SAFETY DATA SHEET

Based upon Regulation (EC) No 1907/2006, as amended by Regulation (EU) No 2015/830

MPG - MPG USP

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

1.1. Product identifier

Product name : MPG - MPG USP
Synonyms : 1,2-propanediol; alpha-propylene glycol; monopropylene glycol; MPG; propane-1,2-diol
Registration number REACH : 01-2119456809-23-0006
Product type REACH : Substance/mono-constituent
CAS number : 57-55-6
EC number : 200-338-0
Molecular mass : 76.10 g/mol
Formula : C3H8O2

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

1.2.1 Relevant identified uses

Exposure scenario title	Exposure scenario group	Sector of use	Use descriptors (PROC or PC)	Use descriptors (ERC)
01 Manufacture of substance, or use as an intermediate or process chemical	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
02 Distribution of substance	Industrial	SU 8	PROC 1, PROC 2, PROC 3, PROC 4, PROC 8a, PROC 8b, PROC 9, PROC 15	ERC 1
	Industrial	SU 8	PROC 1, PROC 2, PROC 3, PROC 4, PROC 8a, PROC 8b, PROC 9, PROC 15	ERC 2
	Industrial	SU 9	PROC 1, PROC 2, PROC 3, PROC 4, PROC 8a, PROC 8b, PROC 9, PROC 15	ERC 1
	Industrial	SU 9	PROC 1, PROC 2, PROC 3, PROC 4, PROC 8a, PROC 8b, PROC 9, PROC 15	ERC 2
03 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 14, PROC 15	ERC 2
04 Use in coatings	Consumer		PC 1, PC 4, PC 9a, PC 9b, PC 9c, PC 18, PC 23, PC 24, PC 31	ERC 8a
	Consumer		PC 1, PC 4, PC 9a, PC 9b, PC 9c, PC 18, PC 23, PC 24, PC 31	ERC 8d
	Industrial		PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 7, PROC 8a, PROC 8b, PROC 9, PROC 10, PROC 13, PROC 15	ERC 4
	Professional		PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 8a, PROC 8b, PROC 9, 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 9, PROC 10, PROC 11, PROC 13, PROC 15, PROC 19	ERC 8d
05 Use in Cleaning Agents	Consumer		PC 3, PC 4, PC 9a, PC 9b, PC 9c, PC 24, PC 35	ERC 8a
	Consumer		PC 3, PC 4, PC 9a, PC 9b, PC 9c, PC 24, PC 35	ERC 8d
	Industrial		PROC 1, PROC 2, PROC 3, PROC 4, PROC 7, PROC 8a, PROC 8b, PROC 10, PROC 13	ERC 4
	Professional		PROC 1, PROC 2, PROC 3, PROC 4, PROC 8a, PROC 8b, PROC 9, PROC 10, PROC 11, PROC 13	ERC 8a
	Professional		PROC 1, PROC 2, PROC 3, PROC 4, PROC 8a, PROC 8b, PROC 9, PROC 10, PROC 11, PROC 13	ERC 8d

06 Use as binders and release agents	Industrial		PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 6, PROC 7, PROC 8b, PROC 9, PROC 10, PROC 12, PROC 13, PROC 14, PROC 15	ERC 4
	Professional		PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 6, PROC 8a, PROC 8b, PROC 9, PROC 10, PROC 11, PROC 13, PROC 14, PROC 19	ERC 8a
	Professional		PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 6, PROC 8a, PROC 8b, PROC 9, PROC 10, PROC 11, PROC 13, PROC 14, PROC 19	ERC 8d
07 Functional Fluids	Consumer		PC 16, PC 17	ERC 9a
	Consumer		PC 16, PC 17	ERC 9b
	Industrial		PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 8a, PROC 8b, PROC 9	ERC 7
	Professional		PROC 1, PROC 2, PROC 3, PROC 8a, PROC 9, PROC 20	ERC 9a
	Professional		PROC 1, PROC 2, PROC 3, PROC 8a, PROC 9, PROC 20	ERC 9b
08 Use as laboratory agent	Industrial		PROC 10, PROC 15	ERC 4
	Professional		PROC 10, PROC 15	ERC 8a
09 Production of polymers	Industrial		PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 6, PROC 8a, PROC 8b, PROC 14, PROC 21	ERC 3
	Industrial		PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 6, PROC 8a, PROC 8b, PROC 14, PROC 21	ERC 6c
10 Rubber production and processing	Industrial		PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 6, PROC 8a, PROC 8b, PROC 14, PROC 21	ERC 6d
11 Water treatment chemicals	Industrial		PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 8a, PROC 8b	ERC 4
	Professional		PROC 1, PROC 2, PROC 3, PROC 4, PROC 8b	ERC 8a
	Professional		PROC 1, PROC 2, PROC 3, PROC 4, PROC 8b	ERC 8b
	Professional		PROC 1, PROC 2, PROC 3, PROC 4, PROC 8b	ERC 8d
	Professional		PROC 1, PROC 2, PROC 3, PROC 4, PROC 8b	ERC 8e
12 Mining chemicals	Industrial		PROC 1, PROC 2, PROC 3, PROC 4, PROC 8b, PROC 9, PROC 10, PROC 23	ERC 4
13 Use in/as de-icing/anti-icing applications/agents	Consumer		PC 4	ERC 8d
	Professional		PROC 2, PROC 8b, PROC 11	ERC 8d
14 Agrochemical uses	Consumer		PC 12, PC 27	ERC 8d
	Professional		PROC 4, PROC 8a, PROC 8b, PROC 11, PROC 13	ERC 8a
	Professional		PROC 4, PROC 8a, PROC 8b, PROC 11, PROC 13	ERC 8d
15 Other Consumer Uses	Consumer		PC 28, PC 29, PC 39	ERC 8a
	Consumer		PC 28, PC 29, PC 39	ERC 8d

1.2.2 Uses advised against

Group	Uses advised against	Use descriptors (PC)	Environmental release category (ERC)	Article (AC)
Consumer	Use in e-cigarettes and artificial (theatrical) fogs	PC 0		
Professional	Use in e-cigarettes and artificial (theatrical) fogs	PC 0		

1.3. Details of the supplier of the safety data sheet

Supplier of the safety data sheet

INEOS N.V.
Haven 1053 - Nieuwe Weg 1
B-2070 Zwijndrecht
☎ +32 3 250 91 11
🖷 +32 3 252 84 33
reach.oxide.be@ineos.com

Manufacturer of the product

INEOS Manufactering Deutschland Gmbh
Alte Strasse 201
D-50769 Köln
☎ +49 221 35 55 22 22
🖷 +49 21 33 55 57 89

1.4. Emergency telephone number

24h/24h (Telephone advice: English, French, German, Dutch):

+32 14 58 45 45 (BIG)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

2.2. Label elements

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

2.3. Other hazards

No other hazards known

SECTION 3: Composition/information on ingredients

3.1. Substances

Name REACH Registration No	CAS No EC No	Conc. (C)	Classification according to CLP	Note	Remark
propane-1,2-diol 01-2119456809-23	57-55-6 200-338-0	C>99%		(2)	Mono-constituent

(2) Substance with a Community workplace exposure limit

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

General:

Check the vital functions. Unconscious: maintain adequate airway and respiration. Respiratory arrest: artificial respiration or oxygen. Cardiac arrest: perform resuscitation. Victim conscious with laboured breathing: half-seated. Victim in shock: on his back with legs slightly raised. Vomiting: prevent asphyxia/aspiration pneumonia. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain. Depending on the victim's condition: doctor/hospital. Alcohol consumption increases the toxicity.

After inhalation:

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

After skin contact:

Rinse with water. Do not apply (chemical) neutralizing agents. Take victim to a doctor if irritation persists.

After eye contact:

Rinse with water. Do not apply neutralizing agents. Take victim to an ophthalmologist if irritation persists.

After ingestion:

Rinse mouth with water. Consult a doctor/medical service if you feel unwell.

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

4.2.1 Acute symptoms

Cramps/uncontrolled muscular contractions

AFTER INGESTION OF HIGH QUANTITIES:

After inhalation:

EXPOSURE TO HIGH CONCENTRATIONS: Dry/sore throat.

After skin contact:

Slight irritation. ON CONTINUOUS EXPOSURE/CONTACT: Red skin. Dry skin.

After eye contact:

Redness of the eye tissue. Slight irritation.

After ingestion:

AFTER INGESTION OF HIGH QUANTITIES: Nausea. Abdominal pain.

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.

SECTION 5: Firefighting measures

5.1. Extinguishing media

5.1.1 Suitable extinguishing media:

Water spray. BC powder. Carbon dioxide. Preferably: alcohol resistant foam.

5.1.2 Unsuitable extinguishing media:

Container may slop over if solid jet (water/foam) is applied.

5.2. Special hazards arising from the substance or mixture

Upon combustion: CO and CO2 are formed.

5.3. Advice for firefighters

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.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

No naked flames.

6.1.1 Protective equipment for non-emergency personnel

See heading 8.2

6.1.2 Protective equipment for emergency responders

Gloves. Protective clothing.

Suitable protective clothing

See heading 8.2

6.2. Environmental precautions

Contain released product, pump into suitable containers. Plug the leak, cut off the supply.

6.3. Methods and material for containment and cleaning up

Take up liquid spill into a non combustible material e.g.: sand, earth, vermiculite. Scoop absorbed substance into closing containers. Clean contaminated surfaces with an excess of water. Wash clothing and equipment after handling.

6.4. Reference to other sections

See heading 13.

SECTION 7: Handling and storage

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

7.1. Precautions for safe handling

Keep away from naked flames/heat. At temperature > flashpoint: use spark-/explosionproof appliances. Finely divided: spark- and explosionproof appliances. Finely divided: 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.

7.2. Conditions for safe storage, including any incompatibilities

7.2.1 Safe storage requirements:

Store at ambient temperature. Keep out of direct sunlight. Store in a dry area. Ventilation at floor level. Meet the legal requirements.

7.2.2 Keep away from:

Heat sources, oxidizing agents, reducing agents, (strong) acids, water/moisture.

7.2.3 Suitable packaging material:

Stainless steel, carbon steel, aluminium, copper, bronze, nickel, steel with plastic inner lining.

7.2.4 Non suitable packaging material:

No data available

7.3. Specific end use(s)

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

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

8.1.1 Occupational exposure

a) Occupational exposure limit values

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

UK

Propane-1,2-diol particulates	Time-weighted average exposure limit 8 h (Workplace exposure limit (EH40/2005))	10 mg/m³
Propane-1,2-diol total vapour and particulates	Time-weighted average exposure limit 8 h (Workplace exposure limit (EH40/2005))	150 ppm
	Time-weighted average exposure limit 8 h (Workplace exposure limit (EH40/2005))	474 mg/m³

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
Propylene Glycol	NIOSH	5523
Propylene Glycol	OSHA	2051

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

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

8.1.4 DNEL/PNEC values

DNEL/DMEL - Workers

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Effect level (DNEL/DMEL)	Type	Value	Remark
DNEL	Long-term systemic effects inhalation	168 mg/m³	
	Long-term local effects inhalation	10 mg/m³	

DNEL/DMEL - General population

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Effect level (DNEL/DMEL)	Type	Value	Remark
DNEL	Long-term systemic effects inhalation	50 mg/m³	
	Long-term local effects inhalation	10 mg/m³	

PNEC

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Compartments	Value	Remark
Fresh water	260 mg/l	
Marine water	26 mg/l	
Aqua (intermittent releases)	183 mg/l	
Fresh water sediment	572 mg/kg sediment dw	
Marine water sediment	57.2 mg/kg sediment dw	
Soil	50 mg/kg soil dw	
STP	20000 mg/l	

8.1.5 Control banding

If applicable and available it will be listed below.

8.2. Exposure controls

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

8.2.1 Appropriate engineering controls

Keep away from naked flames/heat. At temperature > flashpoint: use spark-/explosionproof appliances. Finely divided: spark- and explosionproof appliances. Finely divided: 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.

8.2.2 Individual protection measures, such as personal protective equipment

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

a) Respiratory protection:

Respiratory protection not required in normal conditions.

b) Hand protection:

Gloves.

- materials (good resistance)

Butyl rubber, natural rubber, polyethylene, PVC, polyethylene/ethylenevinylalcohol.

c) Eye protection:

Safety glasses.

d) Skin protection:

Protective clothing.

8.2.3 Environmental exposure controls:

See headings 6.2, 6.3 and 13

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical form	Liquid
Odour	Almost odourless
Odour threshold	No data available
Colour	Colourless
Particle size	Not applicable
Explosion limits	No data available
Flammability	Non-flammable
Log Kow	-1.07 ; Test data ; Equivalent to OECD 107 ; 20.5 °C
Dynamic viscosity	0.0434 Pa.s ; 25 °C
Kinematic viscosity	Not determined
Melting point	< -20 °C ; Test data
Boiling point	184 °C ; 1003.2 hPa ; Test data
Flash point	104 °C ; Test data ; 1000.1 hPa
Evaporation rate	< 0.1 ; butyl acetate
Relative vapour density	2.6
Vapour pressure	0.2 hPa ; 20 °C ; Test data
Solubility	water ; Complete
	ethanol ; Complete
	acetone ; Complete
	ether ; 12 g/100 ml
Relative density	1.03 ; 20 °C ; Test data
Decomposition temperature	No data available
Auto-ignition temperature	> 400 °C ; Test data ; 1000.1 hPa - 1014 hPa
Explosive properties	No chemical group associated with explosive properties
Oxidising properties	No chemical group associated with oxidising properties
pH	6.5 - 7.5 ; 50 %

9.2. Other information

Specific conductivity	4.400 µS/m
Critical temperature	352 °C
Surface tension	0.0716 N/m ; 21.5 °C
Relative density saturated vapour/air mixture	1.0
Saturation concentration	0.54 g/m³
Absolute density	1038 kg/m³

SECTION 10: Stability and reactivity

10.1. Reactivity

Temperature above flashpoint: higher fire/explosion hazard.

10.2. Chemical stability

Hygroscopic.

10.3. Possibility of hazardous reactions

Reacts violently with (strong) oxidizers: (increased) risk of fire. Violent to explosive reaction with (strong) acids.

10.4. Conditions to avoid

Keep away from naked flames/heat. At temperature > flashpoint: use spark-/explosionproof appliances. Finely divided: spark- and explosionproof appliances. Finely divided: keep away from ignition sources/sparks.

10.5. Incompatible materials

Oxidizing agents, reducing agents, (strong) acids, water/moisture.

10.6. Hazardous decomposition products

Upon combustion: CO and CO2 are formed.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

11.1.1 Test results

- Toxicokinetics: summary

Oral absorption: Toxicokinetic behavior of monopropylene glycol and its structural homologue tripropylene glycol upon oral administration to rats was investigated in a well-conducted and well-reported study (The Dow Chemical Company, 1995). In this study, two groups of 5 male rats were administered a single oral dose of either radiolabeled (14C) tripropylene glycol or non-radiolabeled monopropylene glycol by gavage in water at target concentrations 40 mg/kg bw and 50 mg/kg bw, respectively. The excreta were collected for ca. 24 hours postdosing. After sacrifice 24 hours post-dosing the remaining radioactivity in tissues was determined for the first group and urine was analyzed for free and acid-abile conjugates of mono-, di- and tripropylene glycol for both groups. While the absorption of monopropylene glycol has not been specifically investigated in the study, the data on tripropylene glycol indicate that it is rapidly adsorbed if administered by gavage, based on the average recovery of ca. 91% of the 14C label administered from excreta, CO2, skin, tissues and carcass after ca. 24 hours postdosing sacrifice. The absorption of tripropylene glycol via oral route was calculated to amount to at least 86%, based on 5% of the administered dose recovered in faeces. As monopropylene glycol has a significantly lower molecular weight, its absorption from the gut is expected to occur even faster. Toxicokinetic behavior of monopropylene glycol in humans and experimental animals was also evaluated by the NTP CERHR expert panel (National Toxicology Program, 2004a), which concluded that available data indicate rapid and extensive absorption. Therefore a value of 100% for oral absorption shall be used for risk assessment for monopropylene glycol

Distribution: No data on the distribution of monopropylene glycol were reported in the study; however, in case of tripropylene glycol, approximately 10% of the radiolabeled dose was recovered in tissues and carcass, with the liver and kidney having the greatest amount of radiolabel per gram of tissue 24 hours after dosing (ca. 0.2 and 0.1%, respectively). The 14C concentration in blood was approximately 6.4 and 2.8 -fold lower than in liver and kidney, respectively. The expert panel of NTP CERHR (National Toxicology Program, 2004a) concluded that monopropylene glycol is rapidly distributed into total body water

Metabolism and excretion: In the study with rats administered monopropylene glycol and radiolabeled monopropylene glycol, the data on the animals indicate that approximately 11% of the monopropylene glycol administered was recovered in the urine as free monopropylene glycol (with < 1% of the dose recovered as acid-labile conjugates). In the study with radiolabeld tripropylene glycol, twenty-four hours after administration of a single oral dose of 40 mg/kg bw to male rats, only 5.8% of the dose was recovered as unmetabolized parent compound in the urine, while 7.2% was recovered as acid-labile conjugates of tripropylene glycol, 5.1% and 3.3% as free and acid-labile conjugates of dipropylene glycol and 3.3% and 0.6% as free and acid-labile conjugates of monopropylene glycol, respectively. A large fraction (21%) of the 14C-tripropylene glycol dose was catabolized all the way to 14CO2, indicating considerable breakdown of tripropylene glycol. According to the NTP CERHR expert panel report (National Toxicology Program, 2004a), the rate-determining step in the metabolism is alcohol dehydrogenase which, when saturated, switches from a first order process into a zero order process. Saturation of metabolism appears to occur in rats and rabbits at a dose of about 1600 to 2000 mg/kg bw, whereas in humans this seems to happen at a dose of about 200 mg/kg bw. In accordance with a
zero order process, the half-life of monopropylene glycol in humans and rats increases from about 1.5 hours to more than 5 hours with increasing doses above metabolic saturation. By a NAD-dependent reaction, alcohol dehydrogenase converts monopropylene glycol to lactaldehyde, which is further metabolized to lactate

Since monopropylene glycol has a chiral center, technical grade monopropylene glycol results in the formation of 50/50 D, L-lactate. L-lactate is indistinguishable from endogenous lactate, which is a good substrate for gluconeogenesis. D-lactate is less readily converted to glucose than L-lactate, which prolongs its half-life leading, under conditions of prolonged exposure, to D-lactic acidosis. It is difficult to cause L-lactic acidosis even with very high doses of monopropylene glycol because of its efficient detoxification via gluconeogenesis. The second reason for lack of development of L-lactic acidosis is the saturation of alcohol dehydrogenase, which results in a constant rate of lactate production. Due to removal of L-lactate by gluconeogenesis, a further increase in lactate levels is not possible after saturation of metabolism. The excretion of monopropylene glycol is species-dependent. Humans clear about 45% of monopropylene glycol via kidney, and in dogs, up to 88%. In rats and rabbits, very little of the parent compound is excreted by the kidney until saturation of metabolism occurs. Inhibition of alcohol dehydrogenase by pyrazole increases urinary excretion of monopropylene glycol to 75% in rats, as expected. Since monopropylene glycol has very low intrinsic toxicity, saturation of metabolism plays a protective role in its toxicity since the conversion of monopropylene glycol to the more toxic lactate (particularly D-lactate) is slowed

Inhalation route of exposure: Only limited data addressing the absorption of monopropylene glycol by inhalation are available. Bau et al. (1971) reported that less than 5% of a technetium-labeled aerosol containing 10% monopropylene glycol in deionized water was taken up by human volunteers after inhalation for 1 hour in a mist tent. The authors measured the aerosol mass median diameter to be 4.8 -5.4 microns, a size small enough to have enabled penetration to the deep lung. Ninety percent of the dose was found in the nasopharynx and it rapidly entered the stomach with very little entering the lungs. Monopropylene glycol was not directly measured, not allowing the determination of absorption through the nasal mucosa. However, the low dose rate from inhalation exposure and the small surface area would not lead to significant absorption of monopropylene glycol

Dermal route of exposure: An in vitro skin penetration study (El du Pont de Nemours and Company, 2007) with the monopropylene glycol using human cadaver skin and performed under infinite dose conditions, was available for assessment. A nominal dose of 1200 µL/cm2 (ca. 1.2 g/cm2) of the neat substance was applied for 24 hours under occlusive conditions to 6 skin replicates representing 5 human subjects. By the conclusion of the 24-hour exposure interval, only a negligible portion of the applied dose of neat monopropylene glycol (0.14%) had penetrated through the skin into the receptor fluid. The integrity of human skin, as determined by electrical impendance (EI), was affected by continuous exposure to monopropylene glycol under occlusive conditions. The ratio of the post-EI values was 0.33, confirming that the barrier properties of the stratum corneum were altered by monopropylene glycol

In general, monopropylene glycol was detected in receptor fluid within about an hour of application (lag time ~ 6 hours); steady-state penetration, which was represented by no less than 4 data points, was determined to be 95.4 µg/cm2/h (r2]0.999). This represents the maximum flux for neat monopropylene glycol. Based on the slope at steady-state (95.4 µg/cm2/h) and the concentration of monopropylene glycol in the applied solution, taken as its density (1,036,000 µg/cm3), the permeability coefficient for neat monopropylene glycol calculated to be 9.21×10-5cm/h. Based on the results of the study, a value of 40% for dermal absorption has been chosen by expert judgment to be used in the risk assessment. This value has been chosen as an average value between the percentage of dermal absorption obtained in the study and the maximal oral absorption (corresponding to 100%), and is considered to represent a worst-case approach

Acute toxicity

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Route of exposure	Parameter	Method	Value	Exposure time	Species	Value determination	Remark
Oral	LD50	Equivalent to OECD 401	22000 mg/kg bw		Rat (male/female)	Experimental value	
Dermal	LD50	Equivalent to OECD 402	> 2000 mg/kg bw	24 h	Rabbit	Experimental value	
Inhalation	LC50	Equivalent to OECD 403	317042 mg/l	2 h	Rabbit	Experimental value	

Conclusion

Not classified for acute toxicity

Corrosion/irritation

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Route of exposure	Result	Method	Exposure time	Time point	Species	Value determination	Remark
Eye	Not irritating	OECD 405		24; 48; 72 hours	Rabbit	Experimental value	
Skin	Not irritating	OECD 404		24; 48; 72 hours	Rabbit	Experimental value	
Skin	Slightly irritating	Patch test	24 h	24 hours	Human	Experimental value	

Conclusion

Not classified as irritating to the skin

Not classified as irritating to the eyes

Respiratory or skin sensitisation

MPG - MPG USP

Route of exposure	Result	Method	Exposure time	Observation time point	Species	Value determination	Remark
Skin	Not sensitizing	OECD 429			Mouse	Experimental value	
Skin	Not sensitizing	Patch test	24 h	24 hours	Human (male/female)	Experimental value	
Inhalation	Not relevant, expert judgement						

Conclusion

Not classified as sensitizing for skin

No respiratory sensitization data available

Specific target organ toxicity

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Route of exposure	Parameter	Method	Value	Organ	Effect	Exposure time	Species	Value determination
Oral	NOAEL	Other	1700 mg/kg bw/day		No effect	102 weeks (daily, 5 days/week)	Rat (male/female)	Experimental value
Dermal	NOAEL	Other	0.02 ml (twice a week)		No effect	10 weeks (daily, 5 days/week)	Mouse (female)	Experimental value
Inhalation	LOAEC	Other	160 mg/m³	Nose	No effect	90 day(s)	Rat (male/female)	Experimental value

Conclusion

Not classified for subchronic toxicity

Mutagenicity (in vitro)

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Result	Method	Test substrate	Effect	Value determination
Negative	Other	Bacteria (S.typhimurium)		Experimental value
Negative	OECD 473	Human lymphocytes		Experimental value

Mutagenicity (in vivo)

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Result	Method	Exposure time	Test substrate	Organ	Value determination
Negative	Other		Rat (male)		Experimental value

Carcinogenicity

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Route of exposure	Parameter	Method	Value	Exposure time	Species	Effect	Organ	Value determination
Inhalation	NOAEC	Other	> 350 mg/m³ air	18 month(s)	Rat (male/female)	No effect		Experimental value
Dermal	NOAEL	Other	0.02 ml (twice a week)		Mouse (female)	No effect		Experimental value
Oral	NOAEL	Other	1700 mg/kg bw/day	2 year(s)	Rat (male/female)	No effect		Experimental value
Oral	NOAEL	Other	3040 mg/kg bw/day	105 week(s)	Rat (male/female)	No effect		
Oral	NOAEL	Other	2390 mg/kg bw/day	105 week(s)	Mouse (male/female)	No effect		

Reproductive toxicity

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	Parameter	Method	Value	Exposure time	Species	Effect	Organ	Value determination
Developmental toxicity	NOAEL	Equivalent to OECD 414	10400 mg/kg bw/day	9 day(s)	Mouse (male/female)	No effect		Experimental value
Effects on fertility	NOAEL	OECD 416	10100 mg/kg bw/day		Mouse (male/female)	No effect		Experimental value

Conclusion CMR

Not classified for carcinogenicity

Not classified for mutagenic or genotoxic toxicity

Not classified for reprotoxic or developmental toxicity

Toxicity other effects

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No (test)data available

Chronic effects from short and long-term exposure

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ON CONTINUOUS/REPEATED EXPOSURE/CONTACT: Change in the haemogramme/blood composition. Decreased renal function.

SECTION 12: Ecological information

12.1. Toxicity

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	Parameter	Method	Value	Duration	Species	Test design	Fresh/salt water	Value determination
Acute toxicity fishes	LC50	Other	40613 mg/l	96 h	Oncorhynchus mykiss	Static system	Fresh water	Experimental value
Acute toxicity invertebrates	LC50	EPA 600/4-90/027	18340 mg/l	48 h	Ceriodaphnia dubia	Static system	Fresh water	Experimental value
	LC50	FIFRA 72-3	18800 mg/l	96 h	Americamysis bahia	Static system	Salt water	Experimental value
Toxicity algae and other aquatic plants	EC50	OECD 201	19000 mg/l	96 h	Pseudokirchneriella subcapitata	Static system	Fresh water	Experimental value
	EC50	OECD 201	19100 mg/l	96 h	Skeletonema costatum	Static system	Salt water	Experimental value
Long-term toxicity fish	ChV	ECOSAR	2500 mg/l	30 day(s)			Fresh water	QSAR
Long-term toxicity aquatic invertebrates	NOEC	EPA 600/4-89/001	13020 mg/l	7 day(s)	Ceriodaphnia sp.	Semi-static system	Fresh water	Experimental value
Toxicity aquatic micro-organisms	NOEC	Other	20000 mg/l	18 day(s)	Pseudomonas putida		Fresh water	Experimental value
Toxicity sediment organisms	LC50	Other	6983 mg/kg sediment dw	10 day(s)	Corophium volutator	Static system	Salt water	Experimental value

Conclusion

Not harmful to fishes

Not harmful to algae

Not harmful to crustacea

Not 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

MPG - MPG USP

Biodegradation water

Method	Value	Duration	Value determination
OECD 301F: Manometric Respirometry Test	81.7 %	28 day(s)	Experimental value

Phototransformation air (DT50 air)

Method	Value	Conc. OH-radicals	Value determination
AOPWIN v1.92	0.834 day(s)	1500000 /cm³	QSAR

Phototransformation water (DT50 water)

Method	Value	Conc. OH-radicals	Value determination
Other	2.3 year(s)		Calculated value

Biodegradation soil

Method	Value	Duration	Value determination
Other	98 %	105 day(s)	Experimental value

Conclusion

Readily biodegradable in water

Photodegradation in water occurs slowly

Biodegradable in the soil under anaerobic conditions

12.3. Bioaccumulative potential

MPG - MPG USP

BCF fishes

Parameter	Method	Value	Duration	Species	Value determination
BCF		0.09			Calculated value

Log Kow

Method	Remark	Value	Temperature	Value determination
Equivalent to OECD 107		-1.07	20.5 °C	Test data

Conclusion

Not bioaccumulative

12.4. Mobility in soil

MPG - MPG USP

Volatility (Henry's Law constant H)

Value	Method	Temperature	Remark	Value determination
0.00566 atm m³/mol	EUSES calculation	12 °C		Estimated value

Percent distribution

Method	Fraction air	Fraction biota	Fraction sediment	Fraction soil	Fraction water	Value determination
Mackay level III	2.98 %		0.07 %	48.1 %	48.8 %	Calculated value

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

MPG - MPG USP

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

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

Ozone-depleting potential (ODP)

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

Ground water

Ground water pollutant

SECTION 13: Disposal considerations

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

13.1. Waste treatment methods

13.1.1 Provisions relating to waste

Hazardous waste according to Directive 2008/98/EC, as amended by Regulation (EU) No 1357/2014.
Waste material code (Directive 2008/98/EC, Decision 2000/0532/EC).
07 02 04* (wastes from the MFSU of plastics, synthetic rubber and man-made fibres: other organic solvents, washing liquids and mother liquors).
16 01 14* (end-of-life vehicles from different means of transport (including off-road machinery) and wastes from dismantling of end-of-life vehicles and vehicle maintenance (except 13, 14, 16 06 and 16 08): antifreeze fluids containing hazardous substances). Depending on branch of industry and production process, also other waste codes may be applicable.

13.1.2 Disposal methods

Recycle by distillation. Remove to an authorized waste incinerator for solvents 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. Obtain the consent of pollution control authorities before discharging to wastewater treatment plants. 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).

SECTION 14: Transport information

Road (ADR)

14.1. UN number

Transport	Not subject

14.2. UN proper shipping name

14.3. Transport hazard class(es)

Hazard identification number	
Class	
Classification code	

14.4. Packing group

Packing group	
Labels	

14.5. Environmental hazards

Environmentally hazardous substance mark	no

14.6. Special precautions for user

Special provisions	
Limited quantities	

Rail (RID)

14.1. UN number

Transport	Not subject

14.2. UN proper shipping name

14.3. Transport hazard class(es)

Hazard identification number	
Class	
Classification code	

14.4. Packing group

Packing group	
Labels	

14.5. Environmental hazards

Environmentally hazardous substance mark	no

14.6. Special precautions for user

Special provisions	
Limited quantities	

Inland waterways (ADN)

14.1. UN number

Transport	Not subject

14.2. UN proper shipping name

14.3. Transport hazard class(es)

Class	
Classification code	

14.4. Packing group

Packing group	
Labels	

14.5. Environmental hazards

Environmentally hazardous substance mark	no

14.6. Special precautions for user

Special provisions	
Limited quantities	

Sea (IMDG/IMSBC)

14.1. UN number

Transport	Not subject

14.2. UN proper shipping name

14.3. Transport hazard class(es)

Class	

14.4. Packing group

Packing group	
Labels	

14.5. Environmental hazards

Marine pollutant	-
Environmentally hazardous substance mark	no

14.6. Special precautions for user

Special provisions	
Limited quantities	

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

Annex II of MARPOL 73/78	

Air (ICAO-TI/IATA-DGR)

14.1. UN number

Transport	Not subject

14.2. UN proper shipping name

14.3. Transport hazard class(es)

Class	

14.4. Packing group

Packing group	
Labels	

14.5. Environmental hazards

Environmentally hazardous substance mark	no

14.6. Special precautions for user

Special provisions	
Passenger and cargo transport: limited quantities: maximum net quantity per packaging	

SECTION 15: Regulatory information

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

European legislation:

VOC content Directive 2010/75/EU

VOC content	Remark
100 %	

Information exposure scenarios

Substance is not classified as dangerous, so no exposure scenarios are available.

National legislation Belgium

No data available

National legislation The Netherlands

Waste identification (the Netherlands)	LWCA (the Netherlands): KGA category 03
Waterbezwaarlijkheid	11
	B (4)

National legislation France

No data available

National legislation Germany

WGK	1; Classification water polluting in compliance with Verwaltungsvorschrift wassergefährdender Stoffe (VwVwS) of 27 July 2005 (Anhang 2)
TA-Luft	5.2.5

National legislation United Kingdom

No data available

Other relevant data

No data available

15.2. Chemical safety assessment

A chemical safety assessment has been performed.

SECTION 16: Other information

(*) = INTERNAL CLASSIFICATION BY BIG

PBT-substances = persistent, bioaccumulative and toxic substances

CLP (EU-GHS) Classification, labelling and packaging (Globally Harmonised System in Europe)

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