SAFETY DATA SHEET

Permethrin (1%) Formulation

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

1.1 Product identifier
Trade name : Permethrin (1%) Formulation

1.2 Relevant identified uses of the substance or mixture and uses advised against
Use of the Substance/Mixture : Veterinary product

1.3 Details of the supplier of the safety data sheet
Company : MSD
20 Spartan Road
1619 Spartan, South Africa
Telephone : +27119239300
E-mail address of person responsible for the SDS : EHSDATASTEWARD@msd.com

1.4 Emergency telephone number
+1-908-423-6000

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)
Serious eye damage, Category 1 : H318: Causes serious eye damage.
Skin sensitisation, Category 1 : H317: May cause an allergic skin reaction.
Germ cell mutagenicity, Category 2 : H341: Suspected of causing genetic defects.
Carcinogenicity, Category 1B : H350: May cause cancer.
Short-term (acute) aquatic hazard, Category 1 : H400: Very toxic to aquatic life.
Long-term (chronic) aquatic hazard, Category 1 : H410: Very toxic to aquatic life with long last- ing effects.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)
Hazard pictograms :

Signal word : Danger

Hazard statements :
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H341 Suspected of causing genetic defects.
H350 May cause cancer.
H410 Very toxic to aquatic life with long lasting effects.
Precautionary statements:

Prevention:
P201 Obtain special instructions before use.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P391 Collect spillage.

Hazardous components which must be listed on the label:
- Sulfuric acid, mono-C16-18-alkyl esters, sodium salts
- Coconut oil diethanolamide
- Permethrin (ISO)
- Formaldehyde

Additional Labelling:
Restricted to professional users.

2.3 Other hazards
This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Components

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>EC-No.</th>
<th>Index-No.</th>
<th>Registration number</th>
<th>Classification</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric acid, mono-C16-18-alkyl esters, sodium salts</td>
<td>68955-20-4</td>
<td>273-258-7</td>
<td></td>
<td></td>
<td>Flam. Sol. 2; H228 Skin Irrit. 2; H315 Eye Dam. 1; H318 STOT SE 3; H335 Aquatic Chronic 3; H412</td>
<td>&gt;= 10 - &lt; 20</td>
</tr>
<tr>
<td>Coconut oil diethanolamide</td>
<td>68603-42-9</td>
<td>271-657-0</td>
<td></td>
<td></td>
<td>Skin Irrit. 2; H315 Eye Dam. 1; H318 Muta. 2; H341 Aquatic Chronic 2; H411</td>
<td>&gt;= 3 - &lt; 10</td>
</tr>
<tr>
<td>Ethanol#</td>
<td>64-17-5</td>
<td>200-578-6</td>
<td></td>
<td></td>
<td>Flam. Liq. 2; H225 Eye Irrit. 2; H319</td>
<td>&gt;= 1 - &lt; 10</td>
</tr>
</tbody>
</table>
For explanation of abbreviations see section 16.
#: Voluntarily-disclosed non-hazardous substance

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : In the case of accident or if you feel unwell, seek medical advice immediately. When symptoms persist or in all cases of doubt seek medical advice.

Protection of first-aiders : First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists (see section 8).

If inhaled : If inhaled, remove to fresh air. Get medical attention.

In case of skin contact : In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
In case of eye contact: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lens, if worn. Get medical attention immediately.

If swallowed: If swallowed, DO NOT induce vomiting. Get medical attention. Rinse mouth thoroughly with water.

4.2 Most important symptoms and effects, both acute and delayed
Risks: May cause an allergic skin reaction. Causes serious eye damage. Suspected of causing genetic defects. May cause cancer.

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

SECTION 5: Firefighting measures

5.1 Extinguishing media
Suitable extinguishing media: Water spray
Alcohol-resistant foam
Carbon dioxide (CO2)
Dry chemical

Unsuitable extinguishing media: None known.

5.2 Special hazards arising from the substance or mixture
Specific hazards during firefighting: Exposure to combustion products may be a hazard to health.

Hazardous combustion products: Chlorine compounds
Carbon oxides
Nitrogen oxides (NOx)
Sulphur oxides
Metal oxides

5.3 Advice for firefighters
Special protective equipment for firefighters: In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment.

Specific extinguishing methods: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Use water spray to cool unopened containers. Remove undamaged containers from fire area if it is safe to do so. Evacuate area.
SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions:
Use personal protective equipment. Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).

6.2 Environmental precautions

Environmental precautions:
Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Prevent spreading over a wide area (e.g. by containment or oil barriers). Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up:
Soak up with inert absorbent material. For large spills, provide dyking or other appropriate containment to keep material from spreading. If dyked material can be pumped, store recovered material in appropriate container. Clean up remaining materials from spill with suitable absorbent. Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable. Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

6.4 Reference to other sections

See sections: 7, 8, 11, 12 and 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Technical measures:
See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.

Local/Total ventilation:
If sufficient ventilation is unavailable, use with local exhaust ventilation.

Advice on safe handling:
Do not get on skin or clothing. Avoid breathing mist or vapours. Do not swallow. Do not get in eyes. Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment. Keep container tightly closed. Take care to prevent spills, waste and minimize release to the environment.

Hygiene measures:
If exposure to chemical is likely during typical use, provide eye
flushing systems and safety showers close to the working place. When using do not eat, drink or smoke. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before re-use. The effective operation of a facility should include review of engineering controls, proper personal protective equipment, appropriate degowning and decontamination procedures, industrial hygiene monitoring, medical surveillance and the use of administrative controls.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers: Keep in properly labelled containers. Store locked up. Keep tightly closed. Store in accordance with the particular national regulations.

Advice on common storage: Do not store with the following product types:
- Strong oxidizing agents
- Organic peroxides
- Explosives
- Gases

7.3 Specific end use(s)

Specific use(s): No data available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type (Form of exposure)</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>64-17-5</td>
<td>TWA OEL-RL</td>
<td>1.000 ppm</td>
<td>ZA OEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.900 mg/m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Further information: Recommended Limit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Permethrin (ISO)</td>
<td>52645-53-1</td>
<td>TWA</td>
<td>80 µg/m³ (OEB 3)</td>
<td>Internal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wipe limit</td>
<td>800 µg/100 cm²</td>
<td>Internal</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>50-00-0</td>
<td>TWA OEL-CL</td>
<td>2 ppm</td>
<td>ZA OEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2,5 mg/m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Further information: Control Limit</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL OEL-CL</td>
<td>2 ppm</td>
<td>ZA OEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2,5 mg/m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Further information: Control Limit</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>0,3 ppm</td>
<td>2004/37/EC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0,37 mg/m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL</td>
<td>0,6 ppm</td>
<td>2004/37/EC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0,74 mg/m³</td>
<td></td>
</tr>
</tbody>
</table>

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

<table>
<thead>
<tr>
<th>Substance name</th>
<th>End Use</th>
<th>Exposure routes</th>
<th>Potential health effects</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyethylene glycol</td>
<td>Workers</td>
<td>Inhalation</td>
<td>Long-term systemic</td>
<td>16,4 mg/m³</td>
</tr>
</tbody>
</table>
### SAFETY DATA SHEET

**Permethrin (1%) Formulation**

<table>
<thead>
<tr>
<th>Substance name</th>
<th>Environmental Compartment</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyethylene glycol castor oil</td>
<td>Fresh water</td>
<td>0.000 mg/l</td>
</tr>
<tr>
<td></td>
<td>Freshwater - intermittent</td>
<td>0.0661 mg/l</td>
</tr>
</tbody>
</table>

### Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

<table>
<thead>
<tr>
<th>Substance name</th>
<th>Environmental Compartment</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyethylene glycol castor oil</td>
<td>Fresh water</td>
<td>0.000 mg/l</td>
</tr>
<tr>
<td></td>
<td>Freshwater - intermittent</td>
<td>0.0661 mg/l</td>
</tr>
</tbody>
</table>
8.2 Exposure controls

Engineering measures

Use appropriate engineering controls and manufacturing technologies to control airborne concentrations (e.g., drip-less quick connections).

All engineering controls should be implemented by facility design and operated in accordance with GMP principles to protect products, workers, and the environment.

Containment technologies suitable for controlling compounds are required to control at source and to prevent migration of the compound to uncontrolled areas (e.g., open-face containment devices).

Minimize open handling.

Personal protective equipment

Eye protection: Wear safety glasses with side shields or goggles.
If the work environment or activity involves dusty conditions, mists or aerosols, wear the appropriate goggles.
Wear a faceshield or other full face protection if there is a potential for direct contact to the face with dusts, mists, or
Hosted by MSD Public

SAFETY DATA SHEET

Permethrin (1%) Formulation

Version:
2.3
Revision Date:
27.08.2021
SDS Number:
5544461-00005
Date of last issue:
18.03.2021
Date of first issue:
19.03.2020

Hand protection

Material:
Chemical-resistant gloves

Remarks:
Consider double gloving.

Skin and body protection

Work uniform or laboratory coat.

Additional body garments should be used based upon the task being performed (e.g., sleevelets, apron, gauntlets, disposable suits) to avoid exposed skin surfaces.

Use appropriate degowning techniques to remove potentially contaminated clothing.

Respiratory protection

Filter type:
Combined particulates, inorganic gas/vapour and organic vapour type (AB-P)

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance:
liquid

Colour:
amber

Odour:
No data available

Odour Threshold:
No data available

pH:
7.3 - 7.7

Melting point/freezing point:
No data available

Initial boiling point and boiling range:
No data available

Flash point:
No data available

Evaporation rate:
No data available

Flammability (solid, gas):
Not applicable

Upper explosion limit / Upper flammability limit:
No data available

Lower explosion limit / Lower flammability limit:
No data available

Vapour pressure:
No data available

Relative vapour density:
No data available

Relative density:
No data available

Density:
1.025 - 1.035 g/cm³

Solubility(ies):

Water solubility:
No data available
SAFETY DATA SHEET

Permethrin (1%) Formulation

Partition coefficient: n-octanol/water : Not applicable
Auto-ignition temperature : No data available
Decomposition temperature : No data available
Viscosity
  Viscosity, kinematic : No data available
Explosive properties : Not explosive
Oxidizing properties : The substance or mixture is not classified as oxidizing.

9.2 Other information
  Flammability (liquids) : No data available
  Molecular weight : No data available
  Particle size : Not applicable

SECTION 10: Stability and reactivity

10.1 Reactivity
  Not classified as a reactivity hazard.
10.2 Chemical stability
  Stable under normal conditions.
10.3 Possibility of hazardous reactions
  Hazardous reactions : Can react with strong oxidizing agents.
10.4 Conditions to avoid
  Conditions to avoid : None known.
10.5 Incompatible materials
  Materials to avoid : Oxidizing agents
10.6 Hazardous decomposition products
  No hazardous decomposition products are known.

SECTION 11: Toxicological information

11.1 Information on toxicological effects
  Information on likely routes of exposure : Inhalation
  Skin contact
  Ingestion
  Eye contact

  Acute toxicity
  Not classified based on available information.
## SAFETY DATA SHEET

**Permethrin (1%) Formulation**

<table>
<thead>
<tr>
<th>Version</th>
<th>Revision Date</th>
<th>SDS Number</th>
<th>Date of last issue</th>
<th>Date of first issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.3</td>
<td>27.08.2021</td>
<td>5544461-00005</td>
<td>18.03.2021</td>
<td>19.03.2020</td>
</tr>
</tbody>
</table>

### Product:

- **Acute oral toxicity**: Acute toxicity estimate: > 2.000 mg/kg  
  Method: Calculation method

- **Acute inhalation toxicity**: Acute toxicity estimate: > 5 mg/l  
  Exposure time: 4 h  
  Test atmosphere: dust/mist  
  Method: Calculation method

- **Acute dermal toxicity**: Acute toxicity estimate: > 2.000 mg/kg  
  Method: Calculation method

### Components:

#### Sulfuric acid, mono-C16-18-alkyl esters, sodium salts:

- **Acute oral toxicity**: LD50 (Rat): 4.010 mg/kg  
  Remarks: Based on data from similar materials

- **Acute dermal toxicity**: LD50 (Rat): > 2.000 mg/kg  
  Method: OECD Test Guideline 402  
  Remarks: Based on data from similar materials

#### Coconut oil diethanolamide:

- **Acute oral toxicity**: LD50 (Rat): > 5.000 mg/kg

- **Acute dermal toxicity**: LD50 (Rabbit): > 2.000 mg/kg  
  Assessment: The substance or mixture has no acute dermal toxicity

#### Ethanol:

- **Acute oral toxicity**: LD50 (Rat): > 5.000 mg/kg  
  Method: OECD Test Guideline 401

- **Acute inhalation toxicity**: LC50 (Rat): 124.7 mg/l  
  Exposure time: 4 h  
  Test atmosphere: vapour

#### Permethrin (ISO):

- **Acute oral toxicity**: LD50 (Rat): 480 - 554 mg/kg  
  Acute toxicity estimate: 480 mg/kg  
  Method: Calculation method

- **Acute inhalation toxicity**: LC50 (Rat): 2.3 mg/l  
  Exposure time: 4 h  
  Test atmosphere: dust/mist  
  Acute toxicity estimate: 2.3 mg/l  
  Test atmosphere: dust/mist  
  Method: Calculation method

- **Acute dermal toxicity**: LD50 (Rabbit): > 2.000 mg/kg
Formaldehyde:
Acute oral toxicity: Acute toxicity estimate: 100 mg/kg
Method: Expert judgement

Acute inhalation toxicity: Acute toxicity estimate: 100 ppm
Exposure time: 4 h
Test atmosphere: gas
Method: Expert judgement

Acute dermal toxicity: LD50 (Rabbit): 270 mg/kg
Acute toxicity estimate: 270 mg/kg
Method: Calculation method

Skin corrosion/irritation
Not classified based on available information.

Components:

Sulfuric acid, mono-C16-18-alkyl esters, sodium salts:
Species: Rabbit
Method: OECD Test Guideline 404
Result: Skin irritation
Remarks: Based on data from similar materials

Coconut oil diethanolamide:
Species: Rabbit
Method: OECD Test Guideline 404
Result: Skin irritation
Remarks: Based on data from similar materials

Ethanol:
Species: Rabbit
Method: OECD Test Guideline 404
Result: No skin irritation

Permethrin (ISO):
Species: Rabbit
Result: No skin irritation

Formaldehyde:
Species: Rabbit
Method: OECD Test Guideline 404
Result: Corrosive after 3 minutes to 1 hour of exposure

Serious eye damage/eye irritation
Causes serious eye damage.
Components:

Sulfuric acid, mono-C16-18-alkyl esters, sodium salts:
Species: Rabbit
Method: OECD Test Guideline 405
Result: Irreversible effects on the eye
Remarks: Based on data from similar materials

Coconut oil diethanolamide:
Species: Rabbit
Method: OECD Test Guideline 405
Result: Irreversible effects on the eye
Remarks: Based on data from similar materials

Ethanol:
Species: Rabbit
Method: OECD Test Guideline 405
Result: Irritation to eyes, reversing within 21 days

Permethrin (ISO):
Species: Rabbit
Result: No eye irritation

Formaldehyde:
Species: Rabbit
Result: Irreversible effects on the eye

Respiratory or skin sensitisation

Skin sensitisation
May cause an allergic skin reaction.

Respiratory sensitisation
Not classified based on available information.

Components:

Sulfuric acid, mono-C16-18-alkyl esters, sodium salts:
Test Type: Maximisation Test
Exposure routes: Skin contact
Species: Guinea pig
Method: OECD Test Guideline 406
Result: negative

Coconut oil diethanolamide:
Test Type: Maximisation Test
Exposure routes: Skin contact
Species: Guinea pig
Method: OECD Test Guideline 406
Result: negative
Remarks: Based on data from similar materials
Ethanol:
Test Type: Local lymph node assay (LLNA)
Exposure routes: Skin contact
Species: Mouse
Result: negative

Permethrin (ISO):
Test Type: Buehler Test
Exposure routes: Skin contact
Species: Guinea pig
Result: positive
Assessment: Probability or evidence of skin sensitisation in humans

Formaldehyde:
Test Type: Local lymph node assay (LLNA)
Exposure routes: Skin contact
Species: Mouse
Method: OECD Test Guideline 429
Result: positive
Assessment: Probability or evidence of high skin sensitisation rate in humans

Germ cell mutagenicity
Suspected of causing genetic defects.

Components:
Sulfuric acid, mono-C16-18-alkyl esters, sodium salts:
Genotoxicity in vitro: Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: negative

Coconut oil diethanolamide:
Genotoxicity in vitro: Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Genotoxicity in vivo: Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Mouse
Application Route: Skin contact
Result: positive

Germ cell mutagenicity: Assessment: Positive result(s) from in vivo mammalian somatic cell mutagenicity tests.

Ethanol:
Genotoxicity in vitro: Test Type: In vitro mammalian cell gene mutation test
Result: negative
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Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Genotoxicity in vivo:
Test Type: Rodent dominant lethal test (germ cell) (in vivo)
Species: Mouse
Application Route: Ingestion
Result: equivocal

Permethrin (ISO):
Genotoxicity in vitro:
Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Test Type: In vitro mammalian cell gene mutation test
Result: negative

Test Type: Chromosome aberration test in vitro
Result: negative

Test Type: DNA damage and repair, unscheduled DNA synthesis in mammalian cells (in vitro)
Result: negative

Test Type: Chromosome aberration test in vitro
Result: positive

Genotoxicity in vivo:
Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Mouse
Result: negative

Test Type: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis)
Species: Mouse
Result: negative

Test Type: Rodent dominant lethal test (germ cell) (in vivo)
Species: Mouse
Result: negative

Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Rat
Application Route: Intraperitoneal injection
Result: negative

Test Type: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis)
Species: Mouse
Application Route: Ingestion
Result: positive

Germ cell mutagenicity- Assessment: Weight of evidence does not support classification as a germ cell mutagen.
Formaldehyde:
Genotoxicity in vitro:
- Test Type: Bacterial reverse mutation assay (AMES)
  Result: positive
- Test Type: Chromosome aberration test in vitro
  Result: positive

Genotoxicity in vivo:
- Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
  Species: Rat
  Application Route: Inhalation
  Result: positive

Germ cell mutagenicity - Assessment:
Positive result(s) from in vivo mammalian somatic cell mutagenicity tests.

Carcinogenicity
May cause cancer.

Components:

Coconut oil diethanolamide:
Species: Rat
Application Route: Skin contact
Exposure time: 2 Years
Result: negative

Permethrin (ISO):
Species: Rat
Result: negative
Species: Mouse
Result: negative

Formaldehyde:
Species: Rat
Application Route: Inhalation (gas)
Exposure time: 28 Months
Result: positive

Carcinogenicity - Assessment:
Sufficient evidence of carcinogenicity in animal experiments

Reproductive toxicity
Not classified based on available information.

Components:

Sulfuric acid, mono-C16-18-alkyl esters, sodium salts:
Effects on foetal development:
- Test Type: Embryo-foetal development
  Species: Rat
  Application Route: Ingestion
SAFETY DATA SHEET

Permethrin (1%) Formulation

Result: negative

Coconut oil diethanolamide:
Effects on foetal development: Test Type: Embryo-foetal development
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 414
Result: negative

Ethanol:
Effects on fertility: Test Type: Two-generation reproduction toxicity study
Species: Mouse
Application Route: Ingestion
Result: negative

Permethrin (ISO):
Effects on fertility: Test Type: Two-generation reproduction toxicity study
Species: Rat
Application Route: Ingestion
Result: negative

Effects on foetal development: Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test
Species: Rat
Application Route: Ingestion
Result: negative

Formaldehyde:
Effects on foetal development: Test Type: Embryo-foetal development
Species: Rat
Application Route: Inhalation (gas)
Result: negative

STOT - single exposure
Not classified based on available information.

Components:

Sulfuric acid, mono-C16-18-alkyl esters, sodium salts:
Assessment: May cause respiratory irritation.

Formaldehyde:
Assessment: May cause respiratory irritation.

STOT - repeated exposure
Not classified based on available information.

Components:

Formaldehyde:
Exposure routes: Inhalation (gas)
Assessment: The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Repeated dose toxicity

Components:

**Sulfuric acid, mono-C16-18-alkyl esters, sodium salts:**

<table>
<thead>
<tr>
<th>Species</th>
<th>NOAEL (mg/kg)</th>
<th>LOAEL (mg/kg)</th>
<th>Application Route</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rat</td>
<td>428</td>
<td>970</td>
<td>Ingestion</td>
<td>90 Days</td>
</tr>
</tbody>
</table>

**Coconut oil diethanolamide:**

<table>
<thead>
<tr>
<th>Species</th>
<th>NOAEL (mg/kg)</th>
<th>Application Route</th>
<th>Exposure time</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rat</td>
<td>&gt; 750</td>
<td>Ingestion</td>
<td>28 Days</td>
<td>Based on data from similar materials</td>
</tr>
</tbody>
</table>

**Ethanol:**

<table>
<thead>
<tr>
<th>Species</th>
<th>NOAEL (mg/kg)</th>
<th>LOAEL (mg/kg)</th>
<th>Application Route</th>
<th>Exposure time</th>
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<td>1.280</td>
<td>3.156</td>
<td>Ingestion</td>
<td>90 Days</td>
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**Permethrin (ISO):**

<table>
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<tr>
<th>Species</th>
<th>NOAEL (mg/l)</th>
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<th>Exposure time</th>
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<td>Rat</td>
<td>0.2201</td>
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</table>

<table>
<thead>
<tr>
<th>Species</th>
<th>NOAEL (mg/kg)</th>
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<th>Exposure time</th>
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<tr>
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**Formaldehyde:**

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<th>Species</th>
<th>NOAEL (ppm)</th>
<th>LOAEL (ppm)</th>
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<th>Exposure time</th>
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</thead>
<tbody>
<tr>
<td>Rat</td>
<td>6</td>
<td>10</td>
<td>Inhalation (gas)</td>
<td>28 Days</td>
</tr>
</tbody>
</table>

**Aspiration toxicity**

Not classified based on available information.
SECTION 12: Ecological information

12.1 Toxicity

**Components:**

**Sulfuric acid, mono-C16-18-alkyl esters, sodium salts:**
- Toxicity to fish: LC50 (Danio rerio (zebra fish)): 5.2 mg/l
  Exposure time: 96 h
- Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): 2.8 mg/l
  Exposure time: 48 h
  Method: OECD Test Guideline 202
  Remarks: Based on data from similar materials
- Toxicity to algae/aquatic plants: ErC50 (Desmodesmus subspicatus (green algae)): 34 mg/l
  Exposure time: 72 h
- Toxicity to microorganisms: NOEC (Pseudomonas putida): 550 mg/l
  Exposure time: 18 h
- Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity): NOEC: 0.204 mg/l
  Exposure time: 7 d
  Species: Ceriodaphnia dubia (water flea)
  Remarks: Based on data from similar materials

**Coconut oil diethanolamide:**
- Toxicity to fish: LC50 (Brachydanio rerio (zebrafish)): 6.7 mg/l
  Exposure time: 96 h
  Method: OECD Test Guideline 203
- Toxicity to daphnia and other aquatic invertebrates: LC50 (Daphnia magna (Water flea)): 2.15 mg/l
  Exposure time: 48 h
- Toxicity to algae/aquatic plants: EC50 (Scenedesmus subspicatus): 2.2 mg/l
  Exposure time: 72 h
  NOEC (Scenedesmus subspicatus): 0.32 mg/l
  Exposure time: 72 h
- Toxicity to fish (Chronic toxicity): NOEC: 0.32 mg/l
  Exposure time: 28 d
  Species: Oncorhynchus mykiss (rainbow trout)
  Method: OECD Test Guideline 204
  Remarks: Based on data from similar materials
- Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity): NOEC: 0.07 mg/l
  Exposure time: 21 d
  Species: Daphnia magna (Water flea)
  Method: OECD Test Guideline 211
  Remarks: Based on data from similar materials

**Ethanol:**
| **Toxicity to fish** | LC50 (Pimephales promelas (fathead minnow)): > 1.000 mg/l  
Exposure time: 96 h |
|----------------------|-----------------------------------------------------------------|
| **Toxicity to daphnia and other aquatic invertebrates** | EC50 (Ceriodaphnia (water flea)): > 1.000 mg/l  
Exposure time: 48 h |
| **Toxicity to algae/aquatic plants** | ErC50 (Chlorella vulgaris (Fresh water algae)): 275 mg/l  
Exposure time: 72 h  
EC10 (Chlorella vulgaris (Fresh water algae)): 11,5 mg/l  
Exposure time: 72 h |
| **Toxicity to microorganisms** | EC50 (Pseudomonas putida): 6.500 mg/l  
Exposure time: 16 h |
| **Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)** | NOEC: 9,6 mg/l  
Exposure time: 9 d  
Species: Daphnia magna (Water flea) |
| **Permethrin (ISO):** |  |
| **Toxicity to fish** | LC50 (Lepomis macrochirus (Bluegill sunfish)): 0,00079 mg/l  
Exposure time: 96 h |
| **Toxicity to daphnia and other aquatic invertebrates** | EC50 (Daphnia magna (Water flea)): 0,0001 mg/l  
Exposure time: 48 h |
| **Toxicity to algae/aquatic plants** | ErC50 (Pseudokirchneriella subcapitata (green algae)): > 1,13 mg/l  
Exposure time: 72 h  
EC10 (Pseudokirchneriella subcapitata (green algae)): 0,0023 mg/l  
Exposure time: 72 h |
| **M-Factor (Acute aquatic toxicity)** | 10.000 |
| **Toxicity to microorganisms** | EC50 : > 1.000 mg/l  
Exposure time: 3 h |
| **Toxicity to fish (Chronic toxicity)** | NOEC: 0.00041 mg/l  
Exposure time: 35 d  
Species: Danio rerio (zebra fish)  
Method: OECD Test Guideline 210 |
| **Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)** | NOEC: 0.0047 µg/l  
Exposure time: 21 d  
Species: Daphnia magna (Water flea)  
Method: OECD Test Guideline 211 |
| **M-Factor (Chronic aquatic toxicity)** | 10.000 |
| **Formaldehyde:** |  |
| **Toxicity to fish** | LC50 : 6,7 mg/l |
### 12.2 Persistence and degradability

**Components:**

#### Sulfuric acid, mono-C16-18-alkyl esters, sodium salts:
- **Biodegradability**: Result: Readily biodegradable.
- **Biodegradation**: 77 %
- **Exposure time**: 30 d
- **Method**: OECD Test Guideline 301D

#### Coconut oil diethanolamide:
- **Biodegradability**: Result: Readily biodegradable.
- **Biodegradation**: 84 %
- **Exposure time**: 28 d
- **Method**: OECD Test Guideline 301D

#### Ethanol:
- **Biodegradability**: Result: Readily biodegradable.
- **Biodegradation**: 84 %
- **Exposure time**: 20 d

#### Permethrin (ISO):
- **Biodegradability**: Result: Not readily biodegradable.
- **Method**: OECD Test Guideline 301F

#### Formaldehyde:
- **Biodegradability**: Result: Readily biodegradable.
- **Biodegradation**: 91 %
- **Exposure time**: 14 d
12.3 Bioaccumulative potential

**Components:**

**Coconut oil diethanolamide:**
- Partition coefficient: n-octanol/water: log Pow: 4.2
- Remarks: Based on data from similar materials

**Ethanol:**
- Partition coefficient: n-octanol/water: log Pow: -0.35

**Permethrin (ISO):**
- Bioaccumulation: Species: Lepomis macrochirus (Bluegill sunfish)
  - Bioconcentration factor (BCF): 570
- Partition coefficient: n-octanol/water: log Pow: 4.67

**Formaldehyde:**
- Partition coefficient: n-octanol/water: log Pow: 0.35

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

**Product:**
**Assessment:** This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects

**Product:**
**Endocrine disrupting potential:** The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

**Product:** Dispose of in accordance with local regulations. According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user, preferably in
Contaminated packaging: Empty containers should be taken to an approved waste handling site for recycling or disposal. If not otherwise specified: Dispose of as unused product.

SECTION 14: Transport information

14.1 UN number

| ADN  | UN 3082 |
| ADR  | UN 3082 |
| RID  | UN 3082 |
| IMDG | UN 3082 |
| IATA | UN 3082 |

14.2 UN proper shipping name

| ADN  | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Permethrin (ISO)) |
| ADR  | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Permethrin (ISO)) |
| RID  | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Permethrin (ISO)) |
| IMDG | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Permethrin (ISO)) |
| IATA | Environmentally hazardous substance, liquid, n.o.s. (Permethrin (ISO)) |

14.3 Transport hazard class(es)

| ADN  | 9 |
| ADR  | 9 |
| RID  | 9 |
| IMDG | 9 |
| IATA | 9 |

14.4 Packing group

| ADN  |
| ADR  |

| Packing group | III |
| Classification Code | M6 |
| Hazard Identification Number | 90 |
| Labels | 9 |

| Packing group | III |
| Classification Code | M6 |
14.5 Environmental hazards

**ADN**
Environmentally hazardous : yes

**ADR**
Environmentally hazardous : yes

**RID**
Environmentally hazardous : yes

**IMDG**
Marine pollutant : yes

**IATA (Passenger)**
Environmentally hazardous : yes

**IATA (Cargo)**
Environmentally hazardous : yes

14.6 Special precautions for user
The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code
Remarks : Not applicable for product as supplied.
SAFETY DATA SHEET

Permethrin (1%) Formulation

Version 2.3  Revision Date: 27.08.2021  SDS Number: 5544461-00005  Date of last issue: 18.03.2021  Date of first issue: 19.03.2020

SECTION 15: Regulatory information

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

The components of this product are reported in the following inventories:

AICS : not determined
DSL : not determined
IECSC : not determined

15.2 Chemical safety assessment

A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information

Other information : Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

Full text of H-Statements

H221 : Flammable gas.
H225 : Highly flammable liquid and vapour.
H228 : Flammable solid.
H301 : Toxic if swallowed.
H302 : Harmful if swallowed.
H311 : Toxic in contact with skin.
H314 : Causes severe skin burns and eye damage.
H315 : Causes skin irritation.
H317 : May cause an allergic skin reaction.
H318 : Causes serious eye damage.
H319 : Causes serious eye irritation.
H330 : Fatal if inhaled.
H332 : Harmful if inhaled.
H335 : May cause respiratory irritation.
H341 : Suspected of causing genetic defects.
H350 : May cause cancer.
H400 : Very toxic to aquatic life.
H410 : Very toxic to aquatic life with long lasting effects.
H411 : Toxic to aquatic life with long lasting effects.
H412 : Harmful to aquatic life with long lasting effects.

Full text of other abbreviations

Acute Tox. : Acute toxicity
Aquatic Acute : Short-term (acute) aquatic hazard
Aquatic Chronic : Long-term (chronic) aquatic hazard
Carc. : Carcinogenicity
Eye Dam. : Serious eye damage
Eye Irrit. : Eye irritation
Flam. Gas : Flammable gases
Flam. Liq. : Flammable liquids
Flam. Sol. : Flammable solids
**SAFETY DATA SHEET**

Permethrin (1%) Formulation

**Version** 2.3  
**Revision Date:** 27.08.2021  
**SDS Number:** 5544461-00005  
**Date of last issue:** 18.03.2021  
**Date of first issue:** 19.03.2020

<table>
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<tr>
<th>OEL Type</th>
<th>Source</th>
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<tr>
<td>ZA OEL</td>
<td>South Africa. Hazardous Chemical Substances Regulations, Occupational Exposure Limits</td>
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<tr>
<td>2004/37/EC / STEL</td>
<td>Short term exposure limit</td>
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<td>2004/37/EC / TWA</td>
<td>Long term exposure limit</td>
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<tr>
<td>ZA OEL / TWA OEL-CL</td>
<td>Long term occupational exposure limits - control limit</td>
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<td>ZA OEL / STEL OEL-CL</td>
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</tr>
<tr>
<td>ZA OEL / TWA OEL-RL</td>
<td>Long term occupational exposure limits - recommended limit</td>
</tr>
</tbody>
</table>

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observeable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - Quantitative Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of very high concern; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

**Further information**

Classification of the mixture:

<table>
<thead>
<tr>
<th>Property</th>
<th>Code</th>
<th>Calculation method</th>
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<td>Eye Dam. 1</td>
<td>H318</td>
<td>Calculation method</td>
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<tr>
<td>Skin Sens. 1</td>
<td>H317</td>
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<tr>
<td>Muta. 2</td>
<td>H341</td>
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<tr>
<td>Carc. 1B</td>
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<tr>
<td>Aquatic Acute 1</td>
<td>H400</td>
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</tr>
<tr>
<td>Aquatic Chronic 1</td>
<td>H410</td>
<td>Calculation method</td>
</tr>
</tbody>
</table>

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user’s end product, if applicable.