Safety Data Sheet(SDS)

According to Regulation (EU) No. 2020/878

Version : 3-1

Revision date : 01-06-2026

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product identifier : MEG_MONO_ETHYLENE_GLYCOL

Other means of identification : No data

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

○ Relevant identified uses

1.Raw materials and intermediates

○ Uses advised against

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

1.3. Details of the supplier of the safety data sheet

○ Seller

Company name : Lotte Daesan Petrochem Corporation
Address : 82 Dokgot 1-ro, Daesan-eup, Seosan-si, Chungcheongnam-do
Telephone number : +82-41-689-5114
Fax number : +82-41-689-5985
Email : www.ldpc.co.kr (contact)

1.4. Emergency telephone number

Emergency phone number : (Control Room) +82-41-689-5119
Opening hours : 08:30~17:30 (GMT+9)
Other comments(e.g. language(s) of the phone service) : English

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

- Acute toxicity(Oral) Category 4

2.2. Label elements

Hazard pictograms

Signal word

- WARNING

Hazard statements

H302 Harmful if swallowed

Precautionary statements

- Prevention

P264 Avoid contact during pregnancy/ while nursing.

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.

- Disposal

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

2.3. Other hazards

- No data available

SECTION 3: Composition/information on ingredients

3.1. Substances

Substance name	1) CAS No 2) EC No	Classification	1) Index number 2) SCL 3) M-Factor 4) ATE	Content(wt%)
Ethylene glycol	1) 107-21-1 2) 203-473-3	Acute Tox. 4	1) - 2) - 3) - 4) Acute toxicity(Oral) : 7712mg/kg	100

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

○ 4.1.1. Eye contact

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

○ 4.1.2. Skin contact

- 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.
- Seek immediate medical assistance.
- Remove and isolate contaminated clothing and shoes.

- 4.1.3. Inhalation
  - Administer oxygen if breathing is difficult.
  - Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.
  - Move to fresh air.
  - Keep victim warm and quiet.
- 4.1.4. If swallowed
  - Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.
  - Seek immediate medical assistance.

4.2. Most important symptoms and effects, both acute and delayed

- No data available

4.3. Indication of any immediate medical attention and special treatment needed

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

SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media
  - CO2.
  - Dry chemical.
  - Direct water.
  - Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material.
  - Use dry sand or earth to smother fire.
  - Water spray.
- Unsuitable extinguishing media
  - Do not use a solid water stream as it may scatter and spread fire.

5.2. Special hazards arising from the substance or mixture

- Containers may explode when heated.
- 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.

5.3. Advice for firefighters

- 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.
- Substance may be transported in a molten form.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

- Protective equipment
  - The wearing of suitable protective equipment to prevent any contamination of skin, eyes and personal clothing.
- Emergency procedures
  - Removal of ignition sources, provision of sufficient ventilation.

6.1.2. For emergency responders

- Wear protective equipment and keep unprotected persons away.
- Avoid dust formation.

6.2. Environmental precautions

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

6.3. Methods and material for containment and cleaning up

6.3.1. For containment

- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.

6.3.2. For cleaning up

- Clear spills immediately.
- Don't use a brush or compressed air for cleaning surfaces or clothing.

6.3.3. Other information

- 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.

6.4. Reference to other sections

- Section 8 (protective equipment), section 13 (disposal instructions)

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Follow all MSDS/label precautions even after container is emptied because they may retain product residues.
- Handling refer to engineering control/personal protection section.
- Please note that materials and conditions to be avoided.

7.2. 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.

7.3. Specific end use(s)

- See section 1 for recommended use.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Components	Occupational Exposure	ACGIH regulations	Biological limit values	DNEL/DMEL	PNEC-Values
Ethylene glycol	20 ppm TWA; 52 mg/m3 TWA 40 ppm STEL; 104 mg/m3 STEL	25 ppm TWA (vapor fraction) 50 ppm STEL (vapor fraction); 10 mg/m3 STEL (inhalable particulate matter, aerosol only)	No data available	No data available	No data available

8.2. Exposure controls

8.2.1. Appropriate engineering controls

- Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

8.2.2. Individual protection measures, such as personal protective equipment

○ Eye/face protection

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

○ Skin protection

(i) Hand protection

- Wear chemical safety gloves.

(ii) Other

- No data available

○ Respiratory protection

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

○ Thermal hazards

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

8.2.3. Environmental exposure controls

- Ensure not to cause envirionmental pollution by discharging into rivers or other waterways.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Property name	Values	Source
Physical state	Liquid	ICSC
Colour	colourless	ICSC
Odour	Odorless	ICSC
Melting point/freezing point	-13 ℃	ICSC
Initial boiling point and boiling range(℃)	198 ℃	ICSC
Flammability(solid, gas)	non-naturally flammable	ECHA
Upper/lower flammability or explosive limits	Upper 15.3 %(V) Lower 3.2 %(V)	ICSC
Flash point(℃)	111 ℃	ICSC
Auto ignition temperature	398 ℃	ICSC
Decomposition temperature	No data available	
pH	No data available	
Kinematic viscosity(㎟/s, 40℃)	16.1 cP(25℃)	HSDB
Solubility	1000g/L (20℃)	ECHA
Partition coefficient(n-octanol/water)	logPow : -1.36	ECHA
Vapour pressure	No data available	
Density/Relative density	No data available	
Relative Vapour density	2.1 (air = 1)	ICSC
Particle characteristics	Not applicable	
Specific gravity	1.1	

9.2. Other information

9.2.1. Information with regard to physical hazard classes

- No data available

9.2.2. Other safety characteristics

- No data available

SECTION 10: Stability and reactivity

10.1. Reactivity

- 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.

10.2. Chemical stability
- 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.

10.3. Possibility of hazardous reactions
- 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.

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

10.5. Incompatible materials
- Combustibles, reducing material.

10.6. Hazardous decomposition products
- Corrosive/toxic fume.
- Irritating, corrosive and/or toxic gas.

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

○ Acute toxicity

- Acute toxicity(Oral)
  - EU-CLP Classifications (Category 4 : 500mg/kg)
  LD50 7712 mg/kg Species : Rat (ECHA harmonized classification acute oral toxicity Category 4)
- Acute toxicity(Dermal)
  - LD50 >3500 mg/kg Test species: Mouse
- Acute toxicity(Inhalation:Gases)
  - No data available
- Acute toxicity(Inhalation:Vapours)
  - LC50 >2.5 ㎎/ℓ 6 hr Experimental species: Rat
- Acute toxicity(Inhalation:Dust/mist)
  - No data available

○ Skin corrosion/irritation

- Topical application of pure ethylene glycol did not irritate the excised skin (Clark et al., 1979). Intradermal injection of guinea pigs was reported to cause local skin irritation Redness-induced skin LD50 in rabbits was reported to be 9530 mg/kg (Cavender and Sowinski, 2001). ※ Rabbit, guinea pig

○ Serious eye damage/eye irritation

- Severe eye irritation was observed in rabbits after 90 days of continuous exposure at 2 mg/m3 (4.7 ppm), and corneal damage was reported with apparent blindness in 2 of 15 rats after 8 days of exposure. Eye pain upon exposure and flare-up

○ Respiratory sensitization

- No data available

○ Skin sensitization

- As a result of skin sensitization test on guinea pigs, 100% no sensitization Sensitization index: 0, OECD TG 406, GLP As a result of a skin sensitization test on human fingers for 1 year, slight erythema was observed, and skin redness, dehydration, peeling, inflammatory sclerosis, Cracks occurred and lasted for 2 months No sensitization as a result of skin sensitization test using QSAR model

○ Carcinogenicity

- A4 (ACGHI)

○ Germ cell mutagenicity

- In vitro reverse mutation test using microorganismsOECD TG 471, GLP, gene mutation test using mammalian embryonic cells, chromosomal abnormality test using mammalian cultured cells, negative in vivo dominant lethality test using rodent rats with or without metabolic activation system result, negative

○ Reproductive toxicity

- ○Reproductive toxicity According to reproduction studies with ethylene glycol, no evidence of adverse effects on reproductive organs was observed in repeated dose toxicity studies. In the third generation study of rats, weight change and death were not observed, and no reproductive toxicity was observed NOAEL > 1 000 mg/kg bw/day (※Source ECHA) ○ Developmental toxicity (maternal toxicity) Development in rats No adverse effects such as death were observed in toxicity tests. The weight of the liver is reported to be higher than that of the control group under the high concentration condition (NOAEL = 1,000 mg/kg bw/day (maternal toxicity) The upper arm with poor bone formation in the high concentration exposure group (2500 mg / m3) and an increased incidence of facial malformations, and adverse effects on bone formation have been reported even at 1000 mg/m3, and a decrease in the incidence of red blood cells in the thymus in the high-dose exposure group. showed mainly effects on sub-animals, including skeletal malformations, but because it was a very high dose, it was judged that it could not be classified because there was no clear evidence that the mechanism of action that was the basis of the previous classification did not apply to humans (※Source ECHA)

○ Specific target organ toxicity single exposure

- Exposure may cause effects on the central nervous system and kidneys May cause depression, poisoning, euphoria, numbness and respiratory depression due to central nervous system stimulation, nausea and vomiting due to intestinal irritation Exposure to severe concentrations may cause coma, loss of reflexes, seizures (Uncommon) and brain lining tissue irritation may occur ※ Target organs: central nervous system, kidney, metabolic acidosis ※Classification: Category 2 Exposure to low concentration causes coughing and medium concentration ※ Category: Category 3 (respiratory system irritation)

○ Specific target organ toxicity repeated exposure

- In the 90-day repeated oral toxicity test using mice, as a result of NTP and GLP, significant weight loss, significant biological changes, clinical chemical factors, and hematological factors were not observed in 12500 or 50000 ppm exposure groups. In histopathological findings related to the test substance, hyaline degeneration was observed in the hepatic vesicles in the middle lobules of the liver. In kidney disease, renal tissue changes such as sensory tubule dilatation, cytoplasmic vacuole, and tubular epithelial cell regeneration were observed. NOAEL = 12500 ppm Target organs: kidney, liver

○ Aspiration hazard

- No data available

11.2. Information on other hazards

11.2.1. Endocrine disrupting properties

- Ethylene glycol
  Not applicable

11.2.2. Other information

- Ethylene glycol
  No other hazards have been identified

SECTION 12: Ecological information

12.1. Toxicity

- Fish
  LC50 72860 mg/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)

12.2. Persistence and degradability

- Degradability
  No data available
- Biodegradation
  (Decomposed more than 90% after 10 days in an aquatic environment, 100% decomposition within 4 days in an aerobic environment and soil)

12.3. Bioaccumulative potential

- n-octanol water partition coefficient
  -1.36 log Kow
- Bioconcentration factor(BCF)
  0.61 to 0.210

12.4. Mobility in soil

0.2 (estimate)

12.5. Result of PBT and vPvB assessment

Not applicable

12.6. Endocrine disrupting properties

Not applicable

12.7. Other adverse effects

Not applicable

SECTION 13: Disposal considerations

13.1. Waste treatment methods

13.1.1. Product / Packaging disposal

- Empty containers should be taken to an approved waste handling site for recycling or disposal.

○ Waste codes / waste designations according to LoW

- No data available

13.1.2. Waste treatment-relevant information

- Disposal according to local regulations.

13.1.3. Sewage disposal-relevant information

- Disposal according to local regulations and avoid release to the environment.

13.1.4. Other disposal recommendations

- No data available

SECTION 14: Transport information

14.1. UN number or ID number : No data available

14.2. UN proper shipping name : No data available

14.3. Transport hazard class(es) : No data available

14.4. Packing group : Not applicable

14.5. Environmental hazards : No

14.6. Special precautions for user :

Emergency measures in case of fire : No data available

Emergency measures in the effluent : No data available

14.7. Maritime transport in bulk according to IMO instruments :

Not applicable

- ADR

· Tunnel restriction code : No data available

- IMDG

· Marine pollutant : No

- Air transport(IATA)

· UN No. : No data available

· Proper shipping name : No data available

· Class or division : No data available

· Packing group : Not applicable

SECTION 15: Regulatory information

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

15.1.1. EU regulations

- EU - REACH (1907/2006) - Annex XVII - Restrictions on Certain Dangerous Substances

  - Not applicable

- EU - REACH (1907/2006) - Annex XIV - Substances Subject to Authorization

  - Not applicable

15.1.2. Other EU regulations

- EU - Persistent Organic Pollutants (POPs) (2019/1021) - Annex III - Substances Subject to Release Reduction Provisions

  - Not applicable

- EU - Persistent Organic Pollutants (POPs) (2019/1021) - Annex I - Substances Subject to Prohibitions

  - Not applicable

- EU - Persistent Organic Pollutants (POPs) (2019/1021) - Annex IV - Waste Management - Concentration Limits

  - Not applicable

- EU - Persistent Organic Pollutants (POPs) (2019/1021) -Annex V-Waste Management-Maximum Concentration Limits

  - Not applicable

- EU - Paints, Varnishes, Vehicle Refinishing Products (2004/42/CE) - Annex II A - WB Phase 1 - VOCs

  - Not applicable

- EU - Paints, Varnishes, Vehicle Refinishing Products (2004/42/CE) - Annex II A - WB Phase 2 - VOCs

  - Not applicable

- EU - Paints, Varnishes, Vehicle Refinishing Products (2004/42/CE) - Annex II B - Vehicles - VOCs

  - Not applicable

- EU - Paints, Varnishes, Vehicle Refinishing Products (2004/42/CE) - Annex II A - SB Phase 1 - VOCs

  - Not applicable

- EU - Paints, Varnishes, Vehicle Refinishing Products (2004/42/CE) - Annex II A - SB Phase 2 - VOCs

  - Not applicable

- EU - Seveso III Directive (2012/18/EU) - Qualifying Quantities of Dangerous Substances - Lower-Tier Requirements

  - Not applicable

- EU - Seveso III Directive (2012/18/EU) - Qualifying Quantities of Dangerous Substances - Higher-Tier Requirements

  - Not applicable

- EU - Export and Import Restrictions (649/2012) - Chemicals Subject to Export Notification Procedure

  - Not applicable

- EU - Export and Import Restrictions (649/2012) - Chemicals and Articles Subject to Export Ban

  - Not applicable

- EU - Export and Import Restrictions (649/2012) - Chemicals Subject to the PIC Procedure under the Rotterdam Convention

  - Not applicable

- EU - Export and Import Restrictions (649/2012) - Chemicals Qualifying for PIC Notification

  - Not applicable

15.2. Chemical safety assessment

- A Chemical Safety Assessment has been carried out.

SECTION 16: Other information

16.1. Key literature references and sources for data

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

16.2. Issuing date : 26-12-2022

16.3. Indication of changes

- Revision number : 3-1
- Revision date : 01-06-2026

16.4. Abbreviations and acronyms

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

For explanation of abbreviations see section 16.

• This substance/mixture contain(s) only ingredients which have been registered, or are exempt from registration, according to Regulation (EC) No. 1907/2006 (REACH).

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.
EUR/EN