SAFETY DATA SHEET

Fluralaner / Moxidectin Liquid Formulation

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

1.1 Product identifier
   Trade name: Fluralaner / Moxidectin Liquid Formulation

1.2 Relevant identified uses of the substance or mixture and uses advised against
   Use of the Substance/Mixture: Veterinary product

1.3 Details of the supplier of the safety data sheet
   Company: MSD
   20 Spartan Road
   1619 Spartan, South Africa
   Telephone: +27119239300
   Telefax: 908-735-1496
   E-mail address of person responsible for the SDS: EHSDATASTEWARD@msd.com

1.4 Emergency telephone number
   1-908-423-6000

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture
   Classification (REGULATION (EC) No 1272/2008)
   Flammable liquids, Category 2
   Skin irritation, Category 2
   Eye irritation, Category 2
   Reproductive toxicity, Category 1B
   Specific target organ toxicity - repeated exposure, Category 2
   Short-term (acute) aquatic hazard, Category 1
   Long-term (chronic) aquatic hazard, Category 1
   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 through prolonged or repeated exposure.
   H400: Very toxic to aquatic life.
   H410: Very toxic to aquatic life with long lasting effects.

2.2 Label elements
   Labelling (REGULATION (EC) No 1272/2008)
   Hazard pictograms: 
   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 through prolonged or repeated exposure.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements

**Prevention:**
- P201 Obtain special instructions before use.
- P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- P273 Avoid release to the environment.
- P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

**Response:**
- P308 + P313 IF exposed or concerned: Get medical advice/attention.
- P391 Collect spillage.

Hazardous components which must be listed on the label:

- N,N-Dimethylacetamide
- Moxidectin

**Additional Labelling**

Restricted to professional users.

The following percentage of the mixture consists of ingredient(s) with unknown hazards to the aquatic environment: 20 %

**2.3 Other hazards**

Vapours may form explosive mixture with air.

**SECTION 3: Composition/information on ingredients**

**3.2 Mixtures**

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>EC-No.</th>
<th>Index-No.</th>
<th>Registration number</th>
<th>Classification</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N,N-Dimethylacetamide</td>
<td>127-19-5</td>
<td>204-826-4</td>
<td>616-011-00-4</td>
<td></td>
<td>Acute Tox.4; H332 Acute Tox.4; H312 Eye Irrit.2; H319 Repr.1B; H360D</td>
<td>&gt;= 30 - &lt; 50</td>
</tr>
<tr>
<td>Fluralaner</td>
<td>864731-61-3</td>
<td></td>
<td></td>
<td></td>
<td>Repr.2; H361d Aquatic Chronic1; H410</td>
<td>&gt;= 25 - &lt; 30</td>
</tr>
<tr>
<td>N,N-Diethyl-m-toluamide</td>
<td>134-62-3</td>
<td>205-149-7</td>
<td>616-018-00-2</td>
<td></td>
<td>Acute Tox.4; H302 Skin Irrit.2; H315 Eye Irrit.2; H319 Aquatic Chronic3; H412</td>
<td>&gt;= 10 - &lt; 20</td>
</tr>
</tbody>
</table>
SECTION 4: First aid measures

4.1 Description of first aid measures

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

Protection of first-aiders: First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists.

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.

4.2 Most important symptoms and effects, both acute and delayed

Risks: Causes skin irritation. Causes serious eye irritation. May damage the unborn child. May cause damage to organs through prolonged or repeated
4.3 Indication of any immediate medical attention and special treatment needed

Treatment: Treat symptomatically and supportively.

SECTION 5: Firefighting measures

5.1 Extinguishing media

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

Unsuitable extinguishing media:
- High volume water jet

5.2 Special hazards arising from the substance or mixture

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)

5.3 Advice for firefighters

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

Specific extinguishing methods:
- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- Use water spray to cool unopened containers.
- Remove undamaged containers from fire area if it is safe to do so.
- Evacuate area.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions:
- Remove all sources of ignition.
- Ventilate the area.
- Use personal protective equipment.
- Follow safe handling advice and personal protective equipment recommendations.

6.2 Environmental precautions

Environmental precautions:
- Discharge into the environment must be avoided.
Prevent further leakage or spillage if safe to do so.
Prevent spreading over a wide area (e.g. by containment or oil barriers).
Retain and dispose of contaminated wash water.
Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and material for containment and cleaning up

Methods for 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.

6.4 Reference to other sections

See sections: 7, 8, 11, 12 and 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Technical measures: See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.
Local/Total ventilation: Use 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 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.

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.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers:

Advice on common storage:
- Do not store with the following product types:
  - Strong oxidizing agents
  - Organic peroxides
  - Flammable solids
  - Pyrophoric liquids
  - Pyrophoric solids
  - Self-heating substances and mixtures
  - Substances and mixtures, which in contact with water, emit flammable gases
  - Explosives
  - Gases

7.3 Specific end use(s)

Specific use(s):
- No data available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type (Form of exposure)</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>N,N-Dimethylacetamide</td>
<td>127-19-5</td>
<td>TWA OEL-RL</td>
<td>10 ppm</td>
<td>ZA OEL</td>
</tr>
<tr>
<td>Further information</td>
<td>Absorption through the skin, Recommended Limit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL OEL-RL</td>
<td>20 ppm</td>
<td>ZA OEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>71 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Further information</td>
<td>Absorption through the skin, Recommended Limit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL</td>
<td>20 ppm</td>
<td>2000/39/EC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>72 mg/m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10 ppm</td>
<td>2000/39/EC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>36 mg/m³</td>
<td></td>
</tr>
<tr>
<td>Fluralaner</td>
<td>864731-61-3</td>
<td>TWA</td>
<td>100 µg/m³ (OEB 2)</td>
<td>Internal</td>
</tr>
<tr>
<td>Further information</td>
<td>Skin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wipe limit</td>
<td>1000 µg/100 cm²</td>
<td>Internal</td>
</tr>
<tr>
<td>Acetone</td>
<td>67-64-1</td>
<td>TWA OEL-RL</td>
<td>750 ppm</td>
<td>ZA OEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.780 mg/m³</td>
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<tr>
<td>Further information</td>
<td>Recommended Limit</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL OEL-RL</td>
<td>1.500 ppm</td>
<td>ZA OEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3.560 mg/m³</td>
<td></td>
</tr>
</tbody>
</table>
### Further information

<table>
<thead>
<tr>
<th>Substance</th>
<th>CAS-No.</th>
<th>TWA</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moxidectin</td>
<td>113507-06-5</td>
<td>TWA</td>
<td>10 µg/m³ (OEB 3)</td>
<td>Internal</td>
</tr>
<tr>
<td>2,6-Di-tert-butyl-p-cresol</td>
<td>128-37-0</td>
<td>Wipe limit</td>
<td>100 µg/100 cm²</td>
<td>Internal</td>
</tr>
</tbody>
</table>

### Biological occupational exposure limits

<table>
<thead>
<tr>
<th>Substance name</th>
<th>CAS-No.</th>
<th>Control parameters</th>
<th>Sampling time</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetone</td>
<td>67-64-1</td>
<td>Acetone: 100 mg/l (Urine)</td>
<td>End of shift</td>
<td>ZA BEl</td>
</tr>
</tbody>
</table>

### Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

<table>
<thead>
<tr>
<th>Substance name</th>
<th>End Use</th>
<th>Exposure routes</th>
<th>Potential health effects</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>N,N-Dimethylacetamide</td>
<td>Workers</td>
<td>Inhalation</td>
<td>Long-term systemic effects</td>
<td>36 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Workers</td>
<td>Inhalation</td>
<td>Acute systemic effects</td>
<td>36 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Workers</td>
<td>Skin contact</td>
<td>Acute systemic effects</td>
<td>13.6 mg/kg bw/day</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Inhalation</td>
<td>Long-term local effects</td>
<td>7 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Skin contact</td>
<td>Long-term systemic effects</td>
<td>2.7 mg/kg bw/day</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Ingestion</td>
<td>Long-term systemic effects</td>
<td>1 mg/kg bw/day</td>
</tr>
<tr>
<td>Acetone</td>
<td>Workers</td>
<td>Inhalation</td>
<td>Long-term systemic effects</td>
<td>1210 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Workers</td>
<td>Inhalation</td>
<td>Acute local effects</td>
<td>2420 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Workers</td>
<td>Skin contact</td>
<td>Long-term systemic effects</td>
<td>186 mg/kg bw/day</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Inhalation</td>
<td>Long-term systemic effects</td>
<td>200 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Skin contact</td>
<td>Long-term systemic effects</td>
<td>62 mg/kg bw/day</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Ingestion</td>
<td>Long-term systemic effects</td>
<td>62 mg/kg bw/day</td>
</tr>
<tr>
<td>2,6-Di-tert-butyl-p-cresol</td>
<td>Workers</td>
<td>Inhalation</td>
<td>Long-term systemic effects</td>
<td>3.5 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Workers</td>
<td>Dermal</td>
<td>Long-term systemic effects</td>
<td>0.5 mg/kg bw/day</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Inhalation</td>
<td>Long-term systemic effects</td>
<td>0.86 mg/m³</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Dermal</td>
<td>Long-term systemic effects</td>
<td>0.25 mg/kg bw/day</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Ingestion</td>
<td>Long-term systemic effects</td>
<td>0.25 mg/kg bw/day</td>
</tr>
</tbody>
</table>
Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

<table>
<thead>
<tr>
<th>Substance name</th>
<th>Environmental Compartment</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>N,N-Dimethylacetamide</td>
<td>Fresh water</td>
<td>0.5 mg/l</td>
</tr>
<tr>
<td></td>
<td>Marine water</td>
<td>0.0966 mg/l</td>
</tr>
<tr>
<td></td>
<td>Intermittent use/release</td>
<td>5 mg/l</td>
</tr>
<tr>
<td></td>
<td>Sewage treatment plant</td>
<td>485 mg/l</td>
</tr>
<tr>
<td></td>
<td>Fresh water sediment</td>
<td>2.27 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Soil</td>
<td>0.15 mg/kg</td>
</tr>
<tr>
<td>Acetone</td>
<td>Fresh water</td>
<td>10.6 mg/l</td>
</tr>
<tr>
<td></td>
<td>Marine water</td>
<td>1.06 mg/l</td>
</tr>
<tr>
<td></td>
<td>Intermittent use/release</td>
<td>21 mg/l</td>
</tr>
<tr>
<td></td>
<td>Sewage treatment plant</td>
<td>100 mg/l</td>
</tr>
<tr>
<td></td>
<td>Fresh water sediment</td>
<td>30.4 mg/kg dry weight (d.w.)</td>
</tr>
<tr>
<td></td>
<td>Marine sediment</td>
<td>3.04 mg/kg dry weight (d.w.)</td>
</tr>
<tr>
<td></td>
<td>Soil</td>
<td>29.5 mg/kg dry weight (d.w.)</td>
</tr>
<tr>
<td>2,6-Di-tert-butyl-p-cresol</td>
<td>Fresh water</td>
<td>0.199 µg/l</td>
</tr>
<tr>
<td></td>
<td>Intermittent use/release</td>
<td>0.02 µg/l</td>
</tr>
<tr>
<td></td>
<td>Marine water</td>
<td>0.02 µg/l</td>
</tr>
<tr>
<td></td>
<td>Sewage treatment plant</td>
<td>0.17 mg/l</td>
</tr>
<tr>
<td></td>
<td>Fresh water sediment</td>
<td>0.0996 mg/kg dry weight (d.w.)</td>
</tr>
<tr>
<td></td>
<td>Marine sediment</td>
<td>0.00996 mg/kg dry weight (d.w.)</td>
</tr>
<tr>
<td></td>
<td>Soil</td>
<td>0.04769 mg/kg dry weight (d.w.)</td>
</tr>
</tbody>
</table>

8.2 Exposure controls

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

Eye protection: Wear safety glasses with side shields or goggles. If the work environment or activity involves dusty conditions, mists or aerosols, wear the appropriate goggles. Wear a faceshield or other full face protection if there is a potential for direct contact to the face with dusts, mists, or aerosols.

Hand protection

Material: Chemical-resistant gloves

Remarks: Consider double gloving. Take note that the product is flam-
Skin and body protection: Work uniform or laboratory coat. Additional body garments should be used based upon the task being performed (e.g., sleevelets, apron, gauntlets, disposable suits) to avoid exposed skin surfaces. Use appropriate degowning techniques to remove potentially contaminated clothing.

Respiratory protection: 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

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance: liquid
Colour: clear
Odour: No information available.
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: 2 °C Method: closed cup
Evaporation rate: No data available
Flammability (solid, gas): Not applicable
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: 1.06
Density: No data available
Solubility(ies)
Water solubility: No data available
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.

9.2 Other information
Flammability (liquids) : Not applicable

| Particle size | Not applicable |

SECTION 10: Stability and reactivity

10.1 Reactivity
Not classified as a reactivity hazard.

10.2 Chemical stability
Stable under normal conditions.

10.3 Possibility of hazardous reactions

| Hazardous reactions | Highly flammable liquid and vapour.  
|                     | Vapours may form explosive mixture with air.  
|                     | Can react with strong oxidizing agents. |

10.4 Conditions to avoid
Conditions to avoid : Heat, flames and sparks.

10.5 Incompatible materials
Materials to avoid : Oxidizing agents

10.6 Hazardous decomposition products
No hazardous decomposition products are known.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

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

Acute toxicity
Not classified based on available information.

Product:
Acute oral toxicity : Acute toxicity estimate: > 2.000 mg/kg
Method: Calculation method
### Acute Inhalation Toxicity
- **Exposure time:** 4 h
- **Test atmosphere:** dust/mist
- **Acute toxicity estimate:** $> 5 \, \text{mg/l}$

### Acute Dermal Toxicity
- **Acute toxicity estimate:** $> 2.000 \, \text{mg/kg}$
- **Method:** Calculation method

---

### Components:

#### N,N-Dimethylacetamide:

- **Acute Oral Toxicity:**
  - LD$_{50}$ (Rat): $4.800 \, \text{mg/kg}$

- **Acute Inhalation Toxicity:**
  - LC$_{50}$ (Rat): $2.2 \, \text{mg/l}$
  - **Exposure time:** 4 h
  - **Test atmosphere:** dust/mist

- **Acute Dermal Toxicity:**
  - Acute toxicity estimate: $1.100 \, \text{mg/kg}$
  - **Method:** Expert judgement
  - **Remarks:** Based on harmonised classification in EU regulation 1272/2008, Annex VI

#### Fluralaner:

- **Acute Oral Toxicity:**
  - LD$_{50}$ (Rat): $> 2.000 \, \text{mg/kg}$
  - **Remarks:** No mortality observed at this dose.
  - No significant adverse effects were reported

- **Acute Dermal Toxicity:**
  - LD$_{50}$ (Rat): $> 2.000 \, \text{mg/kg}$
  - **Remarks:** No significant adverse effects were reported

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

- **Acute Oral Toxicity:**
  - LD$_{50}$ (Rat): $1.950 \, \text{mg/kg}$

- **Acute Inhalation Toxicity:**
  - LC$_{50}$ (Rat): $5.95 \, \text{mg/l}$
  - **Exposure time:** 4 h
  - **Test atmosphere:** dust/mist

- **Acute Dermal Toxicity:**
  - LD$_{50}$ (Rat): $5.000 \, \text{mg/kg}$

#### Acetone:

- **Acute Oral Toxicity:**
  - LD$_{50}$ (Rat): $5.800 \, \text{mg/kg}$

- **Acute Inhalation Toxicity:**
  - LC$_{50}$ (Rat): $76 \, \text{mg/l}$
  - **Exposure time:** 4 h
  - **Test atmosphere:** vapour

- **Acute Dermal Toxicity:**
  - LD$_{50}$ (Rabbit): $7.426 \, \text{mg/kg}$

#### Moxidectin:

- **Acute Oral Toxicity:**
  - LD$_{50}$ (Rat): $106 \, \text{mg/kg}$
**Acute inhalation toxicity:**
- **LD50 (Mouse):** 42 - 84 mg/kg
- **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

### 2,6-Di-tert-butyl-p-cresol:

**Acute oral toxicity:**
- **LD50 (Rat):** > 6.000 mg/kg
  - Method: OECD Test Guideline 401

**Acute dermal toxicity:**
- **LD50 (Rat):** > 2.000 mg/kg
  - Method: OECD Test Guideline 402
  - Assessment: The substance or mixture has no acute dermal toxicity

**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

2,6-Di-tert-butyl-p-cresol:
Species: Rabbit
Method: OECD Test Guideline 404
Result: No skin irritation
Remarks: Based on data from similar materials

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

Moxidectin:
Species: Rabbit
Result: Moderate eye irritation

2,6-Di-tert-butyl-p-cresol:
Species: Rabbit
Method: OECD Test Guideline 405
Result: No eye irritation
Remarks: Based on data from similar materials

Respiratory or skin sensitisation

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

Components:

N,N-Dimethylacetamide:
<table>
<thead>
<tr>
<th>Exposure routes</th>
<th>Species</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin contact</td>
<td>Guinea pig</td>
<td>negative</td>
</tr>
</tbody>
</table>

Fluralaner:
<table>
<thead>
<tr>
<th>Test Type</th>
<th>Exposure routes</th>
<th>Species</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximisation Test</td>
<td>Dermal</td>
<td>Guinea pig</td>
<td>Not a skin sensitizer.</td>
</tr>
</tbody>
</table>

Acetone:
<table>
<thead>
<tr>
<th>Test Type</th>
<th>Exposure routes</th>
<th>Species</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximisation Test</td>
<td>Skin contact</td>
<td>Guinea pig</td>
<td>negative</td>
</tr>
</tbody>
</table>

Moxidectin:
<table>
<thead>
<tr>
<th>Test Type</th>
<th>Exposure routes</th>
<th>Species</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buehler Test</td>
<td>Dermal</td>
<td>Guinea pig</td>
<td>Not a skin sensitizer.</td>
</tr>
</tbody>
</table>

2,6-Di-tert-butyl-p-cresol:
<table>
<thead>
<tr>
<th>Test Type</th>
<th>Exposure routes</th>
<th>Species</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human repeat insult patch test (HRIPT)</td>
<td>Skin contact</td>
<td>Humans</td>
<td>negative</td>
</tr>
</tbody>
</table>

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) |
Genotoxicity in vivo: 
Result: negative
Test Type: Mouse Lymphoma
Result: negative
Test Type: Chromosomal aberration
Result: negative

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

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

Acetone:
Genotoxicity in vitro: 
Test Type: In vitro mammalian cell gene mutation test
Result: negative
Test Type: Bacterial reverse mutation assay (AMES)
Result: negative
Test Type: Chromosome aberration test in vitro
Result: negative
Genotoxicity in vivo: 
Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Mouse
Application Route: Ingestion
Result: negative

Moxidectin:
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 ovary cells
Result: negative
Test Type: in vitro assay
Test system: Escherichia coli
Result: negative
Genotoxicity in vivo: 
Test Type: Chromosomal aberration
Species: Rat
Cell type: Bone marrow
Result: negative
Test Type: Unscheduled DNA synthesis (UDS) test with mammalian liver cells in vivo
Species: Rat
Cell type: Liver cells
Result: negative

2,6-Di-tert-butyl-p-cresol:

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

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

Test Type: Chromosome aberration test in vitro
Result: negative

Genotoxicity in vivo: Test Type: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis)
Species: Rat
Application Route: Ingestion
Result: negative

Carcinogenicity

Not classified based on available information.

Components:

N,N-Dimethylacetamide:

Species: Rat
Application Route: inhalation (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

<table>
<thead>
<tr>
<th>Species</th>
<th>Rat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Route</td>
<td>Oral</td>
</tr>
<tr>
<td>Exposure time</td>
<td>2 Years</td>
</tr>
<tr>
<td>NOAEL</td>
<td>4.5 mg/kg body weight</td>
</tr>
<tr>
<td>Result</td>
<td>negative</td>
</tr>
</tbody>
</table>

### NOAEL

<table>
<thead>
<tr>
<th>Species</th>
<th>Dog</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Route</td>
<td>Oral</td>
</tr>
<tr>
<td>Exposure time</td>
<td>1 Years</td>
</tr>
<tr>
<td>NOAEL</td>
<td>0.5 mg/kg body weight</td>
</tr>
<tr>
<td>Result</td>
<td>negative</td>
</tr>
</tbody>
</table>

### 2,6-Di-tert-butyl-p-cresol:

<table>
<thead>
<tr>
<th>Species</th>
<th>Rat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Route</td>
<td>Ingestion</td>
</tr>
<tr>
<td>Exposure time</td>
<td>22 Months</td>
</tr>
<tr>
<td>Result</td>
<td>negative</td>
</tr>
</tbody>
</table>

### 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

Reproductive toxicity - Assessment:
Suspected of damaging the unborn child.

N,N-Diethyl-m-toluamide:

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

Acetone:

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

Effects on foetal development:
Test Type: Embryo-foetal development
Species: Rat
Application Route: inhalation (vapour)
Result: negative

Moxidectin:

Effects on fertility:
Test Type: Two-generation reproduction toxicity study
Species: Rat
Application Route: Oral
General Toxicity F1: LOAEL: 0.8 mg/kg body weight
Symptoms: Reduced foetal weight, foetal mortality
Result: No effects on fertility, Some evidence of adverse effects on development, based on animal experiments.
Test Type: Three-generation reproduction toxicity study
Species: Rat
Application Route: Oral
General Toxicity F1: LOAEL: 0.8 mg/kg body weight
Symptoms: Reduced foetal weight, foetal mortality
Result: No effects on fertility, Some evidence of adverse effects on development, based on animal experiments.

Effects on foetal development:
Species: Rat
Application Route: Oral
General Toxicity Maternal: LOAEL: 10 mg/kg body weight
Embryo-foetal toxicity: LOAEL: 10 mg/kg body weight
Result: Skeletal malformations
Remarks: The effects were seen only at maternally toxic doses.

Test Type: Embryo-foetal development
Species: Rabbit
Application Route: Oral
General Toxicity Maternal: LOAEL: 5 mg/kg body weight
Developmental Toxicity: NOAEL: 10 mg/kg body weight
Result: No teratogenic effects, No embryotoxic effects
Remarks: The effects were seen only at maternally toxic doses.

Reproductive toxicity - Assessment:
Species: Rat
Application Route: Oral
Result: negative

2,6-Di-tert-butyl-p-cresol:
Test Type: Two-generation reproduction toxicity study
Species: Rat
Application Route: Ingestion
Result: negative

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 through prolonged or repeated exposure.

Components:

Moxidectin:
Target Organs: Central nervous system
Assessment: Causes damage to organs through prolonged or repeated exposure
**2,6-Di-tert-butyl-p-cresol:**
- **Assessment:** No significant health effects observed in animals at concentrations of 100 mg/kg bw or less.

### Repeated dose toxicity

#### Components:

**N,N-Dimethylacetamide:**
- **Species:** Rat
- **NOAEL:** 90 mg/m³
- **LOAEL:** 360 mg/m³
- **Application Route:** Inhalation (vapour)
- **Exposure time:** 24 Months

**Fluralaner:**
- **Species:** Dog
- **NOAEL:** 1 mg/kg
- **Application Route:** Oral
- **Exposure time:** 52 Weeks
- **Target Organs:** Liver
- **Remarks:** No significant adverse effects were reported

#### Species
- **Species:** Juvenile dog
- **LOAEL:** 56 - 280 mg/kg
- **Application Route:** Oral
- **Exposure time:** 24 Weeks
- **Symptoms:** Diarrhoea

- **Species:** Rat
- **LOAEL:** 400 mg/kg
- **Application Route:** Oral
- **Exposure time:** 90 Days
- **Target Organs:** Liver, thymus
- **Remarks:** No significant adverse effects were reported

- **Species:** Rat
- **NOAEL:** 500 mg/kg
- **Application Route:** Dermal
- **Exposure time:** 90 Days
- **Target Organs:** Liver
- **Remarks:** No significant adverse effects were reported

**Acetone:**
- **Species:** Rat
- **NOAEL:** 900 mg/kg
- **LOAEL:** 1.700 mg/kg
- **Application Route:** Ingestion
- **Exposure time:** 90 Days
### Fluralaner / Moxidectin Liquid Formulation

**Version**: 4.0  
**Revision Date**: 10/18/2018  
**SDS Number**: 656891-00009  
**Date of last issue**: 12.04.2018  
**Date of first issue**: 02.05.2016

<table>
<thead>
<tr>
<th>Component</th>
<th>Species</th>
<th>NOAEL</th>
<th>LOAEL</th>
<th>Application Route</th>
<th>Exposure time</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluralaner:</td>
<td>Mouse</td>
<td>45 mg/l</td>
<td>15,4 mg/kg</td>
<td>Inhalation (vapour)</td>
<td>8 Weeks</td>
<td>Central nervous system</td>
</tr>
<tr>
<td>Moxidectin:</td>
<td>Rat</td>
<td>3,9 mg/kg</td>
<td>7,9 mg/kg</td>
<td>Oral</td>
<td>13 Weeks</td>
<td>Tremors, Salivation</td>
</tr>
<tr>
<td></td>
<td>Dog</td>
<td>0,3 mg/kg</td>
<td>0,9 mg/kg</td>
<td>Oral</td>
<td>90 Days</td>
<td>Tremors, Lachrymation, Salivation</td>
</tr>
<tr>
<td></td>
<td>Dog</td>
<td>0,3 mg/kg</td>
<td>0,87 mg/kg</td>
<td>Oral</td>
<td>52 Weeks</td>
<td>Tremors, Lachrymation</td>
</tr>
<tr>
<td>2,6-Di-tert-butyl-p-cresol:</td>
<td>Rat</td>
<td>25 mg/kg</td>
<td></td>
<td>Ingestion</td>
<td>22 Months</td>
<td></td>
</tr>
</tbody>
</table>

**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

12.1 Toxicity

Product:

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)): >= 0.08 mg/l
  Exposure time: 72 h
  Method: OECD Test Guideline 201
  Remarks: No toxicity at the limit of solubility
<table>
<thead>
<tr>
<th>Substance</th>
<th>Toxicity to fish (Chronic toxicity):</th>
<th>NOEC: (\geq 0.049) mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Exposure time: 21 d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Species: Zebrafish</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Method: OECD Test Guideline 204</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Remarks: No toxicity at the limit of solubility</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):</td>
<td>NOEC: 0.000047 mg/l</td>
</tr>
<tr>
<td></td>
<td>Exposure time: 21 d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Species: Daphnia magna (Water flea)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Method: OECD Test Guideline 211</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>M-Factor (Chronic aquatic toxicity):</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N,N-Diethyl-m-toluamide:</td>
<td>Toxicity to fish:</td>
<td>LC50 (Pimephales promelas (fathead minnow)): 110 mg/l</td>
</tr>
<tr>
<td></td>
<td>Exposure time: 96 h</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Toxicity to daphnia and other aquatic invertebrates:</td>
<td>EC50 (Daphnia magna (Water flea)): 75 mg/l</td>
</tr>
<tr>
<td></td>
<td>Exposure time: 48 h</td>
<td></td>
</tr>
<tr>
<td>Acetone:</td>
<td>Toxicity to fish:</td>
<td>LC50 (Oncorhynchus mykiss (rainbow trout)): 5.540 mg/l</td>
</tr>
<tr>
<td></td>
<td>Exposure time: 96 h</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Toxicity to daphnia and other aquatic invertebrates:</td>
<td>EC50 (Daphnia pulex (Water flea)): 8.800 mg/l</td>
</tr>
<tr>
<td></td>
<td>Exposure time: 48 h</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Toxicity to algae:</td>
<td>NOEC (Pseudokirchneriella subcapitata (green algae)): 7.000 mg/l</td>
</tr>
<tr>
<td></td>
<td>Exposure time: 96 h</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Toxicity to microorganisms:</td>
<td>EC50: 61.150 mg/l</td>
</tr>
<tr>
<td></td>
<td>Exposure time: 30 min</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Method: ISO 8192</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):</td>
<td>NOEC: (\geq 79) mg/l</td>
</tr>
<tr>
<td></td>
<td>Exposure time: 21 d</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Species: Daphnia magna (Water flea)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Method: OECD Test Guideline 211</td>
<td></td>
</tr>
<tr>
<td>Moxidectin:</td>
<td>Toxicity to fish:</td>
<td>LC50 (Lepomis macrochirus (Bluegill sunfish)): 0.0006 mg/l</td>
</tr>
<tr>
<td></td>
<td>Exposure time: 96 h</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Method: OECD Test Guideline 203</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LC50 (Oncorhynchus mykiss (rainbow trout)): 0.0002 mg/l</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Exposure time: 96 h</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Method: OECD Test Guideline 203</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Toxicity to daphnia and other aquatic invertebrates:</td>
<td>EC50 (Daphnia magna (Water flea)): 0.00003 mg/l</td>
</tr>
<tr>
<td></td>
<td>Exposure time: 48 h</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Method: OECD Test Guideline 202</td>
<td></td>
</tr>
</tbody>
</table>
## Toxicity to algae

<table>
<thead>
<tr>
<th>Substance</th>
<th>EC50 (Pseudokirchneriella subcapitata (green algae))</th>
<th>Exposure time</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moxidectin</td>
<td>0.087 mg/l</td>
<td>72 h</td>
<td>OECD Test Guideline 201</td>
</tr>
<tr>
<td>Fluralaner</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

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

### 2,6-Di-tet-r-butyl-p-cresol:

<table>
<thead>
<tr>
<th>Substance</th>
<th>LC50 (Danio rerio (zebra fish)): &gt; 0.57 mg/l</th>
<th>Exposure time</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moxidectin</td>
<td></td>
<td>96 h</td>
<td>Directive 67/548/EEC, Annex V, C.1</td>
</tr>
<tr>
<td>Fluralaner</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Toxicity to daphnia and other aquatic invertebrates**

<table>
<thead>
<tr>
<th>Substance</th>
<th>EC50 (Daphnia magna (Water flea)): 0.48 mg/l</th>
<th>Exposure time</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moxidectin</td>
<td></td>
<td>48 h</td>
<td>OECD Test Guideline 202</td>
</tr>
<tr>
<td>Fluralaner</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Toxicity to algae**

<table>
<thead>
<tr>
<th>Substance</th>
<th>ErC50 (Pseudokirchneriella subcapitata (green algae)): &gt; 0.24 mg/l</th>
<th>Exposure time</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moxidectin</td>
<td></td>
<td>72 h</td>
<td>OECD Test Guideline 201</td>
</tr>
<tr>
<td>Fluralaner</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOEC (Pseudokirchneriella subcapitata (green algae)): 0.24 mg/l**

**Exposure time: 72 h**

**Method: OECD Test Guideline 201**

**M-Factor (Acute aquatic toxicity):** 1

**Toxicity to microorganisms**

<table>
<thead>
<tr>
<th>Substance</th>
<th>EC50: &gt; 10,000 mg/l</th>
<th>Exposure time</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moxidectin</td>
<td></td>
<td>3 h</td>
<td>OECD Test Guideline 209</td>
</tr>
<tr>
<td>Fluralaner</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Toxicity to fish (Chronic toxicity):**

<table>
<thead>
<tr>
<th>Substance</th>
<th>NOEC: 0.053 mg/l</th>
<th>Exposure time</th>
<th>Species: Oryzias latipes (Japanese medaka)</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moxidectin</td>
<td></td>
<td>30 d</td>
<td></td>
<td>OECD Test Guideline 210</td>
</tr>
<tr>
<td>Fluralaner</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):**

<table>
<thead>
<tr>
<th>Substance</th>
<th>NOEC: 0.316 mg/l</th>
<th>Exposure time</th>
<th>Species: Daphnia magna (Water flea)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moxidectin</td>
<td></td>
<td>21 d</td>
<td></td>
</tr>
<tr>
<td>Fluralaner</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**M-Factor (Chronic aquatic toxicity):** 1

### 12.2 Persistence and degradability

**Components:**

**N,N-Dimethylacetamide:**

<table>
<thead>
<tr>
<th>Biodegradability</th>
<th>Result: Not readily biodegradable.</th>
</tr>
</thead>
</table>
12.3 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

**2,6-Di-tert-butyl-p-cresol:**

- **Bioaccumulation:** Species: Cyprinus carpio (Carp)
- **Bioconcentration factor (BCF):** 330 - 1,800

- **Partition coefficient: n-octanol/water:** log Pow: 5,1

12.4 Mobility in soil

**Components:**

**Fluralaner:**
Distribution among environmental compartments: log Koc: 3.4

12.5 Results of PBT and vPvB assessment

Components:

Fluralaner:

Assessment: This substance is not considered to be persistent, bioaccumulating and toxic (PBT).

12.6 Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product:

Dispose of in accordance with local regulations. According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities.

Contaminated packaging:

Empty containers should be taken to an approved waste handling site for recycling or disposal. 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

14.1 UN number

<table>
<thead>
<tr>
<th>Type</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADN</td>
<td>UN 1090</td>
</tr>
<tr>
<td>ADR</td>
<td>UN 1090</td>
</tr>
<tr>
<td>RID</td>
<td>UN 1090</td>
</tr>
<tr>
<td>IMDG</td>
<td>UN 1090</td>
</tr>
<tr>
<td>IATA</td>
<td>UN 1090</td>
</tr>
</tbody>
</table>

14.2 UN proper shipping name

<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADN</td>
<td>ACETONE, SOLUTION</td>
</tr>
<tr>
<td>ADR</td>
<td>ACETONE, SOLUTION</td>
</tr>
<tr>
<td>RID</td>
<td>ACETONE, SOLUTION</td>
</tr>
<tr>
<td>IMDG</td>
<td>ACETONE, SOLUTION (Moxidectin, 2,6-Di-tert-butyl-p-cresol)</td>
</tr>
<tr>
<td>IATA</td>
<td>Acetone, solution</td>
</tr>
</tbody>
</table>
14.4 Packing group

**ADN**
- Packing group: II
- Classification Code: F1
- Hazard Identification Number: 33
- Labels: 3

**ADR**
- Packing group: II
- Classification Code: F1
- Hazard Identification Number: 33
- Labels: 3
- Tunnel restriction code: (D/E)

**RID**
- Packing group: II
- Classification Code: F1
- Hazard Identification Number: 33
- Labels: 3

**IMDG**
- Packing group: II
- Labels: 3

**IATA (Cargo)**
- Packing instruction (cargo aircraft): 364
- Packing instruction (LQ): Y341
- Packing group: II
- Labels: Flammable Liquids

**IATA (Passenger)**
- Packing instruction (passenger aircraft): 353
- Packing instruction (LQ): Y341
- Packing group: II
- Labels: Flammable Liquids

14.5 Environmental hazards

**ADN**
- Environmentally hazardous: yes

**ADR**
- Environmentally hazardous: yes

**RID**
- Environmentally hazardous: yes

**IMDG**
SAFETY DATA SHEET

Fluralaner / Moxidectin Liquid Formulation

Version 4.0
Revision Date: 10/18/2018
SDS Number: 656891-00009
Date of last issue: 12.04.2018
Date of first issue: 02.05.2016

Marine pollutant: yes

14.6 Special precautions for user
The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code
Remarks: Not applicable for product as supplied.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
The components of this product are reported in the following inventories:
AICS: not determined
DSL: not determined
IECSC: not determined

15.2 Chemical safety assessment
A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information

Other information: Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

Full text of H-Statements
H225: Highly flammable liquid and vapour.
H301: Toxic if swallowed.
H302: Harmful if swallowed.
H312: Harmful in contact with skin.
H315: Causes skin irritation.
H319: Causes serious eye irritation.
H332: Harmful if inhaled.
H336: May cause drowsiness or dizziness.
H360D: May damage the unborn child.
H361d: Suspected of damaging the unborn child.
H372: Causes damage to organs through prolonged or repeated exposure.
H400: Very toxic to aquatic life.
H410: Very toxic to aquatic life with long lasting effects.
H412: Harmful to aquatic life with long lasting effects.

Full text of other abbreviations
Acute Tox.: Acute toxicity
Aquatic Acute: Short-term (acute) aquatic hazard
Aquatic Chronic: Long-term (chronic) aquatic hazard
Eye Irrit.: Eye irritation

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ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road; AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of very high concern; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Further information
SAFETY DATA SHEET

Fluralaner / Moxidectin Liquid Formulation

<table>
<thead>
<tr>
<th>Classification of the mixture:</th>
<th>Classification procedure:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flam. Liq. 2</td>
<td>H225</td>
</tr>
<tr>
<td>Skin Irrit. 2</td>
<td>H315</td>
</tr>
<tr>
<td>Eye Irrit. 2</td>
<td>H319</td>
</tr>
<tr>
<td>Repr. 1B</td>
<td>H360D</td>
</tr>
<tr>
<td>STOT RE 2</td>
<td>H373</td>
</tr>
<tr>
<td>Aquatic Acute 1</td>
<td>H400</td>
</tr>
<tr>
<td>Aquatic Chronic 1</td>
<td>H410</td>
</tr>
</tbody>
</table>

Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

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.

ZA / EN