SAFETY DATA SHEET

Fluralaner / Moxidectin Liquid Formulation

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Fluralaner / Moxidectin Liquid Formulation

Manufacturer or supplier’s details

Company : MSD
Address : 26 Talavera Road, Talavera Corp Centre, Macquarie Park
New South Wales, 2113 Australia
Telephone : (61)-02-8988-8000
Emergency telephone number : (61)-02-8988-8000
E-mail address : EHSDATASTEWARD@msd.com
Telefax : 908-735-1496

Recommended use of the chemical and restrictions on use

Recommended use : Veterinary product

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Flammable liquids : Category 2
Skin corrosion/irritation : Category 2
Serious eye damage/eye irritation : Category 2A
Reproductive toxicity : Category 1B
Specific target organ toxicity - repeated exposure : Category 2 (Central nervous system)

GHS label elements

Hazard pictograms : [Flammable, Skin Irritant, Eye Irritant, Reproductive Toxicity]
Signal word : Danger
Hazard statements : H225 Highly flammable liquid and vapour.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H360D May damage the unborn child.
H373 May cause damage to organs (Central nervous system) through prolonged or repeated exposure.
Precautionary statements:

**Prevention:**
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
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.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P281 Use personal protective equipment as required.

**Response:**
P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical advice/attention.
P332 + P313 IF skin irritation occurs: Get medical advice/attention.
P337 + P313 IF eye irritation persists: Get medical advice/attention.
P362 Take off contaminated clothing and wash before reuse.

**Storage:**
P403 + P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.

**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.

**SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**

<table>
<thead>
<tr>
<th>Substance / Mixture</th>
<th>Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical name</td>
<td>CAS-No.</td>
</tr>
<tr>
<td>N,N-Dimethylacetamide</td>
<td>127-19-5</td>
</tr>
<tr>
<td>Fluralaner</td>
<td>864731-61-3</td>
</tr>
<tr>
<td>N,N-Diethyl-m-toluamide</td>
<td>134-62-3</td>
</tr>
<tr>
<td>Acetone</td>
<td>67-64-1</td>
</tr>
<tr>
<td>Moxidectin</td>
<td>113507-06-5</td>
</tr>
</tbody>
</table>
SECTION 4. FIRST AID MEASURES

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

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

In case of skin contact: In case of contact, immediately flush skin with plenty of water 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. Get medical attention. Rinse mouth thoroughly with water.

Most important symptoms and effects, both acute and delayed:
- Causes skin irritation.
- Causes serious eye irritation.
- May damage the unborn child.
- 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.

Notes to physician: Treat symptomatically and supportively.

SECTION 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
- Chlorine compounds
- Fluorine compounds
- Nitrogen oxides (NOx)

Specific extinguishing methods:
- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
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Fluralaner / Moxidectin Liquid Formulation

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.

Hazchem Code: •2YE

SECTION 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.

SECTION 7. HANDLING AND STORAGE

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

Local/Total ventilation:
Use with local exhaust ventilation.
Use only in an area equipped with explosion-proof exhaust ventilation if advised by assessment of the local exposure potential.

Advice on safe handling:
Do not get on skin or clothing.
Do not breathe vapours or spray 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 as-
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.

Hygiene measures:
- Ensure that eye flushing systems and safety showers are located 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.

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

### SECTION 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>N,N-Dimethylacetamide</td>
<td>127-19-5</td>
<td>TWA</td>
<td>10 ppm 36 mg/m³</td>
<td>AU OEL</td>
</tr>
<tr>
<td>Fluralaner</td>
<td>864731-61-3</td>
<td>TWA</td>
<td>100 µg/m³ (OEL 2)</td>
<td>Internal</td>
</tr>
<tr>
<td>Acetone</td>
<td>67-64-1</td>
<td>STEL</td>
<td>1,000 ppm 2,375 mg/m³</td>
<td>AU OEL</td>
</tr>
</tbody>
</table>

Further information:
- **Skin absorption:**
  - TWA 10 ppm ACGIH
  - STEL 1,000 ppm 2,375 mg/m³ AU OEL
- **Skin wipe limit:**
  - 1000 µg/100 cm² Internal
  - TWA 500 ppm 1,185 mg/m³ AU OEL
  - STEL 250 ppm ACGIH
  - TWA 500 ppm ACGIH
Moxidectin | 113507-06-5 | TWA | 10 µg/m³ (OEB 3) | Internal Wipe limit | 100 µg/100 cm² | Internal

**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>
<tr>
<td>N,N-Dimethylacetamide</td>
<td>127-19-5</td>
<td>N-Methyla-cetamide</td>
<td>Urine</td>
<td>End of shift at end of work-week</td>
<td>30 mg/g Creatinine</td>
<td>ACGIH BEI</td>
</tr>
<tr>
<td>Acetone</td>
<td>67-64-1</td>
<td>Acetone</td>
<td>Urine</td>
<td>End of shift (As soon as possible after exposure ceases)</td>
<td>25 mg/l</td>
<td>ACGIH BEI</td>
</tr>
</tbody>
</table>

**Engineering measures**

- Use appropriate engineering controls and manufacturing technologies to control airborne concentrations (e.g., drip-less quick connections).
- All engineering controls should be implemented by facility design and operated in accordance with GMP principles to protect products, workers, and the environment.
- Containment technologies suitable for controlling compounds are required to control at source and to prevent migration of the compound to uncontrolled areas (e.g., open-face containment devices).
- Minimize open handling.

**Personal protective equipment**

- **Respiratory protection**: Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines.
  - **Filter type**: Self-contained breathing apparatus
  - **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.

### SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>liquid</td>
</tr>
<tr>
<td>Colour</td>
<td>clear</td>
</tr>
<tr>
<td>Odour</td>
<td>No information available.</td>
</tr>
<tr>
<td>Odour Threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>No data available</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>2 °C</td>
</tr>
<tr>
<td>Method</td>
<td>closed cup</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flammability (liquids)</td>
<td>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>1.06</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>Not applicable</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity</td>
<td></td>
</tr>
<tr>
<td>Viscosity, kinematic</td>
<td>No data available</td>
</tr>
<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

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.

SECTION 11. TOXICOLOGICAL INFORMATION

Exposure routes:
- Inhalation
- Skin contact
- Ingestion
- Eye contact

Acute toxicity:
Not classified based on available information.

Product:

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

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

Acute dermal toxicity: Acute toxicity estimate: > 2,000 mg/kg
Method: Calculation method

Components:

N,N-Dimethylacetamide:

Acute oral toxicity: LD50 (Rat): 4,800 mg/kg

Acute inhalation toxicity: LC50 (Rat): 2.2 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist

Acute dermal toxicity: Acute toxicity estimate: 1,100 mg/kg
Method: Expert judgement
Remarks: Based on harmonised classification in EU regulation 1272/2008, Annex VI

Fluralaner:

Acute oral toxicity: LD50 (Rat): > 2,000 mg/kg
Remarks: No mortality observed at this dose.
No significant adverse effects were reported

**Acute dermal toxicity**
- LD50 (Rat): > 2,000 mg/kg
  - Remarks: No significant adverse effects were reported

**N,N-Diethyl-m-toluamide:**
- **Acute oral toxicity**
  - LD50 (Rat): 1,950 mg/kg
- **Acute inhalation toxicity**
  - LC50 (Rat): 5.95 mg/l
    - Exposure time: 4 h
    - Test atmosphere: dust/mist
- **Acute dermal toxicity**
  - LD50 (Rat): 5,000 mg/kg

**Acetone:**
- **Acute oral toxicity**
  - LD50 (Rat): 5,800 mg/kg
- **Acute inhalation toxicity**
  - LC50 (Rat): 76 mg/l
    - Exposure time: 4 h
    - Test atmosphere: vapour
- **Acute dermal toxicity**
  - LD50 (Rabbit): 7,426 mg/kg

**Moxidectin:**
- **Acute oral toxicity**
  - LD50 (Rat): 106 mg/kg
    - LD50 (Mouse): 42 - 84 mg/kg
- **Acute inhalation toxicity**
  - LC50 (Rat): 3.28 mg/l
    - Exposure time: 5 h
    - Test atmosphere: dust/mist
    - LC50 (Rat): 2.87 - 4.06 mg/l
    - Test atmosphere: dust/mist
- **Acute dermal toxicity**
  - LD50 (Rat): > 2,000 mg/kg
    - Remarks: No significant adverse effects were reported

**Acute toxicity (other routes of administration)**
- LD50 (Rat): 394 mg/kg
  - Application Route: Intraperitoneal
    - LD50 (Mouse): 84 mg/kg
      - Application Route: Intraperitoneal
    - LD50 (Rat): > 640 mg/kg
      - Application Route: Subcutaneous
    - LD50 (Mouse): 263 mg/kg
      - Application Route: Subcutaneous

**Skin corrosion/irritation**
- Causes skin irritation.
Components:

**N,N-Dimethylacetamide:**
Species: Rabbit
Result: No skin irritation

**Fluralaner:**
Species: Rabbit
Result: No skin irritation

**N,N-Diethyl-m-toluamide:**
Species: Rabbit
Result: Skin irritation

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

**Moxidectin:**
Species: Rabbit
Result: Mild skin irritant

Serious eye damage/eye irritation
Causes serious eye irritation.

Components:

**N,N-Dimethylacetamide:**
Species: Rabbit
Result: Irritation to eyes, reversing within 21 days

**Fluralaner:**
Species: Rabbit
Result: Mild eye irritant

**N,N-Diethyl-m-toluamide:**
Species: Rabbit
Result: Irritation to eyes, reversing within 21 days

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

**Moxidectin:**
Species: Rabbit
Result: Moderate eye irritation
Respiratory or skin sensitisation

Skin sensitisation
Not classified based on available information.

Respiratory sensitisation
Not classified based on available information.

Components:

N,N-Dimethylacetamide:
Exposure routes: Skin contact
Species: Guinea pig
Result: negative

Fluralaner:
Test Type: Maximisation Test
Exposure routes: Dermal
Species: Guinea pig
Result: Not a skin sensitizer.

Acetone:
Test Type: Maximisation Test
Exposure routes: Skin contact
Species: Guinea pig
Result: negative

Moxidectin:
Test Type: Büchner Test
Exposure routes: Dermal
Species: Guinea pig
Result: Not a skin sensitizer.

Chronic toxicity

Germ cell mutagenicity
Not classified based on available information.

Components:

N,N-Dimethylacetamide:
Genotoxicity in vitro: Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Genotoxicity in vivo: Test Type: Rodent dominant lethal test (germ cell) (in vivo)
Species: Rat
Application Route: Inhalation
Method: OECD Test Guideline 478
Result: negative

Fluralaner:
Genotoxicity in vitro: Test Type: Bacterial reverse mutation assay (AMES)
Result: negative
### Genotoxicity in vivo

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micronucleus test</td>
<td>negative</td>
</tr>
<tr>
<td>Mammalian erythrocyte micronucleus test</td>
<td>negative</td>
</tr>
</tbody>
</table>

### N,N-Diethyl-m-toluamide:

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacterial reverse mutation assay (AMES)</td>
<td>negative</td>
</tr>
</tbody>
</table>

### Acetone:

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>In vitro mammalian cell gene mutation test</td>
<td>negative</td>
</tr>
<tr>
<td>Bacterial reverse mutation assay (AMES)</td>
<td>negative</td>
</tr>
<tr>
<td>Chromosome aberration test in vitro</td>
<td>negative</td>
</tr>
</tbody>
</table>

### Moxidectin:

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacterial reverse mutation assay (AMES)</td>
<td>negative</td>
</tr>
<tr>
<td>In vitro mammalian cell gene mutation test</td>
<td>negative</td>
</tr>
<tr>
<td>Chromosomal aberration</td>
<td>negative</td>
</tr>
<tr>
<td>Unscheduled DNA synthesis (UDS) test with mammalian liver cells in vivo</td>
<td>negative</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Species</th>
<th>Cell type</th>
<th>Application Route</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mouse</td>
<td>Bone marrow</td>
<td>Oral</td>
<td>negative</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Species</th>
<th>Cell type</th>
<th>Application Route</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mouse</td>
<td>Bone marrow</td>
<td>Ingestion</td>
<td>negative</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Species</th>
<th>Cell type</th>
<th>Application Route</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rat</td>
<td>Bone marrow</td>
<td></td>
<td>negative</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Species</th>
<th>Cell type</th>
<th>Application Route</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rat</td>
<td></td>
<td></td>
<td>negative</td>
</tr>
</tbody>
</table>
Carcinogenicity
Not classified based on available information.

Components:

**N,N-Dimethylacetamide:**
Species: Rat  
Application Route: Inhilation (vapour)  
Exposure time: 18 month(s)  
Result: negative

**Fluralaner:**
Carcinogenicity - Assessment: No data available

**N,N-Diethyl-m-toluamide:**
Species: Rat  
Application Route: Ingestion  
Exposure time: 104 weeks  
Result: negative

**Acetone:**
Species: Mouse  
Application Route: Skin contact  
Exposure time: 424 days  
Result: negative

**Moxidectin:**
Species: Mouse  
Application Route: Oral  
Exposure time: 2 Years  
NOAEL: 4.5 mg/kg body weight  
Result: negative

Species: Rat  
Application Route: Oral  
Exposure time: 2 Years  
NOAEL: 4.5 mg/kg body weight  
Result: negative

Species: Dog  
Application Route: Oral  
Exposure time: 1 Years  
NOAEL: 0.5 mg/kg body weight  
Result: negative

Reproductive toxicity
May damage the unborn child.
Components:

N,N-Dimethylacetamide:

Effects on fertility : Test Type: One-generation reproduction toxicity study
Species: Rat
Application Route: Inhalation
Result: negative

Effects on foetal development : Test Type: Embryo-foetal development
Species: Rat
Application Route: Inhalation
Result: positive

Reproductive toxicity - Assessment : Clear evidence of adverse effects on development, based on animal experiments.

Fluralaner:

Effects on fertility : Test Type: Two-generation study
Species: Rat
Application Route: Oral
General Toxicity - Parent: NOAEL: 50 mg/kg body weight
General Toxicity F1: LOAEL: 100 mg/kg body weight
Result: No effects on fertility, Postimplantation loss., Adverse neonatal effects.

Test Type: One-generation reproduction toxicity study
Species: Dog
Application Route: Oral
Fertility: NOAEL: 75 mg/kg body weight
Result: No effects on fertility and early embryonic development were detected.
Remarks: No significant adverse effects were reported

Effects on foetal development : Test Type: Development
Species: Rat
Application Route: Oral
Developmental Toxicity: NOAEL: 100 mg/kg body weight
Result: Embryotoxic effects and adverse effects on the offspring were detected only at high maternally toxic doses, No teratogenic effects

Test Type: Development
Species: Rabbit
Application Route: Oral
Developmental Toxicity: NOAEL: 10 mg/kg body weight
Result: Skeletal malformations, Visceral malformations
Remarks: Maternal toxicity observed.

Test Type: Development
Species: Rabbit
Application Route: Dermal
Developmental Toxicity: NOAEL: 100 mg/kg body weight
Result: Skeletal malformations
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reproductive toxicity - Assessment</strong></td>
<td>Suspected of damaging the unborn child.</td>
</tr>
<tr>
<td><strong>N,N-Diethyl-m-toluamide:</strong></td>
<td>Test Type: Embryo-foetal development</td>
</tr>
<tr>
<td>Effects on foetal development</td>
<td>Species: Rat</td>
</tr>
<tr>
<td></td>
<td>Application Route: Ingestion</td>
</tr>
<tr>
<td></td>
<td>Result: negative</td>
</tr>
<tr>
<td><strong>Acetone:</strong></td>
<td>Test Type: One-generation reproduction toxicity study</td>
</tr>
<tr>
<td>Effects on fertility</td>
<td>Species: Rat</td>
</tr>
<tr>
<td></td>
<td>Application Route: Ingestion</td>
</tr>
<tr>
<td></td>
<td>Result: negative</td>
</tr>
<tr>
<td>Effects on foetal development</td>
<td>Test Type: Embryo-foetal development</td>
</tr>
<tr>
<td></td>
<td>Species: Rat</td>
</tr>
<tr>
<td></td>
<td>Application Route: inhalation (vapour)</td>
</tr>
<tr>
<td></td>
<td>Result: negative</td>
</tr>
<tr>
<td><strong>Moxidectin:</strong></td>
<td>Test Type: Two-generation reproduction toxicity study</td>
</tr>
<tr>
<td>Effects on fertility</td>
<td>Species: Rat</td>
</tr>
<tr>
<td></td>
<td>Application Route: Oral</td>
</tr>
<tr>
<td>General Toxicity F1:</td>
<td>LOAEL: 0.8 mg/kg body weight</td>
</tr>
<tr>
<td>Symptomatics:</td>
<td>Reduced foetal weight, foetal mortality</td>
</tr>
<tr>
<td>Result:</td>
<td>No effects on fertility, Some evidence of adverse effects on</td>
</tr>
<tr>
<td></td>
<td>development, based on animal experiments.</td>
</tr>
<tr>
<td>Test Type: Three-generation reproduction toxicity study</td>
<td>Species: Rat</td>
</tr>
<tr>
<td></td>
<td>Application Route: Oral</td>
</tr>
<tr>
<td>General Toxicity F1:</td>
<td>LOAEL: 0.8 mg/kg body weight</td>
</tr>
<tr>
<td>Symptomatics:</td>
<td>Reduced foetal weight, foetal mortality</td>
</tr>
<tr>
<td>Result:</td>
<td>No effects on fertility, Some evidence of adverse effects on</td>
</tr>
<tr>
<td></td>
<td>development, based on animal experiments.</td>
</tr>
<tr>
<td>Effects on foetal development</td>
<td>Test Type: Embryo-foetal development</td>
</tr>
<tr>
<td></td>
<td>Species: Rat</td>
</tr>
<tr>
<td></td>
<td>Application Route: Oral</td>
</tr>
<tr>
<td>General Toxicity Maternal:</td>
<td>LOAEL: 10 mg/kg body weight</td>
</tr>
<tr>
<td>Embryo-foetal toxicity:</td>
<td>LOAEL: 10 mg/kg body weight</td>
</tr>
<tr>
<td>Result:</td>
<td>Skeletal malformations</td>
</tr>
<tr>
<td>Remarks:</td>
<td>The effects were seen only at maternally toxic doses.</td>
</tr>
<tr>
<td>Test Type: Embryo-foetal development</td>
<td>Species: Rabbit</td>
</tr>
<tr>
<td></td>
<td>Application Route: Oral</td>
</tr>
<tr>
<td>General Toxicity Maternal:</td>
<td>LOAEL: 5 mg/kg body weight</td>
</tr>
<tr>
<td>Developmental Toxicity:</td>
<td>NOAEL: 10 mg/kg body weight</td>
</tr>
<tr>
<td>Result:</td>
<td>No teratogenic effects, No embryotoxic effects</td>
</tr>
<tr>
<td>Reproductive toxicity - Assessment</td>
<td>Some evidence of adverse effects on development, based on</td>
</tr>
</tbody>
</table>
**SAFETY DATA SHEET**

**Fluralaner / Moxidectin Liquid Formulation**

<table>
<thead>
<tr>
<th>Version</th>
<th>Revision Date</th>
<th>SDS Number</th>
<th>Date of last issue: 12.04.2018</th>
<th>Date of first issue: 02.05.2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2</td>
<td>10/18/2018</td>
<td>656872-00009</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**STOT - single exposure**
Not classified based on available information.

**Components:**

**Acetone:**
Assessment: May cause drowsiness or dizziness.

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

**Components:**

**Moxidectin:**
Target Organs: Central nervous system
Assessment: Causes damage to organs through prolonged or repeated exposure.

**Repeated dose toxicity**

**Components:**

**N,N-Dimethylacetamide:**
<table>
<thead>
<tr>
<th>Species</th>
<th>NOAEL</th>
<th>LOAEL</th>
<th>Application Route</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rat</td>
<td>90 mg/m³</td>
<td>360 mg/m³</td>
<td>inhalation (vapour)</td>
<td>24 Months</td>
</tr>
</tbody>
</table>

**Fluralaner:**
<table>
<thead>
<tr>
<th>Species</th>
<th>NOAEL</th>
<th>Application Route</th>
<th>Exposure time</th>
<th>Target Organs</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dog</td>
<td>1 mg/kg</td>
<td>Oral</td>
<td>52 Weeks</td>
<td>Liver</td>
<td>No significant adverse effects were reported</td>
</tr>
<tr>
<td>Juvenile dog</td>
<td>56 - 280 mg/kg</td>
<td>Oral</td>
<td>24 Weeks</td>
<td>Liver, thymus</td>
<td></td>
</tr>
<tr>
<td>Rat</td>
<td>400 mg/kg</td>
<td>Oral</td>
<td>90 Days</td>
<td>Liver, thymus</td>
<td></td>
</tr>
<tr>
<td>Rat</td>
<td>500 mg/kg</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Application Route</td>
<td>Exposure time</td>
<td>Target Organs</td>
<td>Remarks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------</td>
<td>---------------</td>
<td>---------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dermal</td>
<td>90 Days</td>
<td>Liver</td>
<td>No significant adverse effects were reported</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Acetone:
- **Species**: Rat
- **NOAEL**: 900 mg/kg
- **LOAEL**: 1,700 mg/kg
- **Application Route**: Ingestion
- **Exposure time**: 90 Days

### Moxidectin:
- **Species**: Mouse
- **NOAEL**: 3.9 mg/kg
- **LOAEL**: 15.4 mg/kg
- **Application Route**: Oral
- **Exposure time**: 4 Weeks
- **Symptoms**: Tremors

- **Species**: Rat
- **NOAEL**: 3.9 mg/kg
- **LOAEL**: 7.9 mg/kg
- **Application Route**: Oral
- **Exposure time**: 13 Weeks
- **Target Organs**: Central nervous system
- **Symptoms**: Tremors, Salivation

- **Species**: Dog
- **NOAEL**: 0.3 mg/kg
- **LOAEL**: 0.9 mg/kg
- **Application Route**: Oral
- **Exposure time**: 90 Days
- **Target Organs**: Central nervous system
- **Symptoms**: Tremors, Lachrymation, Salivation

- **Species**: Dog
- **NOAEL**: 0.3 mg/kg
- **LOAEL**: 0.87 mg/kg
- **Application Route**: Oral
- **Exposure time**: 52 Weeks
- **Target Organs**: Central nervous system
- **Symptoms**: Tremors, Lachrymation

**Aspiration toxicity**
Not classified based on available information.
Components:

Fluralaner:
Not applicable

Experience with human exposure

Components:

Fluralaner:
Skin contact: Remarks: May irritate skin.
Eye contact: Remarks: May cause eye irritation.

Moxidectin:
Inhalation: Remarks: No human information is available.
Skin contact: Remarks: No human information is available.
Eye contact: Remarks: No human information is available.
Ingestion: Remarks: No human information is available.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

N,N-Dimethylacetamide:
Toxicity to fish: LC50 (Leuciscus idus (Golden orfe)): > 500 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): > 500 mg/l
Exposure time: 48 h

Toxicity to algae: EC50 (Desmodesmus subspicatus (green algae)): > 500 mg/l
Exposure time: 72 h

EC10 (Desmodesmus subspicatus (green algae)): > 500 mg/l
Exposure time: 72 h

Toxicity to microorganisms: EC10: > 1,995 mg/l
Exposure time: 30 min

Fluralaner:
Toxicity to fish: LC50 (Oncorhynchus mykiss (rainbow trout)): > 0.0488 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203
Remarks: No toxicity at the limit of solubility

Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): > 0.015 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202
Remarks: No toxicity at the limit of solubility

Toxicity to algae: NOEC (Pseudokirchneriella subcapitata (green algae)): >=
Toxicity to fish (Chronic toxicity)  
Exposure time: 72 h  
Method: OECD Test Guideline 201  
Remarks: No toxicity at the limit of solubility

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)  
Exposure time: 21 d  
Method: OECD Test Guideline 204  
Remarks: No toxicity at the limit of solubility

**N,N-Diethyl-m-toluamide:**
Toxicity to fish  
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates  
Exposure time: 48 h

**Acetone:**
Toxicity to fish  
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates  
Exposure time: 48 h

Toxicity to algae  
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)  
Exposure time: 21 d  
Method: OECD Test Guideline 211

Toxicity to microorganisms  
Exposure time: 30 min  
Method: ISO 8192

**Moxidectin:**
Toxicity to fish  
Exposure time: 96 h  
Method: OECD Test Guideline 203

LC50 (Oncorhynchus mykiss (rainbow trout)): 0.0002 mg/l  
Exposure time: 96 h  
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates  
Exposure time: 48 h  
Method: OECD Test Guideline 202
Toxicity to algae:
  EC50 (Pseudokirchneriella subcapitata (green algae)): 0.087 mg/l
  Exposure time: 72 h
  Method: OECD Test Guideline 201

Persistence and degradability

Components:

N,N-Dimethylacetamide:
  Biodegradability: Result: Not readily biodegradable.
  Biodegradation: 70 %
  Exposure time: 28 d
  Remarks: The 10 day time window criterion is not fulfilled.

N,N-Diethyl-m-toluamide:
  Biodegradability: Result: Not readily biodegradable.

Acetone:
  Biodegradability: Result: Readily biodegradable.

Bioaccumulative potential

Components:

Fluralaner:
  Bioaccumulation: Species: Zebrafish
  Bioconcentration factor (BCF): 79.4
  Method: OECD Test Guideline 305
  Partition coefficient: n-octanol/water: log Pow: 4.5

N,N-Diethyl-m-toluamide:
  Partition coefficient: n-octanol/water: log Pow: 2.02

Acetone:
  Partition coefficient: n-octanol/water: log Pow: -0.27 - -0.23

Moxidectin:
  Partition coefficient: n-octanol/water: log Pow: 4.7

Mobility in soil

Components:

Fluralaner:
  Distribution among environmental compartments: log Koc: 3.4
Other adverse effects

Components:

Fluralaner:
Results of PBT and vPvB assessment: This substance is not considered to be persistent, bioaccumulating and toxic (PBT).

SECTION 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.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG
UN number: UN 1090
Proper shipping name: ACETONE SOLUTION
Class: 3
Packing group: II
Labels: 3

IATA-DGR
UN/ID No.: UN 1090
Proper shipping name: Acetone solution
Class: 3
Packing group: II
Labels: Flammable Liquids
Packing instruction (cargo aircraft): 364
Packing instruction (passenger aircraft): 353

IMDG-Code
UN number: UN 1090
Proper shipping name: ACETONE SOLUTION
(Moxidectin, 2,6-Di-tert-butyl-p-cresol)
Class: 3
Packing group: II
Labels: 3
EmS Code: F-E, S-D
Marine pollutant: yes

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

Fluralaner / Moxidectin Liquid Formulation

National Regulations

ADG
UN number : UN 1090
Proper shipping name : ACETONE SOLUTION
Class : 3
Packing group : II
Labels : 3
Hazchem Code : •2YE

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.

SECTION 15. REGULATORY INFORMATION

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

Prohibition/Licensing Requirements : There is no applicable prohibition or notification/licensing requirements, including for carcinogens under Commonwealth, State or Territory legislation.

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

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

SECTION 16. OTHER INFORMATION

Further information
Revision Date : 10/18/2018

Date format : dd.mm.yyyy

Full text of other abbreviations
ACGIH : USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI : ACGIH - Biological Exposure Indices (BEI)
AU OEL : Australia. Workplace Exposure Standards for Airborne Contaminants.

ACGIH / TWA : 8-hour, time-weighted average
ACGIH / STEL : Short-term exposure limit
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.

AU / EN