

SAFETY DATA SHEET

according to Occupational Safety And Health (Classification,
Labelling And Safety Data Sheet Of Hazardous Chemicals)
Regulations 2013 (CLASS 2013)

Revision Date 29.08.2018

Version 1.4

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Catalogue No. 100926

Product name Diethyl ether EMPROVE® ESSENTIAL Ph Eur,BP

REACH Registration Number A registration number is not available for this substance as the substance or its use are exempted from registration according to Article 2 REACH Regulation (EC) No 1907/2006, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.

CAS-No. 60-29-7

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

Identified uses Pharmaceutical production
For additional information on uses please refer to the Merck Chemicals portal (www.merckgroup.com).

1.3 Details of the supplier of the safety data sheet

Company Merck KGaA * 64271 Darmstadt *Germany* Telefon:+49 6151 72-0

Responsible Department LS-QHC * e-mail: prodsafe@merckgroup.com

Regional representation Merck Sdn. Bhd. (Co. No: 178145), No. 4, Jalan U1/26, Section U1, Hicom Glenmarie Industrial Park, 40150 Shah Alam, Selangor. Tel: 03-74943688 Fax: 03-74910850

1.4 Emergency telephone number Customer Call Centre: + 62 0800 140 1253 (Toll Free)

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SECTION 2. Hazards identification

2.1 Classification of the substance or mixture

Classification according to CLASS regulations 2013

Flammable liquid, Category 1, H224

Acute toxicity, Category 4, Oral, H302

Specific target organ toxicity - single exposure, Category 3, Central nervous system, H336

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 Label elements

Labelling according to CLASS regulations 2013

Hazard pictograms



Signal word

Danger

Hazard statements

H224 Extremely flammable liquid and vapour.

H302 Harmful if swallowed.

H336 May cause drowsiness or dizziness.

EUH019 May form explosive peroxides.

EUH066 Repeated exposure may cause skin dryness or cracking.

Precautionary statements

Prevention

P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.

P240 Ground/bond container and receiving equipment.

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Storage

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

Reduced labelling (≤125 ml)

Hazard pictograms



Signal word

Danger

Hazard statements

H224 Extremely flammable liquid and vapour.

Precautionary statements

P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.

Index-No. 603-022-00-4

2.3 Other hazards

None known.

SECTION 3. Composition/information on ingredients

3.1 Substance

Formula	(C ₂ H ₅) ₂ O	C ₄ H ₁₀ O (Hill)
Index-No.	603-022-00-4	
EC-No.	200-467-2	
Molar mass	74.12 g/mol	

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Hazardous components according to CLASS regulations 2013

Chemical name (Concentration)

CAS-No.	Registration number	Classification
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diethyl ether ($\geq 50\%$ - $\leq 100\%$)		
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Substance does not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII.

60-29-7	*)	
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Flammable liquid, Category 1, H224

Acute toxicity, Category 4, H302

Specific target organ toxicity - single exposure, Category 3, H336

*) A registration number is not available for this substance as the substance or its use are exempted from registration according to Article 2 REACH Regulation (EC) No 1907/2006, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.

For the full text of the H-Statements mentioned in this Section, see Section 16.

3.2 Mixture

Not applicable

SECTION 4. First aid measures

4.1 Description of first aid measures

After inhalation: fresh air. Consult doctor if feeling unwell.

In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower.

After eye contact: rinse out with plenty of water with the eyelid held wide open. Call in ophthalmologist if necessary. Remove contact lenses.

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

4.2 Most important symptoms and effects, both acute and delayed

irritant effects, respiratory paralysis, Drowsiness, Unconsciousness, inebriation, euphoria, collapse, somnolence, ataxia (impaired locomotor coordination), Salivation, Coma, death

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4.3 Indication of any immediate medical attention and special treatment needed

No information available.

SECTION 5. Firefighting measures

5.1 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.

5.2 Special hazards arising from the substance or mixture

Combustible.

Vapours 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 vapours possible in the event of fire.

5.3 Advice for firefighters

Special protective equipment for firefighters

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

6.1 Personal precautions, protective equipment and emergency procedures

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

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Protective equipment see section 8.

6.2 Environmental precautions

Do not let product enter drains. Risk of explosion.

6.3 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. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections

Indications about waste treatment see section 13.

SECTION 7. Handling and storage

7.1 Precautions for safe handling

Advice on safe handling

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

Hygiene measures

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions

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

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Recommended storage temperature see product label.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

SECTION 8. Exposure controls/personal protection

8.1 Control parameters

diethyl eter (60-29-7)

MY OEL	Time Weighted Average	400 ppm
	(TWA):	1,210 mg/m ³

8.2 Exposure controls

Engineering measures

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

See section 7.1.

Individual protection measures

Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of the hazardous substances handled. The chemical resistance of the protective equipment should be enquired at the respective supplier.

Eye/face protection

Safety glasses

Hand protection

splash contact:

Glove material:	Viton (R)
Glove thickness:	0.70 mm
Break through time:	> 30 min

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The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the related standard EN374, for example KCL 890 Vitoject® (splash contact). The breakthrough times stated above were determined by KCL in laboratory tests acc. to EN374 with samples of the recommended glove types.

This recommendation applies only to the product stated in the safety data sheet<(>,<)> supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Other protective equipment

Flame retardant antistatic protective clothing.

Respiratory protection

required when vapours/aerosols are generated.

Recommended Filter type: Filter AX (EN 371)

The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Environmental exposure controls

Do not let product enter drains.

Risk of explosion.

SECTION 9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Form	liquid
Colour	colourless
Odour	characteristic

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Odour Threshold	0.3 - 8.8 ppm
pH	No information available.
Melting point	-116.3 °C
Boiling point/boiling range	34.6 °C at 1,013 hPa
Flash point	-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)
Vapour pressure	587 hPa at 20 °C
Relative vapour density	No information available.
Density	0.71 g/cm ³ at 20 °C
Relative density	No information available.

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Water solubility	69 g/l at 20 °C
Partition coefficient: n-octanol/water	log Pow: 0.89 (experimental) (Lit.) Bioaccumulation is not expected.
Auto-ignition temperature	No information available.
Decomposition temperature	No information available.
Viscosity, dynamic	0.23 mPa.s at 20 °C
Explosive properties	Not classified as explosive.
Oxidizing properties	none
Peroxides	May form explosive peroxides.

9.2 Other data

Ignition temperature	180 °C Method: DIN 51794
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SECTION 10. Stability and reactivity

10.1 Reactivity

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

10.2 Chemical stability

Sensitivity to light
Sensitive to air.

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Product name Diethyl ether EMPROVE® ESSENTIAL Ph Eur,BP

Stabilizer

butyl hydroxytoluene (BHT)

10.3 Possibility of hazardous reactions

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

chromyl chloride, Peroxides

Risk of explosion with:

azides, halogens, halogen-halogen compounds, 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, salts of oxyhalogenic acids, nitrogen oxides, nonmetallic oxides, chromosulfuric acid, chlorates, hydrogen peroxide, permanganic acid

sulphuric acid, with, Nitric acid

sulfur, Risk of explosion during distillation.

Exothermic reaction with:

acid halides

10.4 Conditions to avoid

Warming.

10.5 Incompatible materials

rubber, various plastics

10.6 Hazardous decomposition products

Peroxides

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SECTION 11. Toxicological information

11.1 Information on toxicological effects

Acute oral toxicity

LD50 Rat: 1,215 mg/kg

(RTECS)

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

Acute inhalation toxicity

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

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Product name Diethyl ether EMPROVE® ESSENTIAL Ph Eur,BP

Sensitisation

Sensitisation test: Mouse

Result: negative

Method: OECD Test Guideline 429

Human experience

Result: negative

(Lit.)

Germ cell mutagenicity

Genotoxicity in vivo

Mouse

Red blood cells (erythrocytes)

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 487

Mutagenicity (mammal cell test):

Mouse lymphoma test

Result: negative

Method: OECD Test Guideline 476

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Product name Diethyl ether EMPROVE® ESSENTIAL Ph Eur,BP

Carcinogenicity

This information is not available.

Reproductive toxicity

This information is not available.

Teratogenicity

This information is not available.

Specific target organ toxicity - single exposure

May cause drowsiness or dizziness.

Target Organs: Central nervous system

Specific target organ toxicity - repeated exposure

This information is not available.

Aspiration hazard

This information is not available.

11.2 Further information

Narcotic!

After absorption:

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

Unconsciousness, Coma

Cannot be excluded:

respiratory paralysis, death

Other dangerous properties can not be excluded.

Handle in accordance with good industrial hygiene and safety practice.

SECTION 12. Ecological information

12.1 Toxicity

Toxicity to fish

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

(ECOTOX Database)

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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

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

12.2 Persistence and degradability

Biodegradability

Not readily biodegradable.

12.3 Bioaccumulative potential

Partition coefficient: n-octanol/water

log Pow: 0.89
(experimental)

(Lit.) Bioaccumulation is not expected.

12.4 Mobility in soil

No information available.

12.5 Results of PBT and vPvB assessment

Substance does not meet the criteria for PBT or vPvB according to Regulation (EC) No
1907/2006, Annex XIII.

12.6 Other adverse effects

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Product name Diethyl ether EMPROVE® ESSENTIAL Ph Eur,BP

Henry constant

124.6 Pa*m³/mol

Method: (experimental)

(Lit.) Distribution preferentially in air.

Discharge into the environment must be avoided.

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SECTION 13. Disposal considerations

Waste treatment methods

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

According to Quality Environment Regulation (Scheduled Waste) 2005, waste need to be sent to designated premise for recycle, treatment or disposal. Please contact Kualiti Alam for waste classification and correct disposal method.

SECTION 14. Transport information

Land transport (ADR/RID)

14.1 UN number	UN 1155
14.2 Proper shipping name	DIETHYL ETHER
14.3 Class	3
14.4 Packing group	I
14.5 Environmentally hazardous	--
14.6 Special precautions for user	yes
Tunnel restriction code	D/E

Inland waterway transport (ADN)

Not relevant

Air transport (IATA)

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14.1 UN number	UN 1155
14.2 Proper shipping name	DIETHYL ETHER
14.3 Class	3
14.4 Packing group	I
14.5 Environmentally hazardous	--
14.6 Special precautions for user	no

Sea transport (IMDG)

14.1 UN number	UN 1155
14.2 Proper shipping name	DIETHYL ETHER
14.3 Class	3
14.4 Packing group	I
14.5 Environmentally hazardous	--
14.6 Special precautions for user	yes

EmS	F-E S-D
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14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not relevant

SECTION 15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

All national and local regulations, including Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013, if applicable to the use, should be observed.

EU regulations

Occupational restrictions	Observe work restrictions regarding maternity protection in accordance to Dir 92/85/EEC or stricter national regulations where applicable.
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National legislation

Storage class	3
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15.2 Chemical safety assessment

For this product a chemical safety assessment was not carried out.

SECTION 16. Other information

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

H224	Extremely flammable liquid and vapour.
H302	Harmful if swallowed.
H336	May cause drowsiness or dizziness.

Training advice

Provide adequate information, instruction and training for operators.

Labelling

Hazard pictograms



Signal word

Danger

Hazard statements

H224 Extremely flammable liquid and vapour.
H302 Harmful if swallowed.
H336 May cause drowsiness or dizziness.
EUH019 May form explosive peroxides.
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Precautionary statements

Prevention

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P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.

P240 Ground/bond container and receiving equipment.

Storage

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

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.

Regional representation

Merck Sdn. Bhd. (Co. No: 178145), No. 4, Jalan U1/26, Section U1, Hicom Glenmarie Industrial
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The information contained herein is based on the present state of our knowledge. It characterises the product with regard to the appropriate safety precautions. It does not represent a guarantee of any properties of the product.