

Material Safety Data Sheet (DEG)

1. Product and company identification

- a) Product Name: Diethylene Glycol
- b) Recommended use of the chemical and restrictions on use: Not available
- c) Manufacturer/Supplier/Distributor Information
 - Name: Onsan Plant, Korea Petrochemical Ind, Co.,Ltd.
 - Address: 134 Onsan-ro, Onsan-eup, Ulju-gun, Ulsan 689-892, Korea
 - Emergency phone number: 82-52-231-1236, 82-52-231-1119(24 hour)

2. Hazards identification

- a) Hazard·Risk Classification:
 - Reproductive Toxicology : Category 2
 - Target Organ Toxicity (Repeated Exposure) : Category 1
- b) Label elements including precautionary statements
 - Symbol:



- Signal Word: Danger
 - Hazard·Risk Statement: Not available
 - H361 Suspected of damaging fertility or the unborn child
 - H372 Causes damage to organs through prolonged or repeated exposure
 - Precautionary Statement: Not available
 - Prevention
 - P201 Obtain special instructions before use
 - P202 Do not handle until all safety precaution have been read and understood
 - P260 Do not breathe dust/fume/gas/mist/vapours/spay.
 - P264 Wash..thoroughly after handling
 - P270 Do not eat drink or smoke when using this product
 - P281 Use personal protective equipment as required
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- Response

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

P314 Get medical advice/attention if you feel unwell

- Storage

P405 Store locked up

- Disposal

P501 Dispose of contents/container to...

c) Other Hazard·Risk which are not included in the classification criteria

NFPA: HEALTH = 1 FIRE = 1, REACTIVITY = 0

3. Composition/Information on ingredients

Chemical Name	Other name	CAS number	Content (wt.%)
Diethylene Glycol	2,2"-OXYBISETHANOL	111-46-6	99.64

etc : 0.36wt.% (Monoethylene Glycol, Triethylene Glycol, Water)

4. First aid measures

a) Eye contact:

- Flush eyes with large amounts of water for at least 20 minutes.
- Get medical attention immediately

b) Skin contact:

- Wash with large amounts of water for at least 20 minutes.
- Remove contaminated clothing and shoes immediately.
- Wash contaminated clothing before reuse
- If skin disorder develops, get medical attention.

c) Inhalation:

- Move from exposed area to fresh air area
- Get medical attention immediately.
- If not breathing, give artificial respiration.
- Consider oxygen supply

d) Ingestion:

- Please do not give anything for ingestion if the patient has not consciousness.
- Get medical attention immediately.

e) Most important symptoms/effects, acute and delayed: Not available

f) Indication of immediate medical attention and notes for physician:

- The medical personnel must be aware of the material and take protective measures.

5. Fire-Fighting measures

a) Suitable (and unsuitable) Extinguishing media:

- Suitable extinguishing media: dry sand, dry chemical, alcohol foam, carbon dioxide, water spray.
- Unsuitable extinguishing media: Direct water injection.
- Large fires: Use regular foam or flood with fine water spray.

b) Specific hazards arising from the chemical:

- Will be ignited by heat, sparks and flames.
- A part of liquid may cause dizziness, Vapor may cause suffocation.
- In case of fire : May cause irritation and toxic gas.
- Not easily ignited
- Containers may explode when heated.

c) Special protective equipment and precautions for fire-fighters:

- Move containers from fire area if it can be done without risk.
- If on skin and eyes : may cause irritation and burns.
- Do not get close to the ends of containers.
- Cool containers with water spray until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire.
- Dig a hold area such as lagoon, pond or pit for containment.

6. Accidental release measures

a) Personal precautions, protective equipment and emergency procedures:

- Stop leak if possible without personal risk.
- Remove all sources of ignition
- Ventilate the contaminated area.
- Do not touch or walk through spilled material.

b) Environmental precautions and protective procedures:

- Avoid the spills diffusion to waterways, sewer and enclosed space.

c) Methods and materials for containment and cleaning up:

- Large spill: Dike for later disposal
 - Small spill: Absorb with sand or other non-combustible material.
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7. Handling and storage

- a) Precautions for safe handling:
 - Wash thoroughly after handling.
 - Please attention to high temperature.
 - Use of appropriate and approved the safety equipment.
- b) Conditions for safe storage:
 - Store in a tightly sealed container.
 - Store in a cool and dry place.

8. Exposure controls & personal protection

- a) Control parameters:
 - ACGIH: Not available
 - Biological exposure limit: Not available
- b) Appropriate engineering controls:
 - Use total ventilation, local exhaust to keep air under exposure limit.
- c) Personal protective equipment
 - Respiratory protection: Use respiratory protection equipment that is tested and certified by KOSHA, Korea
 - Eye protection:
 - Wear splash resistant safety goggles.
 - Provide an emergency eye wash fountain and quick drench shower in the immediate work area.
 - Hands protection: Wear appropriate chemical resistant gloves.
 - Body protection: Wear appropriate chemical resistant clothing.

9. Physical and chemical properties

- a) Appearance (physical state, color etc): hygroscopicity liquid
- b) Odour: No odor
- c) Odour threshold: Not available
- d) pH: Not available
- e) Melting point/freezing point: -11°C
- f) Initial boiling point and boiling range: $244 \sim 245^{\circ}\text{C}$
- g) Flashing point : 124°C
- h) Evaporation rate: < 0.001 (butyl acetate)
- i) Flammability (solid, gas): Not available

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- j) Upper/lower flammability or explosive limits: 12.2/1.8%
 - k) Vapor pressure: 0.0057 mmHg (at 25°C)
 - l) Solubility: 100g/100ml (at 25°C, soluble)
 - m) Vapor density: 3.66 (Air=1)
 - n) Relative density: 1.1197 (at 15°C)
 - o) Partition coefficient: n-octanol/water: -1.47
 - p) Auto-ignition temperature: 229°C
 - q) Decomposition temperature: Not available
 - r) Viscosity: 30cP (at 25°C)
 - s) Formula mass: 106.12

10. Stability and reactivity

- a) Chemical stability and possibility of hazardous reactions:
 - Stable at ambient temperature and pressure.
 - Containers may explode when heated.
 - Not easily ignited
 - In case of fire : May cause irritation and toxic gas.
 - Harmful if inhaled.
 - A part of liquid may cause dizziness, Vapor may cause suffocation.
- b) Conditions to avoid (e.g. static discharge, shock or vibration, etc):
 - Avoid heat, sparks, flame and other ignition sources.
- c) Incompatible materials: Combustible materials, irritation and toxic gas.
- d) Hazardous decomposition products: Not available

11. Toxicological information

- a) Information on the likely routes of exposure:

Low body temperature, changes in blood pressure, nausea, vomiting, diarrhea, stomach pain, chest pain, shortness of breath, irregular heartbeat, headache, drowsiness, dizziness, loss of function, bluish skin color, lung congestion, blood disorders, kidney damage, convulsions, loss of consciousness, coma, irritation, absorption.
 - b) Health hazards information
 - Acute toxic:
 - Oral: LD50 12565 mg/kg Rat
 - Dermal: LD50 11890 mg/kg Rabbit
 - Inhalation: Not available
 - Skin corrosive/irritant: mild irritation (500 mg, rabbit)
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- Serious eye damage/eye irritation: mild irritation (500 mg, rabbit)
 - Respiratory sensitization: Not available
 - Skin sensitization: Not available
 - Carcinogenicity:
 - IARC: Not available
 - NTP: Not available
 - OSHA: Not available
 - ACGIH: Not available
 - EU CLP: Not available
 - Germ Cell Mutagenicity : Not available
 - Reproductive toxicity: Not available
 - Specific target organ toxicity (single exposure): Not available
 - Specific target organ toxicity (repeated exposure): Not available
 - Aspiration hazard: Not available
- c) Numerical measures of toxicity (Such as acute toxicity estimates): Not available

12. Ecological information

- a) Aquatic and terrestrial ecotoxicity:
- Fish species: LC50 32000 mg/l 96hr
 - Crustaceans: Not available
 - Algae: Not available
- b) Persistence and degradability:
- Persistence: Not available
 - Degradability: Not available
- c) Bioaccumulative potential:
- Biodegradation: 31(%) 28day((Aerotropic, other bacteria: Abwasser, nicht adaptiert))
 - Bioaccumulation: BCF 100 ((Leuciscus idus melanotus(Fish, fresh water), 0.05mg/l))
- d) Mobility in soil: Not available
- e) Other adverse effects: Not available

13. Disposal considerations

- a) Disposal method: Dispose of container and unused contents in accordance with all applicable regulations.
- b) Disposal precaution: Disposal should be in accordance with applicable regulations.
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14. Transport information

- a) UN number: Not Regulated
- b) UN proper shipping name: Not applicable
- c) Transport hazard class: Not applicable
- d) Packing group (if applicable): Not applicable
- e) Marine pollution: Not available
- f) Special precaution which a user to be aware of or needs to comply with in connection with transport or conveyance either within or outside their premises:
 - EmS(Emergency Schedule) Fire: Not applicable
 - EmS(Emergency Schedule) Spill: Not applicable

15. Regulatory information

- a) Regulations by other countries' law
 - EU Classification
 - Classification result: Xn; R22
 - Hazard statements: R22
 - Precautionary statements: S2, S46
 - U.S. Regulations
 - OSHA Process safety (29CFR1910.119): Not applicable
 - CERCLA Section 103 (40CFR302.4): Not applicable
 - EPCRA Section 302 (40CFR355.30): Not applicable
 - EPCRA Section 304 (40CFR355.40): Not applicable
 - EPCRA Section 313 (40CFR372.65): Applicable
 - Rotterdam convention on harmful chemicals & pesticides: Not applicable
 - Stockholm convention on persistent organic pollutants: Not applicable
 - Montreal protocol: Not applicable

16. Other information

- a) Information source and references:
 - Corporate Solution From Thomson Micromedex(<http://csi.micromedex.com>)
 - International Chemical Safety Cards(ICSC)(<http://www.nihs.go.jp/ICSC>)
 - IUCLID Chemical Data Sheet, EC-ECB
 - TOXNET, U.S. National Library of Medicine(<http://toxnet.nlm.nih.gov>)
 - The Chemical Database, The Department of Chemistry at the University of Akron (<http://ull.chemistry.uakron.edu/erd>)
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- ECB-ESIS(European chemical Substances Information System)(<http://ecb.jrc.it/esis>)
 - (<http://hazmat.nema.go.kr>)
 - (<http://ncis.nier.go.kr>)
 - ECOTOX Database, EPA(<http://cfpub.epa.gov/ecotox>)

b) Issuing date: 2015-10-22

c) Revision number and date: 1

d) others: Not available
