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## 1. Chemical Product & Company Identification

A. Product Name : Diethylene Glycol

B. Recommended Use : Polymer materials, Raw materials and intermediates

Restriction on use : Do not use for purposes other than recommended.

C. Manufacturer/Supplier :

1) Manufacturer :

Hanwha TotalEnergies Petrochemical Co.,Ltd			
103, Dokgot2-Ro, Daesan-Eup, Seosan-Si, Chungnam, 31900, Korea			
T e l e p h o n e	82-41-660-6392	F a x	82-41-660-6637

2) Supplier : (Product information: 041-660-6180)

Hanwha TotalEnergies Petrochemical Co.,Ltd			
Base Chemicals Sales Team 2, Hanwha Finance Plaza, 92, Sejong-daero, Jung-gu, Seoul 04525, Korea			
T e l e p h o n e	82-2-3415-9379	F a x	82-2-3415-9370

## 2. Hazard Identification

A. GHS Classification :

1) Physicochemical Hazards - Not Classified

2) Health Hazards – Acute Toxicity(Oral): Category 4

- Reproductive toxicity : Category2

- Specific target organ toxicity(Repeated exposure) : Category1

3) Environmental Hazards - Not Classified

### B. GHS label elements

1) Hazard symbols:



2) Signal Word: Danger

3) Hazard Statement(s):

H302 Harmful if swallowed

H361 Suspected of damaging fertility or the unborn child

H372 Causes damage to organs(kidney, liver) through prolonged or repeated exposure

4) Precautionary Statement(s):



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### ■ Prevention

P201 Obtain special instructions before use.

P202 Do not handle until all safety precautions have been read and understood.

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.

P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.

### ■ Response

P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

P308+P313 If exposed or concerned: Get medical advice/attention.

P314 Get medical advice/attention if you feel unwell.

P330 Rinse mouth.

### ■ Storage

P405 Store locked up.

### ■ Disposal

P501 Dispose of contents/container in accordance with local/regional/national/international regulation

C. Other hazards which do not result in classification

- Not available

### 3. Composition / Information on ingredients

Chemical Name	Other Name	CAS No. or EC No.	(%)
Diethylene Glycol	2,2'-oxydiethanol	111-46-6 (EC No.203-872-2)	100

### 4. First Aid Measures

#### A. Eye Contact

- Flush thoroughly with water at least 20minutes.
- Get medical assistance.

#### B. Skin Contact

- If you feel unwell, consult a medical institution (doctor).
- Get emergency medical attention.
- Remove contaminated clothing and shoes and isolate contaminated area.
- In case of contact with substance, immediately flush skin with running water for at least 20



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minutes.

- Prevent spread of contamination in case of minor skin contact.

### C. Inhalation contact

- If exposed to excessive dust or fumes, remove to fresh air and seek medical attention if coughing or other symptoms develop.
- If not breathing, give artificial respiration.
- If breathing is difficult, give oxygen.

### D. Ingestion contact

- Get emergency medical attention.
- If vomiting occurs spontaneously, keep the head lower than the hips to prevent vomit from blocking the airway.
- If unconscious, turn head to side.
- Seek medical attention immediately.
- Do not feed anything if unconscious.
- If conscious, immediately give 2-4 cups of water or milk.

### E. Delayed and immediate effects and also chronic effects from short and long term exposure

- Not available

### F. Notes to physician

- In case of ingestion, perform gastric lavage.
- Consider the supply of oxygen.

#### Basic treatment

- Establish a patent airway with suction where necessary.
- Watch for signs of respiratory insufficiency and assist ventilation as necessary.
- Monitor and treat, where necessary, for shock.
- Give activated charcoal.
- Notify medical personnel of contaminated situations and have them take appropriate protective measures.

## 5. Fire Fighting Measures

### A. Extinguishing extinguishing media

- 1) Suitable extinguishing media : Alcohol-resistant foam, powder extinguishing agent, water, carbon dioxide
- 2) Unsuitable extinguishing media : Not available
- 3) Unusual fire(big fire) : Use normal extinguishing agents or flood with fine water spray.



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### B. Specific hazards arising from the chemical :

- Thermal decomposition products: carbon oxides
- Minor fire hazard
- Containers may explode when heated
- Some can burn but do not ignite easily
- Non-flammable, material itself does not burn, but may decompose when heated to generate corrosive/toxic fumes
- In case of fire, irritating, corrosive and toxic gases may be generated.

### C. Special protective actions for firefighters :

- Get out of the area and extinguish at a safe distance.
- May be transported melted
- Dig a ditch for disposal of fire extinguishing water and keep the material from dispersing.
- Move container from fire area if you can do it without risk.
- In case of tank fire, extinguish at maximum distance or use unmanned fire extinguishing equipment.
- In case of tank fire, cool containers with plenty of water even after extinguishing.
- In the event of a tank fire, if there is a high sound from the pressure relief device or if the tank is discolored, leave immediately.
- In case of a tank fire, get away from the tank in flames.
- In case of a tank fire, in case of a large-scale fire, use unmanned fire extinguishing equipment, and if it is impossible, leave and let it burn.

## 6. Accidental Release Measures

### A. Personal precautions, protective equipment and emergency procedures :

- Wipe up spills immediately and follow precautions in the section on protective equipment.
- Eliminate all sources of ignition.
- Stop leak if you can do it without risk.
- Do not touch broken containers or leaks without wearing appropriate protective clothing.

### B. Environmental precautions :

- Prevent entry into waterways, sewers, basements and confined spaces.

### C. Methods and materials for containment and cleaning up :

- Absorb spillage with inert material (eg dry sand or earth) and place in a chemical waste container.
- Absorb liquid and flush contaminated area with detergent and water.



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### 7. Handling and Storage

#### A. Precautions for safe handling

- Avoid inhalation of dust·fume·mist·vapor·spray.
- Handle only outdoors or in a well-ventilated area.
- Follow all MSDS/Warning precautions as product residue may remain after container is emptied.
- Open the cap carefully before opening.
- Work with reference to engineering controls and personal protective equipment.

#### B. Conditions for safe storage, including any incompatibilities

- Store the container tightly closed in a well-ventilated place.
- Drain empty drums completely, cap properly, and immediately return to drum regulator or place appropriately.

### 8. Exposure Controls / Personal Protection

#### A. Exposure limit value :

- 1) ACGIH TLV : Not applicable
- 2) OSHA PEL : Not applicable

#### B. Engineering controls

- According to the information so far, additional ventilation is not required
- Check if it meets the relevant exposure standards.

#### C. Individual protection measures, such as personal protective equipment

##### 1) Respiratory protection

- Prevent inhalation of the solvents.
- If required to control exposure, use only suitable respirators and components tested and approved under appropriate government standards such as NIOSH.
- Under conditions of frequent use or heavy exposure, Respiratory protection may be needed.
- Respiratory protection is ranked in order from minimum to maximum.
- Consider warning properties before use.
- Any chemical cartridge respirator with organic vapor cartridge(s).
- Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s).
- Any air-purifying respirator with a full facepiece and an organic vapor canister.
- For Unknown Concentration or Immediately Dangerous to Life or Health : Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full facepiece.



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- In case of insufficient oxygen (< 19.5%), wear a supplied-air mask or self-contained breathing apparatus.
- 2) Eye protection
  - Wear approved chemical safety glasses or goggles where eye exposure is reasonably probable.
  - Eye wash fountain is recommended.
- 3) Hand protection
  - Wear protective gloves. Butyl rubber gloves are recommended.
- 4) Skin / Body protection
  - Wear protective cloths. Wear appropriate glove.

### 9. Physical and Chemical Properties

- A. Appearance(Physical state, color etc.) : Colorless viscous liquid  
The appearance changes: hygroscopic
- B. Odor : Odorless
- C. Odor Threshold : Not available
- D. pH : Not available
- E. Melting point/Freezing point : -8.5 °C
- F. Initial Boiling Point/Boiling Ranges : 244 ~ 247 °C
- G. Flash point : 124°C
- H. Evaporation rate : 0.001(BuAc=1)
- I. Flammability(solid, gas): Not applicable
- J. Upper/Lower Flammability or explosive limits : 1.8 / 12.2 %
- K. Vapor pressure : 2mmHg (20 °C)
- L. Solubility in water : 100 g/100 mL (25 °C, Soluble)
- M. Vapor density(Air=1) : 3.66
- N. Specific gravity(Relative density): 1.12
- O. Partition Coefficient(n-Octanol/water) : -1.47 (est.)
- P. Auto-ignition temperature : 229 °C
- Q. Decomposition temperature : Not available
- R. Viscosity : 30cP (25 °C)
- S. Molecular weight : 106.12

### 10. Stability and Reactivity

- A. Chemical Stability
- Stable at normal temperature and pressure
- B. Possibility of hazardous reactions



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- Does not polymerize
- Containers may explode when heated
- In case of fire, irritating, corrosive and toxic gases may be generated.

### C. Conditions to avoid

- Avoid incompatible substances and conditions.
- Avoid contact with heat, sparks, flames or other sources of ignition.

### D. Incompatible materials :

- Acids, bases, oxidizing agents

### E. Hazardous decomposition products

- Thermal decomposition products or combustion products: carbon oxides

## 11. Toxicological Information

### A. Information on the likely routes of exposure

- 1) Respiratory tracts: Not available
- 2) Oral: Harmful if swallowed
- 3) Eye•Skin: Not available

### B. Delayed and Immediate effect and also chronic effects from short and long term exposure

#### 1) Acute toxicity

- Oral
  - [Diethylene Glycol] : **LD50 300~2000 mg/kg (EU Harmonized Cat. 4) (ECHA)**
- Dermal
  - [Diethylene Glycol] : LD50 13300 mg/kg Rabbit (DFGOT) (NITE)
- Inhalation
  - [Diethylene Glycol] : Not available

#### 2) Skin corrosion/irritation

- [Diethylene Glycol] : Caused mild irritation as a result of skin irritation test on rabbits. Not classified (IUCLID)

#### 3) Serious eye damage/irritation


- [Diethylene Glycol] : Rabbit Test Results Non-irritating (DFGOT) (NITE)

#### 4) Respiratory sensitization

- [Diethylene Glycol] : Not available

#### 5) Skin sensitization

- [Diethylene Glycol] : Not classified as a result of skin sensitization test for guinea pigs (EU Method B.6, GLP) (ECHA)

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6) Carcinogenicity

\* IARC, OSHA, ACGIH, NTP, EU CLP : Not applicable

7) Germ cell mutagenicity

- [Diethylene Glycol] : The result of the reverse mutation test using in vitro microorganisms was negative regardless of the presence or absence of a metabolic activation system (OECD TG 471, GLP), and the result of the micronucleus test of mammalian red blood cells in in vivo mice was negative (OECD TG 474, GLP) (ECHA)

8) Reproductive toxicity

- [Diethylene Glycol] : In a two-generation reproductive study with pre-mating exposure in mice, reduced litter numbers and craniofacial malformations such as hydrocephalus and cleft palate were observed (DFGOT vol.10 (1998)). Weight loss in maternal animals and death in hamsters were observed at doses that produced this effect. i.e., clear reproductive toxicity at doses that exhibit general toxicity to parental animals (NITE)

9) STOT-single exposure

- [Diethylene Glycol] : Not available

10) STOT-repeated exposure

- [Diethylene Glycol] : Bladder stones, kidney damage and intermittent liver damage were partially observed during long-term exposure in repeated oral exposure studies using rats (PATY). In humans, a number of epidemiologic studies have been conducted, and progressive renal failure followed by renal failure, and some liver failure have been reported (DFGOT) Category 1 Target organs: kidney, liver (NITE)

11) Aspiration hazard

- [Diethylene Glycol] : Not available

## 12. Ecological Information

A. Ecotoxicity:

1) Fish

- [Diethylene Glycol] : LC50 75222 mg/L 96 hr Pimephales promelas, NOEC > 40 mg/L 28 d Menidia peninsulae (ECHA)

2) Crustacean

- [Diethylene Glycol] : NOEC 8590 mg/L 7 d Ceriodaphnia dubia (ECHA)


3) Algae

- [Diethylene Glycol] : EC50 6500~13000 mg/L 96 hr Raphidocelis subcapitata (ECHA), NOEC > 100 mg/L 72 hr Raphidocelis subcapitata (OECD TG 201, GLP) (ECHA)

B. Persistence and Degradability :

1) Persistence

- [Diethylene Glycol] : Not available

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2) Degradability

- [Diethylene Glycol] : Not available

C. Bioaccumulation potential :

1) Biodegradation

- [Diethylene Glycol] : 102%, 28 d, Readily biodegradable (OECD TG 301 A, GLP) (ECHA)

2) Bioaccumulative potential

- [Diethylene Glycol] : Not available

D. Mobility in soil

- [Diethylene Glycol] : Not available

E. Other adverse effects : Not available

### 13. Disposal Consideration

A. Disposal methods

- Incinerate it.
- If incineration is difficult, crush, cut, or melt into a size of 15 cm or less in maximum diameter, and then landfill in a managed landfill facility where designated waste can be buried.

B. Special precautions for disposal

- Dispose of waste in accordance with all applicable laws and regulations

### 14. Transportation Information

A. UN No. (IMDG CODE/IATA DGR) : Not applicable

B. Proper shipping name: Not applicable

C. Hazard Class : Not applicable


D. IMDG CODE/IATA DGR Packing group : Not applicable

E. Marine pollutant: Not applicable

F. Special precautions for user related to transport or transportation measures

- ☐ Local transport follows in accordance with Dangerous goods Safety Management Law.
- ☐ Package and transport follow in accordance with Department of Transportation (DOT) and other regulatory agency requirements.
- EmS FIRE SCHEDULE: Not available
- EmS SPILLAGE SCHEDULE: Not available

### 15. Regulatory Information

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A. National and/or international regulatory information

- ☐ POPs Management Law
  - [Diethylene Glycol] : Not applicable
- ☐ Information of EU Classification
  - \* Classification
    - [Diethylene Glycol] : H302
- ☐ U.S. Federal regulations
  - \* OSHA PROCESS SAFETY (29CFR1910.119) : Not applicable
  - \* CERCLA Section 103 (40CFR302.4) : Not applicable
  - \* EPCRA Section 302 (40CFR355.30) : Not applicable
  - \* EPCRA Section 304 (40CFR355.40) : Not applicable
  - \* EPCRA Section 313 (40CFR372.65) : Not applicable
- ☐ Rotterdam Convention listed ingredients: Not applicable
- ☐ Stockholm Convention listed ingredients: Not applicable
- ☐ Montreal Protocol listed ingredients: Not applicable

#### 16. Other Information

This information relates to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is to the best of our knowledge and belief, accurate and reliable as of the date compiled. However, no representation, warranty or guarantee is made as to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability and completeness of such information for his own particular use. We do not accept liability for any loss or damage that may occur from the use of this information nor do we offer warranty against patent infringement.

A. Issue date: 2010. 07. 27

B. Last revision: 2023. 08. 17, Rev.5

- Rev.4: Change Company name and logo
- Rev.5 : Change GHS Classification