Lambda-Cyhalothrin / Piperonyl Butoxide Formulation

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

1.1 Product identifier
Trade name: Lambda-Cyhalothrin / Piperonyl Butoxide 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
Walton Manor, Walton
MK7 7AJ Milton Keynes - United Kingdom

Telephone: 908-740-4000
Telefax: 908-735-1496
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)
Acute toxicity, Category 4: H302: Harmful if swallowed.
Skin irritation, Category 2: H315: Causes skin irritation.
Eye irritation, Category 2: H319: Causes serious eye irritation.
Specific target organ toxicity - single exposure, Category 2: H371: May cause damage to organs.
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 lasting effects.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms:

Signal word: Warning
Lambda-Cyhalothrin / Piperonyl Butoxide
Formulation

Version 3.2  Revision Date: 13.09.2019  SDS Number: 1366772-00010  Date of last issue: 24.04.2019
Date of first issue: 01.03.2017

Hazard statements:
H302 Harmful if swallowed.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H371 May cause damage to organs.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements:
Prevention:
P270 Do not eat, drink or smoke when using this product.
P273 Avoid release to the environment.
P280 Wear protective gloves/ eye protection/ face protection.
Response:
P308 + P311 IF exposed or concerned: Call a POISON CENTER/doctor.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P391 Collect spillage.

Hazardous components which must be listed on the label:
lambda-cyhalothrin (ISO)

2.3 Other hazards
None known.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>EC-No.</th>
<th>Index-No. Registration number</th>
<th>Classification</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether</td>
<td>51-03-6</td>
<td>200-076-7</td>
<td></td>
<td>Aquatic Acute 1; H400 Aquatic Chronic 1; H410</td>
<td>&gt;= 2.5 - &lt; 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>M-Factor (Acute aquatic toxicity): 1 M-Factor (Chronic aquatic toxicity): 1</td>
<td></td>
</tr>
<tr>
<td>lambda-cyhalothrin (ISO)</td>
<td>91465-08-6</td>
<td>415-130-7</td>
<td>607-252-00-6</td>
<td>Acute Tox. 3; H301 Acute Tox. 2; H330 Acute Tox. 3; H311 Eye Irrit. 2; H319 STOT SE 1; H370 Aquatic Acute 1; H400 Aquatic Chronic 1; H410</td>
<td>&gt;= 1 - &lt; 2.5</td>
</tr>
</tbody>
</table>
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 for at least 15 minutes while removing 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.

If swallowed: If swallowed, DO NOT induce vomiting unless directed to do so by medical personnel. Get medical attention. Rinse mouth thoroughly with water. Never give anything by mouth to an unconscious person.

4.2 Most important symptoms and effects, both acute and delayed

Risks: Harmful if swallowed. Causes skin irritation. Causes serious eye irritation. May cause damage to organs.
Lambda-Cyhalothrin / Piperonyl Butoxide Formulation

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: Carbon oxides
Nitrogen oxides (NOx)
Chlorine compounds
Fluorine compounds

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 and personal protective equipment recommendations.

6.2 Environmental precautions

Environmental precautions: Discharge into the environment must be avoided. 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
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: Use only with adequate ventilation.

Advice on safe handling: Do not get on skin or clothing. Avoid inhalation of vapour or mist. 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. 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. 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. 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
Lambda-Cyhalothrin / Piperonyl Butoxide
Formulation

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>2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether</td>
<td>51-03-6</td>
<td>TWA</td>
<td>4 mg/m³ (OEB 1)</td>
<td>Internal</td>
</tr>
<tr>
<td>lambda-cyhalothrin (ISO)</td>
<td>91465-08-6</td>
<td>TWA</td>
<td>5 µg/m³ (OEB 4)</td>
<td>Internal</td>
</tr>
</tbody>
</table>

Further information

| Skin | Wipe limit | 50 µg/100 cm² | Internal |

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>2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether</td>
<td>Workers</td>
<td>Inhalation</td>
<td>Long-term systemic effects</td>
<td>3.875 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Workers</td>
<td>Inhalation</td>
<td>Acute systemic effects</td>
<td>7.75 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Workers</td>
<td>Inhalation</td>
<td>Long-term systemic effects</td>
<td>3.875 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Workers</td>
<td>Inhalation</td>
<td>Acute local effects</td>
<td>3.875 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Workers</td>
<td>Skin contact</td>
<td>Long-term systemic effects</td>
<td>27.7 mg/kg bw/day</td>
</tr>
<tr>
<td></td>
<td>Workers</td>
<td>Skin contact</td>
<td>Acute systemic effects</td>
<td>55.5 mg/kg bw/day</td>
</tr>
<tr>
<td></td>
<td>Workers</td>
<td>Skin contact</td>
<td>Long-term local effects</td>
<td>0.44 mg/cm²</td>
</tr>
<tr>
<td></td>
<td>Workers</td>
<td>Skin contact</td>
<td>Acute local effects</td>
<td>0.888 mg/cm²</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Inhalation</td>
<td>Long-term systemic effects</td>
<td>1.94 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Inhalation</td>
<td>Acute systemic effects</td>
<td>3.875 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Inhalation</td>
<td>Long-term local effects</td>
<td>1.94 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Skin contact</td>
<td>Acute local effects</td>
<td>1.94 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Skin contact</td>
<td>Long-term systemic effects</td>
<td>13.9 mg/kg</td>
</tr>
</tbody>
</table>
### Lambda-Cyhalothrin / Piperonyl Butoxide Formulation

**SAFETY DATA SHEET**
according to Regulation (EC) No. 1907/2006

**Version**: 3.2  
**Revision Date**: 13.09.2019  
**SDS Number**: 1366772-00010  
**Date of last issue**: 24.04.2019  
**Date of first issue**: 01.03.2017

#### Effects

<table>
<thead>
<tr>
<th>Consumers</th>
<th>Skin contact</th>
<th>Acute systemic effects</th>
<th>27.8 mg/kg bw/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumers</td>
<td>Skin contact</td>
<td>Long-term local effects</td>
<td>0.22 mg/cm²</td>
</tr>
<tr>
<td>Consumers</td>
<td>Skin contact</td>
<td>Acute local effects</td>
<td>0.22 mg/cm²</td>
</tr>
<tr>
<td>Consumers</td>
<td>Ingestion</td>
<td>Long-term systemic effects</td>
<td>1.14 mg/kg bw/day</td>
</tr>
<tr>
<td>Consumers</td>
<td>Ingestion</td>
<td>Acute systemic effects</td>
<td>2.3 mg/kg bw/day</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>2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether</td>
<td>Fresh water</td>
<td>0.003 mg/l</td>
</tr>
<tr>
<td></td>
<td>Marine water</td>
<td>0 mg/l</td>
</tr>
<tr>
<td></td>
<td>Intermittent use/release</td>
<td>0 mg/l</td>
</tr>
<tr>
<td></td>
<td>Sewage treatment plant</td>
<td>10 mg/l</td>
</tr>
<tr>
<td></td>
<td>Fresh water sediment</td>
<td>0.019 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Marine sediment</td>
<td>0.0002 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Soil</td>
<td>0.016 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Oral (Secondary Poisoning)</td>
<td>12.53 mg/kg food</td>
</tr>
</tbody>
</table>

#### 8.2 Exposure controls

**Engineering measures**
All engineering controls should be implemented by facility design and operated in accordance with GMP principles to protect products, workers, and the environment. Essentially no open handling permitted. Use closed processing systems or containment technologies. If handled in a laboratory, use a properly designed biosafety cabinet, fume hood, or other containment device if the potential exists for aerosolization. If this potential does not exist, handle over lined trays or benchtops.

**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 aerosols.

**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**: If adequate local exhaust ventilation is not available or expo-
Lambda-Cyhalothrin / Piperonyl Butoxide
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SECTION 9: Physical and chemical properties

9.1 Information on basic 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>clear, light yellow</td>
</tr>
<tr>
<td>Odour</td>
<td>mild, oily</td>
</tr>
<tr>
<td>Odour Threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>6.16</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>105.5 °C</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>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>0.9326</td>
</tr>
<tr>
<td>Density</td>
<td>No data available</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>No data available</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>
<tr>
<td>Explosive properties</td>
<td>Not explosive</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>The substance or mixture is not classified as oxidizing.</td>
</tr>
</tbody>
</table>
**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**
Harmful if swallowed.

**Product:**
- Acute oral toxicity: LD50 (Rat): 2,000 mg/kg
- TDLo (Rat): 300 mg/kg
  Remarks: No mortality observed at this dose.

- Acute inhalation toxicity: Acute toxicity estimate: > 5 mg/l
  Exposure time: 4 h
  Test atmosphere: dust/mist
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Components:

2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether:
- Acute dermal toxicity: LD50 (Rat): > 2,000 mg/kg
  Method: Calculation method

2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether:
- Acute oral toxicity: LD50 (Rat): > 2,000 mg/kg
  Method: OECD Test Guideline 423
- Acute inhalation toxicity: LC50 (Rat): > 5.2 mg/l
  Exposure time: 4 h
  Test atmosphere: dust/mist
  Method: OECD Test Guideline 403
- Acute dermal toxicity: LD50 (Rat): > 2,000 mg/kg
  Method: OECD Test Guideline 402

lambda-cyhalothrin (ISO):
- Acute oral toxicity: LD50 (Rat): 56 - 79 mg/kg
  LD50 (Mouse): 20 mg/kg

Skin corrosion/irritation
Causes skin irritation.

Product:
- Species: Rabbit
- Result: irritating

Components:

2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether:
- Species: Rabbit
- Method: OECD Test Guideline 404
- Result: No skin irritation

lambda-cyhalothrin (ISO):
- Species: Rabbit
- Result: No skin irritation
### Serious eye damage/eye irritation
Causes serious eye irritation.

**Product:**
- **Species:** Rabbit
- **Result:** Mild eye irritation

**Components:**
- **2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether:**
  - **Species:** Rabbit
  - **Method:** OECD Test Guideline 405
  - **Result:** No eye irritation

- **lambda-cyhalothrin (ISO):**
  - **Species:** Rabbit
  - **Result:** Mild eye irritation

### Respiratory or skin sensitisation

#### Skin sensitisation
Not classified based on available information.

#### Respiratory sensitisation
Not classified based on available information.

**Product:**
- **Test Type:** Local lymph node assay (LLNA)
- **Exposure routes:** Dermal
- **Assessment:** Does not cause skin sensitisation.
- **Result:** negative

**Test Type:** Magnusson-Kligman-Test
- **Exposure routes:** Dermal
- **Result:** Not a skin sensitizer.

**Components:**
- **2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether:**
  - **Test Type:** Maximisation Test
  - **Exposure routes:** Skin contact
  - **Species:** Guinea pig
  - **Method:** OECD Test Guideline 406
  - **Result:** negative

- **lambda-cyhalothrin (ISO):**
  - **Test Type:** Magnusson-Kligman-Test
  - **Exposure routes:** Dermal
  - **Species:** Guinea pig
  - **Result:** Not a skin sensitizer.
**Germ cell mutagenicity**
Not classified based on available information.

**Components:**

2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether:
Genotoxicity in vitro: Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

**lambda-cyhalothrin (ISO):**
Genotoxicity in vitro: Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Test Type: Chromosomal aberration
Test system: Human lymphocytes
Result: negative

Test Type: unscheduled DNA synthesis assay
Test system: rat hepatocytes
Result: negative

Test Type: In vitro mammalian cell gene mutation test
Test system: mouse lymphoma cells
Result: negative

Genotoxicity in vivo: Test Type: Micronucleus test
Species: Mouse
Cell type: Bone marrow
Application Route: Intraperitoneal
Result: negative

**Carcinogenicity**
Not classified based on available information.

**Components:**

2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether:
Species: Rat
Application Route: Ingestion
Exposure time: 107 weeks
Method: OECD Test Guideline 451
Result: negative

**lambda-cyhalothrin (ISO):**
Species: Mouse
Application Route: oral (feed)
Exposure time: 2 Years
Result: negative
Remarks: Based on data from similar materials
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Species: Rat
Application Route: oral (feed)
Exposure time: 2 Years
Result: negative
Remarks: Based on data from similar materials

Reproductive toxicity
Not classified based on available information.

Components:

2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether:
Effects on fertility:
- Test Type: Two-generation reproduction toxicity study
- Species: Rat
- Application Route: Ingestion
- Result: negative

Effects on foetal development:
- Test Type: Embryo-foetal development
- Species: Rat
- Application Route: Ingestion
- Result: negative

lambda-cyhalothrin (ISO):
Effects on fertility:
- Test Type: Three-generation study
- Species: Rat
- Application Route: oral (feed)
- General Toxicity - Parent: NOAEL: 2 mg/kg body weight
- General Toxicity F1: LOAEL: 6.7 mg/kg body weight
- Symptoms: Reduced offspring weight gain
- Result: No effects on fertility
- Remarks: Based on data from similar materials

Effects on foetal development:
- Test Type: Development
- Species: Rat
- Application Route: Oral
- General Toxicity Maternal: NOAEL: 10 mg/kg body weight
- Developmental Toxicity: LOAEL: 15 mg/kg body weight
- Result: No effects on foetal development, Reduced maternal body weight gain, Reduced foetal weight
- Remarks: Based on data from similar materials

Test Type: Development
Species: Rabbit
Application Route: Oral
General Toxicity Maternal: NOAEL: 10 mg/kg body weight
Developmental Toxicity: NOAEL: 30 mg/kg body weight
Result: No effects on foetal development, Reduced maternal body weight gain, Reduced foetal weight
Remarks: Based on data from similar materials
SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

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Date of first issue:  01.03.2017

STOT - single exposure
May cause damage to organs.

Components:

lambda-cyhalothrin (ISO):
Target Organs  :  Nervous system
Assessment  :  Causes damage to organs.

STOT - repeated exposure
Not classified based on available information.

Repeated dose toxicity

Components:

2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether:
Species  :  Rat
NOAEL  :  1,323 mg/kg
Application Route  :  Ingestion
Exposure time  :  7 Weeks

lambda-cyhalothrin (ISO):
Species  :  Dog
NOAEL  :  2.5 mg/kg
LOAEL  :  12.5 mg/kg
Application Route  :  oral (feed)
Exposure time  :  90 d
Symptoms  :  reduced body weight gain, reduced food consumption

Species  :  Rat
NOAEL  :  10 mg/kg
LOAEL  :  50 mg/kg
Application Route  :  Dermal
Exposure time  :  21 d
Target Organs  :  Nervous system

Species  :  Rat
NOAEL  :  0.08 mg/kg
LOAEL  :  0.9 mg/kg
Application Route  :  Inhalation
Exposure time  :  21 d
Target Organs  :  Nervous system

Species  :  Dog
NOAEL  :  0.1 mg/kg
LOAEL  :  0.5 mg/kg
Application Route  :  Oral
Exposure time  :  1 yr
Target Organs  :  Nervous system
Symptoms  :  Gastrointestinal disturbance, Vomiting, Convulsions, ataxia, Liver effects
Aspiration toxicity
Not classified based on available information.

Experience with human exposure

Components:

lambda-cyhalothrin (ISO):
Inhalation : Symptoms: Cough, Local irritation, sneezing
Skin contact : Symptoms: Skin irritation, tingling, superficial burning sensation, Local irritation
Remarks: Can be absorbed through skin.

Eye contact : Symptoms: Eye irritation
Ingestion : Symptoms: Gastrointestinal disturbance

SECTION 12: Ecological information

12.1 Toxicity

Components:

2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether:
Toxicity to fish : LC50 (Cyprinodon variegatus (sheepshead minnow)): 3.94 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 0.51 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (green algae)): 3.89 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

NOEC (Pseudokirchneriella subcapitata (green algae)): 0.824 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

M-Factor (Acute aquatic toxicity) : 1

Toxicity to microorganisms : EC50: > 1,000 mg/l
Exposure time: 3 h
Method: OECD Test Guideline 209

Toxicity to fish (Chronic toxicity) : NOEC: 0.18 mg/l
Exposure time: 35 d
Species: Pimephales promelas (fathead minnow)
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Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):
- NOEC: 0.03 mg/l
- Exposure time: 21 d
- Species: Daphnia magna (Water flea)

M-Factor (Chronic aquatic toxicity): 1

lambda-cyhalothrin (ISO):
- Toxicity to fish:
  - LC50 (Onchorhynchus mykiss (rainbow trout)): 0.00019 mg/l
  - Exposure time: 96 h
  - Method: OECD Test Guideline 203
  - Remarks: Based on data from similar materials

  - LC50 (Lepomis macrochirus (Bluegill sunfish)): 0.00021 mg/l
  - Exposure time: 96 h
  - Method: OECD Test Guideline 203
  - Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates:
- EC50 (Daphnia magna (Water flea)): 0.00004 mg/l
- Exposure time: 48 h
- Method: OECD Test Guideline 202
- Remarks: Based on data from similar materials

M-Factor (Acute aquatic toxicity): 10,000

Toxicity to fish (Chronic toxicity):
- NOEC: 0.000062 mg/l
- Exposure time: 32 d
- Species: Pimephales promelas (fathead minnow)
- Method: OECD Test Guideline 210
- Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):
- NOEC: 0.0035 µg/l
- Exposure time: 21 d
- Species: Daphnia magna (Water flea)
- Method: OECD Test Guideline 211
- Remarks: Based on data from similar materials

M-Factor (Chronic aquatic toxicity): 10,000

12.2 Persistence and degradability

Components:

2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether:
- Biodegradability: Result: Not readily biodegradable.
  - Biodegradation: 0 %
  - Exposure time: 28 d
  - Method: OECD Test Guideline 301D
12.3 Bioaccumulative potential

Components:

2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether:
Partition coefficient: n-octanol/water: log Pow: 5

Lambda-cyhalothrin (ISO):
Bioaccumulation: Bioconcentration factor (BCF): 2,240
Method: OECD Test Guideline 305
Partition coefficient: n-octanol/water: log Pow: 7.0 (20 °C)

12.4 Mobility in soil

Components:

Lambda-cyhalothrin (ISO):
Distribution among environmental compartments: log Koc: 5.5

12.5 Results of PBT and vPvB assessment

Not relevant

12.6 Other adverse effects

No data available

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 discussion with the waste disposal authorities.

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
Lambda-Cyhalothrin / Piperonyl Butoxide
Formulation

Version: 3.2  Revision Date: 13.09.2019
SDS Number: 1366772-00010  Date of last issue: 24.04.2019
Date of first issue: 01.03.2017

ADN : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether, lambda-cyhalothrin (ISO))

ADR : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether, lambda-cyhalothrin (ISO))

RID : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether, lambda-cyhalothrin (ISO))

IMDG : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether, lambda-cyhalothrin (ISO))

IATA : Environmentally hazardous substance, liquid, n.o.s.
(2-(2-butoxyethoxy)ethyl 6-propylpiperonyl ether, lambda-cyhalothrin (ISO))

14.3 Transport hazard class(es)

ADN : 9  ADR : 9  RID : 9  IMDG : 9  IATA : 9

14.4 Packing group

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

ADR
Packing group : III
Classification Code : M6
Hazard Identification Number : 90
Labels : 9
Tunnel restriction code : (-)

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

IMDG
Packing group : III
Lambda-Cyhalothrin / Piperonyl Butoxide
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>
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<tbody>
<tr>
<td>3.2</td>
<td>13.09.2019</td>
<td>1366772-00010</td>
<td>24.04.2019</td>
<td>01.03.2017</td>
</tr>
</tbody>
</table>

Labels : 9
EmS Code : F-A, S-F

**IATA (Cargo)**
- Packing instruction (cargo aircraft) : 964
- Packing instruction (LQ) : Y964
- Packing group : III
- Labels : Miscellaneous

**IATA (Passenger)**
- Packing instruction (passenger aircraft) : 964
- Packing instruction (LQ) : Y964
- Packing group : III
- Labels : Miscellaneous

### 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.

### SECTION 15: Regulatory information

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

- REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59) : Not applicable
- REACH - List of substances subject to authorisation (Annex XIV) : Not applicable
- Regulation (EC) No 1005/2009 on substances that deplete the ozone layer : Not applicable
SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

Lambda-Cyhalothrin / Piperonyl Butoxide
Formulation

Version  Revision Date:  SDS Number:  Date of last issue: 24.04.2019
3.2  13.09.2019  1366772-00010  Date of first issue: 01.03.2017

Regulation (EC) No 850/2004 on persistent organic pollutants : Not applicable

Regulation (EC) No 649/2012 of the European Parliament and the Council concerning the export and import of dangerous chemicals : Not applicable

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, preparations and articles (Annex XVII) : Conditions of restriction for the following entries should be considered:
Number on list 3


<table>
<thead>
<tr>
<th>E1</th>
<th>ENVIRONMENTAL HAZARDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity 1</td>
<td>Quantity 2</td>
</tr>
<tr>
<td>100 t</td>
<td>200 t</td>
</tr>
</tbody>
</table>

Other regulations:
Take note of Directive 92/85/EEC regarding maternity protection or stricter national regulations, where applicable.
Take note of Directive 94/33/EC on the protection of young people at work or stricter national regulations, where applicable.

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
H301 : Toxic if swallowed.
H311 : Toxic in contact with skin.
H319 : Causes serious eye irritation.
H330 : Fatal if inhaled.
H370 : Causes damage to organs.
H400 : Very toxic to aquatic life.
H410 : Very toxic 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
Eye Irrit. : Eye irritation
STOT SE : Specific target organ toxicity - single exposure
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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; AICS - Australian Inventory of Chemical Substances; 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 Observable 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; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Further information

Classification of the mixture:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Classification</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Tox. 4</td>
<td>H302</td>
<td>Based on product data or assessment</td>
</tr>
<tr>
<td>Skin Irrit. 2</td>
<td>H315</td>
<td>Based on product data or assessment</td>
</tr>
<tr>
<td>Eye Irrit. 2</td>
<td>H319</td>
<td>Based on product data or assessment</td>
</tr>
<tr>
<td>STOT SE 2</td>
<td>H371</td>
<td>Calculation method</td>
</tr>
<tr>
<td>Aquatic Acute 1</td>
<td>H400</td>
<td>Calculation method</td>
</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.

GB / EN