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

1.1 Product identifier

Identification of the substance

Diethyl ether

Article number
3942

Registration number (REACH)
01-2119535785-29-xxxx

Index No
603-022-00-4

EC number
200-467-2

CAS number
60-29-7

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

Identified uses:
laboratory chemical
laboratory and analytical use

1.3 Details of the supplier of the safety data sheet

Carl Roth GmbH + Co KG
Schoemperlenstr. 3-5
D-76185 Karlsruhe
Germany

Telephone: +49 (0) 721 - 56 06 0
Telefax: +49 (0) 721 - 56 06 149
e-mail: sicherheit@carlroth.de
Website: www.carlroth.de

Competent person responsible for the safety data sheet:
sicherheit@carlroth.de

1.4 Emergency telephone number

<table>
<thead>
<tr>
<th>Name</th>
<th>Street</th>
<th>Postal code/city</th>
<th>Telephone</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Poisons Information Service City Hospital</td>
<td>Dudley Rd</td>
<td>B187QH Birmingham</td>
<td>844 892 0111</td>
<td></td>
</tr>
</tbody>
</table>

Emergency information service: +49/(0)89 19240

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 (CLP)
### Safety data sheet

according to Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU

**Diethyl ether ROTIPURAN® ≥99,5 %, p.a. stabilized**

article number: 3942

#### Classification acc. to GHS

<table>
<thead>
<tr>
<th>Section</th>
<th>Hazard class</th>
<th>Hazard class and category</th>
<th>Hazard statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.6</td>
<td>flammable liquid</td>
<td>(Flam. Liq. 1)</td>
<td>H224</td>
</tr>
<tr>
<td>3.1O</td>
<td>acute toxicity (oral)</td>
<td>(Acute Tox. 4)</td>
<td>H302</td>
</tr>
<tr>
<td>3.8D</td>
<td>specific target organ toxicity - single exposure (narcotic effects, drowsiness)</td>
<td>(STOT SE 3)</td>
<td>H336</td>
</tr>
</tbody>
</table>

#### Supplemental hazard information

<table>
<thead>
<tr>
<th>Code</th>
<th>Supplemental hazard information</th>
</tr>
</thead>
<tbody>
<tr>
<td>EUH019</td>
<td>May form explosive peroxides</td>
</tr>
<tr>
<td>EUH066</td>
<td>Repeated exposure may cause skin dryness or cracking</td>
</tr>
</tbody>
</table>

#### The most important adverse physicochemical, human health and environmental effects

Narcotic effects.

#### 2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 (CLP)

**Signal word** Danger

**Pictograms**

GHS02, GHS07

**Hazard statements**

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

**Precautionary statements**

**Precautionary statements - prevention**

- P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- P243 Take action to prevent static discharges.
- P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

**Precautionary statements - response**

- P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
- P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
- P312 Call a POISON CENTRE/doctor if you feel unwell.

**Supplemental hazard information**

- EUH019 May form explosive peroxides.
- EUH066 Repeated exposure may cause skin dryness or cracking.
Safety data sheet
according to Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU

Diethyl ether ROTIPURAN® ≥99,5 %, p.a. stabilized

article number: 3942

Labelling of packages where the contents do not exceed 125 ml
Signal word: Danger
Symbol(s)

H224 Extremely flammable liquid and vapour.
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P243 Take action to prevent static discharges.
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
EUH019 May form explosive peroxides.
EUH066 Repeated exposure may cause skin dryness or cracking.

2.3 Other hazards
There is no additional information.

SECTION 3: Composition/information on ingredients

3.1 Substances

Name of substance | Diethyl ether
Index No | 603-022-00-4
Registration number (REACH) | 01-2119535785-29-xxxx
EC number | 200-467-2
CAS number | 60-29-7
Molecular formula | C₄H₁₀O
Molar mass | 74,12 g/mol

Impurities and additives, classification acc. to EU regulation

<table>
<thead>
<tr>
<th>Name of substance</th>
<th>Identifier</th>
<th>Wt%</th>
<th>Classification acc. to 1272/2008/EC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butylated hydroxytoluene</td>
<td>CAS No 128-37-0</td>
<td>0,1</td>
<td>Aquatic Acute 1 / H400 Aquatic Chronic 1 / H410</td>
</tr>
<tr>
<td></td>
<td>EC No 204-881-4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SECTION 4: First aid measures

4.1 Description of first aid measures

General notes
Take off contaminated clothing.

Following inhalation
Provide fresh air. In all cases of doubt, or when symptoms persist, seek medical advice.

Following skin contact
Rinse skin with water/shower.
Following eye contact
Rinse cautiously with water for several minutes. In all cases of doubt, or when symptoms persist, seek medical advice.

Following ingestion
Rinse mouth with water (only if the person is conscious). Call a doctor.

4.2 Most important symptoms and effects, both acute and delayed
Breathing difficulties, Dizziness, Unconsciousness, Vomiting, Irritant effects, Drowsiness, Narcosis, Inebriation, Circulatory collapse

4.3 Indication of any immediate medical attention and special treatment needed
Treat symptomatically.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Co-ordinate fire-fighting measures to the fire surroundings
water spray, foam, dry extinguishing powder, carbon dioxide (CO₂)

Unsuitable extinguishing media
water jet

5.2 Special hazards arising from the substance or mixture
Combustible. Vapours are heavier than air, spread along floors and form explosive mixtures with air.
Vapours can form explosive mixtures with air.

Hazardous combustion products
In case of fire may be liberated: carbon monoxide (CO), carbon dioxide (CO₂)

5.3 Advice for firefighters
Fight fire with normal precautions from a reasonable distance. Wear self-contained breathing apparatus.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel
Wearing of suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing. Avoid contact with skin, eyes and clothes. Do not breathe vapour/spray. Avoidance of ignition sources.

6.2 Environmental precautions
Keep away from drains, surface and ground water. Explosive properties.
6.3 Methods and material for containment and cleaning up

Advice on how to contain a spill
Covering of drains.

Advice on how to clean up a spill
Absorb with liquid-binding material (e.g. sand, diatomaceous earth, acid- or universal binding agents).

Other information relating to spills and releases
Place in appropriate containers for disposal. Ventilate affected area.

6.4 Reference to other sections

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Provision of sufficient ventilation.

• Measures to prevent fire as well as aerosol and dust generation

Keep away from sources of ignition - No smoking.

Take precautionary measures against static discharge. Due to danger of explosion, prevent leakage of vapours into cellars, flues and ditches.

Advice on general occupational hygiene
Wash hands before breaks and after work. Keep away from food, drink and animal feedingstuffs. When using do not smoke.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed.

Incompatible substances or mixtures
Observe hints for combined storage.

Consideration of other advice
Ground/bond container and receiving equipment.

• Ventilation requirements
Use local and general ventilation.

• Specific designs for storage rooms or vessels
Recommended storage temperature: 15 – 25 °C.

7.3 Specific end use(s)
No information available.
## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

#### National limit values

**Occupational exposure limit values (Workplace Exposure Limits)**

<table>
<thead>
<tr>
<th>Country</th>
<th>Name of agent</th>
<th>CAS No</th>
<th>Notation</th>
<th>Identifier</th>
<th>TWA [ppm]</th>
<th>TWA [mg/m³]</th>
<th>STEL [ppm]</th>
<th>STEL [mg/m³]</th>
<th>Ceiling-C [ppm]</th>
<th>Ceiling-C [mg/m³]</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU</td>
<td>diethyl ether</td>
<td>60-29-7</td>
<td>IOELV</td>
<td></td>
<td>100</td>
<td>308</td>
<td>200</td>
<td>616</td>
<td></td>
<td></td>
<td>2000/39/EC</td>
</tr>
<tr>
<td>GB</td>
<td>diethyl ether</td>
<td>60-29-7</td>
<td>WEL</td>
<td></td>
<td>100</td>
<td>310</td>
<td>200</td>
<td>620</td>
<td></td>
<td></td>
<td>EH40/2005</td>
</tr>
</tbody>
</table>

**Notation**
- Ceiling-C: Ceiling value is a limit value above which exposure should not occur
- STEL: Short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period (unless otherwise specified)
- TWA: Time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours time-weighted average (unless otherwise specified)

#### Relevant DNELs/DMELs/PNECs and other threshold levels

**• human health values**

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Threshold level</th>
<th>Protection goal, route of exposure</th>
<th>Used in</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNEL</td>
<td>308 mg/m³</td>
<td>human, inhalatory</td>
<td>worker (industry)</td>
<td>chronic - systemic effects</td>
</tr>
<tr>
<td>DNEL</td>
<td>616 mg/m³</td>
<td>human, inhalatory</td>
<td>worker (industry)</td>
<td>acute - systemic effects</td>
</tr>
<tr>
<td>DNEL</td>
<td>44 mg/kg bw/ day</td>
<td>human, dermal</td>
<td>worker (industry)</td>
<td>chronic - systemic effects</td>
</tr>
</tbody>
</table>

**• relevant DNELs of components of the mixture**

<table>
<thead>
<tr>
<th>Name of substance</th>
<th>CAS No</th>
<th>Endpoint</th>
<th>Threshold level</th>
<th>Protection goal, route of exposure</th>
<th>Used in</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butylated hydroxy-toluene</td>
<td>128-37-0</td>
<td>DNEL</td>
<td>19 mg/kg bw/ day</td>
<td>human, dermal</td>
<td>worker (industry)</td>
<td>acute - systemic effects</td>
</tr>
<tr>
<td>Butylated hydroxy-toluene</td>
<td>128-37-0</td>
<td>DNEL</td>
<td>18 mg/m³</td>
<td>human, inhalatory</td>
<td>worker (industry)</td>
<td>acute - systemic effects</td>
</tr>
<tr>
<td>Butylated hydroxy-toluene</td>
<td>128-37-0</td>
<td>DNEL</td>
<td>3,5 mg/m³</td>
<td>human, inhalatory</td>
<td>worker (industry)</td>
<td>chronic - systemic effects</td>
</tr>
<tr>
<td>Butylated hydroxy-toluene</td>
<td>128-37-0</td>
<td>DNEL</td>
<td>0,5 mg/kg bw/ day</td>
<td>human, dermal</td>
<td>worker (industry)</td>
<td>chronic - systemic effects</td>
</tr>
</tbody>
</table>

**• environmental values**
8.2 Exposure controls

Individual protection measures (personal protective equipment)

Eye/face protection

Use safety goggle with side protection.

Skin protection

• relevant PNECs of components of the mixture

<table>
<thead>
<tr>
<th>Name of substance</th>
<th>CAS No</th>
<th>Endpoint</th>
<th>Threshold level</th>
<th>Environmental compartment</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butylated hydroxytoluene</td>
<td>128-37-0</td>
<td>PNEC</td>
<td>8,33 mg/kg</td>
<td>water</td>
<td>short-term (single instance)</td>
</tr>
<tr>
<td>Butylated hydroxytoluene</td>
<td>128-37-0</td>
<td>PNEC</td>
<td>1,99 µg/l</td>
<td>water</td>
<td>intermittent release</td>
</tr>
<tr>
<td>Butylated hydroxytoluene</td>
<td>128-37-0</td>
<td>PNEC</td>
<td>0,199 µg/l</td>
<td>freshwater</td>
<td>short-term (single instance)</td>
</tr>
<tr>
<td>Butylated hydroxytoluene</td>
<td>128-37-0</td>
<td>PNEC</td>
<td>0,02 µg/l</td>
<td>marine water</td>
<td>short-term (single instance)</td>
</tr>
<tr>
<td>Butylated hydroxytoluene</td>
<td>128-37-0</td>
<td>PNEC</td>
<td>0,17 mg/l</td>
<td>sewage treatment plant (STP)</td>
<td>short-term (single instance)</td>
</tr>
<tr>
<td>Butylated hydroxytoluene</td>
<td>128-37-0</td>
<td>PNEC</td>
<td>99,6 µg/kg</td>
<td>freshwater sediment</td>
<td>short-term (single instance)</td>
</tr>
<tr>
<td>Butylated hydroxytoluene</td>
<td>128-37-0</td>
<td>PNEC</td>
<td>9,96 µg/kg</td>
<td>marine sediment</td>
<td>short-term (single instance)</td>
</tr>
<tr>
<td>Butylated hydroxytoluene</td>
<td>128-37-0</td>
<td>PNEC</td>
<td>47,69 µg/kg</td>
<td>soil</td>
<td>short-term (single instance)</td>
</tr>
</tbody>
</table>
• **hand protection**
  Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves. The times are approximate values from measurements at 22 °C and permanent contact. Increased temperatures due to heated substances, body heat etc. and a reduction of the effective layer thickness by stretching can lead to a considerable reduction of the breakthrough time. If in doubt, contact manufacturer. At an approx. 1.5 times larger / smaller layer thickness, the respective breakthrough time is doubled / halved. The data apply only to the pure substance. When transferred to substance mixtures, they may only be considered as a guide.

• **type of material**
  NBR (Nitrile rubber)

• **material thickness**
  >0,11 mm

• **breakthrough times of the glove material**
  >480 minutes (permeation: level 6)

• **other protection measures**
  Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended.
  Flame-retardant protective clothing.

**Respiratory protection**

Respiratory protection necessary at: Aerosol or mist formation. Type: AX (gas filters and combined filters against low-boiling point organic compounds, colour code: Brown).

**Environmental exposure controls**

Keep away from drains, surface and ground water.

---

**SECTION 9: Physical and chemical properties**

### 9.1 Information on basic physical and chemical properties

**Appearance**

- Physical state: liquid (fluid)
- Colour: colourless
- Odour: mild sweet
- Odour threshold: No data available

**Other physical and chemical parameters**

- **pH (value)**: This information is not available.
- **Melting point/freezing point**: -116 °C
- **Initial boiling point and boiling range**: 34,58 – 34,59 °C at 760 mmHg
- **Flash point**: -40 °C (closed cup)
- **Evaporation rate**: no data available
- **Flammability (solid, gas)**: not relevant (fluid)
Explosive limits

- lower explosion limit (LEL) 1.7 vol%
- upper explosion limit (UEL) 39 vol%

Explosion limits of dust clouds not relevant

Vapour pressure 58.96 kPa at 293.2 K

Density 0.71 g/cm³ at 20 °C

Vapour density 2.56 (air = 1)

Bulk density Not applicable

Relative density Information on this property is not available.

Solubility(ies)

Water solubility 64.9 g/l at 20 °C

Partition coefficient

n-octanol/water (log KOW) 1.19 (pH value: 7, 25 °C) (ECHA)

Soil organic carbon/water (log KOC) 0.987 (ECHA)

Auto-ignition temperature 175 °C at 1 atm - ECHA

Decomposition temperature no data available

Viscosity

- kinematic viscosity 0.331 mm²/s at 293.2 K
- dynamic viscosity 0.235 mPa s at 293.2 K

Explosive properties Shall not be classified as explosive

Oxidising properties none

9.2 Other information

Refractive index 1.353

Temperature class (EU, acc. to ATEX) T4 (Maximum permissible surface temperature on the equipment: 135°C)

SECTION 10: Stability and reactivity

10.1 Reactivity

Risk of ignition. Vapours can form explosive mixtures with air. May form explosive peroxides.

10.2 Chemical stability

The material is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure. This substance contains a stabiliser.

10.3 Possibility of hazardous reactions

Nitrate, Perchlorates, Peroxides, Nitric acid, Oxygen, Sulphuric acid, Strong oxidiser, Nitrogen oxides (NOx), Hydrogen peroxide

10.4 Conditions to avoid

UV-radiation/sunlight. Keep away from heat. No smoking. Protect from moisture.

10.5 Incompatible materials
10.6 Hazardous decomposition products
Peroxides. Hazardous combustion products: see section 5.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

<table>
<thead>
<tr>
<th>Exposure route</th>
<th>Endpoint</th>
<th>Value</th>
<th>Species</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>oral</td>
<td>LD50</td>
<td>1.215 mg/kg</td>
<td>rat</td>
<td>TOXNET</td>
</tr>
</tbody>
</table>

Skin corrosion/irritation
Shall not be classified as corrosive/irritant to skin.

Serious eye damage/eye irritation
Shall not be classified as seriously damaging to the eye or eye irritant.

Respiratory or skin sensitisation
Shall not be classified as a respiratory or skin sensitiser.

Summary of evaluation of the CMR properties
Shall not be classified as germ cell mutagenic, carcinogenic nor as a reproductive toxicant

• Specific target organ toxicity - single exposure
May cause drowsiness or dizziness.

• Specific target organ toxicity - repeated exposure
Shall not be classified as a specific target organ toxicant (repeated exposure).

Aspiration hazard
Shall not be classified as presenting an aspiration hazard.

Symptoms related to the physical, chemical and toxicological characteristics

• If swallowed
vomiting, abdominal pain

• If in eyes
slightly irritant but not relevant for classification

• If inhaled
irritant effects, breathing difficulties, fatigue, narcosis, vapours may cause drowsiness and dizziness, inebriation, circulatory collapse

• If on skin
has degreasing effect on the skin, irritant effects

Other information
None
SECTION 12: Ecological information

12.1 Toxicity
acc. to 1272/2008/EC: Shall not be classified as hazardous to the aquatic environment.

**Aquatic toxicity (acute)**

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Value</th>
<th>Species</th>
<th>Source</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td>ErC50</td>
<td>&gt;100 mg/l</td>
<td>algae</td>
<td>ECHA</td>
<td>72 h</td>
</tr>
<tr>
<td>EC50</td>
<td>&gt;100 mg/l</td>
<td>algae</td>
<td>ECHA</td>
<td>72 h</td>
</tr>
</tbody>
</table>

**Aquatic toxicity (acute) of components of the mixture**

<table>
<thead>
<tr>
<th>Name of substance</th>
<th>CAS No</th>
<th>Endpoint</th>
<th>Value</th>
<th>Species</th>
<th>Source</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butylated hydroxytoluene</td>
<td>128-37-0</td>
<td>LC50</td>
<td>&gt;0,57 mg/l</td>
<td>fish</td>
<td>ECHA</td>
<td>96 h</td>
</tr>
<tr>
<td>Butylated hydroxytoluene</td>
<td>128-37-0</td>
<td>EC50</td>
<td>0,48 mg/l</td>
<td>aquatic invertebrates</td>
<td>48 h</td>
<td></td>
</tr>
<tr>
<td>Butylated hydroxytoluene</td>
<td>128-37-0</td>
<td>ErC50</td>
<td>&gt;0,4 mg/l</td>
<td>algae</td>
<td></td>
<td>72 h</td>
</tr>
</tbody>
</table>

**Aquatic toxicity (chronic)**

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Value</th>
<th>Species</th>
<th>Source</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC50</td>
<td>&gt;100 mg/l</td>
<td>aquatic invertebrates</td>
<td>ECHA</td>
<td>21 d</td>
</tr>
<tr>
<td>NOEC</td>
<td>100 mg/l</td>
<td>aquatic invertebrates</td>
<td>ECHA</td>
<td>21 d</td>
</tr>
<tr>
<td>LOEC</td>
<td>&gt;100 mg/l</td>
<td>aquatic invertebrates</td>
<td>ECHA</td>
<td>21 d</td>
</tr>
<tr>
<td>Growth (EbCx) 20%</td>
<td>310 mg/l</td>
<td>microorganisms</td>
<td>ECHA</td>
<td>3 h</td>
</tr>
</tbody>
</table>

**Aquatic toxicity (chronic) of components of the mixture**

<table>
<thead>
<tr>
<th>Name of substance</th>
<th>CAS No</th>
<th>Endpoint</th>
<th>Value</th>
<th>Species</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butylated hydroxytoluene</td>
<td>128-37-0</td>
<td>EC50</td>
<td>0,096 mg/l</td>
<td>aquatic invertebrates</td>
<td>21 d</td>
</tr>
</tbody>
</table>

12.2 Process of degradability

Not readily biodegradable. Theoretical Oxygen Demand: 2,59 mg/mg
Theoretical Carbon Dioxide: 2,375 mg/mg

**Degradability of components of the mixture**

<table>
<thead>
<tr>
<th>Name of substance</th>
<th>CAS No</th>
<th>Process</th>
<th>Degradation rate</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butylated hydroxytoluene</td>
<td>128-37-0</td>
<td>biotic/abiotic</td>
<td>&lt;10 %</td>
<td>20 d</td>
</tr>
</tbody>
</table>

12.3 Bioaccumulative potential

Does not significantly accumulate in organisms.
n-octanol/water (log KOW) 1,19 (pH value: 7, 25 °C)

BCF 2,29

Bioaccumulative potential of components of the mixture

<table>
<thead>
<tr>
<th>Name of substance</th>
<th>CAS No</th>
<th>BCF</th>
<th>Log KOW</th>
<th>BOD5/COD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butylated hydroxy-toluene</td>
<td>128-37-0</td>
<td>598,4</td>
<td>5,1</td>
<td></td>
</tr>
</tbody>
</table>

12.4 Mobility in soil

The Organic Carbon normalised adsorption coefficient 0,987

12.5 Results of PBT and vPvB assessment

Data are not available.

12.6 Other adverse effects

Data are not available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

This material and its container must be disposed of as hazardous waste. Dispose of contents/container in accordance with local/regional/national/international regulations.

Sewage disposal-relevant information

Do not empty into drains.

Waste treatment of containers-packagings

It is a dangerous waste; only packagings which are approved (e.g. acc. to ADR) may be used.

13.2 Relevant provisions relating to waste

The allocation of waste identity numbers/waste descriptions must be carried out according to the EEC, specific to the industry and process.

13.3 Remarks

Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities. Please consider the relevant national or regional provisions.

SECTION 14: Transport information

14.1 UN number

1155

14.2 UN proper shipping name

DIETHYL ETHER

Hazardous ingredients

Diethyl ether

14.3 Transport hazard class(es)

Class 3 (flammable liquids)
Safety data sheet
according to Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU

Diethyl ether ROTIPURAN® ≥99.5 %, p.a. stabilized
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14.4 Packing group
I (substance presenting high danger)

14.5 Environmental hazards
none (non-environmentally hazardous acc. to the dangerous goods regulations)

14.6 Special precautions for user
Provisions for dangerous goods (ADR) should be complied within the premises.

14.7 Transport in bulk according to Annex II of MARPOL and the IBC Code
The cargo is not intended to be carried in bulk.

14.8 Information for each of the UN Model Regulations

- **Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN)**
  - **UN number**: 1155
  - **Proper shipping name**: DIETHYL ETHER
  - **Particulars in the transport document**: UN1155, DIETHYL ETHER, 3, I, (D/E)
  - **Class**: 3
  - **Classification code**: F1
  - **Packing group**: I
  - **Danger label(s)**: 3

- **Excepted quantities (EQ)**: E3
- **Transport category (TC)**: 1
- **Tunnel restriction code (TRC)**: D/E
- **Hazard identification No**: 33
- **Emergency Action Code**: 3YE

- **International Maritime Dangerous Goods Code (IMDG)**
  - **UN number**: 1155
  - **Proper shipping name**: DIETHYL ETHER
  - **Particulars in the shipper's declaration**: UN1155, DIETHYL ETHER, 3, I, -40°C c.c.
  - **Class**: 3
  - **Marine pollutant**: -
  - **Packing group**: I
  - **Danger label(s)**: 3

- **Special provisions (SP)**: -
- **Excepted quantities (EQ)**: E3
- **Limited quantities (LQ)**: 0
Diethyl ether ROTIPURAN® ≥99.5 %, p.a. stabilized

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<table>
<thead>
<tr>
<th>EmS</th>
<th>F-E, S-D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stowage category</td>
<td>E</td>
</tr>
<tr>
<td>• International Civil Aviation Organization (ICAO-IATA/DGR)</td>
<td></td>
</tr>
<tr>
<td>UN number</td>
<td>1155</td>
</tr>
<tr>
<td>Proper shipping name</td>
<td>Diethyl ether</td>
</tr>
<tr>
<td>Particulars in the shipper’s declaration</td>
<td>UN1155, Diethyl ether, 3, I</td>
</tr>
<tr>
<td>Class</td>
<td>3</td>
</tr>
<tr>
<td>Packing group</td>
<td>I</td>
</tr>
<tr>
<td>Danger label(s)</td>
<td>3</td>
</tr>
</tbody>
</table>

Excepted quantities (EQ) E3

SECTION 15: Regulatory information

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

Relevant provisions of the European Union (EU)

• Regulation 649/2012/EU concerning the export and import of hazardous chemicals (PIC)
  Not listed.

• Regulation 1005/2009/EC on substances that deplete the ozone layer (ODS)
  Not listed.

• Regulation 850/2004/EC on persistent organic pollutants (POP)
  Not listed.

• Restrictions according to REACH, Annex XVII

<table>
<thead>
<tr>
<th>Name of substance</th>
<th>CAS No</th>
<th>Wt%</th>
<th>Type of registration</th>
<th>Conditions of restriction</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diethyl ether</td>
<td></td>
<td>100</td>
<td>1907/2006/EC annex XVII</td>
<td>R3</td>
<td>3</td>
</tr>
<tr>
<td>Diethyl ether</td>
<td></td>
<td>100</td>
<td>1907/2006/EC annex XVII</td>
<td>R40</td>
<td>40</td>
</tr>
</tbody>
</table>

Legend

R3 1. Shall not be used in:
- ornamental articles intended to produce light or colour effects by means of different phases, for example in ornamental lamps and ashtrays,
- tricks and jokes,
- games for one or more participants, or any article intended to be used as such, even with ornamental aspects,
2. Articles not complying with paragraph 1 shall not be placed on the market,
3. Shall not be placed on the market if they contain a colouring agent, unless required for fiscal reasons, or perfume, or both, if they:
- can be used as fuel in decorative oil lamps for supply to the general public, and,
- present an aspiration hazard and are labelled with R65 or H304,
4. Decorative oil lamps for supply to the general public shall not be placed on the market unless they conform to the European Standard on Decorative oil lamps (EN 14059) adopted by the European Committee for Standardisation (CEN).
5. Without prejudice to the implementation of other Community provisions relating to the classification, packaging and labelling of dangerous substances and mixtures, suppliers shall ensure, before the placing on the market, that the following requirements are met:
(a) Lamp oils, labelled with R65 or H304, intended for supply to the general public are visibly, legibly and indelibly marked as follows: ‘Keep lamps filled with this liquid out of the reach of children’; and, by 1 December 2010, ‘Just a
Diethyl ether ROTIPURAN® ≥99,5 %, p.a. stabilized

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Legend

sip of lamp oil - or even sucking the wick of lamps - may lead to life-threatening lung damage;
(b) grill lighter fluids, labelled with R65 or H304, intended for supply to the general public are legibly and indelibly marked by 1 December 2010 as follows: ‘Just a sip of grill lighter may lead to life threatening lung damage’;
(c) lamp oils and grill lighters, labelled with R65 or H304, intended for supply to the general public are packaged in black opaque containers not exceeding 1 litre by 1 December 2010.

6. No later than 1 June 2014, the Commission shall request the European Chemicals Agency to prepare a dossier, in accordance with Article 69 of the present Regulation with a view to ban, if appropriate, grill lighter fluids and fuel for decorative lamps, labelled R65 or H304, intended for supply to the general public.
7. Natural or legal persons placing on the market for the first time lamp oils and grill lighter fluids, labelled with R65 or H304, shall by 1 December 2011, and annually thereafter, provide data on alternatives to lamp oils and grill lighter fluids labelled R65 or H304 to the competent authority in the Member State concerned. Member States shall make those data available to the Commission.

R40
1. Shall not be used, as substance or as mixtures in aerosol dispensers where these aerosol dispensers are intended for supply to the general public for entertainment and decorative purposes such as the following:
   - metallic glitter intended mainly for decoration,
   - artificial snow and frost,
   - ‘whooppee’ cushions,
   - silly string aerosols,
   - imitation excrement,
   - horns for parties,
   - decorative flakes and foams,
   - artificial cobwebs,
   - stink bombs.
2. Without prejudice to the application of other Community provisions on the classification, packaging and labelling of substances, suppliers shall ensure before the placing on the market that the packaging of aerosol dispensers referred to above is marked visibly, legibly and indelibly with: ‘For professional users only’.
3. By way of derogation, paragraphs 1 and 2 shall not apply to the aerosol dispensers referred to Article 8 (1a) of Council Directive 75/324/EEC (2).
4. The aerosol dispensers referred to in paragraphs 1 and 2 shall not be placed on the market unless they conform to the requirements indicated.

• Restrictions according to REACH, Title VIII
None.

• List of substances subject to authorisation (REACH, Annex XIV)/SVHC - candidate list
not listed

• Seveso Directive

2012/18/EU (Seveso III)

<table>
<thead>
<tr>
<th>No</th>
<th>Dangerous substance/hazard categories</th>
<th>Qualifying quantity (tonnes) for the application of lower and upper-tier requirements</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSA</td>
<td>flammable liquids (cat. 1)</td>
<td>10</td>
<td>50</td>
</tr>
</tbody>
</table>

Notation
49) - Flammable liquids, category 1, or
- flammable liquids category 2 or 3 maintained at a temperature above their boiling point, or
- other liquids with a flash point ≤ 60 °C, maintained at a temperature above their boiling point

• Directive 75/324/EEC relating to aerosol dispensers

Filling batch

<table>
<thead>
<tr>
<th>VOC content</th>
<th>100 %</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>710 g/l</td>
</tr>
</tbody>
</table>

Directive on industrial emissions (VOCs, 2010/75/EU)
Safety data sheet
according to Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU

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<table>
<thead>
<tr>
<th>VOC content</th>
<th>100 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOC content</td>
<td>710 g/l</td>
</tr>
</tbody>
</table>

Directives and Regulations

- Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS) - Annex II: not listed
- Regulation 166/2006/EC concerning the establishment of a European Pollutant Release and Transfer Register (PRTR): not listed
- Directive 2000/60/EC establishing a framework for Community action in the field of water policy (WFD): not listed
- Regulation 98/2013/EU on the marketing and use of explosives precursors: not listed
- Regulation 111/2005/EC laying down rules for the monitoring of trade between the Community and third countries in drug precursors: not listed

**Name of substance**

<table>
<thead>
<tr>
<th>Name of substance</th>
<th>CAS No</th>
<th>Classification</th>
<th>CN Code</th>
<th>Threshold level</th>
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</thead>
<tbody>
<tr>
<td>Diethyl ether</td>
<td>60-29-7</td>
<td>Category 3</td>
<td>2909 11 00</td>
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</table>

**National inventories**

Substance is listed in the following national inventories:

<table>
<thead>
<tr>
<th>Country</th>
<th>National inventories</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>AU</td>
<td>AICS</td>
<td>substance is listed</td>
</tr>
<tr>
<td>CA</td>
<td>DSL</td>
<td>substance is listed</td>
</tr>
<tr>
<td>CN</td>
<td>IECSC</td>
<td>substance is listed</td>
</tr>
<tr>
<td>EU</td>
<td>ECSI</td>
<td>substance is listed</td>
</tr>
<tr>
<td>EU</td>
<td>REACH Reg.</td>
<td>substance is listed</td>
</tr>
<tr>
<td>JP</td>
<td>CSCL-ENCS</td>
<td>substance is listed</td>
</tr>
<tr>
<td>KR</td>
<td>KECI</td>
<td>substance is listed</td>
</tr>
<tr>
<td>MX</td>
<td>INSQ</td>
<td>substance is listed</td>
</tr>
<tr>
<td>NZ</td>
<td>NZIoC</td>
<td>substance is listed</td>
</tr>
<tr>
<td>PH</td>
<td>PICCS</td>
<td>substance is listed</td>
</tr>
<tr>
<td>TR</td>
<td>CICR</td>
<td>substance is listed</td>
</tr>
<tr>
<td>TW</td>
<td>TCSI</td>
<td>substance is listed</td>
</tr>
<tr>
<td>US</td>
<td>TSCA</td>
<td>substance is listed</td>
</tr>
</tbody>
</table>

**Legend**

- AICS: Australian Inventory of Chemical Substances
- CICR: Chemical Inventory and Control Regulation
- CSCL-ENCS: List of Existing and New Chemical Substances (CSCL-ENCS)
- DSL: Domestic Substances List (DSL)
- ECSI: EC Substance Inventory (EINECS, ELINCS, NLP)
- IECSC: Inventory of Existing Chemical Substances Produced or Imported in China
- INSQ: National Inventory of Chemical Substances

United Kingdom (en)
### 15.2 Chemical Safety Assessment

No Chemical Safety Assessment has been carried out for this substance.

### SECTION 16: Other information

#### Indication of changes (revised safety data sheet)

<table>
<thead>
<tr>
<th>Section</th>
<th>Former entry (text/value)</th>
<th>Actual entry (text/value)</th>
<th>Safety-relevant</th>
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</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Remarks: For full text of Hazard- and EU Hazard-statements: see SECTION 16.</td>
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<td>2.2</td>
<td>Pictograms: change in the listing (table)</td>
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<td>2.2</td>
<td>Precautionary statements - prevention: change in the listing (table)</td>
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<tr>
<td>2.2</td>
<td>Precautionary statements - storage</td>
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<tr>
<td>2.2</td>
<td>Precautionary statements - storage: change in the listing (table)</td>
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</tr>
<tr>
<td>2.2</td>
<td>Precautionary statements - response</td>
<td></td>
<td>yes</td>
</tr>
<tr>
<td>2.2</td>
<td>Precautionary statements - response: change in the listing (table)</td>
<td></td>
<td>yes</td>
</tr>
<tr>
<td>2.2</td>
<td>Labelling of packages where the contents do not exceed 125 ml: change in the listing (table)</td>
<td></td>
<td>yes</td>
</tr>
<tr>
<td>8.1</td>
<td>Occupational exposure limit values (Workplace Exposure Limits): change in the listing (table)</td>
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<td>yes</td>
</tr>
<tr>
<td>8.1</td>
<td>• human health values: change in the listing (table)</td>
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</tr>
<tr>
<td>8.1</td>
<td>• relevant DNELs of components of the mixture</td>
<td></td>
<td>yes</td>
</tr>
<tr>
<td>8.1</td>
<td>• relevant DNELs of components of the mixture: change in the listing (table)</td>
<td></td>
<td>yes</td>
</tr>
<tr>
<td>8.1</td>
<td>• environmental values: change in the listing (table)</td>
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<td>yes</td>
</tr>
<tr>
<td>8.1</td>
<td>• relevant PNECs of components of the mixture</td>
<td></td>
<td>yes</td>
</tr>
<tr>
<td>8.1</td>
<td>• relevant PNECs of components of the mixture: change in the listing (table)</td>
<td></td>
<td>yes</td>
</tr>
<tr>
<td>14.3</td>
<td>Transport hazard class(es)</td>
<td>Transport hazard class(es): class 3 hazard - flammable liquids</td>
<td>yes</td>
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<tr>
<td>14.8</td>
<td>Particulars in the transport document: UN1155, DIETHYL ETHER, (ether), 3, I, (D/E)</td>
<td>Particulars in the transport document: UN1155, DIETHYL ETHER, 3, I, (D/E)</td>
<td>yes</td>
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<tr>
<td>14.8</td>
<td>Limited quantities (LQ): 0</td>
<td></td>
<td>yes</td>
</tr>
<tr>
<td>14.8</td>
<td>Emergency Action Code: 3YE</td>
<td></td>
<td>yes</td>
</tr>
</tbody>
</table>
Diethyl ether ROTIPURAN® ≥99.5%, p.a. stabilized

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<table>
<thead>
<tr>
<th>Section</th>
<th>Former entry (text/value)</th>
<th>Actual entry (text/value)</th>
<th>Safety-relevant</th>
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<tbody>
<tr>
<td>14.8</td>
<td>Particulars in the shipper's declaration: UN1155, DIETHYL ETHER, ether, 3, I, -40°C c.c.</td>
<td>Particulars in the shipper's declaration: UN1155, DIETHYL ETHER, 3, I, -40°C c.c.</td>
<td>yes</td>
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<tr>
<td>14.8</td>
<td>Marine pollutant: -</td>
<td>-</td>
<td>yes</td>
</tr>
<tr>
<td>14.8</td>
<td>• International Civil Aviation Organization (ICAO-IATA/DGR)</td>
<td>-</td>
<td>yes</td>
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<td>14.8</td>
<td>UN number: 1155</td>
<td>-</td>
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<tr>
<td>14.8</td>
<td>Proper shipping name: Diethyl ether</td>
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<td>14.8</td>
<td>Particulars in the shipper's declaration: UN1155, Diethyl ether, 3, I</td>
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<td>14.8</td>
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<tr>
<td>14.8</td>
<td>Packing group: 1</td>
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</tr>
<tr>
<td>14.8</td>
<td>Danger label(s): 3</td>
<td>-</td>
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<tr>
<td>14.8</td>
<td>Excepted quantities (EQ): E3</td>
<td>-</td>
<td>yes</td>
</tr>
</tbody>
</table>

Abbreviations and acronyms

<table>
<thead>
<tr>
<th>Abbr.</th>
<th>Descriptions of used abbreviations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADN</td>
<td>Accord européen relatif au transport international des marchandises dangereuses par voies de navigation intérieures (European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways)</td>
</tr>
<tr>
<td>ADR</td>
<td>Accord européen relatif au transport international des marchandises dangereuses par route (European Agreement concerning the International Carriage of Dangerous Goods by Road)</td>
</tr>
<tr>
<td>Aquatic Acute</td>
<td>hazardous to the aquatic environment - acute hazard</td>
</tr>
<tr>
<td>Aquatic Chronic</td>
<td>hazardous to the aquatic environment - chronic hazard</td>
</tr>
<tr>
<td>BCF</td>
<td>bioconcentration factor</td>
</tr>
<tr>
<td>BOD</td>
<td>Biochemical Oxygen Demand</td>
</tr>
<tr>
<td>CAS</td>
<td>Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)</td>
</tr>
<tr>
<td>Ceiling-C</td>
<td>ceiling value</td>
</tr>
<tr>
<td>CLP</td>
<td>Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures</td>
</tr>
<tr>
<td>CMR</td>
<td>Carcinogenic, Mutagenic or toxic for Reproduction</td>
</tr>
<tr>
<td>CN Code</td>
<td>Combined Nomenclature</td>
</tr>
<tr>
<td>COD</td>
<td>chemical oxygen demand</td>
</tr>
<tr>
<td>DGR</td>
<td>Dangerous Goods Regulations (see IATA/DGR)</td>
</tr>
<tr>
<td>DMEL</td>
<td>Derived Minimal Effect Level</td>
</tr>
</tbody>
</table>
### Abbr. | Descriptions of used abbreviations
--- | ---
DNEL | Derived No-Effect Level
EC50 | Effective Concentration 50%. The EC50 corresponds to the concentration of a tested substance causing 50% changes in response (e.g. on growth) during a specified time interval
EC No | The EC Inventory (EINECS, ELINCS and the NLP-list) is the source for the seven-digit EC number, an identifier of substances commercially available within the EU (European Union)
EINECS | European Inventory of Existing Commercial Chemical Substances
ELINCS | European List of Notified Chemical Substances
EmS | Emergency Schedule
ErC50 | ≡ EC50: in this method, that concentration of test substance which results in a 50% reduction in either growth (EbC50) or growth rate (ErC50) relative to the control
GHS | "Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
IATA | International Air Transport Association
IATA/DGR | Dangerous Goods Regulations (DGR) for the air transport (IATA)
ICAO | International Civil Aviation Organization
IMDG | International Maritime Dangerous Goods Code
index No | the Index number is the identification code given to the substance in Part 3 of Annex VI to Regulation (EC) No 1272/2008
IOELV | indicative occupational exposure limit value
LC50 | Lethal Concentration 50%: the LC50 corresponds to the concentration of a tested substance causing 50% lethality during a specified time interval
LD50 | Lethal Dose 50%: the LD50 corresponds to the dose of a tested substance causing 50% lethality during a specified time interval
LOEC | Lowest Observed Effect Concentration
log KOW | n-octanol/water
MARPOL | International Convention for the Prevention of Pollution from Ships (abbr. of "Marine Pollutant")
NLP | No-Longer Polymer
NOEC | No Observed Effect Concentration
PBT | Persistent, Bioaccumulative and Toxic
PNEC | Predicted No-Effect Concentration
ppm | parts per million
REACH | Registration, Evaluation, Authorisation and Restriction of Chemicals
RID | Règlement concernant le transport International ferroviaire des marchandises Dangereuses (Regulations concerning the International carriage of Dangerous goods by Rail)
STEL | short-term exposure limit
SVHC | Substance of Very High Concern
TWA | time-weighted average
VOC | Volatile Organic Compounds
vPvB | very Persistent and very Bioaccumulative
WEL | workplace exposure limit
Key literature references and sources for data
- Regulation (EC) No. 1272/2008 (CLP, EU GHS)
- Dangerous Goods Regulations (DGR) for the air transport (IATA)
- International Maritime Dangerous Goods Code (IMDG)

List of relevant phrases (code and full text as stated in chapter 2 and 3)

<table>
<thead>
<tr>
<th>Code</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>H224</td>
<td>extremely flammable liquid and vapour</td>
</tr>
<tr>
<td>H302</td>
<td>harmful if swallowed</td>
</tr>
<tr>
<td>H336</td>
<td>may cause drowsiness or dizziness</td>
</tr>
<tr>
<td>H400</td>
<td>very toxic to aquatic life</td>
</tr>
<tr>
<td>H410</td>
<td>very toxic to aquatic life with long lasting effects</td>
</tr>
</tbody>
</table>

Disclaimer
The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material.