



SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Revision Date 04/18/2014

Version 1.2

SECTION 1. Identification

Product identifier

Product number	100926
Product name	Diethyl ether suitable for use as excipient EMPROVE® exp Ph Eur,BP
Synonyms	Et2O
CAS-No.	60-29-7

Relevant identified uses of the substance or mixture and uses advised against

Identified uses	Pharmaceutical production
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Details of the supplier of the safety data sheet

Company	EMD Millipore Corporation 290 Concord Road, Billerica, MA 01821, United States of America General Inquiries: +1-978-715-4321 Monday to Friday, 9:00 AM to 4:00 PM Eastern Time (GMT-5)
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Emergency telephone	800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week
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SECTION 2. Hazards identification

GHS Classification

Flammable liquid, Category 1, H224
Acute toxicity, Category 4, Oral, H302
Specific target organ systemic toxicity - single exposure, Category 3, Central nervous system, H336
For the full text of the H-Statements mentioned in this Section, see Section 16.

GHS-Labeling

Hazard pictograms



Signal Word
Danger

Hazard Statements

H224 Extremely flammable liquid and vapor.

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H302 Harmful if swallowed.
H336 May cause drowsiness or dizziness.

Precautionary Statements

P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P240 Ground/bond container and receiving equipment.
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

OSHA Hazards

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200). This information is based on 29 CFR 1910.1200 criteria prior to adoption of the GHS and may deviate from the GHS information.

Other hazards

None known.

SECTION 3. Composition/information on ingredients

Formula	(C ₂ H ₅) ₂ O	C ₄ H ₁₀ O (Hill)
Synonyms	Et ₂ O	
Molar mass	74.12 g/mol	

Hazardous ingredients

Chemical Name (Concentration)

CAS-No.

Diethyl ether (>= 90 % - <= 100 %)

60-29-7

Exact percentages are being withheld as a trade secret.

SECTION 4. First aid measures

Description of first-aid measures

Inhalation

After inhalation: fresh air. If necessary, apply artificial respiration. Keep respiratory tract clear.

Skin contact

After skin contact: wash off with plenty of water. Remove contaminated clothing.

Eye contact

After eye contact: rinse out with plenty of water.

Ingestion

After swallowing: caution if victim vomits. Risk of aspiration! Keep airways free. Pulmonary failure possible after aspiration of vomit. Call a physician immediately.

Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed

irritant effects, respiratory paralysis, Drowsiness, Unconsciousness, inebriation, euphoria, collapse, drowsiness, ataxia (impaired locomotor coordination), Salivation, Coma, death
Repeated exposure may cause skin dryness or cracking.

Indication of any immediate medical attention and special treatment needed

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No information available.

SECTION 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

Carbon dioxide (CO₂), Foam, Dry powder

Unsuitable extinguishing media

For this substance/mixture no limitations of extinguishing agents are given.

Special hazards arising from the substance or mixture

Combustible.

Vapors are heavier than air and may spread along floors.

Forms explosive mixtures with air at ambient temperatures.

Pay attention to flashback.

Development of hazardous combustion gases or vapors possible in the event of fire.

Advice for firefighters

Special protective equipment for fire-fighters

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

Further information

Prevent fire extinguishing water from contaminating surface water or the ground water system.

Remove container from danger zone and cool with water.

SECTION 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Avoid substance contact. Do not breathe vapors, aerosols.

Keep away from heat and sources of ignition. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders: Protective equipment see section 8.

Environmental precautions

Do not let product enter drains. Risk of explosion.

Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills.

Observe possible material restrictions (see sections 7 and 10).

Take up with liquid-absorbent material (e.g. Chemisorb®). Dispose of properly. Clean up affected area.

SECTION 7. Handling and storage

Precautions for safe handling

Work under hood. Do not inhale substance/mixture. Avoid generation of vapors/aerosols.

Observe label precautions.

Advice on protection against fire and explosion

Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

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Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition. Protected from light.

Store at +15°C to +25°C (+59°F to +77°F).

SECTION 8. Exposure controls/personal protection

Exposure limit(s)

Ingredients

Basis	Value	Threshold limits	Remarks
<i>Diethyl ether 60-29-7</i>			
ACGIH	Time Weighted Average (TWA):	400 ppm	
	Short Term Exposure Limit (STEL):	500 ppm	
OSHA_TRANS	PEL:	400 ppm 1,200 mg/m ³	
	Z1A	Time Weighted Average (TWA):	400 ppm 1,200 mg/m ³
	Short Term Exposure Limit (STEL):	500 ppm 1,500 mg/m ³	

Engineering measures

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

Individual protection measures

Protective clothing should be selected specifically for the workplace, depending on concentration and quantity of the hazardous substances handled. The chemical resistance of the protective equipment should be inquired at the respective supplier.

Hygiene measures

Immediately change contaminated clothing. Apply skin- protective barrier cream. Wash hands and face after working with substance.

Eye/face protection

Safety glasses

Hand protection

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Other protective equipment:

Flame retardant antistatic protective clothing

Respiratory protection

required when vapors/aerosols are generated.

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

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SECTION 9. Physical and chemical properties

Physical state	liquid
Color	colorless
Odor	characteristic
Odor Threshold	0.3 - 8.8 ppm
pH	No information available.
Melting point	-116.3 °C
Boiling point/boiling range	94.3 °F (34.6 °C) at 1,013 hPa
Flash point	-40 °F (-40 °C) Method: c.c.
Evaporation rate	No information available.
Flammability (solid, gas)	No information available.
Lower explosion limit	1.7 %(V)
Upper explosion limit	36 %(V)
Vapor pressure	587 hPa at 68 °F (20 °C)
Relative vapor density	No information available.
Density	0.71 g/cm ³
Relative density	No information available.
Water solubility	69 g/l at 68 °F (20 °C)
Partition coefficient: n-octanol/water	log Pow: 0.89 (experimental) (Lit.) Bioaccumulation is not expected.
Autoignition temperature	No information available.
Decomposition temperature	Distillable in an undecomposed state at normal pressure.
Viscosity, dynamic	0.23 mPa.s at 68 °F (20 °C)

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Explosive properties Not classified as explosive.
Oxidizing properties none
Ignition temperature 356 °F (180 °C)
Method: DIN 51794

SECTION 10. Stability and reactivity

Reactivity

Vapors may form explosive mixture with air.
Formation of peroxides possible.

Chemical stability

Sensitivity to light
Sensitive to air.

Stabilizer

butyl hydroxytoluene (BHT)

Possibility of hazardous reactions

Risk of explosion with:

azides, halogens, halogen-halogen compounds, nonmetals, nonmetallic oxyhalides, Strong oxidizing agents, chromium(VI) oxide, halogen oxides, peroxi compounds, perchloric acid, perchlorates, Nitric acid, nitrating acid, Oxygen, Ozone, turpentine oils and/or turpentine substitutes, nitrates, metallic chlorides

Risk of ignition or formation of inflammable gases or vapors with:

chromyl chloride, Peroxides

Conditions to avoid

Warming.

Incompatible materials

rubber, various plastics

Hazardous decomposition products

Peroxides

SECTION 11. Toxicological information

Information on toxicological effects

Likely route of exposure

Inhalation, Eye contact, Skin contact, Ingestion

Target Organs

Eyes

Skin

Respiratory system

Central nervous system

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Acute oral toxicity

LDLO human: 260 mg/kg (RTECS)

LD50 rat: 1,215 mg/kg (RTECS)

absorption

Symptoms: Risk of aspiration upon vomiting., Aspiration may cause pulmonary edema and pneumonitis.

Acute inhalation toxicity

absorption

Symptoms: mucosal irritations

Acute dermal toxicity

LD50 rabbit: > 2,000 mg/kg
(ECHA)

Skin irritation

rabbit

Result: No irritation

OECD Test Guideline 404

Dermatitis

Repeated exposure may cause skin dryness or cracking.

Eye irritation

rabbit

Result: No eye irritation

OECD Test Guideline 405

Sensitization

Sensitization test: mouse

Result: negative

Method: OECD Test Guideline 429

Human experience

Result: negative

(Lit.)

Genotoxicity in vivo

mouse

Result: negative

Method: OECD Test Guideline 474

Genotoxicity in vitro

Ames test

Salmonella typhimurium

Result: negative

(IUCLID)

Mutagenicity (mammal cell test): chromosome aberration.

Human lymphocytes

Result: negative

Method: OECD Test Guideline 405

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Mutagenicity (mammal cell test):

MOUSE LYMPHOMA TEST

Result: negative

Method: OECD Test Guideline 476

Specific target organ systemic toxicity - single exposure

Target Organs: Central nervous system

May cause drowsiness or dizziness.

Specific target organ systemic toxicity - repeated exposure

The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Aspiration hazard

Regarding the available data the classification criteria are not fulfilled.

Carcinogenicity

IARC	No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
OSHA	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
NTP	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
ACGIH	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

Further information

Narcotic!

After absorption:

Salivation, euphoria, ataxia (impaired locomotor coordination), inebriation, collapse,

Unconsciousness, Coma

Cannot be excluded:

respiratory paralysis, death

Handle in accordance with good industrial hygiene and safety practice.

SECTION 12. Ecological information

Ecotoxicity

Toxicity to fish

LC50 *Leuciscus idus* (Golden orfe): 2,840 mg/l; 48 h (ECOTOX Database)

Toxicity to daphnia and other aquatic invertebrates

EC50 *Daphnia magna* (Water flea): 1,380 mg/l; 48 h (IUCLID)

Toxicity to algae

static test EC50 *Desmodesmus subspicatus* (green algae): > 100 mg/l; 72 h

OECD Test Guideline 201

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Toxicity to bacteria

static test EC50 activated sludge: 21,000 mg/l; 3 h
OECD Test Guideline 209

static test NOEC activated sludge: 42 mg/l; 3 h
OECD Test Guideline 209

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

semi-static test NOEC Daphnia magna (Water flea): > 100 mg/l; 21 d

OECD Test Guideline 211

Persistence and degradability

Biodegradability

Not readily biodegradable.

Bioaccumulative potential

Partition coefficient: n-octanol/water

log Pow: 0.89

(experimental)

(Lit.) Bioaccumulation is not expected.

Mobility in soil

No information available.

Other adverse effects

Henry constant

124.6 Pa·m³/mol

Method: (experimental)

(Lit.) Distribution preferentially in air.

Additional ecological information

Discharge into the environment must be avoided.

SECTION 13. Disposal considerations

The information presented only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Disposal should be in accordance with applicable regional, national and local laws and regulations.

SECTION 14. Transport information

Land transport (DOT)

UN number	UN 1155
Proper shipping name	DIETHYL ETHER
Class	3
Packing group	I
Environmentally hazardous	--

Air transport (IATA)

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UN number UN 1155
Proper shipping name DIETHYL ETHER
Class 3
Packing group I
Environmentally hazardous --
Special precautions for user no

Sea transport (IMDG)

UN number UN 1155
Proper shipping name DIETHYL ETHER
Class 3
Packing group I
Environmentally hazardous --
Special precautions for user yes
EmS F-E S-D

SECTION 15. Regulatory information

United States of America

OSHA Hazards

Flammable Liquid
Harmful if swallowed.
Target organ effects
Eye irritant
Skin irritant
Respiratory irritant
Harmful if inhaled.

This information is based on 29 CFR 1910.1200 criteria prior to adoption of the GHS, and may deviate from the GHS information on the label and in section 2.

SARA 311/312 Hazards

Fire Hazard
Acute Health Hazard
Chronic Health Hazard

SARA 313

SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 302

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

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Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

DEA List I

Not listed

DEA List II

Listed

Ingredients

Diethyl ether 60-29-7

US State Regulations

Massachusetts Right To Know

Ingredients

Diethyl ether

Pennsylvania Right To Know

Ingredients

Diethyl ether

New Jersey Right To Know

Ingredients

Diethyl ether

California Prop 65 Components

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

Notification status

TSCA: All components of the product are listed in the TSCA-inventory.

DSL: All components of this product are on the Canadian DSL.

SECTION 16. Other information

Training advice

Provide adequate information, instruction and training for operators.

Full text of H-Statements referred to under sections 2 and 3.

H224 Extremely flammable liquid and vapor.

H302 Harmful if swallowed.

H336 May cause drowsiness or dizziness.

Key or legend to abbreviations and acronyms used in the safety data sheet

Used abbreviations and acronyms can be looked up at www.wikipedia.org.

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The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to appropriate safety precautions. It does not represent a warranty of any product properties and we assume no liability for any loss or injury which may result from the use of this information. Users should conduct their own investigations to determine the suitability of the information.

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