SAFETY DATA SHEET

Abamectin Liquid Formulation

Version 3.5  Revision Date: 09/13/2019  SDS Number: 1219563-00010  Date of last issue: 24.04.2019
Date of first issue: 18.01.2017

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: Abamectin Liquid Formulation

Manufacturer or supplier’s details
Company: MSD
Address: 50 Tuas West Drive
Singapore - Singapore 638408
Telephone: 908-740-4000
Emergency telephone number: 65 6697 2111 (24/7/365)
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
Acute toxicity (Inhalation): Category 4
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: Warning

Hazard statements:
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:
P260 Do not breathe mist or vapours.
P271 Use only outdoors or in a well-ventilated area.
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P273 Avoid release to the environment.

**Response:**

- **P304 + P340 + P312 IF INHALED:** Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
- **P314 Get medical advice/ attention if you feel unwell.**
- **P391 Collect spillage.**

**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

<table>
<thead>
<tr>
<th>Substance / Mixture</th>
<th>Components</th>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixture</td>
<td>Abamectin (combination of avermectin B1a and avermectin B1b)</td>
<td>71751-41-2</td>
<td>&gt;= 1 -&lt; 2.5</td>
<td></td>
</tr>
</tbody>
</table>

### 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 soap and 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:**

- Flush eyes with water as a precaution.
- Get medical attention if irritation develops and persists.

**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:**

- 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 : None known.

Specific hazards during firefighting : Exposure to combustion products may be a hazard to health.

Hazardous combustion products : Carbon 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 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 : 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.

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.
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ventilation.

Advice on safe handling : Do not breathe vapours or spray mist.
Do not swallow.
Avoid contact with 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
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.
Keep tightly closed.
Keep in a cool, well-ventilated place.
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>
<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>
<tr>
<td></td>
<td></td>
<td>Wipe limit</td>
<td>300 µg/100 cm²</td>
<td>Internal</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 and organic vapour type
Hand protection : Chemical-resistant gloves

Remarks : Consider double gloving.
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.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance** : liquid

**Colour** : light yellow

**Odour** : characteristic

**Odour Threshold** : No data available

**pH** : No data available

**Melting point/freezing point** : No data available

**Initial boiling point and boiling range** : No data available

**Flash point** : No data available

**Evaporation rate** : No data available

**Flammability (solid, gas)** : Not applicable

**Flammability (liquids)** : No data available

**Upper explosion limit / Upper flammability limit** : No data available

**Lower explosion limit / Lower flammability limit** : No data available

**Vapour pressure** : No data available

**Relative vapour density** : No data available
Relative density: No data available

Density: 0.90 - 0.94 g/cm³

Solubility(ies):
- Water solubility: insoluble

Partition coefficient: n-octanol/water: Not applicable

Auto-ignition temperature: No data available

Decomposition temperature: No data available

Viscosity:
- Viscosity, kinematic: No data available

Explosive properties: Not explosive

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

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 reactions: 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
Harmful if inhaled.

Product:
- Acute oral toxicity: Acute toxicity estimate: > 2,000 mg/kg
  Method: Calculation method

- Acute inhalation toxicity: Acute toxicity estimate: 2.3 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:**

**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 (Rat): 330 mg/kg
LD50 (Rabbit): 2,000 mg/kg

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

**Components:**

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

Species: Rabbit
Result: No skin irritation

**Serious eye damage/eye irritation**
Not classified based on available information.

**Components:**

**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:**

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

Test Type: Maximisation Test
Exposure routes: Skin contact
Result: Not a skin sensitizer.
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Germ cell mutagenicity
Not classified based on available information.

Components:
Abamectin (combination of avermectin B1a and avermectin B1b):
Genotoxicity in vitro:
Test Type: Bacterial reverse mutation assay (AMES)
Result: negative
Test Type: In vitro mammalian cell gene mutation test
Test system: Chinese hamster lung cells
Result: negative
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:
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
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:

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.

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:

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
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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

Species: Monkey
NOAEL: 1.0 mg/kg
Application Route: Oral
Exposure time: 14 Weeks
Target Organs: Central nervous system

Aspiration toxicity
Not classified based on available information.

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:

Abamectin (combination of avermectin B1a and avermectin B1b):

Toxicity to fish: LC50 (Onchorhynchus mykiss (rainbow trout)): 3.2 µg/l
Exposure time: 96 h

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 (Mysisidopsis 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:

Abamectin (combination of avermectin B1a and avermectin B1b):
Stability in water: Hydrolysis: 50 % (< 12 h)

Bioaccumulative potential

Components:

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
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.
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, N.O.S.
(Abamectin (combination of avermectin B1a and avermectin B1b))
Class: 9
Packing group: III
Labels: 9

**IATA-DGR**
UN/ID No.: UN 3082
Proper shipping name: Environmentally hazardous substance, liquid, n.o.s.
(Abamectin (combination of avermectin B1a and avermectin B1b))
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.
(Abamectin (combination of avermectin B1a and avermectin B1b))
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.
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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

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 (Hazardous Substances) Regulations: Not applicable

Fire Safety (Petroleum and Flammable Materials) Regulations: 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: dd.mm.yyyy

Full text of other abbreviations

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 Con-
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