Safety Data Sheet(SDS)

Revision date : 01-06-2026

1. Identification

1) Product identifier : MEG_MONO_ETHYLENE_GLYCOL

2) Relevant identified uses of the substance or mixture and uses advised against

○ Relevant identified uses

1.Raw materials and intermediates

○ Restrictions on use

Use for recommended use only
Do not use it for weapons manufacturing and related purposes.

3) Supplier information

○ Seller

Company name : Lotte Daesan Petrochem Corporation
Address : 82 Dokgot 1-ro, Daesan-eup, Seosan-si, Chungcheongnam-do
Telephone number : +82-41-689-5114
Emergency phone number : (Control Room) +82-41-689-5119
Fax number : +82-41-689-5985

2. Hazards identification

1) Hazard classification

- Skin corrosion/irritation Category 2
- Serious eye damage/eye irritation Category 2
- Specific target organ toxicity single exposure Category 2
- Specific target organ toxicity single exposure Category 3(Respiratory tract irritation)
- Specific target organ toxicity repeated exposure Category 2

2) Allocation label elements

Hazard pictograms

Signal word

- WARNING

Hazard statements

H315 Causes skin irritation
H319 Causes serious eye irritation
H335 May cause respiratory irritation
H371 May cause damage to organs
H373 May cause damage to organs through prolonged or repeated exposure

Precautionary statements

- Prevention

P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P264 Avoid contact during pregnancy/ while nursing.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a wellventilated area.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/…

- Response

P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P311 IF exposed or concerned: Call a POISON CENTER/ doctor.
P312 Discomfort call a POISON CENTER / toxins center / physician if you feel unwell.
P314 Get medical advice/attention if you feel unwell.
P321 Specific treatment (see supplemental instructions on the administration of antidotes on this label).
P332+P313 If skin irritation occurs: Get medical advice/attention.
P337+P313 If eye irritation persists: Get medical advice/attention.
P362+P364 Take off contaminated clothing and wash it before reuse.

- Storage

P403+P233 Store in a wellventilated place. Keep container tightly closed.
P405 Store locked up.

- Disposal

P501 Discard the contents/containers in accordance with the laws and laws related to waste.

3) Other hazards:

According to experience and information provided, this product does not affect harmful effects when using and handling it as a regulation.

3. Composition/Information on ingredients

Chemical name	Common name	CAS No.	Content(wt%)
Ethylene glycol	ethane-1,2-diol	107-21-1	100

4. First-aid measures

1) Following eye contact
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Seek immediate medical assistance.

2) Following skin contact
- For hot product, immediately immerse in or flush the affected area with large amounts of cold water to dissipate heat.
- For minor skin contact, avoid spreading material on unaffected skin.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Remove and isolate contaminated clothing and shoes.
- Seek immediate medical assistance.

3) Following inhalation
- Administer oxygen if breathing is difficult.
- Give artificial respiration if victim is not breathing.
- If exposed to excessive levels of dusts or fumes, remove to fresh air and get medical attention if cough or other symptoms develop.
- Keep victim warm and quiet.
- Move to fresh air.

4) Following ingestion
- Seek immediate medical assistance.

5) Delayed and immediate effects and also chronic effects from short and long term exposure
- Causes serious eye irritation
- Causes skin irritation
- May cause damage to organs
- May cause damage to organs through prolonged or repeated exposure
- May cause respiratory irritation

6) Advice to physician
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

5. Fire-Fighting measures

1) Suitable (and unsuitable) extinguishing media

○ Suitable extinguishing media

- Use dry sand or earth to smother fire.
- Dry chemical.
- CO2.
- Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material.
- Water spray.

○ Unsuitable extinguishing media

- Direct water.

2) Special hazards arising from the substance or mixture

○ Pyrolytic product

- During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.
- Can decompose at high temperatures forming toxic gases.
- Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.

○ Risk of fire and explosion

- Containers may explode when heated.
- Some may burn but none ignite readily.

○ Other

- May cause toxic effects if inhaled.

3) Special protective equipment for firefighters

- Substance may be transported in a molten form.
- Dike fire-control water for later disposal; do not scatter the material.
- Evacuate area and fight fire from a safe distance.
- Fire involving Tanks: ALWAYS stay away from tanks engulfed in fire.
- Fire involving Tanks: Cool containers with flooding quantities of water until well after fire is out.
- Fire involving Tanks: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Fire involving Tanks: For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.
- Fire involving Tanks: Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- Move containers from fire area if you can do it without risk.
- Rescuers should put on appropriate protective gear.

6. Accident release measures

1) Personal precautions, protective equipment and emergency procedures

- Clean up spills immediately, observing precautions in Protective Equipment section.
- Cover with plastic sheet to prevent spreading.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- Please note that materials and conditions to be avoided.

- Stop leak if you can do it without risk.

2) Environmental precautions

- Prevent entry into waterways, sewers, basements or confined areas.

3) Methods and materials for containment and cleaning up

- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
- Absorb spill with inert material (e.g., dry sand or earth), then place in a chemical waste container.
- Absorb the liquid and scrub the area with detergent and water.

7. Handling and storage

1) Precautions for safe handling

- Avoid breathing vapors from heated material.
- Avoid prolonged or repeated contact with skin.
- Do not enter storage area unless adequately ventilated.
- Follow all MSDS/label precautions even after container is emptied because they may retain product residues.
- Handling refer to engineering control/personal protection section.
- Loosen closure cautiously before opening.
- Please note that materials and conditions to be avoided.
- Use care in handling/storage.
- Use only in a well-ventilated area.

2) Conditions for safe storage (including any incompatibilities)

- Empty drums should be completely drained, properly bunged, and promptly returned to a drum reconditioner, or properly disposed of.
- Keep away from food and drinking water.

8. Exposure controls & personal protection

1) Chemical exposure limits, Biological exposure standard

Components	ACGIH regulations	Biological limit values
Ethylene glycol	25 ppm TWA (vapor fraction) 50 ppm STEL (vapor fraction); 10 mg/m3 STEL (inhalable particulate matter, aerosol only)	No data available

2) Appropriate engineering controls

- Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.
- If user operations generate dust, fume, or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
- Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

3) Personal protective equipment

○ Respiratory protection

- If you have a direct contact or exposed to the material, wear the appropriate form of respiratory protection certified.

○ Eye protection

- If the work environment or activity involves dusty conditions, mists or aerosols, wear the appropriate goggles.

○ Hand protection

- Wear chemical safety gloves.

○ Skin protection

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

9. Physical and chemical information

Property name	Values	Source
Appearance		
Physical state	Liquid	ICSC
Color	colourless	ICSC
Odor	Odorless	ICSC
Odor threshold	No data available	
pH	No data available	
Melting point/freezing point	-13 ℃	ICSC
Initial boiling point and boiling range(℃)	198 ℃	ICSC
Flash point(℃)	111 ℃	ICSC
Evaporation rate	No data available	
Flammability(solid, gas)	non-naturally flammable	ECHA
Upper/lower flammability or explosive limits	Upper 15.3 %(V) Lower 3.2 %(V)	ICSC
Vapour pressure	7Pa 20 ℃	ICSC
Solubility(ies)	1000g/L (20℃)	ECHA
Vapour density	2.1	ICSC
Relative density	No data available	ICSC
n-octanol/water partition coefficient	logPow : -1.36	ECHA
Auto ignition temperature	398 ℃	ICSC
Decomposition temperature	No data available	
Viscosity(㎟/s, 40℃)	16.1 cP(25℃)	HSDB
Molecular weight(mass)	62.07 g/mol	ICSC
Density	1.11 g/㎤ (20℃)	ECHA
Specific gravity	1.1	

10. Stability and hazardous reactivity

1) Chemical stability and Possibility of hazardous reactions
- Can decompose at high temperatures forming toxic gases.
- Containers may explode when heated.
- Fire may produce irritating, corrosive and/or toxic gases.
- Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.
- Some may burn but none ignite readily.

2) Conditions to avoid
- Ignition source(heat, spark, flame, etc.).

3) Incompatible materials
- Combustibles, reducing material.

4) Hazardous decomposition products
- Corrosive/toxic fume.
- During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.
- Irritating, corrosive and/or toxic gas.

11. Toxicological information

1) Information on the likely routes of exposure

○ Skin Contact
- Liquids can be exposed through the eyes, skin and oral.

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

○ Acute toxicity

- Acute toxicity(Oral)
  - LD50 7712 ㎎ / kg Experimental Arts: RAT (ECHA Condensed Classification Acute Oral Toxicity Classification 4)
- Acute toxicity(Dermal)
  - LD50> 3500 ㎎ / ㎏ kinds of experiments: Mouse
- Acute toxicity(Inhalation:Gases)
  - No data available
- Acute toxicity(Inhalation:Vapours)
  - LC50> 2.5 ㎎ / ℓ 6 hr experiment Species: Rat
- Acute toxicity(Inhalation:Dust/mist)
  - No data available

○ Skin corrosion/irritation

- Topical application of pure ethylene glycol did not irritate the skin excised (Clark et al., 1979). Percutaneous injection guinea pigs are raised and local skin irritation as reported redness (Redness) Dermal LD50 in

rabbits causes were reported to be 9530 mg / kg (Cavender and Sowinski, 2001). ※ rabbits, guinea pigs,

○ Serious eye damage/eye irritation

- 2 mg / m3 was a severe eye irritation observed (4.7 ppm) for continuous exposure to rabbits for 90 days, 8 days eye pain when exposed to being reported that the corneal damage caused by apparent blindness in 2 of the 15 mice after exposure and redness caused

○ Respiratory sensitization

- No data available

○ Skin sensitization

- Skin sensitization test at a guinea a result, no 100% sensitization Sensitization Index: 0, OECD TG 406, GLP human finger one year skin sensitization test results showed a weak erythema, skin redness, dehydration, separation, inflammation, atherosclerosis, a using QSAR model lasted for two months, cracking skin sensitization test, no sensitization

○ Carcinogenicity

- A4 (ACGIH)

○ Germ cell mutagenicity

- Reverse mutation test using microorganisms in vitro OECD TG 471, GLP, gene mutation tests with mammalian baeang cells, mammalian cultured chromosome aberration test using cells, dominant lethal tests with negative vivo rodent rat regardless of metabolic activation system presence results, voice

○ Reproductive toxicity

- ○ evidence of adverse effect on the reproductive system in a repeated dose toxicity studies, according to the reproduction by the reproduction toxicity study glycol was not observed. Were such as weight gain and mortality were observed in the third-generation study in rats, the reproductive toxicity is not observed NOAEL> 1 000 mg / kg bw / day (※ The source ECHA) ○ Developmental Toxicity Developmental targets (maternal toxicity) Rats part impact of deaths from toxicity tests are not observed. In between the weight reported to be observed in the high-concentration condition higher than control group search (NOAEL = 1,000 mg / kg bw / day (maternal toxicity (fetal toxicity) high concentration exposure group (2500 mg / m3) place in bone formation brachial poor (upper arm) and a facial deformities rate increases are reported, as reported bone formation associated part impact on the 1000 mg / m3. in addition, red blood cell rate reported being NOAEC = 150 mg / m³ air capacity animal toxicity is not visible decrease in the thymus in high concentrations exposed group because it showed the influence mainly on the skeletal deformities in animals, including Ah is a very high capacity in, being judged can not be classified deseo did not obtain clear evidence based on the mechanism of action of the previous classification does not correspond to the person (※ the source ECHA)

○ Specific target organ toxicity single exposure

- That can affect the central nervous system and kidneys when exposed to depression of the central nervous system stimulation, intoxication, euphoria, numbness and breathing can cause depression, coma, when nausea and vomiting caused severe concentration of exposures in accordance with this chapter stimuli, reflexes , loss, seizures in the (not uncommon) and brain tissue can cause irritation of the lining ※ tARGET oRGANS: central nervous system, kidneys, metabolic acidosis ※ classification: Category 2 when causing

coughing and low concentration exposure jungnong also ※ classification: Category 3 (respiratory irritation)

○ Specific target organ toxicity repeated exposure

- 90 days repeated oral toxicity test using mice NTP, GLP results 12500 or 50000 ppm significant weight loss in the exposed group, significant biological change, the impact of clinical and chemical factors, hematologic factors have not been observed. The search was Hyaline degeneration observed in vesicles between the leaflets jungsip liver tissue pathological findings associated with the test substance is nephropathy metallocene customs expansion, cytoplasmic horror observed kidney tissue changes such as epithelial cells play proliferation of customs. NOAEL = 12500 ppm organs: kidney, liver

○ Aspiration hazard

- No data available

12. Ecological information

1) Ecotoxicity

- Hazardous to the aquatic environment, short-term (acute)
  No data available
- Hazardous to the aquatic environment, long-term (chronic)
  No data available
- Fish
  LC50 72860 ㎎ / ℓ 96 Hr PIMEPHALES PROMELAS
- Crustaceans
  EC50 57600 ㎎ / ℓ ~ 13900 ㎎ / ℓ 48 hr Daphnia Magna (OECD Guideline 202, GLP)
- Aquatic algae
  EC50 13000 ㎎ / ℓ ~ 6500 ㎎ / ℓ 96 Hr Other (Pseudokirchnerella Subcapitata, EPA 600 / 9-78-018)

2) Persistence and degradability

- Degradability
  No data available
- Biodegradation
  (After 10 days in aerobic aquatic environments exploded more than 90%, 100% decomposition in the soil 4 days)

3) Bioaccumulative potential

- n-octanol water partition coefficient
  -1.36 Log Kow
- Bioconcentration factor(BCF)
  0.61 ~ 0.210

4) Mobility in soil

0.2 (estimation value)

5) Other adverse effects

No data available

13. Disposal considerations

1) Disposal methods
   - Empty containers should be taken to an approved waste handling site for recycling or disposal.
2) Precautions (including disposal of contaminated container of package)
   - Dispose of in accordance with local regulations.
   - Send to a licensed waste management company.

14. Transport information

1) UN No. : Not applicable
2) Proper shipping name : Not applicable
3) Hazard class : Not applicable
4) Packing group : Not applicable
5) Marine pollutant : No
6) Special precautions for user related to transport or transportation measures :

   Emergency measures in case of fire : Not applicable

   Emergency measures in the effluent : Not applicable

- ADR

  · Tunnel restriction code : No data available

- IMDG

  · Marine pollutant : No

- Air transport(IATA)

  · UN No. : Not applicable

  · Proper shipping name : Not applicable

  · Class or division : Not applicable

  · Packing group : Not applicable

15. Regulatory information

Australia Industrial Chemicals Notification and Assessment Act

- Inventory - Australia - Inventory of Industrial Chemicals (AIIC)

  - Ethylene glycol : Present

China Inventory of Existing Chemical Substances (IECSC)

- Inventory - China - Inventory of Existing Chemical Substances (IECSC)

  - Ethylene glycol : Present [38204]

92/32/EEC

- Not applicable

European Union Official Journal of the European Communities 15 June 1990 - Annex Based on Article 13 of Directive 67/548/EEC Amended by Directive 79/831/EEC

- Inventory - European Union - European Inventory of Existing Commercial Chemical Substances (EINECS)

- Ethylene glycol : 203-473-3

Japan - ISHL Ordinance Hazardous Substances Whose Names Are to be Indicated on the Label

Japan Law Concerning the Examination and Regulations of Manufacture, etc. of Chemical Substances

- Inventory - Japan - Existing and New Chemical Substances (ENCS)

- Ethylene glycol : (2)-230

New Zealand Environmental Protection Authority, Inventory of Chemicals

- Inventory - New Zealand - Inventory of Chemicals (NZIoC)

- Ethylene glycol : HSNO Approval: HSR001534

Turkey Regulation on Inventory and Control of Chemicals

- Not applicable

Taiwan Chemical Substance Inventory

- Inventory - Taiwan - Taiwan Chemical Substance Inventory (TCSI)

- Ethylene glycol : Present

U.S. Toxic Substances Control Act

Vietnam National Chemicals Inventory (NCI)

- Inventory - Vietnam - National Chemicals Inventory (NCI) (DRAFT)

- Ethylene glycol : Present 01806

16. Other information

1) Reference

NCIS, KOSHA, Montreal Protocol, ECHA, OECD SIDS, EU IUCLID, HSDB(PubChem), NITE, NTP, ACGIH, IARC, NIOSH, ChemIDplus, EPA, EPI Suite, INCHEM

2) Issue date : 26-12-2022

3) Revision date

○ Revised date count : 3-1

○ Last revised date : 01-06-2026

4) Other

ACGIH : American Conference of Governmental Industrial Hygienists
ADR : Agreement Concerning the International Carriage of Dangerous Goods by Road
ATE : The Acute Toxicity Estimate
ECHA : European Chemicals Agency
EPA : United States Environmental Protection Agency
EPI Suite : The Estimation Programs Interface for Windows
EU IUCLID : International Uniform Chemical Information Database
HSDB : Hazardous Substances Data Bank
IARC : International Agency for Research on Cancer
IATA : International Air Transport Association
IMDG : International Maritime Dangerous Goods Codes
INCHEM : Internationally Peer Reviewed Chemical Safety Information
M-Factor : The Multiplication Factor
NIOSH : National Institute of Occupational Safety and Health
NITE : National Institute of Technology and Evaluation(JAPAN)
NTP : National Toxicology Program
SCL : Specific Concentration Limit
OECD SIDS : Organization for Economic Co-operation and Development Screening Information Dataset

GHS/EN