SAFETY DATA SHEET

Heavy Glycols (SEPC)

Version 3.3 Revision Date 30.07.2024 Print Date 06.08.2024

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Heavy Glycols (SEPC)

Product code : U1269

Manufacturer or supplier's details

Supplier :
SHELL EASTERN CHEMICALS (S)
A REGISTERED BUSINESS OF SHELL EASTERN TRADING (PTE) LTD (UEN:198902087C)
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Contact for Safety Data Sheet :

Emergency telephone number : +800 2537 8747 (ALERT SGS- toll Free) or +65 6542 9595 (ALERT SGS)

Recommended use of the chemical and restrictions on use

Recommended use : Use only as a chemical intermediate.

Restrictions on use : This product must not be used in applications other than the above without first seeking the advice of the supplier.

2. HAZARDS IDENTIFICATION

GHS Classification

Acute toxicity (Oral) : Category 4

Specific target organ toxicity - repeated exposure (Oral) : Category 2 (Kidney)

GHS label elements

Hazard pictograms :

Signal word : Warning

Hazard statements : PHYSICAL HAZARDS:
Not classified as a physical hazard under GHS criteria.
HEALTH HAZARDS:

H302 Harmful if swallowed.
H373 May cause damage to organs (Kidney) through prolonged or repeated exposure if swallowed.
ENVIRONMENTAL HAZARDS:
Not classified as an environmental hazard under GHS criteria.

Precautionary statements :

Prevention:
P260 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264 Wash hands thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.

Response:
P301 + P312 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.
P330 Rinse mouth.
P314 Get medical advice/ attention if you feel unwell.

Storage:
No precautionary phrases.

Disposal:
P501 Dispose of contents and container to appropriate waste site or reclaimer in accordance with local and national regulations.

Other hazards which do not result in classification

Slightly irritating to the skin.Slightly irritating to respiratory system.Vapours may be irritating to the eye.Intentional abuse, misuse or other massive exposure may cause multiple organ damage and or death.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Classification	Concentration (% w/w)
Diethylene glycol	111-46-6	Acute Tox.4; H302	> 90
Ethanediol	107-21-1	Acute Tox.4; H302 STOT RE2; H373	< 1
Triethylene glycol	112-27-6		< 5

For explanation of abbreviations see section 16.

4. FIRST-AID MEASURES

General advice	:	Not expected to be a health hazard when used under normal conditions.
If inhaled	:	No treatment necessary under normal conditions of use. If symptoms persist, obtain medical advice.
In case of skin contact	:	Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available. If persistent irritation occurs, obtain medical attention.
In case of eye contact	:	Flush eye with copious quantities of water. Remove contact lenses, if present and easy to do. Continue rinsing. If persistent irritation occurs, obtain medical attention.
If swallowed	:	If swallowed, do not induce vomiting: transport to nearest medical facility for additional treatment. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. Rinse mouth.
Most important symptoms and effects, both acute and delayed	:	Not considered to be an inhalation hazard under normal conditions of use. Possible respiratory irritation signs and symptoms may include a temporary burning sensation of the nose and throat, coughing, and/or difficulty breathing. No specific hazards under normal use conditions. Skin irritation signs and symptoms may include a burning sensation, redness, or swelling. No specific hazards under normal use conditions. Eye irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blurred vision. Ingestion may result in nausea, vomiting and/or diarrhoea. Kidney damage may be indicated by changes in urine output or appearance, pain upon urination or in the lower back, or general oedema (swelling from fluid retention). May cause significant renal, respiratory, and CNS toxicity. May cause significant acidosis.
Protection of first-aiders	:	When administering first aid, ensure that you are wearing the appropriate personal protective equipment according to the incident, injury and surroundings.
Notes to physician	:	Call a doctor or poison control center for guidance. Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Alcohol-resistant foam, water spray or fog. Dry chemical

powder, carbon dioxide, sand or earth may be used for small fires only.

Unsuitable extinguishing media	:	Do not use water in a jet.
Specific hazards during firefighting	:	Material will not burn unless preheated. Carbon monoxide may be evolved if incomplete combustion occurs. Containers exposed to intense heat from fires should be cooled with large quantities of water.
Specific extinguishing methods	:	Standard procedure for chemical fires. Evacuate the area of all non-essential personnel. Keep adjacent containers cool by spraying with water.
Special protective equipment for firefighters	:	Proper protective equipment including chemical resistant gloves are to be worn; chemical resistant suit is indicated if large contact with spilled product is expected. Self-Contained Breathing Apparatus must be worn when approaching a fire in a confined space. Select fire fighter's clothing approved to relevant Standards (e.g. Europe: EN469).

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Observe all relevant local and international regulations. Notify authorities if any exposure to the general public or the environment occurs or is likely to occur. Local authorities should be advised if significant spillages cannot be contained.
	:	Avoid contact with skin, eyes and clothing.
Environmental precautions	:	Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers. Use appropriate containment to avoid environmental contamination. Ventilate contaminated area thoroughly.
Methods and materials for containment and cleaning up	:	Contain run-off from residue flush and dispose of properly. Soak up residue with an absorbent such as clay, sand or other suitable material. For small liquid spills (< 1 drum), transfer by mechanical means to a labeled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely. For large liquid spills (> 1 drum), transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak

up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely

Additional advice	:	For guidance on selection of personal protective equipment see Section 8 of this Safety Data Sheet. For guidance on disposal of spilled material see Section 13 of this Safety Data Sheet.

7. HANDLING AND STORAGE

General Precautions	:	Avoid breathing of or direct contact with material. Only use in well ventilated areas. Wash thoroughly after handling. For guidance on selection of personal protective equipment see Section 8 of this Safety Data Sheet. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material. Ensure that all local regulations regarding handling and storage facilities are followed.
Advice on safe handling	:	Use local exhaust extraction over processing area. Handle and open container with care in a well-ventilated area. Do not empty into drains. When handling product in drums, safety footwear should be worn and proper handling equipment should be used. Handling Temperature: Ambient.
Avoidance of contact	:	Strong oxidising agents. Strong acids. Strong bases.
Product Transfer	:	Keep containers closed when not in use. Do not pressurize drum containers to empty.

Storage

Conditions for safe storage	:	Refer to section 15 for any additional specific legislation covering the packaging and storage of this product.
Other data	:	Tanks must be clean, dry and rust-free. Keep container tightly closed. Must be stored in a diked (bunded) well- ventilated area, away from sunlight, ignition sources and other sources of heat. Cleaning, inspection and maintenance of storage tanks is a specialist operation, which requires the implementation of strict procedures and precautions. Drums should be stacked to a maximum of 3 high. Storage Temperature: Ambient.

Packaging material	:	Suitable material: Stainless steel., Mild steel., Carbon steel Unsuitable material: Data not available
Container Advice	:	Containers, even those that have been emptied, can contain explosive vapours. Do not cut, drill, grind, weld or perform similar operations on or near containers.
Specific use(s)	:	Not applicable Ensure that all local regulations regarding handling and storage facilities are followed.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Ethanediol	107-21-1	PEL (short term)	50 ppm 127 mg/m3	SG OEL
Ethanediol	107-21-1	TWA (Vapour)	25 ppm	ACGIH
Ethanediol		STEL (Vapour)	50 ppm	ACGIH
Ethanediol		STEL (Inhalable fraction, Aerosol only)	10 mg/m3	ACGIH

Biological occupational exposure limits

No biological limit allocated.

Monitoring Methods

Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate.
Validated exposure measurement methods should be applied by a competent person and samples analysed by an accredited laboratory.
Examples of sources of recommended exposure measurement methods are given below or contact the supplier. Further national methods may be available.
National Institute of Occupational Safety and Health (NIOSH), USA: Manual of Analytical Methods http://www.cdc.gov/niosh/
Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods http://www.osha.gov/
Health and Safety Executive (HSE), UK: Methods for the Determination of Hazardous Substances http://www.hse.gov.uk/
Institut für Arbeitsschutz Deutschen Gesetzlichen Unfallversicherung (IFA) , Germany http://www.dguv.de/inhalt/index.jsp
L'Institut National de Recherche et de Securité, (INRS), France http://www.inrs.fr/accueil

Engineering measures : Adequate ventilation to control airborne concentrations.
Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated.
Eye washes and showers for emergency use.
The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances.
Appropriate measures include:

General Information:
Always observe good personal hygiene measures, such as washing hands after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned.
Practice good housekeeping.
Define procedures for safe handling and maintenance of controls.
Educate and train workers in the hazards and control measures relevant to normal activities associated with this product.
Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g. personal protective equipment, local exhaust ventilation.
Drain down system prior to equipment break-in or maintenance.
Retain drain downs in sealed storage pending disposal or subsequent recycle.

Personal protective equipment

Protective measures

Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.

Respiratory protection : If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation.
Check with respiratory protective equipment suppliers.
Where air-filtering respirators are unsuitable (e.g. airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus.
Where air-filtering respirators are suitable, select an appropriate combination of mask and filter.
If air-filtering respirators are suitable for conditions of use:
Select a filter suitable for the combination of organic gases and vapours and particles [Type A/Type P boiling point >65°C (149°F)].

Hand protection
Remarks : Where hand contact with the product may occur the use of

gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection. Longer term protection: Nitrile rubber gloves. Incidental contact/Splash protection: PVC or neoprene rubber gloves. For continuous contact we recommend gloves with breakthrough time of more than 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same but recognize that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time maybe acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material. Glove thickness should be typically greater than 0.35 mm depending on the glove make and model. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.

Eye protection : If material is handled such that it could be splashed into eyes, protective eyewear is recommended.

Skin and body protection : Skin protection is not ordinarily required beyond standard work clothes.
It is good practice to wear chemical resistant gloves.

Thermal hazards : Not applicable

Hygiene measures : Wash hands before eating, drinking, smoking and using the toilet.
Launder contaminated clothing before re-use.

Environmental exposure controls

General advice : Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour.
Minimise release to the environment. An environmental assessment must be made to ensure compliance with local environmental legislation.
Information on accidental release measures are to be found in section 6.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Liquid.

Colour : Clear pale yellow

Odour	:	mild
Odour Threshold	:	Data not available
pH	:	12 - 13
	:	Data not available
Boiling point/boiling range	:	> 240 °C / > 464 °F
Flash point	:	149 °C / 300 °F
Evaporation rate	:	Data not available
Upper explosion limit	:	Data not available
Lower explosion limit	:	Data not available
Vapour pressure	:	Data not availableData not available
Relative vapour density	:	3
Relative density	:	1.12
Density	:	no data available
Solubility(ies)		
Solubility in other solvents	:	Data not available
Partition coefficient: n-octanol/water	:	Data not available
Auto-ignition temperature	:	Data not available
Decomposition temperature	:	Data not available
Viscosity		
Viscosity, kinematic	:	Data not available
Particle characteristics		
Particle size	:	Data not available
Explosive properties	:	no data available
Oxidizing properties	:	Data not available
Surface tension	:	Data not available
Conductivity	:	Data not available

10. STABILITY AND REACTIVITY

Reactivity	:	The product does not pose any further reactivity hazards in addition to those listed in the following sub-paragraph.
Chemical stability	:	No hazardous reaction is expected when handled and stored

according to provisions Oxidises on contact with air.

Possibility of hazardous reactions	:	None known.
Conditions to avoid	:	Extremes of temperature and direct sunlight. Product cannot ignite due to static electricity.
Incompatible materials	:	Strong oxidising agents. Strong acids. Strong bases.
Hazardous decomposition products	:	Thermal decomposition is highly dependent on conditions. A complex mixture of airborne solids, liquids and gases including carbon monoxide, carbon dioxide, sulphur oxides and unidentified organic compounds will be evolved when this material undergoes combustion or thermal or oxidative degradation.

11. TOXICOLOGICAL INFORMATION

Basis for assessment	:	Information given is based on product testing, and/or similar products, and/or components.
Information on likely routes of exposure	:	Exposure may occur via inhalation, ingestion, skin absorption, skin or eye contact, and accidental ingestion.

Acute toxicity

Product:

Acute oral toxicity	:	LD 50 Rat: > 2,000 mg/kg Remarks: Low toxicity Ingestion may cause drowsiness and dizziness.
Acute inhalation toxicity	:	LC 50 : > 5 mg/l Exposure time: 4 h Remarks: Low toxicity LC50 greater than near-saturated vapour concentration.
Acute dermal toxicity	:	LD 50 Rabbit: > 5,000 mg/kg Remarks: Low toxicity Based on available data, the classification criteria are not met.

Components:

Diethylene glycol:

Acute oral toxicity	:	LD 50 Rat, male and female: > 5,000 mg/kg Method: Literature data Remarks: Harmful if swallowed. There is a marked difference in acute oral toxicity between rodents and man, man being more susceptible than rodents.

The estimated fatal dose for man is 100 milliliters (1/2 cup).
This material has also been shown to be toxic and potentially lethal by ingestion to cats and dogs.

Acute inhalation toxicity : LC 50 Rat: > 1 -<= 5 mg/l
Exposure time: 4 h
Test atmosphere: Aerosol
Method: Literature data
Remarks: LC50 greater than near-saturated vapour concentration.
Based on available data, the classification criteria are not met.

Acute dermal toxicity : LD 50 Rabbit: > 2,000 mg/kg
Method: Literature data
Remarks: Based on available data, the classification criteria are not met.

Ethanediol:

Acute oral toxicity : LD 50 Rat, male and female: > 2,000 mg/kg
Method: Acceptable non-standard method.
Remarks: Harmful if swallowed.
There is a marked difference in acute oral toxicity between rodents and man, man being more susceptible than rodents.
The estimated fatal dose for man is 100 milliliters (1/2 cup).
This material has also been shown to be toxic and potentially lethal by ingestion to cats and dogs.

Acute inhalation toxicity : LC 50 Rat, male and female: > 2.5 mg/l
Exposure time: 6 h
Test atmosphere: Aerosol
Method: Literature data
Remarks: LC50 > 1.0 - <= 5.0 mg/l
LC50 greater than near-saturated vapour concentration.
Based on available data, the classification criteria are not met.

Acute dermal toxicity : LD 50 Mouse, male and female: > 2,000 mg/kg
Method: Literature data
Remarks: Based on available data, the classification criteria are not met.

Triethylene glycol:

Acute oral toxicity : LD 50 Rat, male and female: > 2,000 mg/kg
Method: Literature data
Remarks: Based on available data, the classification criteria are not met.

Acute inhalation toxicity : LC 50 Rat, male and female: > 5 mg/l
Exposure time: 4 h
Test atmosphere: Aerosol
Method: Acceptable non-standard method.
Remarks: Based on available data, the classification criteria

are not met.

Acute dermal toxicity : LD 50 Rabbit, male and female: 16 ml/kg bw
Method: Acceptable non-standard method.
Remarks: Based on available data, the classification criteria are not met.

Skin corrosion/irritation

Product:

Remarks: Slightly irritating to skin., Based on available data, the classification criteria are not met.

Components:

Diethylene glycol:
Species: Rabbit
Method: Literature data
Remarks: Based on available data, the classification criteria are not met.

Ethanediol:
Species: Rabbit
Method: Acceptable non-standard method.
Remarks: Slightly irritating to skin., Insufficient to classify.

Triethylene glycol:
Species: Rabbit
Method: Literature data
Remarks: Slightly irritating., Insufficient to classify.

Serious eye damage/eye irritation

Product:

Remarks: Expected to be irritating to eyes.

Components:

Diethylene glycol:
Species: Rabbit
Method: Literature data
Remarks: Based on available data, the classification criteria are not met.

Ethanediol:
Species: Rabbit
Method: Acceptable non-standard method.
Remarks: Slightly irritating to the eye., Insufficient to classify.

Triethylene glycol:
Species: Rabbit
Method: Literature data
Remarks: Slightly irritating., Insufficient to classify.

Respiratory or skin sensitisation

Product:

Remarks: Not a skin sensitiser.
Based on available data, the classification criteria are not met.

Components:

Diethylene glycol:
Species: Guinea pig
Method: Tested according to Annex V of Directive 67/548/EEC.
Remarks: Based on available data, the classification criteria are not met.

Ethanediol:
Species: Guinea pig
Method: Literature data
Remarks: Based on available data, the classification criteria are not met.

Triethylene glycol:
Species: Guinea pig
Method: Test(s) equivalent or similar to OECD Test Guideline 406
Remarks: Based on available data, the classification criteria are not met.

Germ cell mutagenicity

Product:

: Remarks: No evidence of mutagenic activity.

Components:

Diethylene glycol:

Genotoxicity in vitro
: Method: OECD Test Guideline 471
Remarks: Based on available data, the classification criteria are not met.

: Method: OECD Test Guideline 473
Remarks: Based on available data, the classification criteria are not met.

: Method: OECD Test Guideline 479
Remarks: Based on available data, the classification criteria are not met.

: Test species: MouseMethod: OECD Test Guideline 474
Remarks: Based on available data, the classification criteria are not met.

Germ cell mutagenicity-Assessment
: This product does not meet the criteria for classification in categories 1A/1B.

Ethanediol:

Genotoxicity in vitro
: Method: OECD Test Guideline 471
Remarks: Based on data from similar materials

: Method: Acceptable non-standard method.
Remarks: Based on data from similar materials

: Method: Literature data
Remarks: Based on data from similar materials

: Test species: RatMethod: Literature data
Remarks: Based on available data, the classification criteria are not met.

Germ cell mutagenicity-Assessment : This product does not meet the criteria for classification in categories 1A/1B.

Triethylene glycol:

Genotoxicity in vitro : Method: OECD Test Guideline 471
Remarks: Based on available data, the classification criteria are not met.

: Method: Test(s) equivalent or similar to OECD Test Guideline 473
Remarks: Based on available data, the classification criteria are not met.

: Method: Test(s) equivalent or similar to OECD Test Guideline 479
Remarks: Based on available data, the classification criteria are not met.

Germ cell mutagenicity-Assessment : This product does not meet the criteria for classification in categories 1A/1B.

Carcinogenicity

Product:

Remarks: Tumours produced in animals are not considered relevant to humans., Not a carcinogen., Based on available data, the classification criteria are not met.

Components:

Diethylene glycol:
Species: Rat, (male and female)
Application Route: Oral
Method: Literature data
Remarks: Based on available data, the classification criteria are not met., Tumours produced in animals are not considered relevant to humans.

Carcinogenicity - Assessment : This product does not meet the criteria for classification in categories 1A/1B.

Ethanediol:
Species: Mouse, (male and female)
Application Route: Oral
Method: Literature data
Remarks: Based on available data, the classification criteria are not met.

Carcinogenicity - Assessment : This product does not meet the criteria for classification in categories 1A/1B.

Triethylene glycol:
Species: Rat, (male and female)
Application Route: Oral
Method: Literature data
Test substance: Diethylene glycol
Remarks: Based on available data, the classification criteria are not met.

Carcinogenicity - Assessment : This product does not meet the criteria for classification in categories 1A/1B.

Material	GHS/CLP Carcinogenicity Classification
Diethylene glycol	No carcinogenicity classification.
Ethanediol	No carcinogenicity classification.
Triethylene glycol	No carcinogenicity classification.

Reproductive toxicity

Product:

: Remarks: Not a developmental toxicant., Does not impair fertility.

Components:

Diethylene glycol:

: Species: Mouse
Sex: male and female
Application Route: Oral

Method: Acceptable non-standard method.
Remarks: Based on available data, the classification criteria are not met.

Effects on foetal development : Species: Rabbit, female
Application Route: Oral
Method: OECD Test Guideline 414
Remarks: Based on available data, the classification criteria are not met.

Reproductive toxicity - Assessment : This product does not meet the criteria for classification in categories 1A/1B.

Ethanediol:

Species: Rat
Sex: male and female
Application Route: Oral

Method: Literature data
Remarks: Based on available data, the classification criteria are not met.

Species: Rat, male and female
Application Route: Oral
Method: Literature data
Remarks: Based on available data, the classification criteria are not met., Causes foetotoxicity in animals; considered to be secondary to maternal toxicity.

Reproductive toxicity - Assessment : This product does not meet the criteria for classification in categories 1A/1B.

Triethylene glycol:

Species: Mouse
Sex: male and female
Application Route: Oral

Method: Acceptable non-standard method.
Remarks: Based on available data, the classification criteria are not met.

Species: Mouse, female
Application Route: Oral
Method: Acceptable non-standard method.
Remarks: Based on available data, the classification criteria are not met., Causes foetotoxicity in animals at doses which are maternally toxic.

Reproductive toxicity - Assessment : This product does not meet the criteria for classification in categories 1A/1B.

STOT - single exposure

Product:

Remarks: Repeated inhalation of vapours and mists is expected to cause irritation of the respiratory tract.

Components:

Diethylene glycol:
Remarks: Based on available data, the classification criteria are not met., Inhalation of vapours or mists may cause irritation to the respiratory system., Ingestion may cause drowsiness and dizziness.

Ethanediol:

Remarks: Inhalation of vapours or mists may cause irritation to the respiratory system., Based on available data, the classification criteria are not met., Ingestion may cause drowsiness and dizziness.

Triethylene glycol:
Remarks: Based on available data, the classification criteria are not met., Inhalation of vapours or mists may cause irritation to the respiratory system.

STOT - repeated exposure

Product:

Remarks: Kidney: can cause kidney damage.

Components:

Diethylene glycol:
Remarks: Based on available data, the classification criteria are not met.

Ethanediol:
Exposure routes: Oral
Target Organs: Kidney
Remarks: May cause damage to organs or organ systems through prolonged or repeated exposure.

Triethylene glycol:
Remarks: Based on available data, the classification criteria are not met.

Repeated dose toxicity

Components:

Diethylene glycol:

Rat, male and female:
Application Route: Oral
Method: Acceptable non-standard method.
Target Organs: No specific target organs noted

Dog, male:
Application Route: Dermal
Method: OECD Test Guideline 410
Target Organs: No specific target organs noted

Ethanediol:

Rat, male:
Application Route: Oral
Method: Test(s) equivalent or similar to OECD Test Guideline 408
Target Organs: Kidney

Triethylene glycol:

Rat, male and female:

Application Route: Oral
Method: Test(s) equivalent or similar to OECD Test Guideline 408
Target Organs: No specific target organs noted

Rat, male and female:
Application Route: Inhalation
Test atmosphere: Aerosol
Method: Acceptable non-standard method.
Test substance: PEG 200
Target Organs: No specific target organs noted

Aspiration toxicity

Product:

Not an aspiration hazard.

Components:
Diethylene glycol:
Based on available data, the classification criteria are not met.

Ethanediol:
Based on available data, the classification criteria are not met.

Triethylene glycol:
Based on available data, the classification criteria are not met.

Further information

Product:

Remarks: Classifications by other authorities under varying regulatory frameworks may exist.

Components:
Diethylene glycol:
Remarks: Classifications by other authorities under varying regulatory frameworks may exist.

Ethanediol:
Remarks: Classifications by other authorities under varying regulatory frameworks may exist.

Triethylene glycol:
Remarks: Classifications by other authorities under varying regulatory frameworks may exist.

12. ECOLOGICAL INFORMATION

Basis for assessment : Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

Ecotoxicity

Product:

Toxicity to fish (Acute toxicity)	:	Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to crustacean (Acute toxicity)	:	Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to algae/aquatic plants (Acute toxicity)	:	Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to microorganisms (Acute toxicity)	:	Remarks: LL/EL/IL50 > 100 mg/l Practically non toxic: Based on available data, the classification criteria are not met.

Components:
Diethylene glycol :

Toxicity to fish (Acute toxicity)	:	LC50 (Pimephales promelas (fathead minnow)): > 100 mg/l Exposure time: 96 h Method: Literature data. Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l Method: Other guideline method.
Toxicity to crustacean (Acute toxicity)	:	EC50 (Daphnia magna (Water flea)): > 100 mg/l Exposure time: 48 h Method: Other guideline method. Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to algae/aquatic plants (Acute toxicity)	:	EC50 (Scenedesmus quadricauda (Green algae)): > 100 mg/l Exposure time: 72 h Method: Information given is based on data obtained from similar substances. Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to microorganisms (Acute toxicity)	:	EC20 (Activated sludge, domestic waste): > 1,000 mg/l Exposure time: 3 h Method: OECD Test Guideline 209 Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to fish (Chronic toxicity)	:	NOEC: > 40 mg/l Exposure time: 28 d Species: Pimephales promelas (fathead minnow) Method: Information given is based on data obtained from similar substances.

Remarks: NOEC/NOEL > 100 mg/l

Toxicity to crustacean(Chronic toxicity)	:	NOEC: > 100 mg/l Species: Ceriodaphnia dubia (Water flea) Method: Information given is based on data obtained from similar substances. Remarks: NOEC/NOEL > 100 mg/l

Ethanediol :

Toxicity to fish (Acute toxicity)	:	LC50 (Pimephales promelas (fathead minnow)): 72,860 mg/l Exposure time: 96 h Method: Other guideline method. Remarks: Practically non toxic: LC/EC/IC50 > 100 mg/l
Toxicity to crustacean (Acute toxicity)	:	EC50 (Daphnia magna (Water flea)): > 100 mg/l Exposure time: 48 h Method: OECD Test Guideline 202 Remarks: Practically non toxic: LC/EC/IC50 > 100 mg/l
Toxicity to algae/aquatic plants (Acute toxicity)	:	EC50 (Pseudokirchneriella subcapitata (algae)): 6,500 - 13,000 mg/l Exposure time: 96 h Method: Other guideline method. Remarks: Practically non toxic: LC/EC/IC50 > 100 mg/l
Toxicity to microorganisms (Acute toxicity)	:	EC20 (Activated sludge, domestic waste): > 1,995 mg/l Exposure time: 0.5 h Method: Other guideline method. Remarks: Practically non toxic: LC/EC/IC50 > 100 mg/l
Toxicity to fish (Chronic toxicity)	:	NOEC: 15,380 mg/l Exposure time: 7 d Species: Pimephales promelas (fathead minnow) Method: Other guideline method. Remarks: NOEC/NOEL > 100 mg/l
Toxicity to crustacean(Chronic toxicity)	:	NOEC: 8,590 mg/l Exposure time: 7 d Species: Chironomus sp. (midge) Method: Other guideline method. Remarks: NOEC/NOEL > 100 mg/l

Triethylene glycol :

Toxicity to fish (Acute toxicity)	:	LC50 (Lepomis macrochirus (Bluegill sunfish)): > 10,000 mg/l Exposure time: 96 h Method: Test(s) equivalent or similar to OECD Guideline 203 Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to crustacean (Acute	:	(Daphnia magna (Water flea)): > 10,000 mg/l

toxicity)
Exposure time: 48 h
Method: Other guideline method.
Remarks: Practically non toxic:
LL/EL/IL50 > 100 mg/l

Toxicity to algae/aquatic plants (Acute toxicity) : EC50 (Selenastrum capricornutum (green algae)): 6,500 - 13,000 mg/l
Exposure time: 96 h
Method: Other guideline method.
Remarks: Practically non toxic:
LL/EL/IL50 > 100 mg/l

Toxicity to microorganisms (Acute toxicity) : EC10 (Activated sludge): > 1,995 mg/l
Exposure time: 0.5 h
Method: Other guideline method.
Remarks: Practically non toxic:
LL/EL/IL50 > 100 mg/l

Toxicity to fish (Chronic toxicity) : NOEC: 15,380 mg/l
Exposure time: 7 d
Species: Pimephales promelas (fathead minnow)
Method: Other guideline method.
Remarks: NOEC/NOEL > 100 mg/l

Toxicity to crustacean(Chronic toxicity) : NOEC: > 15,000 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Method: Other guideline method.
Remarks: NOEC/NOEL > 100 mg/l

Persistence and degradability

Product:

Biodegradability : Remarks: Inherently biodegradable., Oxidises rapidly by photo-chemical reactions in air.

Components:
Diethylene glycol :

Biodegradability : Biodegradation: 70 - 80 %
Exposure time: 28 d
Method: OECD Test Guideline 301B
Remarks: Inherently biodegradable.

Ethanediol :

Biodegradability : Biodegradation: 90 - 100 %
Exposure time: 10 d
Method: OECD Test Guideline 301A
Remarks: Readily biodegradable.

Triethylene glycol :

Biodegradability : Biodegradation: 90 - 100 %
Exposure time: 10 d
Method: OECD Test Guideline 301A

Remarks: Readily biodegradable.
Oxidises rapidly by photo-chemical reactions in air.

Bioaccumulative potential

Product:

Bioaccumulation : Remarks: Does not have the potential to bioaccumulate significantly.

Partition coefficient: n-octanol/water : Remarks: Data not available

Components:

Diethylene glycol :

Bioaccumulation : Remarks: Does not bioaccumulate significantly.

Ethanediol :

Bioaccumulation : Remarks: Does not have the potential to bioaccumulate significantly.

Triethylene glycol :

Bioaccumulation : Remarks: Does not have the potential to bioaccumulate significantly.

Mobility in soil

Product:

Mobility : Remarks: Dissolves in water., If product enters soil, it will be highly mobile and may contaminate groundwater.

Components:

Diethylene glycol :

Mobility : Remarks: If the product enters soil, one or more constituents will or may be mobile and may contaminate groundwater., Dissolves in water.

Ethanediol :

Mobility : Remarks: Disperses in water., If product enters soil, one or more constituents will be highly mobile and may contaminate groundwater.

Triethylene glycol :

Mobility : Remarks: If product enters soil, it will be highly mobile and may contaminate groundwater., Sinks in water.

Other adverse effects

Components:

Diethylene glycol :

Results of PBT and vPvB assessment : The substance does not fulfill all screening criteria for persistence, bioaccumulation and toxicity and hence is not considered to be PBT or vPvB.

Additional ecological information : Data not available

Ethanediol :

Results of PBT and vPvB assessment : The substance does not fulfill all screening criteria for persistence, bioaccumulation and toxicity and hence is not

considered to be PBT or vPvB.

Additional ecological information : Does not have ozone depletion potential.

13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : Recover or recycle if possible.
It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations.
Remove all packaging for recovery or waste disposal.
Waste product should not be allowed to contaminate soil or ground water, or be disposed of into the environment.
Do not dispose of tank water bottoms by allowing them to drain into the ground. This will result in soil and groundwater contamination.
Do not dispose into the environment, in drains or in water courses.
Waste arising from a spillage or tank cleaning should be disposed of in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand.

Disposal should be in accordance with applicable regional, national, and local laws and regulations.
Local regulations may be more stringent than regional or national requirements and must be complied with.

Contaminated packaging : Dispose in accordance with prevailing regulations, preferably to a recognized collector or contractor. The competence of the collector or contractor should be established beforehand.

14. TRANSPORT INFORMATION

International Regulations

ADR
Not regulated as a dangerous good

IATA-DGR
Not regulated as a dangerous good

IMDG-Code
Not regulated as a dangerous good

Maritime transport in bulk according to IMO instruments

Pollution category : Data not available
Ship type : Data not available

Product name : Data not available

Special precautions for user

Remarks : Special Precautions: Refer to Section 7, Handling & Storage, for special precautions which a user needs to be aware of or needs to comply with in connection with transport.

15. REGULATORY INFORMATION

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

Local Regulations

Workplace Safety and Health Act & Workplace Safety and Health (General Provision) Regulations	This product is subject to the SDS, Labelling, PEL and other requirements in the Act/ Regulations.

Fire Safety Act and Fire Safety (Petroleum & Flammable Materials) Regulations	This product is not subject to the requirements in the Act/Regulations.

Maritime and Port Authority of Singapore (Dangerous Goods, Petroleum and Explosives) Regulations	This product is not subject to the requirements in the Act/Regulations.

Environmental Protection and Management Act and Environmental Protection and Management (Hazardous Substances) Regulations	This product is not subject to the requirements in the Act/Regulations.

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

Other international regulations

The components of this product are reported in the following inventories:

TSCA : Listed
AICS : Listed
DSL : Listed
IECSC : Listed
ENCS : Listed
KECI : Listed
NZIoC : Listed
PICCS : Listed
TCSI : Listed

16. OTHER INFORMATION

Full text of H-Statements

H302 Harmful if swallowed.

H373 May cause damage to organs through prolonged or repeated exposure.

Full text of other abbreviations

Acute Tox.	Acute toxicity
STOT RE	Specific target organ toxicity - repeated exposure

Abbreviations and Acronyms

AIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

Further information

Training advice	:	Provide adequate information, instruction and training for operators.
Other information	:	A vertical bar (|) in the left margin indicates an amendment from the previous version.
Sources of key data used to compile the Safety Data Sheet	:	The quoted data are from, but not limited to, one or more sources of information (e.g. toxicological data from Shell Health Services, material suppliers' data, CONCAWE, EU IUCLID date base, EC 1272 regulation, etc).

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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