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 : TEG_TRI_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, Solvent and extraction agents

○ 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

- Skin corrosion/irritation Category 2
- Reproductive toxicity Category 2
- Hazardous to the aquatic environment, long-term (chronic) Chronic 4

2.2. Label elements

Hazard pictograms

Signal word

- WARNING

Hazard statements

H315 Causes skin irritation
H361 Suspected of damaging fertility or the unborn child.
H413 May cause long lasting harmful effects to aquatic life

Precautionary statements

- Prevention

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P264 Avoid contact during pregnancy/ while nursing.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

- Response

P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P308+P313 IF exposed or concerned: Get medical advice/ attention.
P321 Specific treatment (see supplemental instructions on the administration of antidotes on this label).
P332+P313 If skin irritation occurs: Get medical advice/ attention.
P362+P364 Take off contaminated clothing and wash it before reuse.

- Storage

P405 Store locked up.

- 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

Not applicable

3.2. Mixtures

Substance name	1) CAS No 2) EC No	Classification	1) Index number 2) SCL 3) M-Factor 4) ATE	Content(wt%)
Triethylene glycol	1) 112-27-6 2) 203-953-2		1) - 2) - 3) - 4) Acute toxicity(Oral) : 17000mg/kg	99.7

Diethylene glycol	1) 111-46-6 2) 203-872-2	Acute Tox. 4	1) - 2) - 3) - 4) Acute toxicity(Oral) : 12565mg/kg, Acute toxicity(Dermal) : 11890mg/kg	0.3

SECTION 4: First aid measures

4.1. Description of first aid measures

- 4.1.1. 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.
- 4.1.2. Skin contact
  - For minor skin contact, avoid spreading material on unaffected skin.
  - For hot product, immediately immerse in or flush the affected area with large amounts of cold water to dissipate heat.
  - 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.
- 4.1.3. Inhalation
  - Administer oxygen if breathing is difficult.
  - Give artificial respiration if victim is not breathing.
  - 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.
  - Keep victim warm and quiet.
  - Move to fresh air.
- 4.1.4. If swallowed
  - Seek immediate medical assistance.
  - 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.

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.
- Exposures require specialized first aid with contact and medical follow-up .

SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media
  - CO2.
  - Dry chemical.
  - Direct water.
  - High-pressure water.
  - Regular foam.

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

- Can decompose at high temperatures forming toxic gases.
- Containers may explode when heated.
- During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.
- 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

- Substance may be transported hot.
- 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.

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

- Keep out of waterways.
- 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 the liquid and scrub the area with detergent and water.
- Absorb spill with inert material (e.g., dry sand or earth), then place in a chemical waste container.
- Cover powder spill with plastic sheet or tarp to minimize spreading and keep powder dry.
- Large Spill: Dike far ahead of liquid spill for later disposal.
- With clean shovel place material into clean, dry container and cover loosely; move containers from spill area.
- Small Spill: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal.

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

- Avoid breathing vapors from heated material.
- Avoid prolonged or repeated contact with skin.
- CAUTION: High temperature.
- 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.

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.

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
Triethylene glycol	No data available	10 mg/m3 TWA (inhalable fraction and vapor)	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.
- Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

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	odourless	HSDB
Melting point/freezing point	-5 ℃	ICSC
Initial boiling point and boiling range(℃)	285℃	ICSC
Flammability(solid, gas)	No data available	
Upper/lower flammability or explosive limits	Upper flammability limits : 9.2 %(V), Lower flammability limits : 0.9 %(V)	ICSC
Flash point(℃)	176℃	ECHA
Auto ignition temperature	371 ℃	ICSC
Decomposition temperature	No data available	
pH	No data available	
Kinematic viscosity(㎟/s, 40℃)	47.8 cP (20 ℃)	HSDB
Solubility	miscible	
Partition coefficient(n-octanol/water)	logPow : -1.98	ChemIDplus
Vapour pressure	0.00132 ㎜Hg (25 ℃)	ChemIDplus
Density/Relative density	1.13 g/㎤ (15 ℃)	
Relative Vapour density	5.2	ICSC
Particle characteristics	No data available	
Specific gravity	1.13	ICSC

9.2. Other information

9.2.1. Information with regard to physical hazard classes

Property name	Values	Source
Flammable liquids	Flash point : 176℃, Initial boiling point and boiling range : 285℃	

9.2.2. Other safety characteristics

- No data available

SECTION 10: Stability and reactivity

10.1. Reactivity

- Can decompose at high temperatures forming toxic gases.
- Containers may explode when heated.
- Fire may produce irritating and/or toxic gases.
- 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

- Can decompose at high temperatures forming toxic gases.
- Containers may explode when heated.
- Fire may produce irritating and/or toxic gases.
- 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

- Can decompose at high temperatures forming toxic gases.
- Containers may explode when heated.
- Fire may produce irritating and/or toxic gases.
- 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

- Heat.
- Ignition source(heat, spark, flame, etc.).

10.5. Incompatible materials

- Combustibles, reducing material.

10.6. Hazardous decomposition products

- Corrosive/toxic fume.
- During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.
- Irritating and/or toxic gas.
- 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) PRODUCT : Not classified
  - Diethylene glycol
    : EU-CLP Classifications (Category 4 : 500mg/kg)
    LD50 12565 mg/kg Test species: Rat
  - Triethylene glycol
    : LD50 17000 mg/kg Test species: Rat
- Acute toxicity(Dermal) PRODUCT : Not classified
  - Diethylene glycol
    : LD50 11890 mg/kg Test species: Rabbit
  - Triethylene glycol
    : LD50 >5000 mg/kg Experimental species: Rabbit
- Acute toxicity(Inhalation:Gases) PRODUCT : Not classified
  - No data available
- Acute toxicity(Inhalation:Vapours) PRODUCT : Not classified
  - No data available
- Acute toxicity(Inhalation:Dust/mist) PRODUCT : Not classified
  - No data available

○ Skin corrosion/irritation PRODUCT : Category 2

- Diethylene glycol
  : Mild stimulation (500mg, rabbit)
- Triethylene glycol
  : rabbit/mild stimulation

○ Serious eye damage/eye irritation PRODUCT : Not classified

- Diethylene glycol
  : Mild irritation (50mg, rabbit)
- Triethylene glycol
  : rabbit light stimulation

○ Respiratory sensitization PRODUCT : Not classified

- No data available

○ Skin sensitization PRODUCT : Not classified

- Triethylene glycol
  : Human/Non-sensitization

○ Carcinogenicity PRODUCT : Not classified

- No data available

○ Germ cell mutagenicity PRODUCT : Not classified

- Triethylene glycol
  : Invitro/Voice

○ Reproductive toxicity PRODUCT : Category 2

- Diethylene glycol
  : In a second-generation reproduction test by exposure prior to mating using mice, a decrease in the number of litters and head-lobe facial deformities were observed (DFGOT vol.10 (1998)). At the dose at

which this effect was observed, weight loss in the maternal animal and death in hamsters were observed, i.e., clear reproductive toxicity at the dose at which general toxicity to the parental animal occurred.

- Triethylene glycol

: Rat/fetal effects

○ Specific target organ toxicity single exposure PRODUCT : Not classified

- No data available

○ Specific target organ toxicity repeated exposure PRODUCT : Not classified

- Diethylene glycol

: As a characteristic finding by repeated oral exposure in rats, renal impairment (nephrase) was observed due to the formation of calcium oxalate crystals in the urine along with increased excretion of oxalic acid (DFGOT vol.10 (1998)). When exposure reaches long-term exposure, bladder stones are also observed, and some descriptions of hepatic injury are included, although mild compared to kidney (PATTY (5th, 2001)). However, both of these effects exceed the limit value of the reference range (100 mg/kg/day). On the other hand, in humans, a number of epidemiological investigations have been conducted regarding the exposure of the substance, and many cases of death, progressive renal failure and eventually renal failure, and some reports of liver failure have been reported (DFGOT vol.10 (1998)).

○ Aspiration hazard PRODUCT : Not classified

- No data available

11.2. Information on other hazards

11.2.1. Endocrine disrupting properties PRODUCT : Not classified

- Diethylene glycol
  Not applicable
- Triethylene glycol
  Not applicable

11.2.2. Other information PRODUCT : Not classified

- Diethylene glycol
  No other hazards have been identified
- Triethylene glycol
  No other hazards have been identified

SECTION 12: Ecological information

12.1. Toxicity

- Fish PRODUCT : Hazardous to the aquatic environment, long-term (chronic) Chronic 4
  - Diethylene glycol
    : LC50 32000 mg/L 96 hr
  - Triethylene glycol
    : LC50 >10000 mg/ℓ 96 hr Lepomis macrochirus
- Crustaceans PRODUCT : Hazardous to the aquatic environment, long-term (chronic) Chronic 4
  - Triethylene glycol
    : LC50 46500 mg/ℓ 48 hr Daphnia magna
- Aquatic algae PRODUCT : Hazardous to the aquatic environment, long-term (chronic) Chronic 4
  No data available

12.2. Persistence and degradability

- Degradability PRODUCT : Not classified

  No data available

- Biodegradation PRODUCT : Not classified

  - Diethylene glycol

    : 31 (%) 28 day ((aerobic, other bacteria: Abwasser, nicht adaptiert))

  - Triethylene glycol

    : 95 (%) 14 days

12.3. Bioaccumulative potential

- n-octanol water partition coefficient PRODUCT : Not classified

  - Diethylene glycol

    : -1.47 log Kow (estimate)

  - Triethylene glycol

    : -1.98 log Kow (estimate)

- Bioconcentration factor(BCF) PRODUCT : Not classified

  - Diethylene glycol

    : 100 3 ((Leuciscus idus melanotus(Fish, fresh water), 0.05mg/l))

  - Triethylene glycol

    : 1700

12.4. Mobility in soil PRODUCT : Not classified

No data available

12.5. Result of PBT and vPvB assessment PRODUCT : Not classified

Not applicable

12.6. Endocrine disrupting properties PRODUCT : Not classified

Not applicable

12.7. Other adverse effects PRODUCT : Not classified

- Diethylene glycol

  : Not applicable

- Triethylene glycol

  : 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 : Not applicable

14.2. UN proper shipping name : Not applicable

14.3. Transport hazard class(es) : Not applicable

14.4. Packing group : Not applicable

14.5. Environmental hazards : Not applicable

14.6. Special precautions for user :

Emergency measures in case of fire : Not applicable

Emergency measures in the effluent : Not applicable

14.7. Maritime transport in bulk according to IMO instruments :

Not applicable

- ADR

· Tunnel restriction code : Not applicable

- IMDG

· Marine pollutant : Not applicable

- Air transport(IATA)

· UN No. : Not applicable

· Proper shipping name : Not applicable

· Class or division : Not applicable

· 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

- Diethylene glycol : Use restricted. See item 75.

- 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 : 07-06-2025

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.
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