# Safety Data Sheet according to Regulation (EC) No. 1907/2006 (REACH)

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

### 1.1. Product identifier

**Trade name/designation:**

RAVENOL DOT 5.1

**UFI:**

X62G-MFU8-92AF-NACS

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

**Use of the substance/mixture:**

brake fluids

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### 1.3. Details of the supplier of the safety data sheet

**Supplier (manufacturer/importer/only representative/downstream user/distributor):**

**Ravensberger Schmierstoffvertrieb GmbH**
Produktsicherheit
Jöllenbecker Str. 2
33824 Werther
Germany

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### 1.4. Emergency telephone number

24 hr. emergency phone number, 24h: +49 700 24 112 112 (Contract ID: RAV) / +1 872 5888271 (Contract ID: RAV)

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

**Classification according to Regulation (EC) No 1272/2008 [CLP]**

| Hazard classes and hazard categories | Hazard statements | Classification procedure |
|---|---|---|
| Reproductive toxicity *(Repr. 2)* | H361d: Suspected of damaging the unborn child. | Calculation method. |

### 2.2. Label elements

**Labelling according to Regulation (EC) No. 1272/2008 [CLP]**

**Hazard pictograms:**



**GHS08**
Health hazard

**Signal word:** Warning

**Hazard components for labelling:**

tris[2-[2-(2-methoxyethoxy)ethoxy]ethyl] orthoborate; 2-(2-methoxyethoxy)ethanol; 2-(2-(2-butoxyethoxy)ethoxy)ethanol

| Hazard statements for health hazards | |
|---|---|
| H361d | Suspected of damaging the unborn child. |

**Supplemental hazard information:** none

| Precautionary statements | |
|---|---|
| P101 | If medical advice is needed, have product container or label at hand. |
| P102 | Keep out of reach of children. |

| Precautionary statements Prevention | |
|---|---|
| P202 | Do not handle until all safety precautions have been read and understood. |
| P280 | Wear protective gloves/protective clothing/eye protection/face protection. |

| Precautionary statements Response | |
|---|---|
| P301 + P310 | IF SWALLOWED: Immediately call a POISON CENTER/doctor/Emergency telephone number. |

| Precautionary statements Storage | |
|---|---|
| P405 | Store locked up. |

| Precautionary statements Disposal | |
|---|---|
| P501 | Dispose of contents/container to an appropriate recycling or disposal facility. |

### 2.3. Other hazards

**Other adverse effects:**

The substances in the mixture do not meet the PBT/vPvB criteria according to REACH, annex XIII.

## SECTION 3: Composition/information on ingredients

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### 3.2. Mixtures

**Additional information:**

Only the ingredients subject to declaration are available in the Safety Data Sheet. This can differ from the composition. In composition there are listed the main ingredients.
It is not intended to list harmless substances in Safety Data Sheet.

**Hazardous ingredients / Hazardous impurities / Stabilisers:**

| Product identifiers | Substance name<br>Classification according to Regulation (EC) No 1272/2008 [CLP] | Concentration |
|---|---|---|
| CAS No.: 30989-05-0<br>EC No.: 250-418-4<br>REACH No.:<br>01-2119462824-33-XXXX | **tris[2-[2-(2-methoxyethoxy)ethoxy]ethyl] orthoborate**<br>Repr. 2 (H361d)<br>Warning | 40 – < 80<br>weight-% |
| CAS No.: 143-22-6<br>EC No.: 205-592-6<br>Index No.: 603-183-00-0<br>REACH No.:<br>01-2119531322-53 | **2-(2-(2-butoxyethoxy)ethoxy)ethanol**<br>Eye Dam. 1 (H318)<br>Danger<br>**Specific concentration limit (SCL)**<br>Eye Dam. 1; H318: C ≥ 30%<br>Eye Irrit. 2; H319: 20% ≤ C < 30% | 5 – < 10<br>weight-% |
| CAS No.: 9004-77-7<br>EC No.: 500-012-0<br>REACH No.:<br>01-2118475115-41 | **Poly(oxy-1,2-ethanediyl), ?-butyl-?-hydroxy-**<br>Eye Dam. 1 (H318)<br>Danger<br>**Specific concentration limit (SCL)**<br>Eye Dam. 1; H318: C ≥ 30%<br>Eye Irrit. 2; H319: 20% ≤ C < 30% | 5 – < 10<br>weight-% |
| CAS No.: 111-77-3<br>EC No.: 203-906-6<br>Index No.: 603-107-00-6<br>REACH No.:<br>01-2119475100-52 | **2-(2-methoxyethoxy)ethanol**<br>Repr. 2 (H361d***)<br>Warning | 1 – < 3<br>weight-% |

*Full text of H- and EUH-phrases: see section 16.*

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

**General information:**

First aider: Pay attention to self-protection! Take off immediately all contaminated clothing.

**Following inhalation:**

In case of respiratory tract irritation, consult a physician. Provide fresh air.

**In case of skin contact:**

After contact with skin, wash immediately with plenty of water and soap. Frequently or prolonged contact with skin may cause dermal irritation.

**After eye contact:**
Rinse immediately carefully and thoroughly with eye-bath or water.

**Following ingestion:**
Seek medical advice immediately.

**Self-protection of the first aider:**
First aider: Pay attention to self-protection!

### 4.2. Most important symptoms and effects, both acute and delayed
Suspected of damaging the unborn child.

### 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), Extinguishing powder, Water spray jet.
In case of major fire and large quantities: Water spray jet, alcohol resistant foam

**Unsuitable extinguishing media:**
Full water jet

### 5.2. Special hazards arising from the substance or mixture
In case of fire may be liberated: Gases/vapours, toxic

**Hazardous combustion products:**
Nitrogen oxides (NOx) Carbon monoxide Carbon dioxide (CO2)

### 5.3. Advice for firefighters
In case of fire: Wear self-contained breathing apparatus. Wear eye/face protection.

### 5.4. Additional information
Co-ordinate fire-fighting measures to the fire surroundings. Collect contaminated fire extinguishing water separately. Do not allow entering drains or surface water.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures
#### 6.1.1. For non-emergency personnel
**Personal precautions:**
Special danger of slipping by leaking/spilling product.

**Protective equipment:**
Wear personal protection equipment (refer to section 8).

**Emergency procedures:**
Remove persons to safety.

#### 6.1.2. For emergency responders
**Personal protection equipment:**
Wear personal protection equipment (refer to section 8).

### 6.2. Environmental precautions
Avoid release to the environment.
Clear spills immediately.
Do not allow to enter into surface water or drains.

### 6.3. Methods and material for containment and cleaning up
**For containment:**
Absorb with liquid-binding material (sand, diatomaceous earth, acid- or universal binding agents).

**For cleaning up:**
Absorb with liquid-binding material (sand, diatomaceous earth, acid- or universal binding agents).

**Other information:**
Treat the recovered material as prescribed in the section on waste disposal.

### 6.4. Reference to other sections
Safe handling: see section 7
Disposal: see section 13
Personal protection equipment: see section 8

### 6.5. Additional information
Clear spills immediately.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

#### Protective measures

**Advices on safe handling:**
Provide adequate ventilation.
To follow: Advices on general occupational hygiene.
When using do not eat, drink or smoke.
Wash hands thoroughly after handling.
Minimum standard for preventive measures while handling with working materials are specified in the TRGS 500.

**Fire prevent measures:**
No special fire protection measures are necessary.

**Measures to prevent aerosol and dust generation:**
Use only in well-ventilated areas.

**Environmental precautions:**
See section 8.

#### Advices on general occupational hygiene
Minimum standard for preventive measures while handling with working materials are specified in the TRGS 500.
Wash hands before breaks and after work.
When using do not eat, drink, smoke, sniff.
Remove contaminated, saturated clothing.

### 7.2. Conditions for safe storage, including any incompatibilities

**Technical measures and storage conditions:**
Keep/Store only in original container. Keep container tightly closed. Protect from moisture.

**Requirements for storage rooms and vessels:**
No special measures are necessary.

**Hints on storage assembly:**
No special measures are necessary.

**Storage class (TRGS 510, Germany):** 10 – Combustible liquids that cannot be assigned to any of the above storage classes

**Further information on storage conditions:**
Keep container tightly closed.

### 7.3. Specific end use(s)

**Recommendation:**
Observe technical data sheet.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

#### 8.1.1. Occupational exposure limit values

| **Limit value type (country of origin)** | **Substance name** | **① Long-term occupational exposure limit value<br>② Short-term occupational exposure limit value<br>③ Instantaneous value<br>④ Monitoring and observation processes<br>⑤ Remark** |
|---|---|---|
| TRGS 900 (DE) | **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | ① 10 ppm (50 mg/m³)<br>⑤ (Aerosol und Dampf, kann über die Haut aufgenommen werden) EU, Y, H, 11 |
| BE | **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | ① 10 ppm (50.1 mg/m³)<br>⑤ peut être absorbé par la peau, 2-Méthoxyéthoxy D |
| CZ<br>from 1 Mar 2020 | **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | ① 10 ppm (50 mg/m³)<br>② 20 ppm (100 mg/m³)<br>⑤ (může pronikat pokožkou) D |

| Limit value type (country of origin) | Substance name | ① Long-term occupational exposure limit value<br>② Short-term occupational exposure limit value<br>③ Instantaneous value<br>④ Monitoring and observation processes<br>⑤ Remark |
|---|---|---|
| NO | **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | ① 10 ppm (50 mg/m³)<br>⑤ (kan absorberes gjennom huden forplantningsevne, verdsetting) HRE |
| IE | **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | ① 10 ppm (50.1 mg/m³)<br>⑤ (may be absorbed through the skin) Sk, IOELV |
| HTP (FI) | **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | ① 10 ppm (50 mg/m³)<br>⑤ (kan absorberas genom huden) iho |
| NPEL (SK) | **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | ① 10 ppm (50.1 mg/m³)<br>⑤ (rátajte so vstrebávaním cez pokožku) K |
| MAK (AT) | **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | ① 10 ppm (50.1 mg/m³)<br>⑤ (kann über die Haut aufgenommen werden) d, H |
| LT | **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | ① 10 ppm (50.1 mg/m³)<br>⑤ (tikėtinas įsisavinimas per odą, pavojingas reprodukcijai) R O |
| SE<br>from 1 Jun 2016 | **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | ① 10 ppm (50 mg/m³)<br>⑤ (kan absorberas genom huden) |
| VRI (FR)<br>from 3 May 2021 | **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | ① 10 ppm (50.1 mg/m³)<br>⑤ (peut être absorbé par la peau) |
| HU<br>from 7 Feb 2020 | **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | ① 50.1 mg/m³<br>⑤ R+T |
| HR | **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | ① 10 ppm (50.1 mg/m³)<br>⑤ (mora se uzeti u obzir prodiranje kroz kožu) koža |
| DK<br>from 13 Feb 2021 | **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | ① 10 ppm (50 mg/m³)<br>② 20 ppm (100 mg/m³)<br>⑤ (kan optages gennem huden) EH |
| LV | **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | ① 10 ppm (50.1 mg/m³)<br>⑤ (var absorbet caur adu) Āda |
| RO<br>from 21 Aug 2018 | **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | ① 10 ppm (50.1 mg/m³)<br>⑤ (e de asteptat asimilarea prin piele) P,R2 |
| ES | **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | ① 10 ppm (50.1 mg/m³)<br>⑤ (puede ser absorbido a través dérmica) vía dérmica, VLI, r |
| IOELV (EU) | **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | ① 10 ppm (50.1 mg/m³)<br>⑤ (may be absorbed through the skin) |
| WEL (GB) | **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | ① 10 ppm (50.1 mg/m³)<br>⑤ (may be absorbed through the skin) |
| SI | **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | ① 10 ppm (50.1 mg/m³)<br>⑤ (računati je treba z možnostjo prodiranja skozi kožo) K, Y, EU2 |
| IS | **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | ① 10 ppm (50.1 mg/m³)<br>⑤ (efnið getur auðveldlega borist inn í líkamann gegnum húð) H |

| Limit value type (country of origin) | Substance name | ① Long-term occupational exposure limit value<br>② Short-term occupational exposure limit value<br>③ Instantaneous value<br>④ Monitoring and observation processes<br>⑤ Remark |
|---|---|---|
| GR<br>from 1 Oct 2016 | **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | ① 10 ppm (50.1 mg/m³)<br>⑤ (αναμένετε απορρόφηση από το δέρμα) |
| NL | **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | ① 45 mg/m³<br>⑤ (kan door de huid in het lichaam worden opgenomen) H |
| TR | **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | ① 10 ppm (50.1 mg/m³)<br>⑤ (cilt yoluyla alınabilir) Deri |
| BG | **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | ① 10 ppm (50.1 mg/m³)<br>⑤ (трябва да се очаква абсорбиране през кожата) |
| PL | **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | ① 50 mg/m³<br>⑤ (może przenikać przez skórę do organizmu) skóra |

## 8.1.2. Biological limit values

| Limit value type (country of origin) | Substance name | Limit value | ① Parameter<br>② Test material<br>③ Time of sampling:<br>④ Remark |
|---|---|---|---|
| BIO (HR)<br>from 12 Oct 2018 | **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | 15 mg/g kreatinin | ① Metoksioctena kiselina<br>② urin<br>③ kraj izloženosti, odnosno kraj smjene |

## 8.1.3. DNEL-/PNEC-values

| Substance name | DNEL value | ① DNEL type<br>② Exposure route |
|---|---|---|
| **tris[2-[2-(2-methoxyethoxy)ethoxy]ethyl] orthoborate**<br>CAS No.: 30989-05-0<br>EC No.: 250-418-4 | 29.1 mg/m³ | ① DNEL worker<br>② Long-term – inhalation, systemic effects |
| **tris[2-[2-(2-methoxyethoxy)ethoxy]ethyl] orthoborate**<br>CAS No.: 30989-05-0<br>EC No.: 250-418-4 | 7.2 mg/m³ | ① DNEL Consumer<br>② Long-term – inhalation, systemic effects |
| **tris[2-[2-(2-methoxyethoxy)ethoxy]ethyl] orthoborate**<br>CAS No.: 30989-05-0<br>EC No.: 250-418-4 | 8.3 mg/kg bw/day | ① DNEL worker<br>② Long-term - dermal, systemic effects |
| **tris[2-[2-(2-methoxyethoxy)ethoxy]ethyl] orthoborate**<br>CAS No.: 30989-05-0<br>EC No.: 250-418-4 | 4.1 mg/kg bw/day | ① DNEL Consumer<br>② Long-term - dermal, systemic effects |
| **2-(2-(2-butoxyethoxy)ethoxy)ethanol**<br>CAS No.: 143-22-6<br>EC No.: 205-592-6 | 195 mg/m³ | ① DNEL worker<br>② Long-term – inhalation, systemic effects |
| **2-(2-(2-butoxyethoxy)ethoxy)ethanol**<br>CAS No.: 143-22-6<br>EC No.: 205-592-6 | 50 mg/kg bw/day | ① DNEL worker<br>② Long-term - dermal, systemic effects |

| Substance name | DNEL value | ① DNEL type<br>② Exposure route |
|---|---|---|
| **Poly(oxy-1,2-ethanediyl), ?-butyl-?-hydroxy-**<br>CAS No.: 9004-77-7<br>EC No.: 500-012-0 | 195 mg/m³ | ① DNEL worker<br>② Long-term – inhalation, systemic effects |
| **Poly(oxy-1,2-ethanediyl), ?-butyl-?-hydroxy-**<br>CAS No.: 9004-77-7<br>EC No.: 500-012-0 | 117 mg/m³ | ① DNEL Consumer<br>② Long-term – inhalation, systemic effects |
| **Poly(oxy-1,2-ethanediyl), ?-butyl-?-hydroxy-**<br>CAS No.: 9004-77-7<br>EC No.: 500-012-0 | 208 mg/kg bw/day | ① DNEL worker<br>② Long-term - dermal, systemic effects |
| **Poly(oxy-1,2-ethanediyl), ?-butyl-?-hydroxy-**<br>CAS No.: 9004-77-7<br>EC No.: 500-012-0 | 125 mg/kg bw/day | ① DNEL Consumer<br>② Long-term - dermal, systemic effects |
| **Poly(oxy-1,2-ethanediyl), ?-butyl-?-hydroxy-**<br>CAS No.: 9004-77-7<br>EC No.: 500-012-0 | 12.5 mg/kg bw/day | ① DNEL Consumer<br>② Long-term - oral, systemic effects |
| **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | 50.1 mg/m³ | ① DNEL worker<br>② Long-term – inhalation, systemic effects |

| Substance name | PNEC Value | ① PNEC type |
|---|---|---|
| **tris[2-[2-(2-methoxyethoxy)ethoxy]ethyl] orthoborate**<br>CAS No.: 30989-05-0<br>EC No.: 250-418-4 | 211.2 µg/L | ① PNEC aquatic, freshwater |
| **tris[2-[2-(2-methoxyethoxy)ethoxy]ethyl] orthoborate**<br>CAS No.: 30989-05-0<br>EC No.: 250-418-4 | 21.12 µg/L | ① PNEC aquatic, marine water |
| **tris[2-[2-(2-methoxyethoxy)ethoxy]ethyl] orthoborate**<br>CAS No.: 30989-05-0<br>EC No.: 250-418-4 | 100 mg/L | ① PNEC sewage treatment plant |
| **tris[2-[2-(2-methoxyethoxy)ethoxy]ethyl] orthoborate**<br>CAS No.: 30989-05-0<br>EC No.: 250-418-4 | 0.76 mg/kg bw/day | ① PNEC sediment, freshwater |
| **tris[2-[2-(2-methoxyethoxy)ethoxy]ethyl] orthoborate**<br>CAS No.: 30989-05-0<br>EC No.: 250-418-4 | 0.076 mg/kg bw/day | ① PNEC sediment, marine water |
| **2-(2-(2-butoxyethoxy)ethoxy)ethanol**<br>CAS No.: 143-22-6<br>EC No.: 205-592-6 | 2 mg/L | ① PNEC aquatic, freshwater |
| **2-(2-(2-butoxyethoxy)ethoxy)ethanol**<br>CAS No.: 143-22-6<br>EC No.: 205-592-6 | 0.25 mg/L | ① PNEC aquatic, marine water |
| **2-(2-(2-butoxyethoxy)ethoxy)ethanol**<br>CAS No.: 143-22-6<br>EC No.: 205-592-6 | 200 mg/L | ① PNEC sewage treatment plant |
| **2-(2-(2-butoxyethoxy)ethoxy)ethanol**<br>CAS No.: 143-22-6<br>EC No.: 205-592-6 | 7.7 mg/kg bw/day | ① PNEC sediment, freshwater |

| Substance name | PNEC Value | ① PNEC type |
|---|---|---|
| **Poly(oxy-1,2-ethanediyl), ?-butyl-?-hydroxy-**<br>CAS No.: 9004-77-7<br>EC No.: 500-012-0 | 4.5 mg/L | ① PNEC aquatic, freshwater |
| **Poly(oxy-1,2-ethanediyl), ?-butyl-?-hydroxy-**<br>CAS No.: 9004-77-7<br>EC No.: 500-012-0 | 310 µg/L | ① PNEC aquatic, marine water |
| **Poly(oxy-1,2-ethanediyl), ?-butyl-?-hydroxy-**<br>CAS No.: 9004-77-7<br>EC No.: 500-012-0 | 500 mg/L | ① PNEC sewage treatment plant |
| **Poly(oxy-1,2-ethanediyl), ?-butyl-?-hydroxy-**<br>CAS No.: 9004-77-7<br>EC No.: 500-012-0 | 6.6 mg/kg bw/day | ① PNEC sediment, freshwater |
| **Poly(oxy-1,2-ethanediyl), ?-butyl-?-hydroxy-**<br>CAS No.: 9004-77-7<br>EC No.: 500-012-0 | 0.66 mg/kg bw/day | ① PNEC sediment, marine water |
| **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | 12 mg/L | ① PNEC aquatic, freshwater |
| **2-(2-methoxyethoxy)ethanol**<br>CAS No.: 111-77-3<br>EC No.: 203-906-6 | 44.4 mg/kg | ① PNEC sediment, freshwater |

## 8.2. Exposure controls

### 8.2.1. Appropriate engineering controls

See section 7. No additional measures necessary.

### 8.2.2. Personal protection equipment



**Eye/face protection:**

Filling and transfer: Eye glasses with side protection
Wear eye/face protection. EN 166

**Skin protection:**

Hand protection
Suitable material: NBR (Nitrile rubber), Butyl caoutchouc (butyl rubber)
Thickness of the glove material: ≥ 0,4 mm
Breakthrough time: 480 min
Breakthrough times and swelling properties of the material must be taken into consideration.
The quality of the protective gloves resistant to chemicals must be chosen as a function of the specific working place concentration and quantity of hazardous substances.
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.
Tested protective gloves must be worn: EN ISO 374

Suitable protective clothing: Protective clothing.

**Respiratory protection:**

Usually no personal respirative protection necessary.
Avoid breathing dust/fume/gas/mist/vapours/spray.
Provide adequate ventilation.

**Other protection measures:**

Do not put any product-impregnated cleaning rags into your trouser pockets.
Wear personal protection equipment (refer to section 8).
Wash hands before breaks and after work.

### 8.2.3. Environmental exposure controls

See section 7. No additional measures necessary.

# SECTION 9: Physical and chemical properties

## * 9.1. Information on basic physical and chemical properties

### Appearance

**Physical state:** Liquid **Colour:** light yellow

**Odour:** characteristic

### Safety relevant basis data

| Parameter | Value | at °C | ① Method<br>② Remark |
|---|---|---|---|
| pH | 7 – < 10.8 | | |
| Melting point | *not determined* | | |
| Freezing point | *not determined* | | |
| Initial boiling point and boiling range | *No data available* | | |
| Decomposition temperature | *not determined* | | |
| Flash point | 120 – < 210 °C | | |
| Evaporation rate | *not determined* | | |
| Auto-ignition temperature | *not determined* | | |
| Upper/lower flammability or explosive limits | *not determined* | | |
| Vapour pressure | *not determined* | | |
| Vapour density | *not determined* | | |
| Density | 1,052 kg/m³ | 20 °C | |
| Relative density | *not determined* | | |
| Bulk density | *not applicable* | | |
| Water solubility | miscible | | |
| Partition coefficient: n-octanol/water | < 2 | 20 °C | |
| Dynamic viscosity | *not determined* | | |
| Kinematic viscosity | 10 mm²/s | 20 °C | |

## * 9.2. Other information

No data available

# SECTION 10: Stability and reactivity

## 10.1. Reactivity

No known hazardous reactions.

## 10.2. Chemical stability

The product is stable under storage at normal ambient temperatures.

## 10.3. Possibility of hazardous reactions

Peroxide formation possible with air oxygen.
May cause strong formation of hydrogen by contact with amphoteric metals (e.g. aluminia, lead, zinc) - danger of explosion.

## 10.4. Conditions to avoid

No special measures are necessary.
Avoid: extreme temperatures

## 10.5. Incompatible materials

Materials to avoid: Oxidising agent, strong, Acid, concentrated, Alkali (lye), concentrated, Reducing agent, strong

## 10.6. Hazardous decomposition products

Hazardous combustion products: Carbon dioxide, Carbon monoxide, Nitrogen oxides (NOx)

# SECTION 11: Toxicological information

## 11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

| **tris[2-[2-(2-methoxyethoxy)ethoxy]ethyl] orthoborate** CAS No.: 30989-05-0 EC No.: 250-418-4 |
|---|
| **$LD_{50}$ oral:** >2,000 mg/kg (Rat) |
| **$LD_{50}$ dermal:** >2,000 mg/kg (Rat) |

| **2-(2-(2-butoxyethoxy)ethoxy)ethanol** CAS No.: 143-22-6 EC No.: 205-592-6 |
|---|
| **$LD_{50}$ oral:** 5,170 mg/kg (Rat) |
| **$LD_{50}$ dermal:** 3,540 mg/kg (Rabbit) |
| **$LC_{50}$ Acute inhalation toxicity (vapour):** >2.4 mg/L 16 h (rat) Inhalation hazard test according to the method described by Smyth H.F. et al.: Am. Ind. Hyg. Ass. J. 23, 95-107, (1962). |
| **Poly(oxy-1,2-ethanediyl), ?-butyl-?-hydroxy-** CAS No.: 9004-77-7 EC No.: 500-012-0 |
| **$LD_{50}$ oral:** 2,001 – 2,630 mg/kg (Rat) |
| **$LD_{50}$ dermal:** 3,540 mg/kg (Rabbit) |
| **2-(2-methoxyethoxy)ethanol** CAS No.: 111-77-3 EC No.: 203-906-6 |
| **$LD_{50}$ oral:** 7,128 – 8,188 mg/kg (Rat) |
| **$LD_{50}$ dermal:** 9,404 mg/kg (Rabbit) |

**Acute oral toxicity:**
Based on available data, the classification criteria are not met.

**Acute dermal toxicity:**
Based on available data, the classification criteria are not met.

**Acute inhalation toxicity:**
Based on available data, the classification criteria are not met.

**Skin corrosion/irritation:**
non-irritant.
Frequently or prolonged contact with skin may cause dermal irritation.

**Serious eye damage/irritation:**
non-irritant.

**Respiratory or skin sensitisation:**
Based on available data, the classification criteria are not met.

**Germ cell mutagenicity:**
No indications of human germ cell mutagenicity exist.

**Carcinogenicity:**
No indication of human carcinogenicity.

**Reproductive toxicity:**
Suspected of damaging the unborn child.

**STOT-single exposure:**
Based on available data, the classification criteria are not met.

**STOT-repeated exposure:**
Based on available data, the classification criteria are not met.

**Aspiration hazard:**
Observe risk of aspiration if vomiting occurs.
For viscosity data, see section 9.

**Additional information:**
No data available

* 
### 11.2. Information on other hazards

**Endocrine disrupting properties:**
This product does not contain a substance that has endocrine disrupting properties with respect to humans as no components meets the criteria.

## SECTION 12: Ecological information

* 
### 12.1. Toxicity

| **tris[2-[2-(2-methoxyethoxy)ethoxy]ethyl] orthoborate** CAS No.: 30989-05-0 EC No.: 250-418-4 |
|---|
| **$LC_{50}$:** 222.2 – <1,010 mg/L 4 d (fish) |
| **$EC_{50}$:** 211.2 – <960 mg/L 2 d (crustaceans) |
| **$EC_{50}$:** 224.4 – <1,020 mg/L 3 d (Algae/water plant) |

| **2-(2-(2-butoxyethoxy)ethoxy)ethanol** CAS No.: 143-22-6 EC No.: 205-592-6 |
|---|
| **$LC_{50}$:** 2,200 – 4,600 mg/L 4 d (fish, Leuciscus idus) German industrial standard test guideline DIN 38 412, part L15. |
| **$LC_{50}$:** 2,400 mg/L 2 d (fish, Pimephales promelas) as described in Standard Methods for the Examination of Water and Wastewater, 13th edition, 1971. |
| **$LC_{50}$:** 2,210 mg/L 2 d (crustaceans, Daphnia magna) test procedures recommended by US EPA and ASTM |
| **$EC_{50}$:** 780 mg/L 3 d (Algae/water plant, Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum)) OECD Guideline 201 (Alga, Growth Inhibition Test) |
| **NOEC:** >100 mg/L 21 d (crustaceans, Daphnia magna) OECD Guideline 211 (Daphnia magna Reproduction Test) |
| **NOEC:** 1,000 mg/L 4 d (fish, Leuciscus idus) German industrial standard test guideline DIN 38 412, part L15. |
| **NOEC:** 100 mg/L 3 d (Algae/water plant, Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum)) OECD Guideline 201 (Alga, Growth Inhibition Test) |
| **Poly(oxy-1,2-ethanediyl), ?-butyl-?-hydroxy-** CAS No.: 9004-77-7 EC No.: 500-012-0 |
| **$LC_{50}$:** 1,800 mg/L 4 d (fish) |
| **$EC_{50}$:** 3,200 mg/L 2 d (crustaceans) |
| **$EC_{50}$:** 2,490 mg/L 3 d (Algae/water plant) |
| **2-(2-methoxyethoxy)ethanol** CAS No.: 111-77-3 EC No.: 203-906-6 |
| **$LC_{50}$:** 5,741 mg/L 4 d (fish) |
| **$EC_{50}$:** 1,192 mg/L 2 d (crustaceans) |
| **$EC_{50}$:** 1,000 mg/L 3 d (Algae/water plant) |

**Assessment/classification:**
Based on available data, the classification criteria are not met.

**Additional ecotoxicological information:**
Do not allow uncontrolled discharge of product into the environment.

## * 12.2. Persistence and degradability

| **tris[2-[2-(2-methoxyethoxy)ethoxy]ethyl] orthoborate** CAS No.: 30989-05-0 EC No.: 250-418-4 |
|---|
| **Biodegradation:** Yes, rapidly |
| **2-(2-(2-butoxyethoxy)ethoxy)ethanol** CAS No.: 143-22-6 EC No.: 205-592-6 |
| **Biodegradation:** Yes, rapidly |
| **Poly(oxy-1,2-ethanediyl), ?-butyl-?-hydroxy-** CAS No.: 9004-77-7 EC No.: 500-012-0 |
| **Biodegradation:** Yes, rapidly |
| **2-(2-methoxyethoxy)ethanol** CAS No.: 111-77-3 EC No.: 203-906-6 |
| **Biodegradation:** Yes, rapidly |

**Biodegradation:**
Readily biodegradable (according to OECD criteria).

## * 12.3. Bioaccumulative potential

| **tris[2-[2-(2-methoxyethoxy)ethoxy]ethyl] orthoborate** CAS No.: 30989-05-0 EC No.: 250-418-4 |
|---|
| **Log $K_{OW}$:** < 3 |
| **2-(2-(2-butoxyethoxy)ethoxy)ethanol** CAS No.: 143-22-6 EC No.: 205-592-6 |
| **Log $K_{OW}$:** 1.22 |
| **Poly(oxy-1,2-ethanediyl), ?-butyl-?-hydroxy-** CAS No.: 9004-77-7 EC No.: 500-012-0 |
| **Log $K_{OW}$:** < 3 |
| **2-(2-methoxyethoxy)ethanol** CAS No.: 111-77-3 EC No.: 203-906-6 |
| **Log $K_{OW}$:** < 3 |

**Partition coefficient: n-octanol/water:**
< 2 at °C: 20

**Accumulation / Evaluation:**
No indication of bioaccumulation potential. Log $K_{OW}$ < 2,0

## 12.4. Mobility in soil
The product has not been tested.

## 12.5. Results of PBT and vPvB assessment

| **tris[2-[2-(2-methoxyethoxy)ethoxy]ethyl] orthoborate** CAS No.: 30989-05-0 EC No.: 250-418-4 |
|---|
| **Results of PBT and vPvB assessment:** This substance does not meet the PBT/vPvB criteria of REACH, Annex XIII. |

| | |
|---|---|
| **2-(2-(2-butoxyethoxy)ethoxy)ethanol** CAS No.: 143-22-6 EC No.: 205-592-6 | |
| **Results of PBT and vPvB assessment:** This substance does not meet the PBT/vPvB criteria of REACH, Annex XIII. | |
| **Poly(oxy-1,2-ethanediyl), ?-butyl-?-hydroxy-** CAS No.: 9004-77-7 EC No.: 500-012-0 | |
| **Results of PBT and vPvB assessment:** This substance does not meet the PBT/vPvB criteria of REACH, Annex XIII. | |
| **2-(2-methoxyethoxy)ethanol** CAS No.: 111-77-3 EC No.: 203-906-6 | |
| **Results of PBT and vPvB assessment:** This substance does not meet the PBT/vPvB criteria of REACH, Annex XIII. | |

The substances in the mixture do not meet the PBT/vPvB criteria according to REACH, annex XIII.

* **12.6. Endocrine disrupting properties**

This product does not contain a substance that has endocrine disrupting properties with respect to non-target organisms as no components meets the criteria.

**12.7. Other adverse effects**

No information available.

## SECTION 13: Disposal considerations

**13.1. Waste treatment methods**

Dispose of waste according to applicable legislation.

**Waste treatment options**

**Appropriate disposal / Product:**

Dispose of waste according to applicable legislation. Consult the appropriate local waste disposal expert about waste disposal.

**Appropriate disposal / Package:**

Non-contaminated packages may be recycled.

**13.2. Additional information**

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

## SECTION 14: Transport information

| Land transport (ADR/RID) | Inland waterway craft (ADN) | Sea transport (IMDG) | Air transport (ICAO-TI / IATA-DGR) |
|---|---|---|---|
| **14.1. UN number or ID number** | | | |
| No dangerous good in sense of these transport regulations. | No dangerous good in sense of these transport regulations. | No dangerous good in sense of these transport regulations. | No dangerous good in sense of these transport regulations. |
| **14.2. UN proper shipping name** | | | |
| No dangerous good in sense of these transport regulations. | No dangerous good in sense of these transport regulations. | No dangerous good in sense of these transport regulations. | No dangerous good in sense of these transport regulations. |
| **14.3. Transport hazard class(es)** | | | |
| not relevant | not relevant | not relevant | not relevant |
| **14.4. Packing group** | | | |
| not relevant | not relevant | not relevant | not relevant |
| **14.5. Environmental hazards** | | | |
| not relevant | not relevant | not relevant | not relevant |
| **14.6. Special precautions for user** | | | |
| not relevant | not relevant | not relevant | not relevant |

**14.7. Maritime transport in bulk according to IMO instruments**

No transport as bulk according to IBC Code.

## SECTION 15: Regulatory information

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

**15.1.1. EU legislation**

**Other regulations (EU):**

Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances [Seveso-III-Directive]: This product is not assigned to a hazard category.

### 15.1.2. National regulations
No data available

### 15.2. Chemical Safety Assessment
Chemical safety assessments for substances in this mixture were not carried out.

## SECTION 16: Other information

### * 16.1. Indication of changes

| | |
|---|---|
| 1.3. | Details of the supplier of the safety data sheet |
| 1.4. | Emergency telephone number |
| 3.2. | Mixtures |
| 9.1. | Information on basic physical and chemical properties |
| 9.2. | Other information |
| 11.2. | Information on other hazards |
| 12.1. | Toxicity |
| 12.2. | Persistence and degradability |
| 12.3. | Bioaccumulative potential |
| 12.6. | Endocrine disrupting properties |
| 16.1. | Indication of changes |
| 16.3. | Key literature references and sources for data |
| 16.5. | Relevant R-, H- and EUH-phrases (Number and full text) |

### 16.2. Abbreviations and acronyms
See overview table at www.euphrac.eu
For abbreviations and acronyms, see: ECHA Guidance on information requirements and chemical safety assessment, chapter R.20 (Table of terms and abbreviations).

### * 16.3. Key literature references and sources for data
Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures
Regulation (EC) No 1907/2006 (REACH)

| Substance name | Type | source of supply |
|---|---|---|
| **2-(2-(2-butoxyethoxy)ethoxy)ethanol**<br>CAS No.: 143-22-6<br>EC No.: 205-592-6 | $LC_{50}$ Acute inhalation toxicity (vapour); $LC_{50}$; $EC_{50}$; NOEC | Source: European Chemicals Agency, http://echa.europa.eu/ |

### 16.4. Classification for mixtures and used evaluation method according to regulation (EC) No 1272/2008 [CLP]

| Hazard classes and hazard categories | Hazard statements | Classification procedure |
|---|---|---|
| Reproductive toxicity *(Repr. 2)* | H361d: Suspected of damaging the unborn child. | Calculation method. |

### * 16.5. Relevant R-, H- and EUH-phrases (Number and full text)

| Hazard statements | |
|---|---|
| H318 | Causes serious eye damage. |
| H319 | Causes serious eye irritation. |
| H361d | Suspected of damaging the unborn child. |

### 16.6. Training advice
No data available

### 16.7. Additional information
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.

* Data changed compared with the previous version.