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 : BPG_BUTYL_POLYGLYCOL_ETHER

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

- Explosives Division 1.6
- Serious eye damage/eye irritation Category 1

2.2. Label elements

Hazard pictograms

Signal word

- DANGER

Hazard statements

H318 Causes serious eye damage

Precautionary statements

- Prevention

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

- Response

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P310 Immediately call a POISON CENTER / toxins center / physician.

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%)
Tetraethylene glycol butyl ether	1) 1559-34-8 2) 216-322-1		1) - 2) - 3) - 4) Acute toxicity(Oral) : 7762.5mg/kg	65
Triethylene glycol monobutyl ether	1) 143-22-6 2) 205-592-6	Eye Dam. 1	1) - 2) - 3) - 4) Acute toxicity(Oral) : 5300mg/kg, Acute toxicity(Dermal) : 2000mg/kg	25
α-Butyl-ω-hydroxypoly(oxy-1,2-ethanediyl)	1) 9004-77-7 2) 500-012-0		1) - 2) - 3) - 4) -	10

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.
  - Remove and isolate contaminated clothing and shoes.
  - In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
  - Seek immediate medical assistance.
- 4.1.3. Inhalation
  - Administer oxygen if breathing is difficult.
  - Keep victim warm and quiet.
  - Give artificial respiration if victim is not breathing.
  - Move to fresh air.
- 4.1.4. If swallowed
  - 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
  - Dry chemical.
  - CO2.
  - Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material.
  - Direct water.
  - 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.
- 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.
- When heated, vapors may form explosive mixtures with air: indoors, outdoors and sewers explosion hazards.

5.3. Advice for firefighters

- MAY EXPLODE AND THROW FRAGMENTS 1600 meters (1 MILE) OR MORE IF FIRE REACHES CARGO.
- MAY EXPLODE AND THROW FRAGMENTS 1600 meters (1 MILE) OR MORE IF FIRE REACHES CARGO.
- Move containers from fire area if you can do it without risk.
- Rescuers should put on appropriate protective gear.
- Substance may be transported in a molten form.
- TIRE or VEHICLE Fire: If possible, and WITHOUT RISK, use unmanned hose holders or monitor nozzles from maximum distance to prevent fire from spreading to cargo area.
- TIRE or VEHICLE Fire: Pay special attention to tire fires as re-ignition may occur. Stand by with extinguisher ready.
- TIRE or VEHICLE Fire: Use plenty of water - FLOOD it! If water is not available, use CO_2, dry chemical or dirt.
- Dike fire-control water for later disposal; do not scatter the material.
- DO NOT fight fire when fire reaches cargo! Cargo may EXPLODE!.
- Do not move cargo or vehicle if cargo has been exposed to heat.
- 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.

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

- All equipment used when handling the product must be grounded.
- 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.

7.3. Specific end use(s)

- See section 1 for recommended use.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

- Contains no substances with occupational exposure limit values.

8.2. Exposure controls

8.2.1. Appropriate engineering controls

- Ensure adequate ventilation and exhaust ventilation at the workplace.

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	
Colour	colourless	
Odour	sweet	
Melting point/freezing point	about -20	
Initial boiling point and boiling range(℃)	300℃	
Flammability(solid, gas)	No data available	
Upper/lower flammability or explosive limits	No data available	
Flash point(℃)	176℃	
Auto ignition temperature	No data available	
Decomposition temperature	No data available	
pH	7.0 (Solution)	
Kinematic viscosity(㎟/s, 40℃)	12.1 mPa.s (25 °C)	
Solubility	No data available	
Partition coefficient(n-octanol/water)	No data available	
Vapour pressure	< 0.001 hPa (20 °C)	
Density/Relative density	No data available	
Relative Vapour density	No data available	
Particle characteristics	Not applicable	
Specific gravity	1.01 (25 °C)	

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.
- When heated, vapors may form explosive mixtures with air: indoors, outdoors and sewers explosion hazards.

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.
- When heated, vapors may form explosive mixtures with air: indoors, outdoors and sewers explosion hazards.

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.
- When heated, vapors may form explosive mixtures with air: indoors, outdoors and sewers explosion hazards.

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.
- During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.
- 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
  - Triethylene glycol monobutyl ether
    : LD50 5300 mg/kg Test species: Rat
  - Tetraethylene glycol butyl ether
    : LD50 10350 ㎎/kg ~ 5175 ㎎/kg Experimental species: Rat
- Acute toxicity(Dermal) PRODUCT : Not classified
  - Triethylene glycol monobutyl ether
    : LD50 2000 ㎎/kg Experimental species: Rabbit
  - Tetraethylene glycol butyl ether
    : LD50 >4220 mg/kg Test species: Rat
- 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 : Not classified

- Triethylene glycol monobutyl ether
  : Mild stimulation (10mg, 24 hours, rabbit), mild stimulation (500mg, 24 hours, rabbit)
- Tetraethylene glycol butyl ether
  : After observation for 4 hours and 72 hours, one rabbit had an erythema score of 1, and all others had an erythema score of 0.

○ Serious eye damage/eye irritation PRODUCT : Category 1

- Triethylene glycol monobutyl ether
  : EU-CLP Classifications (Category 1)
  Moderate irritation (20mg, 24 hours, rabbit), severe irritation (50mg, rabbit), EU CLP Category 1
- α-Butyl-ω-hydroxypoly(oxy-1,2-ethanediyl)
  : Causes eye irritation
- Tetraethylene glycol butyl ether
  : Conjunctival hyperemia score: 2-3, iritis score: 1

○ Respiratory sensitization PRODUCT : Not classified

- No data available

○ Skin sensitization PRODUCT : Not classified

- No data available

○ Carcinogenicity PRODUCT : Not classified

- No data available

○ Germ cell mutagenicity PRODUCT : Not classified

- Tetraethylene glycol butyl ether
  : Reversal mutation test: negative Salmonella typhimurium strains TA98, TA100, TA1535, TA1537, TA1538, E. coli WP2uvrA pKM101 Test results up to 5000 μg/plate Negative chromosomal aberration test: negative Chinese Hamster Ovary Cell: > Negative with or without metabolic activation system up to 5000μg/ml

○ Reproductive toxicity PRODUCT : Not classified

- No data available

○ Specific target organ toxicity single exposure PRODUCT : Not classified

- No data available

○ Specific target organ toxicity repeated exposure PRODUCT : Not classified

- Tetraethylene glycol butyl ether
  : Rat: NOEL 150mg/kg bw/day (28 days), 5 males and some females in the 1000mg/kg/day concentration group had hepatocentral lobule hypertrophy (contains 2-10%)

○ Aspiration hazard PRODUCT : Not classified

- No data available

11.2. Information on other hazards

11.2.1. Endocrine disrupting properties PRODUCT : Not classified

- Triethylene glycol monobutyl ether
  Not applicable
- α-Butyl-ω-hydroxypoly(oxy-1,2-ethanediyl)
  Not applicable
- Tetraethylene glycol butyl ether
  Not applicable

11.2.2. Other information PRODUCT : Not classified

- Triethylene glycol monobutyl ether
  No other hazards have been identified
- α-Butyl-ω-hydroxypoly(oxy-1,2-ethanediyl)
  No other hazards have been identified
- Tetraethylene glycol butyl ether
  No other hazards have been identified

SECTION 12: Ecological information

12.1. Toxicity

- Fish PRODUCT : Not classified
  - Tetraethylene glycol butyl ether
    : LC50 2400 mg/ℓ 96 hr Pimephales promelas
- Crustaceans PRODUCT : Not classified
  - Tetraethylene glycol butyl ether
    : EC50 2210 mg/ℓ 48 hr Daphnia magna
- Aquatic algae PRODUCT : Not classified
  - Tetraethylene glycol butyl ether
    : EC50 >1000 mg/ℓ 96 hr Selenastrum capricornutum

12.2. Persistence and degradability

- Degradability PRODUCT : Not classified
  - Triethylene glycol monobutyl ether
    : BOD5/COD 0.16
- Biodegradation PRODUCT : Not classified
  - Triethylene glycol monobutyl ether
    : 77 (%) 6 days ((aerobic, other bacteria: BASF-Belebtschlamm))
  - Tetraethylene glycol butyl ether
    : 99 (%) 8 days

12.3. Bioaccumulative potential

- n-octanol water partition coefficient PRODUCT : Not classified
  - Tetraethylene glycol butyl ether
    : -0.26 log Kow
- Bioconcentration factor(BCF) PRODUCT : Not classified
  - Tetraethylene glycol butyl ether
    : 1

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
- Triethylene glycol monobutyl ether
  : Not applicable
- α-Butyl-ω-hydroxypoly(oxy-1,2-ethanediyl)

: Not applicable

- Tetraethylene glycol butyl ether

: 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 : No

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 : 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

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

  - Triethylene glycol monobutyl ether : 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 : 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.
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