

Global Product Strategy (GPS) Safety Summary

Mono Ethylene 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, the Product Safety Bulletin and the Product Stewardship Bulletin (PSB).

Chemical Identity

Name: Monoethylene Glycol
Brand names: Mono Ethylene Glycol
Chemical name (IUPAC): Ethan -1, 2 - diol
CAS number: 107-21-1
EC number: 203-473-3
Molecular formula: C₂H₆O₂

Uses and Applications

Mono ethylene glycol, commonly referred to as EG, ethylene glycol, or MEG, is the largest volume product of all ethylene glycols. Mono ethylene glycol is available in four grades: polyester, high purity, industrial and antifreeze.

Polyester grade mono ethylene glycol is used in the manufacture of polyester fibers and polyethylene terephthalate (PET) resins which are used in the production of products such as textiles, tire cords, videotapes, and soft drink and water containers. Polyester mono ethylene glycol meets the highest quality standards.

High purity and industrial grade mono ethylene glycol is used in a variety of applications requiring good solvent, hygroscopic or high boiling point characteristics, such as paints, printing inks, hydraulic fluids, cleaners, heat transfer fluids and electronics.

Antifreeze grade mono ethylene glycol is a major component in automotive engine coolants.

Physical / Chemical Properties

Mono ethylene glycol is a colorless, odorless, and slightly viscous liquid, more hygroscopic than glycerol and miscible with water in all proportions. The flash point for mono ethylene glycol is 111°C (232°F). The boiling point and freezing points are 197°C (387°F) and -13°C (8.6°F) respectively.

Health Effects

Mono ethylene glycol has been classified as hazardous under 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 mono ethylene glycol.

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	Low acute toxicity by the oral, dermal and inhalation routes of exposure.. Accidental or intentional ingestions in humans, however, have caused poisoning and death. Ingestion may cause CNS depression and neurological changes, damage to the digestive tract, lungs, liver, brain, and kidneys.
Irritation / corrosion Skin / eye/ respiratory tract	Mild skin and eye irritant. High aerosol concentrations may cause respiratory irritation.
Sensitization	Not expected to be a sensitizer.
Toxicity after repeated exposure Oral / inhalation / dermal	The kidney is the primary target organ for toxicity.
Genotoxicity / Mutagenicity	Not genotoxic / Not mutagenic.
Carcinogenicity	Not carcinogenic.
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 behavior	Result
Biodegradation	Biodegradable under aerobic conditions.
Bioaccumulation potential	Not expected to bioaccumulate.

Exposure

Human health

Mono ethylene glycol may be present in a variety of products sold to consumers. Consumers should follow all product label instructions.

Personnel exposure to mono ethylene 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 mono ethylene 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 antifreeze, paints, inks and cleaners, mono ethylene glycol has indoor and outdoor environmental release possibilities.

Risk Management Measures

For detailed guidance on the use of mono ethylene glycol, the Safety Data Sheet and the Product Safety Bulletin should be consulted.

Mono ethylene 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

Eliminate all sources of ignition. All equipment used when handling this product must be grounded. Do not touch or walk through spilled material. Stop leak if you can do it without risk. Prevent entry into waterways, sewers, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Use clean non-sparking tools to collect absorbed material. 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. Report spills or leaks to the proper regulatory authorities.

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 Globally 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

- Mono ethylene glycol is used in the manufacture of polymers which go into a number of products including textiles, tire cords, video tapes, and soft drink and water containers. It is also used in paints, printing inks, hydraulic fluids, cleaners, heat transfer fluids, electronics and automotive engine coolants.
- Mono ethylene glycol has been classified as hazardous. 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.
- Mono ethylene glycol shows low toxicity to aquatic organisms, is biodegradable under aerobic conditions 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).

Date of issue

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Disclaimer

Before using a product sold by a company of the LyondellBasell family of companies, users should make their own independent determination that the product is suitable for the intended use and can be used safely and legally.

SELLER MAKES NO WARRANTY; EXPRESS OR IMPLIED (INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY WARRANTY) OTHER THAN AS SEPARATELY AGREED TO BY THE PARTIES IN A CONTRACT.

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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