



Material Safety Data Sheet

Creation	2010.07.27
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Ethylene Glycol

1. Chemical Product & Company Identification

A. Product Name : Ethylene Glycol

B. Intended Use : Polyester textile, antifreezing solution, manufacture of urethane,
Unsaturated polyester

C. Manufacturer/Supplier :

1) Manufacturer :

Hanwha TotalEnergies Petrochemicals Co.,Ltd			
103, Dokgot2-Ro, Daesan-Eup, Seosan-Si, Chungnam, 31900, Korea			
T e l e p h o n e	82-41-660-6415	F a x	82-41-660-6637

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

Hanwha TotalEnergies Petrochemicals Co.,Ltd			
17~20F Hanwha Finance Plaza, 92, Sejong-daero, Jung-gu, Seoul 04525, Korea			
T e l e p h o n e	82-2-3415-9363	F a x	82-2-3415-9370

2. Hazard Identification

A. Hazard Category :

- 1) Physicochemical Hazards - Not Classified
- 2) Health Hazards - Reproductive toxicity : Category 1B
Specific target organ toxicity(Single exposure) : Category 1
Specific target organ toxicity(Repeated exposure) : Category 1
- 3) Environmental Hazards - Not Classified

B. Precautionary Statement(s) & Warning Label

1) Symbol :



2) Signal Word : Danger

3) Hazard Statement(s) :



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H360 May damage fertility or the unborn child

H370 Causes damage to organs(Refer Section SDS 11)

H372 Causes damage to organs through prolonged or repeated exposure (Refer Section SDS 11)

4) Precautionary Statement(s) :

■ 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.

P281 Use personal protective equipment as required.

■ Response

P307+P311 If exposed: Call a POISON CENTER or doctor/physician.

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

P314 Get medical advice/attention if you feel unwell.

P321 Specific treatment

■ Storage

P405 Store locked up.

■ Disposal

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

C. Other hazards

NFPA ratings : Health=2, Fire=1, Reactivity=0

3. Composition / Information on ingredients

Chemical Name	Other Name	CAS No. or EU No.	(%)
Ethylene Glycol	1,2- DIHYDROXYETHANE	107-21-1 (EU No.203-473-3)	100%

4. First Aid Measures

A. Eye Contact : Flush thoroughly with water at least 15minutes.

Get medical assistance.

Do not rub your eyes.



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B. Skin Contact : Wash contact areas with soap and water.

Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.

Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.

Wear gloves when washing the patient, and please avoid contact with contaminated clothing.

C. Inhalation : If inhaled, remove to fresh air.

If not breathing give artificial respiration.

Get medical aid.

When exposed to large amounts of steam and mist, move to fresh air.

Take specific treatment if needed.

D. Ingestion : Potential for aspiration if swallowed. Get medical aid immediately.

Do not induce vomiting unless directed to do so by medical personnel.

Never give anything by mouth to an unconscious person. If vomiting occurs naturally, have victim lean forward.

Rinse your mouth with water immediately.

E. Likely Acute or Delayed Symptoms/Effects :

1) Inhalation

- Short term exposure : irritation, sleepiness, headache, dizziness, blood disorder
- Long term exposure : irritation, headache

2) Skin contact

- Short term exposure : vomiting, gastralgia, headache, dizziness, sleepiness, hallucination, convulsions, coma, allergic reaction
- Long term exposure : irritation, allergic reaction

3) Eye contact

- Short term exposure : irritation
- Long term exposure : Not available

4) Ingestion

- Short term exposure : vomiting, gastralgia, headache, dizziness, sleepiness, hallucination, convulsions, coma
- Long term exposure : kidney trouble

F. Emergency measure / Notes to physician

: Support vital functions, correct for dehydration and shock, and manage fluid balance.

Administer ethanol (orally or by IV (intravenously)) or fomepizole (4-methylpyrazole or



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Antizol)) therapy by IV as an antidote to inhibit the formation of toxic metabolites.
Notify medical personnel of contaminated situations and have them take appropriate protective measures.
If exposed or concerned, get medical attention/advice.

5. Fire Fighting Measures

A. Extinguishing media :

- 1) Suitable extinguishing media
: Alcoholstable foam, dry chemical powder, carbon dioxide
- 2) Unsuitable extinguishing media
: Avoid use of water jet for extinguishing
- 3) Unusual fire(big fire) : Do use extinguishing media with water spray or fog.

B. Unusual fire & Explosion hazard :

- 1) Hazardous combustion product : Carbon oxides
(carbon monoxide (CO), carbon dioxide (CO₂))
- 2) Fire & Explosion hazard : Slightly flammable to flammable in presence of open flames and sparks, of heat. Non-flammable in presence of shocks. Heating may cause expansion or decomposition leading to violent rupture of containers.
Mists containing combustible materials may be explosive.
Contains low boiling substance: Closed containers may rupture due to pressure buildup under fire conditions.

C. Special fire fighting procedure / protection of firefighters :

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
Using a unattended and water devices in case of large fire and leave alone to burn if you do not imperative.
Avoid inhalation of materials or combustion by-products.
Do not access if the tank on fire.
Use appropriate extinguishing measure suitable for surrounding fire.
Vapor or gas is burned at distant ignition sources can be spread quickly.
Prevent, by any means available, spillage from entering drains or water course.
Use water delivered as a fine spray to control fire and cool adjacent area.
DO NOT approach containers suspected to be hot.



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6. Accidental Release Measures

A. Personal precautions :

- Shut off all sources of ignition.
- Wear self-contained breathing apparatus.
- Ventilate closed spaces before entering.
- Do not touch spilled material. Stop leak if you can do it without risk.
- Handling the damaged containers or spilled material after wearing protective equipment.
- Do not direct water at spill or source of leak.
- Keep unauthorized people away, isolate hazard area and deny entry.

B. Environmental precautions :

- 1) atmosphere release : Not available
- 2) soil release :
 - Prevent runoff and contact with waterways, drains or sewers.
 - If large amounts have been spilled, inform the relevant authorities.
- 3) underwater release : Not available

C. Spill cleanup methods :

- 1) Small liquid spill : Use a non-combustible material like sand to soak up the product and place into a container for later disposal.
 - Stay upwind and keep out of low areas. Dike for later disposal.
 - Notification to central government, local government. When emissions at least of the standard amount
 - Dispose of waste in accordance with local regulation.
 - Appropriate container for disposal of spilled material collected.
- 2) Large spillages : sand or other non-combustible material, please let use absorption.
 - Wipe off the solvent.
 - Dike for later disposal.
 - Spilled material should be treated as a potential risk of waste collected.

7. Handling and Storage

- #### A. Handling :
- Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood.
 - Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/vapor/spray. Wear suitable protective clothing.
 - If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents, acids, alkalis.



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Comply with all applicable laws and regulations for handling
Dealing only with a well-ventilated place.
Do not inhale the steam prolonged or repeated.
Contaminated work clothing should not be allowed out of the workplace.

- B. Storage : Keep container tightly closed. Keep container in a cool, well-ventilated area.
Save applicable laws and regulations.
Do not apply any physical shock to container.
Please pay attention to incompatibilities materials and conditions to avoid.

8. Exposure Controls / Personal Protection

A. Exposure limit value :

- 1) ACGIH :
 - TLV-TWA : 100 mg/m³(aerosol only)
 - TLV-STEL : -
- 2) OSHA : Not available

B. Engineering control : Adequate ventilation(localize ventilation) should be provided in workplaces. Use non sparking tools.

A system of local and/or general exhaust is recommended to keep employee exposures above the Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. The use of local exhaust ventilation is recommended to control emissions near the source.

C. 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



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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.

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.

9. Physical and Chemical Properties

- A. Appearance(physical state, color etc.) : Colorless liquid
- B. Odor : Odorless
- C. Odor Threshold : Not available
- D. pH : Not available
- E. Melting point/Freezing point : -12°C
- F. Boiling point/range : 198°C
- G. Flash point : $111^{\circ}\text{C}(\text{c.c})$
- H. Evaporation rate : Not available
- I. Flammability (solid, liquid): Not available
- J. Flammability Limit (lower/upper) : 3.2~15.3%
- K. Vapor pressure : 0.05mmHg(@ 20°C)
- L. Solubility in water : Soluble
- M. Vapor density(Air=1) : 2.14
- N. Specific gravity : 1.1088
- O. Partition Coefficient(n-Octanol/water) : Not available
- P. Auto-ignition temperature : 398°C
- Q. Thermal decomposition : Not available
- R. Viscosity : 21cP@ 15°C
- S. Molecular weight : 62.07

10. Stability and Reactivity

- A. Stability : Stable under normal temperatures and pressures



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B. Possibility of hazardous reaction : Has not been reported

C. Conditions to avoid : Ignition source, excess heat, flame,

D. Incompatible material :

Oxidizing agents, acid, metal, alkalies.

Glycols and their ethers undergo violent decomposition in contact with 70% perchloric acid. This seems likely to involve formation of the glycol perchlorate esters (after scission of ethers) which are explosive, those of ethylene glycol and 3-chloro-1,2-propanediol being more powerful than glyceryl nitrate, and the former so sensitive that it explodes on addition of water.

E. Hazardous decomposition products : Hydrocarbon compounds, Carbon oxides(carbon monoxide (CO), carbon dioxide (CO₂))

11. Toxicological Information

A. Route of exposure

- 1) Inhalation : Not available
- 2) Ingestion : Not available
- 3) Skin contact : Not available
- 4) Eye contact : Not available

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

1) Acute toxicity :

- Oral : LD50 = 4000 mg/kg Rat
- Dermal : LD50 = 10600 mg/kg Rabbit
- Inhalation : Not available

2) Skin corrosion/irritation : Mild irritant in a study conducting with rabbit and guinea pig.

3) Serious eye damage/irritation : Short-term exposure by eye irritant test conducting with rabbits caused irritation of conjunctiva without involving permanent damage of cornea.

4) Respiratory sensitization : Not available

5) Skin sensitization : No sensitization (human)

6) Carcinogenicity :

- MOL Notice : Not available
- OSHA : Not available
- NTP : Not available
- IARC(GROUP) : Not available
- ACGIH : A4



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- EC : Not available
- 7) Germ cell mutagenicity :
 - dominant lethal assay in a albino rat : Negative,
 - Microorganism AMES test : -
 - chromosomal aberration test : Negative
 - Micronucleus Test : Negative
- 8) Reproductive toxicity :

It was observed on effects(deformity, ossification) of fetal animal as a result of continuous cross-fertilization test and teratogenic test in volume without toxicity for a mother's mouse.
- 9) STOT-single exposure :

It was shown about disability awareness, convulsions and confused condition and was observed urea nitrogen, increase in creatinine and uric acid, albuminuria and hematuria and pulmonary congestion in blood.
- 10) STOT-repeated exposure :

It was observed about loss of consciousness, ophthalmodonesis, a slight headache and backache and irritation of upper airway. It was observed about inflammatory change for a lung and heart to animal testing.
- 11) Aspiration hazard : Not available

12. Ecological Information

A. Ecotoxicity :

- 1) Fishes : LC50 = 8050 mg/l 96 hr Pimephales promelas
- 2) Crustacea : LC50 = 41100 mg/l 48 hr Daphnia magna
- 3) Seaweeds : EC50 = 6500 ~ 13000 mg/l 96 hr Selenastrum capricornutum

B. Persistence and Degradability :

- 1) Persistence : log Kow = -1.93
- 2) Degradability : BOD = 0.78 COD = 1.19 BOD = 5/COD = = 0.66

C. Bioaccumulation potential :

- 1) Biodegradation : Biodegradability = 89 (%) 20 day
- 2) Bioaccumulation : BCF = 200

D. Mobility in soil : Not available

E. Hazardous to the ozone layer: Not classified

F. Other adverse effects : Not available



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13. Disposal Consideration

A. Disposal method : Dispose in accordance with all applicable regulations.

Since more than two kinds of designaed waste is mixed, it is difficult to treat seperatly, then can be reduction or stabilization by incineration or similar process.

If water separation is possible, pre-process with Water separation process.

Dispose by incineration.

Will be pre-processed by the separation of oil and water.

B. Disposal instruction : The user of this product must disposal by oneself or entrust to waste disposer or person who other's waste recycle and dispose, person who establish and operate waste disposal facilities. Dispose of waste in accordance with all applicable laws and regulations.

C. Waste code : Not available

14. Transportation Information

A. UN classification : 3082

B. Proper shipping name : Environmentally hazardous substances, liquid, n.o.s.

C. Class/division : 9

D. Packing group : III

E. Marine pollutant : Applicable(Y)

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 : F-A (General fire schedule)

- EmS SPILLAGE SCHEDULE : S-F (Water-soluble marine pollutants)

15. Regulatory Information

A. Additional national and/or international regulatory information

Information of EU Classification :

• Classification :

- [1,2-Ethenediol] : Xn; R22

• Risk Phrases :

- [1,2-Ethenediol] : R22



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- Safety Phrase :
 - [1,2-Ethenediol] : S2
- U.S. Federal regulations :
 - OSHA PROCESS SAFETY (29CFR1910.119) : Not available
 - CERCLA Section 103 (40CFR302.4) :
 - [1,2-Ethenediol] : 2267.995 kg 5000 lb
 - EPCRA Section 302 (40CFR355.30) : Not available
 - EPCRA Section 304 (40CFR355.40) : Not available
 - EPCRA Section 313 (40CFR372.65) :
 - [1,2-Ethenediol] : Applicable
- Rotterdam Convention listed ingredients : Not available
- Stockholm Convention listed ingredients : Not available
- Montreal Protocol listed ingredients : Not available

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 on 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 : 2009.11.27

B. Revision number and date :

- Revision number : 5
- Revision data : 2022.04.01
 - Rev5 : Change company name and logo