



SAFETY DATA SHEET		PR/EHD/OH/F-313	 بترو رابغ Petro Rabigh
PRODUCT NAME : MONOETHYLENE GLYCOL (MEG)			
SDS Reference No. DSD-07-0001	REV NO. 1.3: April 17, 2019	Page 1 of 15	

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:	C2H6O2
Molecular weight range:	62.0678
Structural formula:	

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

IDENTIFIED USES:


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

MOST COMMON TECHNICAL FUNCTION OF SUBSTANCE (WHAT IT DOES):

Anti-freezing agents
 Intermediates
 Heat transfer agents
 Laboratory chemicals

USES BY CONSUMERS ADVISED AGAINST

Chemical product category (PC): PC 29:Pharmaceuticals

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1.3 Manufacturer or supplier's details

Manufacturer	Rabigh Refining and Petrochemical Company
Address	PLANT PO Box 101, Rabigh 21911, Kingdom of Saudi Arabia Tel: +966 12 425 0390 Free Number : 800 440 9000
E-mail of person responsible for this SDS	stephane.dallaire@petrorabigh.com

1.4 Emergency telephone number



Emergency telephone numbers (24-hour)	Asia Pacific (except China):	CareChem 24 +65 3158 1074	English, Cantonese, Indonesian, Japanese, Korean, Malay, Mandarin, Thai, Vietnamese
	China (Off-land)	CareChem 24 +86 512 8090 3042	
	US, Canada Outside above area Europe, America, Middle East, Africa (Europe & English Speaking):	ChemTrec 1-800-424-9300 +703-527-3887 CareChem 24 +44 (0) 1235 239 670	English
			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


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 vapor. 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.

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2.3 Other hazards	
Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII:	Not applicable.
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:

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.

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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.
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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.
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 media	In case of fire, use water spray (fog), foam or dry chemical.
Unsuitable 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 vapor 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).

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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.

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.

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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	
	Vapor	52 mg/m ³	104 mg/m ³		Same
	Vapor	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

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, vapor 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.
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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.
Eye/face 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.


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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 vapor 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, Colorless	
Odor:	Odorless	
Odor 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	
Vapor 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)	
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%	
Vapor 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	
Oxidizing properties:	No oxidizing properties	Value used for CSA: Oxidizing: 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.

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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	-				
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	Rat (Sprague-Dawley) (male/female)	LD50 Oral	7712 mg/kg bw	-																		
Conclusion/summary: No relevant human information is available																						
Corrosivity																						
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Repeated dose toxicity																						
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	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.

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.

Irritation: eyes


Product / Ingredient name	Species	Results	Dose	Exposures
ethanediol	rabbit (Vienna White)	Not irritating; fully reversible	No data	24 hours
	Rabbit (New Zealand White); Draize Test	0.4% was the highest concentration to be non-toxic and non-irritating	No data	7 days

Conclusion/Summary: Classification regarding eye irritation is not warranted.


Sensitization

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.

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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 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)


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	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
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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 . There were no observable effects to the mouse dams or conceptuses at 150 mg/m ³ .	0, 150, 1000 or 2500 mg/m ³
	mouse (CD-1) inhalation: aerosol (nose-only or whole-body exposure) nose-only exposure: exposure: 0 or 2100 mg/m ³ , 30 per group + 5 additional pregnant "satellite" females each at 2500 mg/m ³ nose-only and 2100 mg/m ³ 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/mg ³ ; whole-body

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	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				
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			

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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 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.

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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
14.7 Additional information	-	-	-	-
14.8 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 Schedule I Chemical:	Not listed
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

Conform to Regulation (EC) No. 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH), Annex II -Europe

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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 Harmful if swallowed. H373o 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	1.3
Date of printing	4/17/2019
Date of previous issue	10/15/2018 (Revision 1.2)
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