

Global Product Strategy (GPS) Safety Summary

Diethyl ether

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: Diethyl ether

Brand names: Diethyl ether, ethyl ether

Chemical name (IUPAC): Ethane, 1,1'-oxybis-

CAS number: 60-29-7

EC number: 200-467-2

Molecular formula: C₄H₁₀O

Uses and Applications

Diethyl ether is available in four grades: Refined, Military, Anhydrous, and a Pharmaceutical grade (USP) which is compliant with the requirements of the United States Pharmacopeia and is manufactured under current Good Manufacturing Practices (cGMP). Both the anhydrous and USP grades meet ACS specifications defined by the American Chemical Society (ACS).

Diethyl ether is a common laboratory reagent and solvent, often used in liquid-liquid extraction processes and as a solvent for waxes, resins and gums. Because of its high cetane number it is used in gasoline and diesel engine starting fluids. It is also used to manufacture agricultural chemicals.

The USP grade may be used in the manufacture of pharmaceutical and personal care applications such as in liniments, analgesics and perfumes.

Physical / Chemical Properties

At ambient temperature diethyl ether is a colorless liquid with a sweet, pungent odor. The substance is of low molecular weight and is considered to be extremely flammable. The flash point for diethyl ether is -45°C (-49°F). The boiling and freezing points of diethyl ether are 34-35°C (93-95°F) and -116.3°C (-177.3°F) respectively.

Diethyl ether has been classified as hazardous under GHS (Globally Harmonized System on Classification and Labeling) for its extreme flammability of both the liquid and vapor. Diethyl ether may form explosive peroxides when exposed to light and air. Peroxide formation may be reduced with the addition of antioxidants such as butylated hydroxytoluene (BHT).

Health Effects

Diethyl ether has been classified under GHS as hazardous for acute oral toxicity, respiratory irritation and single exposure narcotic effects.

The table below gives an overview of the health effects assessment results for diethyl ether.

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	Harmful if swallowed. Ingestion may cause Central Nervous System (CNS) effects (excitement, dizziness, drowsiness, headache, loss of consciousness and death) and gastrointestinal tract irritation and distention. Low concern for acute toxicity from inhalation and dermal exposure. May cause cardiac sensitization and arrhythmias at high concentrations.
Irritation / corrosion Skin / eye/ respiratory tract	Not irritating to skin but may cause slight transient eye irritation.
Sensitization	Not known to be a sensitizer
Toxicity after repeated exposure Oral / inhalation / dermal	Low concern for repeated exposure systemic toxicity. Repeated contact may dry the skin causing dryness or cracking.
Genotoxicity / Mutagenicity	Not mutagenic/genotoxic.
Carcinogenicity	Not considered to be a human cancer concern.
Toxicity for reproduction	No adverse effects on fertility and not selectively toxic to the embryo/fetus.

Environmental Effects

Diethyl ether has very low toxicity to aquatic life and has accordingly not been classified under GHS as hazardous.

The table below gives an overview of the environmental assessment results for diethyl ether.

Effect Assessment	Result
Aquatic Toxicity	Very low toxicity to aquatic life

Fate and behaviour	Result
Biodegradation	Not expected to be biodegradable
Bioaccumulation potential	Not expected to bioaccumulate
PBT / vPvB conclusion	Not considered to be either PBT or vPvB.

PBT = Persistent, Bio-accumulative and Toxic in the environment.

vPvB = very Persistent and very Bio-accumulative in the environment.

Exposure

Human health

When using a diethyl ether containing consumer product at home, all instructions and precautions should be read, understood and followed.

Exposure to diethyl ether of personnel in manufacturing facilities is considered very low because the process, storage and handling operations are enclosed. It is not used in a widespread or dispersive manner. Also, transfer (loading and transport) of diethyl ether is done with dedicated equipment in dedicated containers to prevent any release from the system. 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 diethyl ether is in a closed and automated process with no aqueous effluent or gaseous effluent released to the environment. Also, transfer (loading and transport) of diethyl ether is conducted with dedicated equipment in dedicated containers to prevent any release from the system.

Risk Management Measures

For detailed guidance on the use of diethyl ether, the Safety Data Sheet should be consulted.

Diethyl ether should be handled only by knowledgeable and trained personnel.

Flammability

Because of its flammability potential, diethyl ether should not be handled and stored near heat, sparks, open flame or other ignition sources. Vapors can travel to a source of ignition and flash back. Also, equipment should be grounded and bonded to prevent build-up of static electricity.

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 for safe use, such as the use of a complete suit protecting against chemicals and supplied air, a self-contained breathing apparatus or respirator.

Environmental

In case of accidental release or spill, do not allow the product to enter sewers, surface or ground water.

Regulatory Information / Classification and Labeling

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

Under GHS (Globally Harmonized System on Classification and Labeling) 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

- Diethyl ether is used as a chemical solvent or reagent for laboratory or industrial purposes only. The USP grade is used in pharmaceutical or personal care applications.
- Diethyl ether has been classified as hazardous. The main hazards are extreme flammability, acute oral toxicity, respiratory irritation and narcotic effects.
- Exposure to human health and environment is considered very low as the diethyl ether manufacturing process, storage and handling operations are enclosed.

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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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.

LyondellBasell prohibits or restricts the use of its products in certain applications. For further information on restrictions or prohibitions of use, please contact a LyondellBasell representative.

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

Diethyl ether is a product of Equistar Chemicals, LP