SAFETY DATA SHEET

Abamectin (with Propylene Glycol) Formulation

Version 1.1 Revision Date: 2020/03/23 SDS Number: 4795003-00002 Date of last issue: 2019/08/29
Date of first issue: 2019/08/29

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: Abamectin (with Propylene Glycol) Formulation

Manufacturer or supplier's details
Company: MSD
Address: JL Raya Pandaan KM. 48
Pandaan, Jawa Timur - Indonesia
Telephone: 908-740-4000
Emergency telephone number: 1-908-423-6000
E-mail address: EHSDATASTEWARD@msd.com
Telefax: 908-735-1496

Recommended use of the chemical and restrictions on use
Recommended use: Veterinary product

2. HAZARDS IDENTIFICATION

GHS Classification
Flammable liquids: Category 2
Acute toxicity (Inhalation): Category 4
Serious eye damage/eye irritation: Category 2A
Specific target organ toxicity - repeated exposure: Category 2 (Central nervous system)
Short-term (acute) aquatic hazard: Category 1
Long-term (chronic) aquatic hazard: Category 1

GHS label elements
Hazard pictograms: 
Signal word: Danger
Hazard statements: H225 Highly flammable liquid and vapour.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.
H373 May cause damage to organs (Central nervous system) through prolonged or repeated exposure.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements:

Prevention:
P210 Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P233 Keep container tightly closed.
P241 Use explosion-proof electrical/ ventilating/ lighting equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P260 Do not breathe mist or vapours.
P264 Wash skin thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P314 Get medical advice/ attention if you feel unwell.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P391 Collect spillage.

Storage:
P403 + P235 Store in a well-ventilated place. Keep cool.

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

Other hazards which do not result in classification
Vapours may form explosive mixture with air.

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>1,3-Dioxan-5-ol</td>
<td>4740-78-7</td>
<td>&gt;= 30 -&lt; 60</td>
</tr>
<tr>
<td>Butanone</td>
<td>78-93-3</td>
<td>&gt;= 10 -&lt; 20</td>
</tr>
<tr>
<td>Abamectin (combination of avermectin B1a and</td>
<td>71751-41-2</td>
<td>&gt;= 1 -&lt; 2.5</td>
</tr>
</tbody>
</table>
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Abamectin (with Propylene Glycol) Formulation

<table>
<thead>
<tr>
<th>Version</th>
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<tr>
<td>1.1</td>
<td>2020/03/23</td>
<td>4795003-00002</td>
<td>2019/08/29</td>
<td>2019/08/29</td>
</tr>
</tbody>
</table>

3. / 20 avermectin B1b)

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. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. 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.

If swallowed: If swallowed, DO NOT induce vomiting. If vomiting occurs have person lean forward. Call a physician or poison control centre immediately. Rinse mouth thoroughly with water. Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed: Causes serious eye irritation. Harmful if inhaled. May cause damage to organs through prolonged or repeated exposure.

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: High volume water jet

Specific hazards during firefighting: Do not use a solid water stream as it may scatter and spread fire. Flash back possible over considerable distance. Vapours may form explosive mixtures with air. Exposure to combustion products may be a hazard to health.

Hazardous combustion products: Carbon oxides
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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: Remove all sources of ignition. Ventilate the area. Use personal protective equipment. Follow safe handling advice and personal protective equipment recommendations.

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 cannot be contained.

Methods and materials for containment and cleaning up: Non-sparking tools should be used. Soak up with inert absorbent material. Suppress (knock down) gases/vapours/mists with a water spray jet. 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.

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. If advised by assessment of the local exposure potential, use only in an area equipped with explosion-proof exhaust ventilation.

Advice on safe handling: Do not breathe vapours or spray mist. Do not swallow. Do not get in eyes.
Avoid prolonged or repeated contact with skin. Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment. Non-sparking tools should be used. Keep container tightly closed. Keep away from heat and sources of ignition. Take precautionary measures against static discharges. 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. Keep in a cool, well-ventilated place. Store in accordance with the particular national regulations. Keep away from heat and sources of ignition.

**Materials to avoid**: Do not store with the following product types:
- Self-reactive substances and mixtures
- Organic peroxides
- Oxidizing agents
- Flammable gases
- Pyrophoric liquids
- Pyrophoric solids
- Self-heating substances and mixtures
- Poisonous gases
- Explosives

## 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>
<tbody>
<tr>
<td>Butanone</td>
<td>78-93-3</td>
<td>NAB</td>
<td>200 ppm</td>
<td>ID OEL</td>
</tr>
</tbody>
</table>

Further information: Upper respiratory tract irritation, Identifies chemicals that need a BEI (= Biological Exposure Indices)

<table>
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<th>Components</th>
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<th>Control parameters / Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abamectin (combination of avermectin B1a and avermectin B1b)</td>
<td>71751-41-2</td>
<td>TWA</td>
<td>30 µg/m³ (OEB 3)</td>
<td>Internal</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Control parameters</th>
<th>Biological specimen</th>
<th>Sampling time</th>
<th>Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Control parameters</th>
<th>Biological specimen</th>
<th>Sampling time</th>
<th>Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
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</tbody>
</table>

**Biological occupational exposure limits**

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Control parameters</th>
<th>Biological specimen</th>
<th>Sampling time</th>
<th>Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
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<td></td>
</tr>
</tbody>
</table>
### 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Butanone</th>
<th>78-93-3</th>
<th>methyl ethyl ketone</th>
<th>Urine</th>
<th>End of shift (As soon as possible after exposure ceases)</th>
<th>2 mg/l</th>
<th>ACGIH BEI</th>
</tr>
</thead>
</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

Hand protection

Material: Chemical-resistant gloves

**Remarks**: Consider double gloving. Take note that the product is flammable, which may impact the selection of hand protection.

**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.

**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.

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.
<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>Colorless to pale yellow</td>
</tr>
<tr>
<td>Odour</td>
<td>characteristic</td>
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<tr>
<td>Odour Threshold</td>
<td>No data available</td>
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<tr>
<td>pH</td>
<td>No data available</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>&lt; -66 °C</td>
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<tr>
<td>Initial boiling point and boiling range</td>
<td>82 °C</td>
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<tr>
<td>Flash point</td>
<td>16 °C</td>
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<tr>
<td>Evaporation rate</td>
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</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flammability (liquids)</td>
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</tr>
<tr>
<td>Upper explosion limit / Upper flammability limit</td>
<td>No data available</td>
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<tr>
<td>Lower explosion limit / Lower flammability limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapour pressure</td>
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<tr>
<td>Relative vapour density</td>
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<tr>
<td>Relative density</td>
<td>1.05 - 1.09</td>
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<tr>
<td>Density</td>
<td>No data available</td>
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<tr>
<td>Solubility(ies)</td>
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</tr>
<tr>
<td>Water solubility</td>
<td>slightly soluble</td>
</tr>
<tr>
<td>Solubility in other solvents</td>
<td>soluble</td>
</tr>
<tr>
<td>Solvent: Ethanol</td>
<td></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>
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<tr>
<td>Decomposition temperature</td>
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<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>
</tbody>
</table>
10. STABILITY AND REACTIVITY

Reactivity: Not classified as a reactivity hazard.
Chemical stability: Stable under normal conditions.
Possibility of hazardous reactions:
- Highly flammable liquid and vapour.
  Vapours may form explosive mixture with air.
  Can react with strong oxidizing agents.

Conditions to avoid: Heat, flames and sparks.
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**
Harmful if inhaled.

**Product:**

<table>
<thead>
<tr>
<th>Toxicity Route</th>
<th>Estimate</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute oral toxicity</td>
<td>&gt; 2,000 mg/kg</td>
<td>Calculation method</td>
</tr>
<tr>
<td>Acute inhalation toxicity</td>
<td>2.3 mg/l</td>
<td>Calculation method</td>
</tr>
<tr>
<td>Acute dermal toxicity</td>
<td>&gt; 2,000 mg/kg</td>
<td>Calculation method</td>
</tr>
</tbody>
</table>

**Components:**

**1,3-Dioxan-5-ol:**
- Acute oral toxicity: LD50 (Rat): > 5,000 mg/kg
- Acute dermal toxicity: LD50 (Rat): > 2,000 mg/kg
  Remarks: Based on data from similar materials

**Butanone:**
### Acute oral toxicity
- LD50 (Rat): > 2,000 - 5,000 mg/kg
- Remarks: Based on data from similar materials

### Acute inhalation toxicity
- LC50 (Rat): > 25.5 mg/l
- Exposure time: 4 h
- Test atmosphere: vapour
- Method: OECD Test Guideline 436
- Remarks: Based on data from similar materials

### Acute dermal toxicity
- LD50 (Rabbit): > 5,000 mg/kg

**Abamectin (combination of avermectin B1a and avermectin B1b):**

### Acute oral toxicity
- LD50 (Rat): 24 mg/kg
  - LD50 (Mouse): 10 mg/kg
  - LDLo (Monkey): 24 mg/kg
  - Symptoms: Dilatation of the pupil

### Acute inhalation toxicity
- LC50 (Rat): 0.023 mg/l
  - Exposure time: 4 h
  - Test atmosphere: dust/mist

### Acute dermal toxicity
- LD50 (Rabbit): 330 mg/kg
  - LD50 (Rabbit): 2,000 mg/kg

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

**Components:**

**1,3-Dioxan-5-ol:**
- **Species:** Rabbit
- **Method:** OECD Test Guideline 404
- **Result:** No skin irritation
- **Remarks:** Based on data from similar materials

**Butanone:**
- **Assessment:** Repeated exposure may cause skin dryness or cracking.

- **Species:** Rabbit
- **Method:** OECD Test Guideline 404
- **Result:** No skin irritation
- **Remarks:** Based on data from similar materials

**Abamectin (combination of avermectin B1a and avermectin B1b):**
- **Species:** Rabbit
- **Result:** No skin irritation
Serious eye damage/eye irritation
Causes serious eye irritation.

Components:

1,3-Dioxan-5-ol:
Species : Rabbit
Result : Irritation to eyes, reversing within 21 days
Method : OECD Test Guideline 405
Remarks : Based on data from similar materials

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

Abamectin (combination of avermectin B1a and avermectin B1b):
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.

Components:

1,3-Dioxan-5-ol:
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

Butanone:
Test Type : Buehler Test
Exposure routes : Skin contact
Species : Guinea pig
Method : OECD Test Guideline 406
Result : negative

Abamectin (combination of avermectin B1a and avermectin B1b):
Test Type : Maximisation Test
Exposure routes : Skin contact
Result : Not a skin sensitizer.
Germ cell mutagenicity
Not classified based on available information.

Components:

1,3-Dioxan-5-ol:
Genotoxicity in vitro: Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

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

Genotoxicity in vivo: Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Mouse
Result: negative
Remarks: Based on data from similar materials

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

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

Genotoxicity in vitro: Test Type: Chromosome aberration test in vitro
Result: negative

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

Genotoxicity in vitro: Test Type: Saccharomyces cerevisiae, gene mutation assay (in vitro)
Result: negative

Abamectin (combination of avermectin B1a and avermectin B1b):
Genotoxicity in vitro: Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Genotoxicity in vitro: Test Type: In vitro mammalian cell gene mutation test
Test system: Chinese hamster lung cells
Result: negative

Genotoxicity in vitro: Test Type: Alkaline elution assay
Result: negative
Genotoxicity in vivo : Test Type: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis)
Species: Mouse
Application Route: Intraperitoneal injection
Result: negative

Carcinogenicity
Not classified based on available information.

Components:
Abamectin (combination of avermectin B1a and avermectin B1b):
Species : Rat
Application Route : Oral
Exposure time : 105 weeks
Result : negative

Species : Mouse
Application Route : Oral
Exposure time : 93 weeks
Result : negative

Reproductive toxicity
Not classified based on available information.

Components:
Butanone:
Effects on fertility : Test Type: Two-generation reproduction toxicity study
Species: Rat
Application Route: Ingestion
Result: negative
Remarks: Based on data from similar materials

Effects on foetal development : Test Type: Embryo-foetal development
Species: Rat
Application Route: Inhalation
Method: OECD Test Guideline 414
Result: negative

Abamectin (combination of avermectin B1a and avermectin B1b):
Effects on fertility : Test Type: Fertility
Species: Rat, male
Application Route: Oral
Result: Effects on fertility

Test Type: Two-generation reproduction toxicity study
Species: Rat
Application Route: Oral
Early Embryonic Development: NOAEL: 0.12 mg/kg body weight
### SAFETY DATA SHEET

**Abamectin (with Propylene Glycol) Formulation**

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<td>4795003-00002</td>
<td>2019/08/29</td>
<td>2019/08/29</td>
</tr>
</tbody>
</table>

#### Result: Fetotoxicity

**Effects on foetal development**
- **Test Type:** Embryo-foetal development
- **Species:** Mouse
- **Application Route:** Oral
- **General Toxicity Maternal:** NOAEL: 0.05 mg/kg body weight
- **Developmental Toxicity:** NOAEL: 0.2 mg/kg body weight
- **Result:** Cleft palate
- **Remarks:** Adverse developmental effects were observed

**Test Type:** Embryo-foetal development
- **Species:** Rabbit
- **Application Route:** Oral
- **Developmental Toxicity:** LOAEL: 2 mg/kg body weight
- **Result:** Cleft palate, Teratogenic effects, Reduced embryonic survival
- **Remarks:** Adverse developmental effects were observed

**Test Type:** Development
- **Species:** Rat
- **Application Route:** Oral
- **Developmental Toxicity:** LOAEL: 1.6 mg/kg body weight
- **Result:** Teratogenic effects

**Reproductive toxicity - Assessment**
- **Remarks:** Some evidence of adverse effects on sexual function and fertility, based on animal experiments. Some evidence of adverse effects on development, based on animal experiments.

#### STOT - single exposure

Not classified based on available information.

**Components:**

**Butanone:**
- **Assessment:** May cause drowsiness or dizziness.

#### STOT - repeated exposure

May cause damage to organs (Central nervous system) through prolonged or repeated exposure.

**Components:**

**Abamectin (combination of avermectin B1a and avermectin B1b):**
- **Exposure routes:** Ingestion
- **Target Organs:** Central nervous system
- **Assessment:** Causes damage to organs through prolonged or repeated exposure.

**Repeated dose toxicity**

**Components:**

**Butanone:**
### Abamectin (combination of avermectin B1a and avermectin B1b):

- **Species**: Rat  
  **NOAEL**: 1.5 mg/kg  
  **Application Route**: Oral  
  **Exposure time**: 24 Months  
  **Target Organs**: Central nervous system  
  **Symptoms**: Tremors, ataxia

- **Species**: Mouse  
  **NOAEL**: 4.0 mg/kg  
  **Application Route**: Oral  
  **Exposure time**: 24 Months  
  **Target Organs**: Central nervous system  
  **Symptoms**: Tremors, ataxia

- **Species**: Dog  
  **NOAEL**: 0.25 mg/kg  
  **LOAEL**: 0.5 mg/kg  
  **Application Route**: Oral  
  **Exposure time**: 53 Weeks  
  **Target Organs**: Central nervous system  
  **Symptoms**: Tremors, weight loss  
  **Remarks**: mortality observed

### Aspiration toxicity

Not classified based on available information.

### Components:

**Butanone:**

The substance or mixture causes concern owing to the assumption that it causes a human aspiration toxicity hazard.

### Experience with human exposure

**Components:**

**Abamectin (combination of avermectin B1a and avermectin B1b):**

- **Ingestion**: Symptoms: May cause, Tremors, Diarrhoea, central nervous system effects, Salivation, tearing
12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

1,3-Dioxan-5-ol:
Toxicity to fish: LL50 (Pimephales promelas (fathead minnow)): > 100 mg/l
Exposure time: 96 h
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates: EL50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h
Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants: EL50 (Pseudokirchneriella subcapitata (green algae)): > 100 mg/l
Exposure time: 72 h
Remarks: Based on data from similar materials

NOELR (Pseudokirchneriella subcapitata (green algae)): > 1 mg/l
Exposure time: 72 h
Remarks: Based on data from similar materials

Toxicity to microorganisms: EC10: > 1,000 mg/l
Exposure time: 3 h
Method: OECD Test Guideline 209
Remarks: Based on data from similar materials

Butanone:
Toxicity to fish: LC50 (Pimephales promelas (fathead minnow)): 2,993 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): 308 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants: ErC50 (Pseudokirchneriella subcapitata (green algae)): 2,029 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 201

NOEC (Pseudokirchneriella subcapitata (green algae)): 1,240 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 201

Abamectin (combination of avermectin B1a and avermectin B1b):
Toxicity to fish: LC50 (Oncorhynchus mykiss (rainbow trout)): 3.2 µg/l
Exposure time: 96 h
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LC50 (Lepomis macrochirus (Bluegill sunfish)): 9.6 µg/l
Exposure time: 96 h

LC50 (Ictalurus punctatus (channel catfish)): 24 µg/l
Exposure time: 96 h

LC50 (Cyprinus carpio (Carp)): 42 µg/l
Exposure time: 96 h

LC50 (Cyprinodon variegatus (sheepshead minnow)): 15 µg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates:
EC50 (Americamysis): 0.022 µg/l
Exposure time: 96 h
EC50 (Daphnia magna (Water flea)): 0.34 µg/l
Exposure time: 48 h

Toxicity to algae/aquatic plants:
EC50 (Pseudokirchneriella subcapitata (green algae)): 100 mg/l
Exposure time: 72 h

M-Factor (Acute aquatic toxicity): 10,000
Toxicity to fish (Chronic toxicity):
NOEC (Pimephales promelas (fathead minnow)): 0.52 µg/l
Exposure time: 32 d

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):
NOEC (Daphnia magna (Water flea)): 0.03 µg/l
Exposure time: 21 d
NOEC (Mysidopsis bahia (opossum shrimp)): 0.0035 µg/l
Exposure time: 28 d

M-Factor (Chronic aquatic toxicity): 10,000
Toxicity to microorganisms:
EC50: > 1,000 mg/l
Exposure time: 3 h
Test Type: Respiration inhibition

Persistence and degradability

Components:

1,3-Dioxan-5-ol:
Biodegradability: Result: Inherently biodegradable.
Remarks: Based on data from similar materials

Butanone:
Biodegradability: Result: Readily biodegradable.
Biodegradation: 98 %
Exposure time: 28 d
Method: OECD Test Guideline 301D
SAFETY DATA SHEET

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**Abamectin (combination of avermectin B1a and avermectin B1b):**

**Stability in water:** Hydrolysis: 50 % (< 12 h)

**Bioaccumulative potential**

**Components:**

- **1,3-Dioxan-5-ol:**
  - Partition coefficient: n-octanol/water: log Pow: -0.65

- **Butanone:**
  - Partition coefficient: n-octanol/water: log Pow: 0.3

**Abamectin (combination of avermectin B1a and avermectin B1b):**

**Bioaccumulation:** Bioconcentration factor (BCF): 52

**Partition coefficient: n-octanol/water:** log Pow: 4

**Mobility in soil**

**Components:**

**Abamectin (combination of avermectin B1a and avermectin B1b):**

**Distribution among environmental compartments:** log Koc: > 3.6

**Other adverse effects**

No data available

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**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. Empty containers retain residue and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury and/or death. If not otherwise specified: Dispose of as unused product.

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**14. TRANSPORT INFORMATION**

**International Regulations**

**UNRTDG**

- **UN number:** UN 1993
- **Proper shipping name:** FLAMMABLE LIQUID, N.O.S. (Butanone)
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Abamectin (with Propylene Glycol) Formulation

Class: 3
Packing group: II
Labels: 3

IATA-DGR
UN/ID No.: UN 1993
Proper shipping name: Flammable liquid, n.o.s. (Butanone)
Class: 3
Packing group: II
Labels: Flammable Liquids
Packing instruction (cargo aircraft): 364
Packing instruction (passenger aircraft): 353

IMDG-Code
UN number: UN 1993
Proper shipping name: FLAMMABLE LIQUID, N.O.S. (Butanone, Abamectin (combination of avermectin B1a and avermectin B1b))
Class: 3
Packing group: II
Labels: 3
EmS Code: F-E, S-E
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 variations in regional or country regulations.

15. REGULATORY INFORMATION

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

Minister of Industry Regulation No. 23/M-IND/PER/4/2013 concerning the Revision of Minister of Industry Regulation No. 87/M-IND/PER/9/2009 concerning Globally Harmonized System of Classification and Labelling of Chemicals.

Regulation of the Minister of Health No. 472 of 1996 on the Safeguarding of Substances Hazardous to Health
Hazardous substances that must be registered: Not applicable

Government Regulation No. 74 of 2001 on the Management of Hazardous and Toxic Substances
Hazardous substances approved for use: Butanone
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Prohibited substances: Not applicable
Restricted substances: Not applicable

Regulation of the Minister of Trade No. 44 of 2009 on Procurement, Distribution and Supervision of Hazardous Materials
Type of Hazardous Materials Restricted to Import, Distribution and Supervision: Not applicable

The components of this product are reported in the following inventories:
AICS: not determined
DSL: not determined
IECSC: not determined

16. OTHER INFORMATION

Further information
Date format: yyyy/mm/dd
Full text of other abbreviations
ACGIH: USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI: ACGIH - Biological Exposure Indices (BEI)
ID OEL: Indonesia. Occupational Exposure Limits
ACGIH / TWA: 8-hour, time-weighted average
ACGIH / STEL: Short-term exposure limit
ID OEL / NAB: Long term exposure limit
ID OEL / PSD: Short term exposure limit
AICS - Australian Inventory of Chemical Substances; 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 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
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.

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