

Global Product Strategy (GPS) Safety Summary

Diethylene glycol

This GPS Safety Summary is a high-level summary intended to provide the general public with an overview of product safety information on this chemical substance. It is not intended to provide emergency response, medical or treatment information, nor to provide an overview of all safety and health information. This summary is not intended to replace the Safety Data Sheet. For detailed guidance on the use or regulatory status of this substance, please consult the Safety Data Sheet and the Product Stewardship Bulletin (PSB).

Chemical Identity

Name: Diethylene Glycol

Brand names: Diethylene Glycol

Chemical name (IUPAC): (2-hydroxyethoxy) ethan-2-ol

CAS number: 111-46-6

EC number: 203-872-2

Molecular formula: C₄H₁₀O₃

Uses and Applications

Diethylene glycol, commonly referred to as DEG, is similar in properties to Mono ethylene glycol, but with a higher boiling point and viscosity and specific gravity.

Diethylene glycol's very good solvent properties make it useful in a variety of applications, such as cleaners, cement processing, heat transfer fluids and adhesives. Diethylene glycol is also frequently used as a chemical intermediate in the production of unsaturated polyester resins (UPR) and polyurethanes.

Physical / Chemical Properties

Diethylene glycol is a colorless, odorless, hygroscopic and slightly viscous liquid completely miscible with water and many other organic solvents. The flash point for diethylene glycol is 138°C (280°F). The boiling point and freezing points are 245°C (473°F) and -8°C (18°F) respectively.

Health Effects

Diethylene glycol has been classified as hazardous under the Globally Harmonized System on Classification and Labeling (GHS) for its health effects.

The table below gives an overview of the health effects assessment results for diethylene glycol.

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	Low acute toxicity by the oral, inhalation and dermal routes of exposure. Accidental or intentional ingestions in humans, however, have caused poisoning and death. Ingestion may cause CNS depression, damage to the digestive tract, lungs, liver, brain, kidney and pancreas.
Irritation / corrosion Skin / eye/ respiratory tract	Slight skin and eye irritant.
Sensitization	Not expected to be a sensitizer.
Toxicity after repeated exposure Oral / inhalation / dermal	The kidney, liver and possibly bladder are the primary target organs for toxicity.
Genotoxicity / Mutagenicity	Not genotoxic / Not mutagenic.
Carcinogenicity	Considered a low concern for cancer.
Toxicity for reproduction	May cause toxicity to reproduction and may be toxic to embryo/fetal development at high exposure levels.

Environmental Effects

Effect Assessment	Result
Aquatic Toxicity	Low toxicity to aquatic organisms

Fate and behaviour	Result
Biodegradation	Readily biodegradable.
Bioaccumulation potential	Not expected to bioaccumulate.

Exposure

Human health

Diethylene glycol may be present in cleaners, cement processing, heat transfer fluids and adhesives. DEG is also frequently used as a chemical intermediate in the production of unsaturated polyester resins (UPRs) and polyurethanes. Consumers should follow all product label instructions.

Personnel exposure to diethylene glycol in manufacturing facilities is considered very low because the process, storage and handling operations are enclosed. However, worker exposure can potentially occur during operations such as product transfer, product sampling, or maintenance / repair activities on product-containing systems. The risk of accidental exposure should be controlled by selecting and applying the appropriate Risk Management Measures.

Environment

The manufacture of diethylene glycol is a closed and automated process. Also, transfer (loading and transport) of the product is conducted in closed containers to prevent release from the system. Due to its use as a solvent in formulations such as cleaners, diethylene glycol has indoor and outdoor environmental release possibilities.

Risk Management Measures

For detailed guidance on the use of diethylene glycol, the Safety Data Sheet should be consulted.

Diethylene glycol should only be handled by knowledgeable and trained personnel.

Human health

When using chemicals, make sure that there is adequate ventilation. Always use appropriate chemical-resistant gloves to protect your hands and skin, always wear eye protection such as chemical goggles and always wear flame-retardant clothing. Do not eat, drink, or smoke where chemicals are handled, processed, or stored. Wash hands and skin following contact. If the substance gets into your eyes, rinse eyes thoroughly for at least 15 minutes with tap water and seek medical attention.

In the case of transfer or maintenance operations, always clear transfer lines prior to decoupling, and flush/drain to a closed system for recycle prior to opening equipment.

In cases where engineering controls cannot maintain airborne substance concentrations below exposure limits, or in cases with a risk of accidental exposure, additional risk management measures may be necessary, such as the use of a complete suit protecting against chemicals and supplied air, a self-contained breathing apparatus or respirator.

Spills and Leaks

Contain spill with dike to prevent entry into sewers or waterways. For large spills, dike and pump into properly labeled containers for reclamation or disposal. For small spills, soak up with absorbent material and place in properly labeled containers for disposal. All recovered material should be packaged, labeled, transported and disposed of or reclaimed in conformance with applicable laws and regulations and in conformance with good engineering practices. Reclaim where possible.

Regulatory Information / Classification and Labeling

For a detailed overview of the regulatory status of this substance, please refer to the Product Stewardship Bulletin available from the LyondellBasell corporate website.

Under the Global Harmonized System on Classification and Labeling (GHS) substances are classified according to their physical, health and environmental hazards. The hazards are communicated via specific labels on the product packaging and the Safety Data Sheet. GHS attempts to standardize hazard communication so that the intended audience (workers, consumers, transport workers, and emergency responders) can better understand the hazards of the chemicals in use.

For a detailed overview of the classification and labeling of this substance, please refer to the regional Safety Data Sheet, which can be found on the LyondellBasell corporate website.

Conclusion Statements

- Diethylene glycol is used as a solvent in a variety of applications, such as cleaners, cement processing, heat transfer fluids and adhesives. Diethylene glycol is also used as a chemical intermediate in the production of unsaturated polyester resins (UPRs) and polyurethanes.
- Diethylene glycol has been classified as hazardous for its health effects. The main hazards are low acute toxicity via the oral route of exposure and repeated exposure damage to the kidney. Accidental or intentional ingestions in humans, however, have caused poisoning and death.
- Diethylene glycol shows low toxicity to aquatic organisms, is readily biodegradable and is not expected to bio-accumulate.

Contact Information within Company

For further information on this product in general, please consult the LyondellBasell corporate website (www.lyb.com).

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This product(s) may not be used in:

- (i) any U.S. FDA Class I, Health Canada Class I, and/or European Union Class I medical devices, without prior notification to Seller for each specific product and application; or
 - (ii) the manufacture of any of the following, without prior written approval by Seller for each specific product and application: U.S. FDA Class II Medical Devices; Health Canada Class II or Class III Medical Devices; European Union Class II Medical Devices; film, overwrap and/or product packaging that is considered a part or component of one of the aforementioned medical devices; packaging in direct contact with a pharmaceutical active ingredient and/or dosage form that is intended for inhalation, injection, intravenous, nasal, ophthalmic (eye), digestive, or topical (skin) administration; tobacco related products and applications, electronic cigarettes and similar devices, and pressure pipe or fittings that are considered a part or component of a nuclear reactor.
- Additionally, the product(s) may not be used in: (i) U.S. FDA Class III Medical Devices; Health Canada Class IV Medical Devices; European Class III Medical Devices; (ii) applications involving permanent implantation into the body; (iii) life-sustaining medical applications; and (iv) lead, asbestos or MTBE related applications. All references to U.S. FDA, Health Canada, and European Union regulations include another country's equivalent regulatory classification.

Users should review the applicable Safety Data Sheet before handling the product.

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