SAFETY DATA SHEET

Permethrin (1%) Formulation

Version 2.2  Revision Date: 27.08.2021  SDS Number: 5544459-00004  Date of last issue: 10.10.2020

Date of first issue: 19.03.2020

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: Permethrin (1%) Formulation

Manufacturer or supplier’s details

Company: MSD
Address: 50 Tuas West Drive
          Singapore - Singapore 638408
Telephone: +1-908-740-4000
Emergency telephone number: 65 6697 2111 (24/7/365)
E-mail address: EHSDATASTEWARD@msd.com

Recommended use of the chemical and restrictions on use

Recommended use: Veterinary product

2. HAZARDS IDENTIFICATION

GHS Classification

Serious eye damage/eye irritation: Category 1
Skin sensitisation: Category 1
Germ cell mutagenicity: Category 2
Carcinogenicity: Category 1B
Short-term (acute) aquatic hazard: Category 1
Long-term (chronic) aquatic hazard: Category 1

GHS label elements

Hazard pictograms: [Images of hazard symbols]
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.
P202 Do not handle until all safety precautions have been read and understood.
P261 Avoid breathing mist or vapours.
P272 Contaminated work clothing should not be allowed out of the workplace.
P273 Avoid release to the environment.
P280 Wear protective gloves/protective clothing/eye protection/face protection.

**Response:**
P302 + P352 IF ON SKIN: Wash with plenty of water.
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.
P333 + P313 IF skin irritation or rash occurs: Get medical advice/attention.
P362 + P364 Take off contaminated clothing and wash before reuse.
P391 Collect spillage.

**Storage:**
P405 Store locked up.

**Disposal:**
P501 Dispose of contents/container to an approved waste disposal plant.

Other hazards which do not result in classification
None known.

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

**Substance / Mixture:** Mixture

**Components**

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</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>&gt;= 10 - &lt; 20</td>
</tr>
<tr>
<td>Coconut oil diethanolamide</td>
<td>68603-42-9</td>
<td>&gt;= 3 - &lt; 10</td>
</tr>
<tr>
<td>Ethanol#</td>
<td>64-17-5</td>
<td>&gt;= 1 - &lt; 10</td>
</tr>
<tr>
<td>Permethrin (ISO)</td>
<td>52645-53-1</td>
<td>&gt;= 1 - &lt; 2.5</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>50-00-0</td>
<td>&gt;= 0.2 - &lt; 1</td>
</tr>
</tbody>
</table>

# Voluntarily-disclosed non-hazardous substance

### 4. 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.

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.

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

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).

Notes to physician: Treat symptomatically and supportively.

5. FIREFIGHTING MEASURES

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

Unsuitable extinguishing media: None known.

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

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.

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

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Use personal protective equipment. Follow safe handling advice (see section 7) and personal pro-
7. HANDLING AND STORAGE

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.

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

Materials to avoid : Do not store with the following product types: Strong oxidizing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type (Form of exposure)</th>
<th>Control parameters / Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
</table>
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<table>
<thead>
<tr>
<th>Substance</th>
<th>CAS Number</th>
<th>PEL (long term)</th>
<th>SG OEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>64-17-5</td>
<td>1,000 ppm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1,880 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Permethrin (ISO)</td>
<td>52645-53-1</td>
<td>TWA 80 µg/m³ (OEB 3)</td>
<td>Internal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wipe limit 800 µg/100 cm²</td>
<td>Internal</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>50-00-0</td>
<td>PEL (short term) 0.3 ppm</td>
<td>ACGIH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.37 mg/m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL 0.3 ppm</td>
<td>ACGIH</td>
</tr>
</tbody>
</table>

Engineering measures
Use appropriate engineering controls and manufacturing technologies to control airborne concentrations (e.g., dripless 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

Respiratory protection
If adequate local exhaust ventilation is not available or exposure assessment demonstrates exposures outside the recommended guidelines, use respiratory protection.
Filter type: Combined particulates, inorganic gas/vapour and organic vapour type

Hand protection
Material: Chemical-resistant gloves

Eye protection
Remarks: Consider double gloving.
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 aerosols.

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.

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.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>liquid</td>
</tr>
<tr>
<td>Colour</td>
<td>amber</td>
</tr>
<tr>
<td>Odour</td>
<td>No data available</td>
</tr>
<tr>
<td>Odour Threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>7.3 - 7.7</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>No data available</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>No data available</td>
</tr>
<tr>
<td>Flash point</td>
<td>No data available</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flammability (liquids)</td>
<td>No data available</td>
</tr>
<tr>
<td>Upper explosion limit / Upper flammability limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Lower explosion limit / Lower flammability limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative vapour density</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative density</td>
<td>No data available</td>
</tr>
<tr>
<td>Density</td>
<td>1.025 - 1.035 g/cm³</td>
</tr>
<tr>
<td>Solubility(ies)</td>
<td></td>
</tr>
<tr>
<td>Water solubility</td>
<td>No data available</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity</td>
<td></td>
</tr>
<tr>
<td>Viscosity, kinematic</td>
<td>No data available</td>
</tr>
</tbody>
</table>
Explosive properties : Not explosive

Oxidizing properties : The substance or mixture is not classified as oxidizing.

Molecular weight : No data available

Particle size : Not applicable

10. STABILITY AND REACTIVITY

Reactivity : Not classified as a reactivity hazard.
Chemical stability : Stable under normal conditions.
Possibility of hazardous reac-
tions : Can react with strong oxidizing agents.
Conditions to avoid : None known.
Incompatible materials : Oxidizing agents
Hazardous decomposition products : No hazardous decomposition products are known.

11. TOXICOLOGICAL INFORMATION

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

Acute toxicity
Not classified based on available information.

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 inhalation toxicity**: LC50 (Rat): 2.3 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist

**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

**Skin corrosion/irritation**
Not classified based on available information.

**Components:**

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

<table>
<thead>
<tr>
<th>Species</th>
<th>Rabbit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method</td>
<td>OECD Test Guideline 404</td>
</tr>
<tr>
<td>Result</td>
<td>Skin irritation</td>
</tr>
<tr>
<td>Remarks</td>
<td>Based on data from similar materials</td>
</tr>
</tbody>
</table>

**Coconut oil diethanolamide:**

<table>
<thead>
<tr>
<th>Species</th>
<th>Rabbit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method</td>
<td>OECD Test Guideline 404</td>
</tr>
<tr>
<td>Result</td>
<td>Skin irritation</td>
</tr>
<tr>
<td>Remarks</td>
<td>Based on data from similar materials</td>
</tr>
</tbody>
</table>

**Ethanol:**
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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
Result: Irreversible effects on the eye
Method: OECD Test Guideline 405
Remarks: Based on data from similar materials

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

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

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) 
  
- **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 
  
  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
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:
Species : Rat
NOAEL : 428 mg/kg
LOAEL : 970 mg/kg
Application Route : Ingestion
Exposure time : 90 Days

Coconut oil diethanolamide:
Species : Rat
NOAEL : > 750 mg/kg
Application Route : Ingestion
Exposure time : 28 Days
Remarks : Based on data from similar materials

Ethanol:
Species : Rat
NOAEL : 1,280 mg/kg
LOAEL : 3,156 mg/kg
Application Route : Ingestion
Exposure time : 90 Days

Permethrin (ISO):
Species : Rat
NOAEL : 0.2201 mg/l
Application Route : Inhalation
Exposure time : 90 Days
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Species: Rat
NOAEL: 175 mg/kg
Application Route: Ingestion
Exposure time: 90 Days

Formaldehyde:
Species: Rat
NOAEL: 6 ppm
LOAEL: 10 ppm
Application Route: Inhalation (gas)
Exposure time: 28 Days

Aspiration toxicity
Not classified based on available information.

12. ECOLOGICAL INFORMATION

Ecotoxicity

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 daphnia and other aquatic invertebrates (Chronic toxicity): NOEC (Ceriodaphnia dubia (water flea)): 0.204 mg/l
  Exposure time: 7 d
  Remarks: Based on data from similar materials
- Toxicity to microorganisms: NOEC (Pseudomonas putida): 550 mg/l
  Exposure time: 18 h

Coconut oil diethanolamide:
- Toxicity to fish: LC50 (Brachydano 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)

<table>
<thead>
<tr>
<th>Compound</th>
<th>NOEC (Onchorhynchus mykiss (rainbow trout))</th>
<th>Exposure time</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>0.32 mg/l</td>
<td>28 d</td>
<td>OECD Test Guideline 204</td>
</tr>
<tr>
<td>Permethrin (ISO)</td>
<td>0.00079 mg/l</td>
<td>96 h</td>
<td>OECD Test Guideline 210</td>
</tr>
</tbody>
</table>

Remainder of text...

### Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

<table>
<thead>
<tr>
<th>Compound</th>
<th>NOEC (Daphnia magna (Water flea))</th>
<th>Exposure time</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>0.07 mg/l</td>
<td>21 d</td>
<td>OECD Test Guideline 211</td>
</tr>
<tr>
<td>Permethrin (ISO)</td>
<td>9.6 mg/l</td>
<td>9 d</td>
<td>OECD Test Guideline 211</td>
</tr>
</tbody>
</table>

Remainder of text...

### Ethanol:

<table>
<thead>
<tr>
<th>Toxicity to Fish</th>
<th>LC50 (Pimephales promelas (fathead minnow))</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&gt; 1,000 mg/l</td>
<td>96 h</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Toxicity to daphnia and other aquatic invertebrates</th>
<th>EC50 (Ceriodaphnia (water flea))</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&gt; 1,000 mg/l</td>
<td>48 h</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Toxicity to algae/aquatic plants</th>
<th>ErC50 (Chlorella vulgaris (Fresh water algae))</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>275 mg/l</td>
<td>72 h</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)</th>
<th>NOEC (Daphnia magna (Water flea))</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9.6 mg/l</td>
<td>9 d</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Toxicity to microorganisms</th>
<th>EC50 (Pseudomonas putida)</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6,500 mg/l</td>
<td>16 h</td>
</tr>
</tbody>
</table>

### Permethrin (ISO):

<table>
<thead>
<tr>
<th>Toxicity to Fish</th>
<th>LC50 (Lepomis macrochirus (Bluegill sunfish))</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.00079 mg/l</td>
<td>96 h</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Toxicity to daphnia and other aquatic invertebrates</th>
<th>EC50 (Daphnia magna (Water flea))</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.0001 mg/l</td>
<td>48 h</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Toxicity to algae/aquatic plants</th>
<th>ErC50 (Pseudokirchneriella subcapitata (green algae))</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&gt; 1.13 mg/l</td>
<td>72 h</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)</th>
<th>NOEC (Pseudokirchneriella subcapitata (green algae))</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.0023 mg/l</td>
<td>72 h</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Toxicity to microorganisms</th>
<th>EC10 (Pseudokirchneriella subcapitata (green algae))</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.0023 mg/l</td>
<td>72 h</td>
</tr>
</tbody>
</table>

### M-Factor (Acute aquatic toxicity)

| M-Factor | 10,000 |

<table>
<thead>
<tr>
<th>Toxicity to Fish (Chronic toxicity)</th>
<th>NOEC (Danio rerio (zebra fish))</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.00041 mg/l</td>
<td>35 d</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)</th>
<th>NOEC (Daphnia magna (Water flea))</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.0047 µg/l</td>
<td>21 d</td>
</tr>
</tbody>
</table>

Remainder of text...
M-Factor (Chronic aquatic toxicity): 10,000
Toxicity to microorganisms: EC50: > 1,000 mg/l
Exposure time: 3 h

Formaldehyde:
Toxicity to fish: LC50: 6.7 mg/l
Exposure time: 96 h
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia pulex (Water flea)): 5.8 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants: EC50 (Desmodesmus subspicatus (green algae)): 4.89 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

Toxicity to fish (Chronic toxicity): NOEC (Oryzias latipes (Orange-red killifish)): >= 48 mg/l
Exposure time: 28 d

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity): NOEC (Daphnia magna (Water flea)): >= 6.4 mg/l
Exposure time: 21 d
Method: OECD Test Guideline 211

Toxicity to microorganisms: EC50: 34.1 mg/l
Exposure time: 120 h

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
- Method: OECD Test Guideline 301C
- Remarks: Based on data from similar materials

**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

**Mobility in soil**
- No data available

**Other adverse effects**
- No data available

### 13. DISPOSAL CONSIDERATIONS

**Disposal methods**
- Waste from residues: Dispose of in accordance with local regulations.
- Contaminated packaging: Empty containers should be taken to an approved waste handling site for recycling or disposal.
- Remarks: If not otherwise specified: Dispose of as unused product.

### 14. TRANSPORT INFORMATION

**International Regulations**

**UNRTDG**
- UN number: UN 3082
- Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID,
SAFETY DATA SHEET

Perm (1%) Formulation

N.O.S.  
(Permethrin (ISO))

Class : 9
Packing group : III
Labels : 9

IATA-DGR
UN/ID No. : UN 3082
Proper shipping name : Environmentally hazardous substance, liquid, n.o.s.  
(Permethrin (ISO))

Class : 9
Packing group : III
Labels : Miscellaneous
Packing instruction (cargo aircraft) : 964
Packing instruction (passenger aircraft) : 964
Environmentally hazardous : yes

IMDG-Code
UN number : UN 3082
Proper shipping name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID,  
N.O.S.  
(Permethrin (ISO))

Class : 9
Packing group : III
Labels : 9
EmS Code : F-A, S-F
Marine pollutant : yes

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable for product as supplied.

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 var-
iations in regional or country regulations.

15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mix-
ture

Workplace Safety and Health Act and Workplace Safety and Health (General Provisions)  
Regulations: This product is subjected to the SDS, labelling, PEL and other requirements in the Act/Regulations.

Environmental Protection and Management Act and Environmental Protection and Management (Hazard-
ous Substances) Regulations : Not applicable

Fire Safety (Petroleum and Flammable Materials) Regulations : Not applicable

The components of this product are reported in the following inventories:
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>2.2</td>
<td>27.08.2021</td>
<td>5544459-00004</td>
<td>10.10.2020</td>
<td>19.03.2020</td>
</tr>
</tbody>
</table>

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

16. OTHER INFORMATION

Further information

Date format: dd.mm/yyyy

Full text of other abbreviations
ACGIH: USA. ACGIH Threshold Limit Values (TLV)

ACGIH / TWA: 8-hour, time-weighted average
ACGIH / STEL: Short-term exposure limit
SG OEL / PEL (long term): Permissible Exposure Level (PEL) Long Term
SG OEL / PEL (short term): Permissible Exposure Level (PEL) Short Term

AIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); 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; ERG - Emergency Response Guide; 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 Chemicals in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardisation; 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; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; 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; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recom-
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.

SG / EN