




SAFETY DATA SHEET		PR/EHD/OH/F-313	
PRODUCT NAME : MONOETHYLENE GLYCOL (MEG)			
SDS Reference No. DSD-07-0001	REV NO. 1.1: October 01, 2016	Page 1 of 14	

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

1.1 Product Identifier	
Product Name:	ethane-1,2-diol
Description:	Monoethylene Glycol
REACH Registration Number:	01-2119456816-28-xxxx
EC Number:	203-473-3
EC name:	ethane-1,2-diol
CAS Number:	107-21-1
CAS name:	1,2-Ethanediol
IUPAC name:	ethylene glycol
Molecular formula:	C ₂ H ₆ O ₂
Molecular weight range:	62.0678
Structural formula:	

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

<p>IDENTIFIED USES:</p> <ul style="list-style-type: none"> Manufacturing of substance Use as intermediate Use as process chemical Distribution of substance Formulation and (re)packing of substances and mixtures Production of polymers Use in Paints/Coatings (Industrial) Use in Paints/ Coatings /Adhesives/ Sealants/ Foams/ Polymers / filled Polymers (professional) Use in Paints/ Coatings / Surface treatment products (Consumer use) Use in Cleaning Agents (Industrial) Use in Cleaning agents (professional) Use in Cleaning agents (Consumer use) Use in Lubricants (Industrial) Use in metal-working fluids (Industrial) Use in metal-working fluids (professional) Use in agrochemicals (professional) Use in/as functional fluids (industrial) Use in/as functional fluids (professional) Use in heat transfer and hydraulic fluids (Consumer use) Use in/as de-icing/anti-icing applications/agents (professional) Use in/as de-icing/anti-icing applications/agents (Consumer use) Use in laboratories (industrial and professional) Use in Laboratory (Industrial and Professional) Use in water-treatment Chemicals (Industrial) Use in adhesives and sealants (Consumer) Production of Polymers, Filled Polymers, Foams, Coatings, Adhesives, Sealants Production of rigid foam <p>MOST COMMON TECHNICAL FUNCTION OF SUBSTANCE (WHAT IT DOES):</p> <ul style="list-style-type: none"> Anti-freezing agents Intermediates Heat transfer agents Laboratory chemicals <p>USES BY CONSUMERS ADVISED AGAINST</p> <p>Chemical product category (PC): PC 29:Pharmaceuticals</p>


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1.3 Details of the supplier of the safety data sheet	
Supplier	Rabigh Refining and Petrochemical (PetroRabigh) Company
Address	<u>PLANT</u> PO Box 666, Rabigh 21911, Kingdom of Saudi Arabia <u>OFFICE</u> P.O. Box 40448, Prince Mohammed Abdul- Aziz Street Bin Homran Center, Jeddah- 21499, Kingdom of Saudi Arabia Tel +966 2 284 5500 Fax : +966 2 284 6001
e-mail address of person responsible for this SDS	Moustafa A. Awad: Moustafa.Awad@PetroRabigh.com Mohamed I. El-Khashab: MohamedIbrahim.Khashab@PetroRabigh.com


1.4 Emergency telephone number		
Asia Pacific (except China) :	+65 3158 1074	English, Cantonese, Indonesian, Japanese, Korean, Malay, Mandarin, Thai, Vietnamese
China :	+86 512 8090 3042 (only in case of high seas emergencies)	English, Mandarin
Europe, America, Middle East, Africa (Europe & English Speaking):	+44 208 762 8322	English, Albanian, Bulgarian, Czech, Danish, Dutch, Finnish, French, German, Greek, Hungarian, Italian, Lithuanian, Norwegian, Polish, Portuguese, Romanian, Russian, Serb-Croat, Slovak, Spanish, Swedish, Turkish, Ukrainian
Middle East & Africa (Arabic speaking):	+44 (0) 1235 239 671	English, Arabic, French

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture	
Product Definition:	Monoethylene Glycol
Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]:	Acute Tox. 4. H302 STOT Rep. Exp. 2, H373o See Section 16 for the full text of the R Phrases or H Statements.
Classification according to Directive 67/548/EEC [DSD]:	Xn; R22 See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements	
Hazard pictograms:	
Signal word:	Warning
Hazard statements:	H302: Harmful if swallowed. H373o: May cause damage to kidneys through prolonged or repeated exposure if swallowed.
Precautionary statements	
Prevention:	Do not breathe vapour. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling
Response:	Get medical attention if you feel unwell. IF SWALLOWED: Call a POISONCENTER or physician if you feel unwell.
Storage:	Not applicable.
Disposal:	Not applicable.
Supplemental label elements:	Not applicable.
Special packaging requirements	
Containers to be fitted with child-resistant fastenings:	Not applicable.
Tactile warning of danger:	Not applicable.

2.3 Other hazards	
Substance meets the criteria for PBT according to	Not applicable.

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Regulation (EC) No. 1907/2006, Annex XIII:	
Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII:	Not applicable.
Other hazards which do not result in classification:	Not applicable.

SECTION 3: Composition/information on ingredients

3.1 Classification of the substance or mixture

Name:	Ethane-1,2-diol
Description:	Monoethylene Glycol
Degree of purity:	Ca. 80.0 – ca. 100.0% (w/w)

Constituents:		Classification			
Product/ingredient name	Identifiers	Typical concentration	Classification		
			67/548/EEC	Regulation (EC) No. 1272/2008 [CLP]	Type
ethanediol	EC: 203-473-3	>=99.99 (w/w)	Xn; R22	Acute Tox. 4, H302 STOT Re 2, H373	[A]
	CAS: 107-21-1	>=99.99 (w/w)	See section 16 for the full	See section 16 for the full	
	Index: 603-027-00-1	>=99.99 (w/w)	Text of the R-phrases	Text of the H-phrases	

Impurities:

Impurity	Identifiers	Typical concentration	Classification		Type
			67/548/EEC	Regulation (EC) No. 1272/2008 [CLP]	
2,2'-oxydiethanol	EC: 203-872-2	<0.01% (w/w)	Not applicable	Not applicable	[B]

There are no additional ingredients present which, within the current knowledge of the supplier, are classified and contribute to the classification of the substance and hence require reporting in this section.

Type: [A] Constituent [B] Impurity [C] Stabilizing additive

Occupational exposure limits, if available, are listed in Section 8.


SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention following exposure or if feeling unwell.
Inhalation	Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention following exposure or if feeling unwell. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
Skin contact	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention following exposure or if feeling unwell. Wash clothing before reuse. Clean shoes thoroughly before reuse.
Ingestion	Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. If necessary, call a poison center or physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband
Protection of first-aiders	No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects	
Eye contact	No relevant human information is available.
Inhalation	No relevant human information is available.

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Skin contact	No relevant human information is available.
Ingestion	Harmful if swallowed
Over-exposure signs/symptoms	
Eye contact	No specific data
Inhalation	No specific data
Skin contact	No specific data
Ingestion	No specific data
4.3 Indication of any immediate medical attention and special treatment needed	
Notes to physician	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled
Specific treatments	No specific treatment

SECTION 5: Firefighting measures

5.1 Extinguishing media	
Suitable extinguishing media	In case of fire, use water spray (fog), foam or dry chemical
Unsuitable extinguishing media	None known
5.2 Special hazards arising from the substance of mixture	
Hazards from the substance or mixture	In a fire or if heated, a pressure increase will occur and the container may burst.
Hazardous thermal decomposition products	Decomposition products may include the following materials: carbon dioxide and carbon monoxide
5.3 Advice for firefighters	
Special protective actions for fire-fighting	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
Specific protective equipment for fire-fighting	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures	
For non-emergency personnel	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
For emergency responders	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
6.2 Environmental precautions	
	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
6.3 Methods and materials for containment and cleaning up	
Small spill	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
Large spill	Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see section 1 for emergency contact information and section 13 for waste disposal.
6.4 Reference to other sections	
	See Section 1 for emergency contact information. See Section 8 for information on appropriate personal protective equipment. See Section 13 for additional waste treatment information.

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SECTION 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

7.1 Precautions for safe handling

- 7.1.1. Recommendations shall be specified to:**
- (a) allow safe handling of the substance such as containment and measures to prevent fire as well as aerosol and dust generation;
 - (b) prevent handling of incompatible substances or mixtures; and
 - (c) reduce the release of the substance or mixture to the environment, such as avoiding spills or keeping away from drains.
- 7.1.2. Advice on general occupational hygiene shall be provided, such as:**
- (a) not to eat, drink, and smoke in work areas;
 - (b) to wash hands after use; and
 - (c) to remove contaminated clothing and protective equipment before entering eating areas.

7.2 Conditions for safe storage, including any incompatibilities

- (a) store in accordance with local regulations;
- (b) store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink;
- (c) keep container tightly closed and sealed until ready for use;
- (d) containers that have been opened must be carefully resealed and kept upright to prevent leakage;
- (e) do not store in unlabelled containers; and
- (f) use appropriate containment to avoid environmental contamination.

7.3 Specific end use(s)

Recommendations	Not available.
Industrial sector specific solutions	Not available.

SECTION 8: Exposure controls/personal protection

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

8.1 Control parameters


<u>Occupational exposure limits</u>				
Product/ingredient name	Exposure limit values			
Substance	Form	TWA	STEL	Reference
ethanediol	Particulate	10 mg/m ³		EH40/2005 WELs (United Kingdom (UK), 8/2007). Absorbed through skin
	Vapour	52 mg/m ³	104 mg/m ³	
	Vapour	20ppm	40ppm	Same
				ACGIH
				OSHA

Recommended monitoring procedures

If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to European Standard EN 689 for methods for the assessment of exposure by inhalation to chemical agents and national guidance documents for methods for the determination of hazardous substances.


Derived effect levels

Product/ingredient name	Type	Exposure	Value	Population	Effects
ethanediol	DNEL	Long term Dermal	106 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Inhalation	35 mg/m ³	Workers	Local
	DNEL	Long term Dermal	53 mg/kg bw/day	General public	Systemic
	DNEL	Long term Inhalation	7 mg/m ³	General public	Local

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Predicted effect concentrations				
Product/ingredient name	Type	Compartment Detail	Value	Method Detail
ethanediol	PNEC	Fresh water	10 mg/l	Assessment Factors
	PNEC	Marine	1 mg/l	Assessment Factors
	PNEC	Intermittent release	10m mg/l	Assessment Factors
	PNEC	Fresh water sediment	20.9 mg/kg sediment dw	Assessment Factors
8.2 Exposure controls				
Appropriate engineering controls	If user operations generate dust, fumes, gas, vapour or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.			
Individual protection measures				
Hygiene measures:	Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.			
Eyeface protection:	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. Recommended: safety glasses with side-shields			
Skin protection				
Hand protection:	Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this are necessary. >8 hours (breakthrough time): butyl rubber, nitrile rubber, PVC, Viton®			
Body protection:	Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.			
Other skin protection:	Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.			
Respiratory protection:	Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommended: organic vapour filter (Type A)			
Environmental exposure controls:	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.			


SECTION 9: Physical and chemical properties		
9.1 Information on basic physical and chemical properties		
Appearance		
Physical state:	Liquid at 20°C and 1013hPa	
Form:	Syrupy	
Color:	Clear, Colourless	
Odour:	Odourless	
Odour threshold :	Not available	
pH:	Not available	
Melting point/freezing point range:	-13°C	
Initial boiling point and boiling range:	197.4°C at 1013 hPa	
Relative density (Water=1)	1.11	
Vapour Pressure:	0.123 hPa at 25°C	
Surface tension:	Not surface active	Based on chemical structure, no surface activity is predicted
Water solubility:	Miscible in all proportions	
Partition coefficient; n-octane/water (log value):	-1.36	
Flash point:	Closed cup: 111.0°C at 1013.25 hPa	
Evaporation rate:	0.01 (butyl acetate=1)	

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Flammability (solid, gas):	non flammable upon ignition.	Flammability derived from flash point.
Burning time:	not applicable	The substance has no pyrophoric properties and does not liberate flammable gases on contact with water.
Burning rate:	not applicable	
Upper/lower flammability or explosive limits:	Lower: 1.8% Upper: 12.8%	
Vapour density:	2.14 [Air=1]	
Viscosity:	Dynamic: 20mPa.s	
Auto-ignition temperature:	not available	
Explosive properties:	non explosive	Value used for CSA: non explosive There are no chemical groups associated with explosive properties present in the molecule.
Self-ignition temperature	398°C	
Decomposition temperature:	Not available	
Oxidising properties:	No oxidising properties	Value used for CSA: Oxidising: no The substance is incapable of reacting exothermically with combustible materials on the basis of the chemical structure
Viscosity:	16.1mPas at 25°C	
Stability in organic solvents and identity or relevant degradation products	not applicable	
Dissociation constant	not applicable	
Granulometry	not applicable	The substance is marketed or used in a non solid or granular form.
9.2 Other properties		
No additional information		

SECTION 10: Stability and reactivity
10.1 Reactivity
No specific test data related to reactivity available for this product or its ingredients.
10.2 Chemical stability
The product is stable.
10.3 Possibility of hazardous reactions
Under normal conditions of storage and use, hazardous reactions will not occur.
10.4 Conditions to avoid
Keep away from heat, sparks and flame.
10.5. Incompatible materials
Oxidizing agents
10.6 Hazardous decomposition products
Under normal conditions of storage and use, hazardous decomposition products should not be produced. The substance will burn to carbon oxides.

SECTION 11: Toxicological information																		
11.1 Information on toxicological effects																		
Acute Toxicity																		
<table border="1"> <thead> <tr> <th>Product/ingredient name</th> <th>Species</th> <th>Results</th> <th>Dose</th> <th>Exposure</th> </tr> </thead> <tbody> <tr> <td rowspan="3">ethanediol</td> <td>Rat (COBS CD (SD)BR) (male/female)</td> <td>LC50 Inhalation Vapour</td> <td>>2.5 mg/l</td> <td>6 hours</td> </tr> <tr> <td>Mouse (CD-1) male/female</td> <td>LD50 Dermal</td> <td>>3500 mg/kg bw</td> <td>-</td> </tr> <tr> <td>Rat (Sprague-Dawley) (male/female)</td> <td>LD50 Oral</td> <td>7712 mg/kg bw</td> <td>-</td> </tr> </tbody> </table>	Product/ingredient name	Species	Results	Dose	Exposure	ethanediol	Rat (COBS CD (SD)BR) (male/female)	LC50 Inhalation Vapour	>2.5 mg/l	6 hours	Mouse (CD-1) male/female	LD50 Dermal	>3500 mg/kg bw	-	Rat (Sprague-Dawley) (male/female)	LD50 Oral	7712 mg/kg bw	-
Product/ingredient name	Species	Results	Dose	Exposure														
ethanediol	Rat (COBS CD (SD)BR) (male/female)	LC50 Inhalation Vapour	>2.5 mg/l	6 hours														
	Mouse (CD-1) male/female	LD50 Dermal	>3500 mg/kg bw	-														
	Rat (Sprague-Dawley) (male/female)	LD50 Oral	7712 mg/kg bw	-														
Conclusion/summary:	No relevant human information is available																	

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Corrosivity	
Conclusion/Summary:	The substance has shown to be not irritating for non-human The substance has shown to be not irritating for human

Repeated dose toxicity

Product/ingredient name	Species	Results	Dose	Exposures
ethanediol	Rat (Wistar) male/female	NOAEL: probably 200 mg/kg bw; Oral; Kidney was confirmed to be the target organ	0, 220, 660, 2000 mg/kg (actual ingested)	33 days (daily)
	Rat (Wistar & Fischer) male	NOEL: 150 mg/kg bw (nominal); oral	50, 150, 500, 1000 mg/kg (actual ingested)	16 weeks (daily)
	Mouse (B6C3F1) male /female	NOAEL: 12,500ppm; oral: feed	0, 3,200, 6,300, 12,500, 25,000, 50,000ppm (actual ingested)	13 weeks, 92 96 consecutive days (continuously)
	Rat (Wistar) male	NOAEL: 150 mg/kg bw/day; oral; actual dose received	0, 50, 150, 300, 400 mg/kg/day (actual dose ingested)	12 months (daily)
	Dog (Beagle) male	NOAEL: 2ml/kg bw dermal, subacute	0.5, 2.0, 8.0 ml/kg bw	4 weeks (daily)
	Dog (Beagle) male	NOEL: 2 – 4 ml/kg bw; dermal, subacute	2.0, 4.0 ml/kg bw	4 weeks (daily)
	Dog (Beagle) male	No NOAEL identified; ca. 4 ml/kg bw; dermal, subacute	4.0 ml/kg bw (analytical per unit area)	4 weeks (daily)
	Mouse (CD-1) female	NOAEL: ca 3,549 mg/kg bw/day dermal, subacute	0, ca. 404, ca. 1,677, ca. 3,549 mg/kg bw	10 days

Conclusion/summary:	No relevant information is available for other routes. No relevant information is available for human
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Irritation: skin

Product/ingredient name	Species	Results	Dose	Exposures
ethanediol	rabbit (Vienna White)	not irritating; fully reversible	-	8 days
	rabbit; Draize Test	not irritating	-	23 hours
	Human; no data about method(s)	evidence of irritation	-	-

Conclusion/Summary:	Classification regarding skin irritation is not warranted.
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Irritation: eyes

Product/ingredient name	Species	Results	Dose	Exposures
ethanediol	rabbit (Vienna White)	Not irritating; fully reversible	No data	24 hours

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Rabbit (New Zealand White); Draize Test	0.4% was the highest concentration to be non-toxic and non-irritating	No data	7 days
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Conclusion/Summary: Classification regarding eye irritation is not warranted.

Sensitisation

Product/ingredient name	Species	Results	Dose	Exposures
ethanediol	guinea pig (Dunkin Hartley) female	not sensitizing; no; with positive reactions	No data	24 hours after challenge
	human female Patch Test	No data	No data	No data

Conclusion/Summary: No structural alert; no testing necessary. In some orientating studies with animals and humans no sensitizing properties were found.

Mutagenicity


Product/ingredient name	Method	Results	Dose
ethanediol	In vitro- bacterial reverse mutation assay (e.g. Ames test) (gene mutation): S. typhimurium TA 1535, TA 1537, TA 98 and TA 100 (met. act.: with and without)	Negative	Doses: 0, 20, 100, 500, 2500, 5000 µg/plate
	In vitro mammalian cell gene mutation assay (gene mutation): mouse lymphoma L5178Y cells (met. act.: with and without metabolic activation)	Negative	up to 5000 µg/ml
	in vitro mammalian chromosome aberration test (chromosome aberration): Chinese hamster Ovary (CHO) (met. act.: with and without metabolic activation)	Negative	10 - 100 mg/ml
	In vivo dominant lethal assay (chromosome aberration) rat (Fischer 344) male/female oral: feed	Negative	0.04, 0.2, 1.0 g/kg bw /day

Conclusion/summary: No relevant human information is available

Carcinogenicity

Product/ingredient name	Method	Results	Dose
ethanediol	rat (Fischer 344) male/female oral: feed (nominal in diet) Assessing the potential oncogenicity and chronic toxicity when fed to rats Exposure: 24 months (daily) for two years.	NOAEL (carcinogenicity): 1000 mg/kg bw/day	0.04, 0.2, 1.0 g/kg bw /day
	mouse (B6C3F1) male/female oral: feed Exposure: 103 weeks (daily)	NOAEL (carcinogenicity): 1500 mg/kg bw/day (male) (liver histopathology)	male mice: 0, 6250, 12500, 25000ppm; female mice: 0, 12500, 25000, 50000ppm (nominal in diet)
	mouse (CD-1) male/female oral: feed Exposure: 24 months (daily) Assessing oncogenicity and effects on survival when fed to mice for 2 years.	no NOAEL identified : (No clear NOAEL was identified)	0.04, 0.2 or 1.0 g/kg bw (nominal diet)

Conclusion/summary: No information available for carcinogenicity via inhalation, dermal or other exposure routes

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No relevant human information is available

Reproduction Toxicity

Effects on fertility


Product/ingredient name	Method	Results	Dose
ethanediol	rat (Fischer 344) male/female three-generation study oral: feed Exposure: 3 generations (daily)	NOAEL (parental and offspring): > 1000 mg/kg bw/day (male/female) (There were no reproductive effects associated with the inclusion of as much as 1.0 g/kg/day of EO in the diet.)	0.04, 0.2, 1.0 g/kg bw /day (nominal in diet)
	mouse (CD-1) male/female fertility oral: drinking water	NOEL (P): 1000 mg/kg bw/day (male/female) NOEL (F1): 1000 mg/kg bw/day (male/female)	ca. 500, 1000 and 2000

Conclusion/summary: No information available for carcinogenicity via inhalation, dermal or other exposure routes
No relevant human information is available

Toxicity of reproduction

Developmental toxicity

Product/ingredient name	Method	Results	Dose
ethanediol	rat (COBS CD (SD)BR) inhalation: aerosol (whole body) Exposure: g.d. 6 - 15 (6 h/day)	NOAEC (maternal toxicity): 1000 mg/m ³ air (NOAEC (developmental toxicity): 150 mg/m ³ air (NOAEC from inhalation exposure alone cannot be determined due to confounding oral exposure during whole-body exposure.	0, 150, 1000 or 2500 mg/m ³
	rat (Sprague-Dawley) oral: gavage Exposure: g.d. 6 - 15 (daily)	NOEL (maternal toxicity): 1000 mg/kg bw/day NOEL (developmental toxicity): 500 mg/kg bw/day	0, 150, 500, 1000 or 2500 mg/kg bw /day
	rat (Sprague-Dawley) oral: gavage Exposure: g.d. 6 - 20 (daily)	NOAEL (maternal toxicity): 250 mg/kg bw/day (overall effects) NOAEL (developmental toxicity): 250 mg/kg bw/day (overall effects)	0, 250, 1250, 2250 mg/kg bw/d
	rabbit (New Zealand White) oral: gavage Exposure: g.d. 6 - 19 (daily)	NOAEL (maternal toxicity): 1000 mg/kg bw/day NOAEL (developmental toxicity): 2000 mg/kg bw/day	0, 100, 500, 1000, 2000 mg/kg/day (nominal conc.)
	mouse (CD-1) inhalation: aerosol (whole body) Exposure: g.d. 6 - 15 (6 h/day)	NOAEC (maternal toxicity): 150 mg/m ³ air (Evidence of maternal and embryofetal toxicity, including teratogenicity, was observed at 1000 and 2500 mg/m ³ .	0, 150, 1000 or 2500 mg/m ³

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		There were no observable effects to the mouse dams or conceptuses at 150 mg/m3.	
mouse (CD-1) inhalation: aerosol (nose-only or whole-body exposure) nose-only exposure: exposure: 0 or 2100 mg/m3, 30 per group + 5 additional pregnant "satellite" females each at 2500 mg/m3 nose-only and 2100 mg/m3 whole-body (target exposure concentrations) Exposure: g.d. 6 - 15 (6 h/d)		NOEC (maternal toxicity): 500 mg/m ³ air (nose-only exposure) NOEC (developmental toxicity): 1000 mg/m ³ air (nose-only exposure) NOEC (maternal toxicity): 150 mg/m ³ air (whole-body exposure) NOEC (developmental toxicity): 150 mg/m ³ air	0, 50, 1000 or 2500 mg/mg3; whole-body
mouse (CD-1) oral: gavage Exposure: g.d. 6 - 15 (daily)		NOEL (maternal toxicity): 1500 mg/kg bw/day NOEL (developmental toxicity): 150 mg/kg bw/day	0.0, 50.0, 150.0, 500.0, or 1500.0 mg/kg bw/day

Conclusion/summary: Classification concerning toxicity to reproduction is not warranted.

Teratogenicity

Conclusion/Summary: No relevant human or non-human information is available

Specific target organ toxicity (single exposure)

Conclusion/summary: No relevant human or non-human information is available

Specific target organ toxicity (repeated exposure)

Product/ingredient name	Category	Route of exposure	Target organs
ethanediol	Category 2	Oral	Kidneys

Aspiration hazards

Hazards: No relevant human or non-human information is available

Information on the likely routes of exposure: No relevant human or non-human information is available

Potential acute health effects

Eye contact: No known significant effects or critical hazards.

Inhalation: No known significant effects or critical hazards.

Skin contact: No known significant effects or critical hazards.

Ingestion: Harmful if swallowed

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact: No specific data.

Inhalation: No specific data.

Skin contact: No specific data.

Ingestion: No specific data.


Delayed and immediate effects and also chronic effects from short and long term exposure

Short-term exposure

Potential immediate effects: No relevant human or non-human information is available

Potential delayed effects: No relevant human or non-human information is available

Long-term exposure

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Potential immediate effects:	No relevant human or non-human information is available
Potential delayed effects:	No relevant human or non-human information is available

Potential chronic health effects

Product/ingredient name	Result	Species	Dose	Exposure
ethanediol	Sub-acute NOAEL Oral	Rat	200 mg/kg	33 days; 7 days per week
	Sub-acute NOAEL Dermal	Dog	2.22 mg/kg	4 weeks; 7 days per week

Conclusion/summary:	Not available
General:	May cause damage to kidney through prolonged or repeated exposure if swallowed.
Carcinogenicity:	No known significant effects or critical hazards.
Mutagenicity:	No known significant effects or critical hazards.
Teratogenicity:	No known significant effects or critical hazards.
Developmental effects:	No known significant effects or critical hazards.
Fertility effects:	No known significant effects or critical hazards.

Other information: Not available

SECTION 12: Ecological information

12.1 Toxicity

Acute Toxicity

Product/ingredient name	Result	Species	Exposure
ethanediol	EC50 6500 to 13000 mg/l	Aquatic plants -Pseudokirchnerella subcapitata	96 hours
	Acute EC50 >100 mg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 72860 mg/l Fresh water	Fish - Pimephales promelas	96 hours
	Chronic NOEC 8590 mg/l Fresh water	Crustaceans - Ceriodaphnia sp.	7 days
	Chronic NOEC 15380 mg/l Fresh water	Fish - Pimephales promelas	7 days

Conclusion/summary: Not available

12.2 Persistence and degradability

Product/ingredient name	Aquatic half-life	Photolysis	Potential
ethanediol	-	-	Low

Conclusion/summary: Not available

12.3 Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Biodegradability
ethanediol	-1.36	-	Readily

Conclusion/summary: Not available

12.4 Mobility in soil

Soil/water partition coefficient (K_{oc})	1
Mobility	Not available

12.5 Results of PBT and vPvB assessment


PBT:	Not available P: Not available B: Not available T:Yes
vPvB:	Not available. vP: Not available. vB: Not available.

12.6 Other adverse effects

No known significant effects or critical hazards.

SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1

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should be consulted for any available use-specific information provided in the Exposure Scenario(s).


13.1 Waste treatment methods	
Product	
Methods of disposal:	The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.
Hazardous waste:	The classification of the product may meet the criteria for a hazardous waste.
Packaging	
Methods of disposal:	The generation of waste should be avoided or minimized wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.
Special precautions:	This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

	ADR/RID	ADN/ADNR	IMDG	IATA
14.1 UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
14.2 UN proper shipping name	-	-	-	-
14.3 Transport hazard class(es)	-	-	-	-
14.4 Packing group	-	-	-	-
14.5 Environmental hazards	No	No	No	No
14.6 Special precautions for user	Not available.	Not available.	Not available.	Not available.
Additional information	-	-	-	-
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	-	-	-	-

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture	
EU Regulation (EC) No. 1907/2006 (REACH)	
Annex XIV - List of substances subject to authorization	
Substances of very high concern	
None of the components are listed.	
Annex XVII – Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles: Not applicable	
Other EU regulations	
Europe inventory:	All components are listed or exempted.
Black List Chemicals:	Not listed
Priority List Chemicals:	Not listed
Integrated pollution prevention and control list (IPPC) - Air:	Not listed
Integrated pollution prevention and control list (IPPC) - Water:	Not listed
International regulations	
Chemical Weapons Convention List	Not listed
Schedule I Chemical:	

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Chemical Weapons Convention List Schedule II Chemicals: Not listed
 Chemical Weapons Convention List Schedule III Chemicals: Not listed

15.2 Chemical Safety Assessment

This product contains substances for which Chemical Safety Assessments are still required.

SECTION 16: Other information

Indicates information that has changed from previously issued version.

Abbreviations and acronyms: ATE = Acute Toxicity Estimate
 CLP = Classification, Labeling and Packaging Regulation [Regulation (EC) No.1272/2008]
 DNEL = Derived No Effect Level
 EUH statement = CLP-specific Hazard statement
 PNEC = Predicted No Effect Concentration
 RRN = REACH Registration Number
 DNEL=Derived No Effect Level
 DMEL=Derived Minimum Effect Level
 NOAEL= No Observable Adverse Effect Level
 STOT= Specific Target Organ Toxicity

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
Acute Tox. 4, H302	Expert judgment
STOT RE 2, H373o	Expert judgment

Full text of abbreviated H statements:	H302 H373o	Harmful if swallowed. May cause damage to organs through prolonged or repeated exposure if swallowed
Full text of classifications[CLP/GHS]:	Acute Tox. 4, H302	ACUTE TOXICITY: ORAL - Category 4
	STOT Rep. Exp. 2, H373o	SPECIFIC TARGET ORGAN TOXICITY (REPEATEDEXPOSURE): ORAL [kidneys] - Category 2
Full text of abbreviated R phrases	R22- Harmful if swallowed.	
Full text of classifications[DSD/DPD]	Xn - Harmful	
Version	1.1	
Date of printing	10/01/2016	
Date of previous issue	6/21/2011 (Revision 1.0)	
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