert" (biological limit value, Germany) | Other information: Sen = Capable of causing occupational asthma. Sk = Can be absorbed through skin. Carc = Capable of causing cancer and/or heritable genetic damage.
 ** = The exposure limit for this substance is repealed through the TRGS 900 (Germany) of January 2006 with the goal of revision.
 (13) = The substance can cause sensitisation of the skin and of the respiratory tract (Directive 2004/37/CE), (14) = The substance can cause sensitisation of the skin (Directive 2004/37/CE).

8.2 Exposure controls

8.2.1 Appropriate engineering controls

Ensure good ventilation. This can be achieved by local suction or general air extraction.
 If this is insufficient to maintain the concentration under the WEL or AGW values, suitable breathing protection should be worn.
 Applies only if maximum permissible exposure values are listed here.
 Suitable assessment methods for reviewing the effectiveness of protection measures adopted include metrological and non-metrological investigative techniques.
 These are specified by e.g. EN 14042.
 EN 14042 "Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents".

8.2.2 Individual protection measures, such as personal protective equipment

General hygiene measures for the handling of chemicals are applicable.
 Wash hands before breaks and at end of work.
 Keep away from food, drink and animal feedingstuffs.
 Remove contaminated clothing and protective equipment before entering areas in which food is consumed.

Eye/face protection:
 Tight fitting protective goggles (EN 166) with side protection, with danger of splashes.

Skin protection - Hand protection:
 Chemical resistant protective gloves (EN 374).
 Recommended
 Protective gloves in butyl rubber (EN 374).
 Protective gloves made of natural rubber latex (EN 374).
 Protective nitrile gloves (EN 374).
 Protective PVC gloves (EN 374).
 Minimum layer thickness in mm:

>= 0,5

Permeation time (penetration time) in minutes:

>= 480

The breakthrough times determined in accordance with EN 16523-1 were not obtained under practical conditions.

The recommended maximum wearing time is 50% of breakthrough time.

Protective hand cream recommended.

Skin protection - Other:

Protective working garments (e.g. safety shoes EN ISO 20345, long-sleeved protective working garments).

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Respiratory protection:
 Normally not necessary.
 If fumes build up, use suitable breathing mask.
 Filter A2 P2 (EN 14387), code colour brown, white
 Observe wearing time limitations for respiratory protection equipment.

Thermal hazards:
 Not applicable

Additional information on hand protection - No tests have been performed.
 In the case of mixtures, the selection has been made according to the knowledge available and the information about the contents.
 Selection of materials derived from glove manufacturer's indications.
 Final selection of glove material must be made taking the breakthrough times, permeation rates and degradation into account.
 Selection of a suitable glove depends not only on the material but also on other quality characteristics and varies from manufacturer to manufacturer.
 In the case of mixtures, the resistance of glove materials cannot be predicted and must therefore be tested before use.
 The exact breakthrough time of the glove material can be requested from the protective glove manufacturer and must be observed.

8.2.3 Environmental exposure controls

No information available at present.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state:	Liquid
Colour:	Colourless, Amber, Clear
Odour:	Mild
Odour threshold:	Not determined
pH-value:	7-11,5 (SAE J 1703)
Melting point/freezing point:	Not determined
Initial boiling point and boiling range:	>260 °C (SAE J 1703)
Flash point:	>100 °C (IP 35 (Pensky-Martens, open cup))
Evaporation rate:	Not determined
Flammability (solid, gas):	Not determined
Lower explosive limit:	Not determined
Upper explosive limit:	Not determined
Vapour pressure:	<2 mbar (20°C)
Vapour density (air = 1):	n.a.
Density:	1,02-1,07 g/ml (20°C, DIN 51757)
Bulk density:	Not determined
Solubility(ies):	Ethanol
Water solubility:	Mixable
Partition coefficient (n-octanol/water):	<2 (OECD 117 (Partition Coefficient (n-octanol/water) - HPLC method))
Auto-ignition temperature:	>300 °C (ASTM D 286)
Decomposition temperature:	>300 °C
Viscosity:	5-10 cSt (20°C, ASTM D 445)
Explosive properties:	Product is not explosive.
Oxidising properties:	No

9.2 Other information

Miscibility:	Not determined
Fat solubility / solvent:	Not determined
Conductivity:	Not determined
Surface tension:	Not determined
Solvents content:	Not determined

SECTION 10: Stability and reactivity

10.1 Reactivity

The product has not been tested.

10.2 Chemical stability

Stable with proper storage and handling.

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10.3 Possibility of hazardous reactions

No dangerous reactions are known.

10.4 Conditions to avoid

See also section 7.

Strong heat

Protect from humidity.

Product is hygroscopic.

10.5 Incompatible materials

See also section 7.

Avoid contact with strong oxidizing agents.

Carefully avoid contamination of the product with foreign substances.

10.6 Hazardous decomposition products

See also section 5.2

No decomposition when used as directed.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Possibly more information on health effects, see Section 2.1 (classification).

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Toxicity / effect	Endpoint	Value	Unit	Organism	Test method	Notes
Acute toxicity, by oral route:	LD50	> 5000	mg/kg	Rat		
Acute toxicity, by dermal route:	LD50	> 3000	mg/kg	Rabbit		
Acute toxicity, by inhalation:						n.d.a.
Skin corrosion/irritation:					OECD 404 (Acute Dermal Irritation/Corrosion)	Not irritant
Serious eye damage/irritation:					OECD 405 (Acute Eye Irritation/Corrosion)	Eye Irrit. 2
Respiratory or skin sensitisation:						n.d.a.
Germ cell mutagenicity:						n.d.a.
Carcinogenicity:						n.d.a.
Reproductive toxicity:						n.d.a.
Specific target organ toxicity - single exposure (STOT-SE):						n.d.a.
Specific target organ toxicity - repeated exposure (STOT-RE):						n.d.a.
Aspiration hazard:						n.d.a.
Symptoms:						n.d.a.

2-[2-(2-butoxyethoxy)ethoxy]ethanol						
Toxicity / effect	Endpoint	Value	Unit	Organism	Test method	Notes
Acute toxicity, by oral route:	LD50	5100-6616	mg/kg	Rat		
Acute toxicity, by dermal route:	LD50	>2000-6540	mg/kg	Rabbit		
Skin corrosion/irritation:						Not irritant
Serious eye damage/irritation:						Eye Dam. 1
Germ cell mutagenicity:					OECD 471 (Bacterial Reverse Mutation Test)	Negative
Aspiration hazard:						No
Symptoms:						cornea opacity, mucous membrane irritation

Diethylene glycol						
Toxicity / effect	Endpoint	Value	Unit	Organism	Test method	Notes
Acute toxicity, by oral route:				Human being		Harmful
Acute toxicity, by dermal route:	LD50	13300	mg/kg	Rabbit		Analogous conclusion

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Acute toxicity, by inhalation:	LC50	>4,6	mg/l/4h	Rat		Expert judgement, Dust, Mist
Skin corrosion/irritation:				Rabbit	(Draize-Test)	Not irritant
Serious eye damage/irritation:				Rabbit		Not irritant
Respiratory or skin sensitisation:				Guinea pig	Regulation (EC) 440/2008 B.6 (SKIN SENSITISATION)	No (skin contact)
Germ cell mutagenicity:				Mouse	OECD 474 (Mammalian Erythrocyte Micronucleus Test)	Negative
Germ cell mutagenicity:				Salmonella typhimurium	OECD 471 (Bacterial Reverse Mutation Test)	Negative
Carcinogenicity:				Mouse		Negative
Reproductive toxicity:				Rabbit	OECD 414 (Prenatal Developmental Toxicity Study)	No indications of such an effect.
Symptoms:						acidosis, breathing difficulties, unconsciousness, diarrhoea, coughing, cramps, fatigue, mucous membrane irritation, dizziness, nausea and vomiting., trembling
Specific target organ toxicity - repeated exposure (STOT-RE), oral:						Target organ(s): kidneys

2-(2-butoxyethoxy)ethanol						
Toxicity / effect	Endpoint	Value	Unit	Organism	Test method	Notes
Acute toxicity, by oral route:	LD50	>5000	mg/kg	Rat	OECD 401 (Acute Oral Toxicity)	
Acute toxicity, by dermal route:	LD50	2764	mg/kg	Rabbit	OECD 402 (Acute Dermal Toxicity)	
Skin corrosion/irritation:				Rabbit	OECD 404 (Acute Dermal Irritation/Corrosion)	Not irritant
Serious eye damage/irritation:				Rabbit	OECD 405 (Acute Eye Irritation/Corrosion)	Eye Irrit. 2
Respiratory or skin sensitisation:				Guinea pig	OECD 406 (Skin Sensitisation)	No (skin contact)
Germ cell mutagenicity:					OECD 471 (Bacterial Reverse Mutation Test)	Negative
Germ cell mutagenicity:					OECD 473 (In Vitro Mammalian Chromosome Aberration Test)	Negative
Germ cell mutagenicity:					OECD 475 (Mammalian Bone Marrow Chromosome Aberration Test)	Negative
Germ cell mutagenicity:					OECD 476 (In Vitro Mammalian Cell Gene Mutation Test)	Negative
Reproductive toxicity:		1000	mg/kg	Rat	OECD 414 (Prenatal Developmental Toxicity Study)	Negative, Analogous conclusion

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Aspiration hazard:						No
Symptoms:						breathing difficulties, respiratory distress, diarrhoea, coughing, mucous membrane irritation, dizziness, watering eyes, nausea
Specific target organ toxicity - repeated exposure (STOT-RE), oral:	NOAEL	250	mg/kg	Rat		
Specific target organ toxicity - repeated exposure (STOT-RE), dermal:	NOAEL	>2000	mg/kg	Rat		
Specific target organ toxicity - repeated exposure (STOT-RE), inhalat.:	NOAEL	14	ppm	Rat		Vapours

2-(2-methoxyethoxy)ethanol

Toxicity / effect	Endpoint	Value	Unit	Organism	Test method	Notes
Acute toxicity, by oral route:	LD50	9210	mg/kg	Rat		
Acute toxicity, by oral route:	LD50	7128	mg/kg	Mouse	OECD 401 (Acute Oral Toxicity)	male
Acute toxicity, by dermal route:	LD50	9404	mg/kg	Rabbit	OECD 402 (Acute Dermal Toxicity)	male
Acute toxicity, by dermal route:	LD50	6500	mg/kg	Rabbit		
Symptoms:						breathing difficulties, respiratory distress, heart/circulatory disorders, coughing, headaches, gastrointestinal disturbances, mucous membrane irritation, dizziness, nausea

SECTION 12: Ecological information

Possibly more information on environmental effects, see Section 2.1 (classification).

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Toxicity / effect	Endpoint	Time	Value	Unit	Organism	Test method	Notes
12.1. Toxicity to fish:	LC50	96h	> 100	mg/l	Oncorhynchus mykiss		
12.1. Toxicity to daphnia:							n.d.a.
12.1. Toxicity to algae:							n.d.a.
12.2. Persistence and degradability:		21d	100	%		OECD 302 B (Inherent Biodegradability - Zahn-Wellens/EMPA Test)	

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12.3. Bioaccumulative potential:							Not accepted owing to the logP values of the components.
12.4. Mobility in soil:							n.d.a.
12.5. Results of PBT and vPvB assessment							n.d.a.
12.6. Other adverse effects:							n.d.a.

2-[2-(2-butoxyethoxy)ethoxy]ethanol							
Toxicity / effect	Endpoint	Time	Value	Unit	Organism	Test method	Notes
12.5. Results of PBT and vPvB assessment							No PBT substance, No vPvB substance
12.1. Toxicity to fish:	LC50	96h	1305-4600	mg/l	Leuciscus idus		
12.1. Toxicity to fish:	LC50	96h	1350-2400	mg/l	Pimephales promelas		
12.1. Toxicity to daphnia:	EC50	48h	500-2802	mg/l	Daphnia magna		
12.1. Toxicity to algae:	EC50	72h	>500	mg/l	Scenedesmus subspicatus		
12.2. Persistence and degradability:		14d	88	%		OECD 301 E (Ready Biodegradability - Modified OECD Screening Test)	

Diethylene glycol							
Toxicity / effect	Endpoint	Time	Value	Unit	Organism	Test method	Notes
12.5. Results of PBT and vPvB assessment							No PBT substance, No vPvB substance
12.1. Toxicity to fish:	LC50	96h	75200	mg/l	Pimephales promelas		
12.1. Toxicity to fish:	LC50	96h	>32000	mg/l	Gambusia affinis		
12.1. Toxicity to daphnia:	EC50	24h	>10000	mg/l	Daphnia magna	DIN 38412 T.11	
12.1. Toxicity to algae:	NOEC/NOEL	72h	100	mg/l	Scenedesmus quadricauda		References
12.2. Persistence and degradability:	DOC	28d	90-100	%		OECD 301 A (Ready Biodegradability - DOC Die-Away Test)	Readily biodegradable
12.3. Bioaccumulative potential:	BCF	3d	100				
Toxicity to bacteria:	EC20	30min	1995	mg/l	Pseudomonas putida	ISO 8192	References

2-(2-butoxyethoxy)ethanol							
Toxicity / effect	Endpoint	Time	Value	Unit	Organism	Test method	Notes
12.1. Toxicity to algae:	NOEC/NOEL	96h	>100	mg/l	Desmodesmus subspicatus	OECD 201 (Alga, Growth Inhibition Test)	
12.1. Toxicity to daphnia:	NOEC/NOEL	48h	>=100	mg/l	Daphnia magna	OECD 202 (Daphnia sp. Acute Immobilisation Test)	

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Toxicity to bacteria:	EC10	30min	>1995	mg/l	activated sludge	OECD 209 (Activated Sludge, Respiration Inhibition Test (Carbon and Ammonium Oxidation))	
12.1. Toxicity to fish:	LC50	96h	1300	mg/l	Lepomis macrochirus	OECD 203 (Fish, Acute Toxicity Test)	
12.1. Toxicity to daphnia:	EC50	48h	>100	mg/l	Daphnia magna	OECD 202 (Daphnia sp. Acute Immobilisation Test)	
12.2. Persistence and degradability:		28d	76	%		OECD 301 D (Ready Biodegradability - Closed Bottle Test)	
12.2. Persistence and degradability:		28d	100	%	activated sludge	OECD 302 B (Inherent Biodegradability - Zahn-Wellens/EMPA Test)	Readily biodegradable
12.3. Bioaccumulative potential:	Log Pow		1			OECD 117 (Partition Coefficient (n-octanol/water) - HPLC method)	Slight
12.5. Results of PBT and vPvB assessment							No PBT substance, No vPvB substance
Other information:							Does not contain any organically bound halogens which can contribute to the AOX value in waste water.

2-(2-methoxyethoxy)ethanol							
Toxicity / effect	Endpoint	Time	Value	Unit	Organism	Test method	Notes
12.1. Toxicity to daphnia:	EC50	48h	1192	mg/l	Daphnia magna		
12.2. Persistence and degradability:		28d	100	%		OECD 301 B (Ready Biodegradability - Co2 Evolution Test)	
12.1. Toxicity to fish:	LC50	24h	>5000	mg/l	Leuciscus idus		
12.1. Toxicity to algae:	EC50	72h	>500	mg/l	Scenedesmus subspicatus		
12.1. Toxicity to algae:	EC50	96h	>1000	mg/l	Pseudokirchneriella subcapitata	OECD 201 (Alga, Growth Inhibition Test)	

SECTION 13: Disposal considerations

13.1 Waste treatment methods

For the substance / mixture / residual amounts

EC disposal code no.:

The waste codes are recommendations based on the scheduled use of this product.

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Owing to the user's specific conditions for use and disposal, other waste codes may be allocated under certain circumstances. (2014/955/EU)

16 01 13 brake fluids

Recommendation:

Sewage disposal shall be discouraged.
 Pay attention to local and national official regulations.
 E.g. dispose at suitable refuse site.
 E.g. suitable incineration plant.

For contaminated packing material

Pay attention to local and national official regulations.
 Empty container completely.
 Uncontaminated packaging can be recycled.
 Dispose of packaging that cannot be cleaned in the same manner as the substance.

SECTION 14: Transport information

General statements

14.1. UN number: n.a.

Transport by road/by rail (ADR/RID)

14.2. UN proper shipping name:
 14.3. Transport hazard class(es): n.a.
 14.4. Packing group: n.a.
 Classification code: n.a.
 LQ: n.a.
 14.5. Environmental hazards: Not applicable
 Tunnel restriction code:

Transport by sea (IMDG-code)

14.2. UN proper shipping name:
 14.3. Transport hazard class(es): n.a.
 14.4. Packing group: n.a.
 Marine Pollutant: n.a.
 14.5. Environmental hazards: Not applicable

Transport by air (IATA)

14.2. UN proper shipping name:
 14.3. Transport hazard class(es): n.a.
 14.4. Packing group: n.a.
 14.5. Environmental hazards: Not applicable

14.6. Special precautions for user

Unless specified otherwise, general measures for safe transport must be followed.

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

Non-dangerous material according to Transport Regulations.

SECTION 15: Regulatory information

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

Observe restrictions:

Comply with national regulations/laws governing maternity protection (national implementation of the Directive 92/85/EEC)!

Regulation (EC) No 1907/2006, Annex XVII

2-(2-butoxyethoxy)ethanol

2-(2-methoxyethoxy)ethanol

This product is regulated by Regulation (EU) 2019/1148. All suspicious transactions, and significant disappearances and thefts should be reported to the relevant national contact point.

For exceptions, see Regulation (EU) 2019/1148 and the guidelines for implementing Regulation (EU) 2019/1148.

Comply with trade association/occupational health regulations.

Directive 2010/75/EU (VOC): 0,35 %

15.2 Chemical safety assessment

A chemical safety assessment is not provided for mixtures.

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SECTION 16: Other information

Revised sections: 15
 These details refer to the product as it is delivered.
 Employee instruction/training in handling hazardous materials is required.

Classification and processes used to derive the classification of the mixture in accordance with the ordinance (EG) 1272/2008 (CLP):

Classification in accordance with regulation (EC) No. 1272/2008 (CLP)	Evaluation method used
Eye Irrit. 2, H319	Classification based on toxicological analyses.

The following phrases represent the posted Hazard Class and Risk Category Code (GHS/CLP) of the product and the constituents (specified in Section 2 and 3).

H361d Suspected of damaging the unborn child.
 H373 May cause damage to organs through prolonged or repeated exposure if swallowed.
 H302 Harmful if swallowed.
 H318 Causes serious eye damage.
 H319 Causes serious eye irritation.

Eye Irrit. — Eye irritation
 Eye Dam. — Serious eye damage
 Acute Tox. — Acute toxicity - oral
 STOT RE — Specific target organ toxicity - repeated exposure
 Repr. — Reproductive toxicity

Any abbreviations and acronyms used in this document:

acc., acc. to according, according to
 ADR Accord européen relatif au transport international des marchandises Dangereuses par Route (= European Agreement concerning the International Carriage of Dangerous Goods by Road)
 AOX Adsorbable organic halogen compounds
 approx. approximately
 Art., Art. no. Article number
 ASTM ASTM International (American Society for Testing and Materials)
 ATE Acute Toxicity Estimate
 BAM Bundesanstalt für Materialforschung und -prüfung (Federal Institute for Materials Research and Testing, Germany)
 BAuA Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (= Federal Institute for Occupational Health and Safety, Germany)
 BSEF The International Bromine Council
 bw body weight
 CAS Chemical Abstracts Service
 CLP Classification, Labelling and Packaging (REGULATION (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures)
 CMR carcinogenic, mutagenic, reproductive toxic
 DMEL Derived Minimum Effect Level
 DNEL Derived No Effect Level
 dw dry weight
 e.g. for example (abbreviation of Latin 'exempli gratia'), for instance
 EC European Community
 ECHA European Chemicals Agency
 EEC European Economic Community
 EINECS European Inventory of Existing Commercial Chemical Substances
 ELINCS European List of Notified Chemical Substances
 EN European Norms
 EPA United States Environmental Protection Agency (United States of America)
 etc. et cetera
 EU European Union
 EVAL Ethylene-vinyl alcohol copolymer

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Fax. Fax number
gen. general
GHS Globally Harmonized System of Classification and Labelling of Chemicals
GWP Global warming potential
IARC International Agency for Research on Cancer
IATA International Air Transport Association
IBC (Code) International Bulk Chemical (Code)
IMDG-code International Maritime Code for Dangerous Goods
incl. including, inclusive
IUCLID International Uniform Chemical Information Database
IUPAC International Union for Pure Applied Chemistry
LC50 Lethal Concentration to 50 % of a test population
LD50 Lethal Dose to 50% of a test population (Median Lethal Dose)
LQ Limited Quantities
MARPOL International Convention for the Prevention of Marine Pollution from Ships
n.a. not applicable
n.av. not available
n.c. not checked
n.d.a. no data available
OECD Organisation for Economic Co-operation and Development
org. organic
PBT persistent, bioaccumulative and toxic
PE Polyethylene
PNEC Predicted No Effect Concentration
ppm parts per million
PVC Polyvinylchloride
REACH Registration, Evaluation, Authorisation and Restriction of Chemicals (REGULATION (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals)
REACH-IT List-No. 9xx-xxx-x No. is automatically assigned, e.g. to pre-registrations without a CAS No. or other numerical identifier. List Numbers do not have any legal significance, rather they are purely technical identifiers for processing a submission via REACH-IT.
RID Règlement concernant le transport International ferroviaire de marchandises Dangereuses (= Regulation concerning the International Carriage of Dangerous Goods by Rail)
SVHC Substances of Very High Concern
Tel. Telephone
UN RTDG United Nations Recommendations on the Transport of Dangerous Goods
VOC Volatile organic compounds
vPvB very persistent and very bioaccumulative
wwt wet weight

The statements made here should describe the product with regard to the necessary safety precautions - they are not meant to guarantee definite characteristics - but they are based on our present up-to-date knowledge.

No responsibility.

These statements were made by:

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