SAFETY DATA SHEET
Flunixin Liquid Formulation

Version 6.0  Revision Date: 2020/03/23  SDS Number: 437368-00013  Date of last issue: 2019/12/12  Date of first issue: 2016/01/28

1. PRODUCT AND COMPANY IDENTIFICATION

   Chemical product name : Flunixin Liquid Formulation

   Supplier’s company name, address and phone number
   Company name of supplier : MSD
   Address : Kumagaya, Saitama Prefecture, Xicheng 810 MSD Co., Ltd. Menua factory
   Telephone : 048-588-8411
   E-mail address : EHSDATASTEWARD@msd.com
   Emergency telephone number : 1-908-423-6000

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

2. HAZARDS IDENTIFICATION

   GHS classification of chemical product
   Acute toxicity (Oral) : Category 4
   Acute toxicity (Inhalation) : Category 3
   Serious eye damage/eye irritation : Category 1
   Reproductive toxicity : Category 1B
   Specific target organ toxicity - repeated exposure : Category 2 (Gastrointestinal tract, Kidney, Blood)
   Short-term (acute) aquatic hazard : Category 3
   Long-term (chronic) aquatic hazard : Category 3

   GHS label elements
   Hazard pictograms :

   Signal word : Danger
   Hazard statements : H302 Harmful if swallowed.
   H318 Causes serious eye damage.
   H331 Toxic if inhaled.
Precautionary statements:

**Prevention:**
- P201 Obtain special instructions before use.
- P202 Do not handle until all safety precautions have been read and understood.
- P260 Do not breathe mist or vapours.
- P264 Wash skin thoroughly after handling.
- P270 Do not eat, drink or smoke when using this product.
- P271 Use only outdoors or in a well-ventilated area.
- P273 Avoid release to the environment.
- P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

**Response:**
- P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.
- P304 + P340 + P311 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor.
- P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
- P308 + P313 IF exposed or concerned: Get medical advice/ attention.

**Storage:**
- P405 Store locked up.

**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

#### Substance / Mixture:
- Mixture

#### Components

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>Concentration (% w/w)</th>
<th>ENCS No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-menthol</td>
<td>2216-51-5</td>
<td>&gt;= 10 - &lt; 20</td>
<td>3-2333</td>
</tr>
<tr>
<td>2-Pyrrolidone</td>
<td>616-45-5</td>
<td>&gt;= 10 - &lt; 20</td>
<td>5-112</td>
</tr>
<tr>
<td>1-Deoxy-1-(methylamino)-D-glucitol 2-[2-methyl-3-perfluoromethyl]anilino]nicotinate</td>
<td>42461-84-7</td>
<td>&gt;= 3 - &lt; 10</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: 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 immediately.

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

Most important symptoms and effects, both acute and delayed: Harmful if swallowed. Causes serious eye damage. Toxic if inhaled. May damage fertility. 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 (see section 8).

Notes to physician: Treat symptomatically and supportively.

5. FIREFIGHTING MEASURES


Unsuitable extinguishing media: None known.

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


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

Handling

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

Local/Total ventilation: If sufficient ventilation is unavailable, use with local exhaust ventilation.

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. Keep container tightly closed. Take care to prevent spills, waste and minimize release to the environment.

Avoidance of contact Hygiene measures: Oxidizing agents

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.

**Storage**

**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.

**Materials to avoid**
- Do not store with the following product types:
  - Strong oxidizing agents

**Packaging material**
- Unsuitable material: None known.

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Threshold limit value and permissible exposure limits for each component in the work environment**

<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>1-Deoxy-1-(methylamino)-D-glucitol 2-[2-methyl-3-(perfluoromethyl)anilino]nicotinate</td>
<td>42461-84-7</td>
<td>TWA</td>
<td>40 µg/m³ (OEB 3)</td>
<td>Internal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wipe limit</td>
<td>400 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**
- Material: Chemical-resistant gloves
- Remarks: Consider double gloving.

**Eye protection**
- If the work environment or activity involves dusty conditions,
  - Wear safety glasses with side shields or goggles.
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.

9. PHYSICAL AND CHEMICAL PROPERTIES

- Physical state: liquid
- Colour: red
- Odour: amine-like
- Odour Threshold: No data available
- Melting point/freezing point: No data available
- Boiling point, initial boiling point and boiling range: No data available
- Flammability (solid, gas): Not applicable
- Flammability (liquids): No data available
- Lower explosion limit and upper explosion limit / flammability limit
  - Upper explosion limit / Upper flammability limit: No data available
  - Lower explosion limit / Lower flammability limit: No data available
- Flash point: No data available
- Decomposition temperature: No data available
- pH: No data available
- Evaporation rate: No data available
- Auto-ignition temperature: No data available
- Viscosity
  - Viscosity, kinematic: No data available
- Solubility(ies)
  - Water solubility: No data available
- Partition coefficient: n-octanol/water: Not applicable
Vapour pressure : No data available
Density and / or relative density
Relative density : No data available
Density : No data available
Relative vapour density : No data available
Explosive properties : Not explosive
Oxidizing properties : The substance or mixture is not classified as oxidizing.
Particle characteristics
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 swallowed.
Toxic if inhaled.

Product:
Acute oral toxicity : Acute toxicity estimate: 638.55 mg/kg
Method: Calculation method

Acute inhalation toxicity : Acute toxicity estimate: 0.6145 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

Components:
L-menthol:
Acute inhalation toxicity : LC50 (Rat): 5.289 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403

Acute dermal toxicity : LD50 (Rabbit): > 5,000 mg/kg
Method: OECD Test Guideline 402

2-Pyrrolidone:
Acute oral toxicity : LD50 (Rat): > 2,000 mg/kg
Method: OECD Test Guideline 401
Assessment: The substance or mixture has no acute oral toxicity

Acute dermal toxicity : LD50 (Rabbit): > 2,000 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity

1-Deoxy-1-(methylamino)-D-glucitol 2-[2-methyl-3-(perfluoromethyl)anilino]nicotinate:
Acute oral toxicity : LD50 (Rat): 53 - 157 mg/kg
LD50 (Mouse): 176 - 249 mg/kg
LD50 (Guinea pig): 488.3 mg/kg
LD50 (Monkey): 300 mg/kg

Acute inhalation toxicity : LC50 (Rat): < 0.52 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist

Acute toxicity (other routes of administration) : LD50 (Rat): 59.4 - 185.3 mg/kg
Application Route: Intraperitoneal
LD50 (Mouse): 164 - 363 mg/kg
Application Route: Intraperitoneal

Skin corrosion/irritation
Not classified based on available information.

Components:

L-menthol:
Species : Rabbit
Method : OECD Test Guideline 404
Result : Skin irritation

2-Pyrrolidone:
Species : Rabbit
Method : OECD Test Guideline 404
Result : No skin irritation
SAFETY DATA SHEET

Flunixin Liquid Formulation

Version 6.0
Revision Date: 2020/03/23
SDS Number: 437368-00013
Date of last issue: 2019/12/12
Date of first issue: 2016/01/28

1-Deoxy-1-(methylamino)-D-glucitol 2-[2-methyl-3-(perfluoromethyl)anilino]nicotinate:
Species: Rabbit
Result: Mild skin irritation

Serious eye damage/eye irritation
Causes serious eye damage.

Components:

L-menthol:
Species: Rabbit
Result: Irritation to eyes, reversing within 7 days

Method: OECD Test Guideline 405

2-Pyrrolidone:
Species: Rabbit
Result: Irritation to eyes, reversing within 7 days

1-Deoxy-1-(methylamino)-D-glucitol 2-[2-methyl-3-(perfluoromethyl)anilino]nicotinate:
Species: Rabbit
Result: Irreversible effects on the eye

Respiratory or skin sensitisation

Skin sensitisation
Not classified based on available information.

Respiratory sensitisation
Not classified based on available information.

Components:

L-menthol:
Test Type: Local lymph node assay (LLNA)
Exposure routes: Skin contact
Species: Mouse
Method: OECD Test Guideline 429
Result: negative

2-Pyrrolidone:
Test Type: Local lymph node assay (LLNA)
Exposure routes: Skin contact
Species: Mouse
Method: OECD Test Guideline 429
Result: negative
Remarks: Based on data from similar materials

1-Deoxy-1-(methylamino)-D-glucitol 2-[2-methyl-3-(perfluoromethyl)anilino]nicotinate:
Test Type: Maximisation Test
Exposure routes: Dermal
Species: Guinea pig
Assessment: Does not cause skin sensitisation.

9 / 20
**Germ cell mutagenicity**
Not classified based on available information.

**Components:**

**1-Menthol:**
- **Genotoxicity in vitro:** Test Type: Chromosome aberration test in vitro  
  Result: negative  
  Remarks: Based on data from similar materials

**2-Pyrrolidone:**
- **Genotoxicity in vitro:** Test Type: Bacterial reverse mutation assay (AMES)  
  Result: negative
  
  Test Type: In vitro mammalian cell gene mutation test  
  Method: OECD Test Guideline 476  
  Result: negative  
  Remarks: Based on data from similar materials

**Genotoxicity in vivo:** Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)  
  Species: Mouse  
  Application Route: Intraperitoneal injection  
  Method: OECD Test Guideline 474  
  Result: negative  
  Remarks: Based on data from similar materials

**1-Deoxy-1-(methylamino)-D-glucitol 2-[2-methyl-3-(perfluoromethyl)anilino]nicotinate:**
- **Genotoxicity in vitro:** Test Type: Bacterial reverse mutation assay (AMES)  
  Result: negative

  Test Type: in vitro assay  
  Test system: mouse lymphoma cells  
  Result: positive

  Test Type: Chromosomal aberration  
  Test system: Chinese hamster ovary cells  
  Result: positive

  Test Type: in vitro assay
### Genotoxicity in vivo
- **Test system:** Escherichia coli
  - **Result:** Positive
- **Test Type:** Micronucleus test
- **Species:** Mouse
- **Application Route:** Oral
- **Result:** Negative

### Germ cell mutagenicity - Assessment
- **Weight of evidence does not support classification as a germ cell mutagen.**

### Components:
#### L-menthol:
- **Species:** Mouse
- **Application Route:** Ingestion
- **Exposure time:** 103 weeks
- **Method:** OECD Test Guideline 453
- **Result:** Negative
  - **Remarks:** Based on data from similar materials

#### 2-Pyrrolidone:
- **Species:** Mouse
- **Application Route:** Ingestion
- **Exposure time:** 18 month(s)
- **Result:** Negative
  - **Remarks:** Based on data from similar materials

#### 1-Deoxy-1-(methylamino)-D-glucitol 2-[2-methyl-3-(perfluoromethyl)anilino]nicotinate:
- **Species:** Rat
- **Application Route:** Oral (feed)
- **Exposure time:** 104 w
- **LOAEL:** 2 mg/kg body weight
- **Result:** Negative
  - **Target Organs:** Gastrointestinal tract
  - **Remarks:** Significant toxicity observed in testing

- **Species:** Mouse
  - **Application Route:** Oral (feed)
  - **Exposure time:** 97 w
  - **NOAEL:** 0.6 mg/kg body weight
  - **Result:** Negative
  - **Target Organs:** Gastrointestinal tract
  - **Remarks:** Significant toxicity observed in testing

### Reproductive toxicity
- **May damage fertility. May damage the unborn child.**
### Components:

<table>
<thead>
<tr>
<th>Component</th>
<th>Effects on foetal development</th>
<th>Effects on fertility</th>
<th>Reproductive toxicity - Assessment</th>
<th>1-Deoxy-1-(methylamino)-D-glucitol 2-{2-methyl-3-(perfluoromethyl)anilino}nicotinate</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-menthol</td>
<td>Test Type: Embryo-foetal development Species: Rat Application Route: Ingestion Result: negative</td>
<td>Test Type: One-generation reproduction toxicity study Species: Rat Application Route: Ingestion Result: positive Remarks: Based on data from similar materials</td>
<td>Clear evidence of adverse effects on sexual function and fertility, based on animal experiments. Clear evidence of adverse effects on development, based on animal experiments.</td>
<td>Test Type: Two-generation reproduction toxicity study Species: Rat Application Route: Oral General Toxicity - Parent: LOAEL: 1 - 1.5 mg/kg body weight Symptoms: No foetal abnormalities Result: No effects on fertility and early embryonic development were detected.</td>
</tr>
<tr>
<td>2-Pyrrolidone</td>
<td>Test Type: Embryo-foetal development Species: Rat Application Route: Ingestion Result: negative</td>
<td></td>
<td></td>
<td>Test Type: Development Species: Rat Application Route: Oral General Toxicity Maternal: LOAEL: 2 mg/kg body weight Embryo-foetal toxicity: NOAEL: 2 mg/kg body weight Result: Embryotoxic effects and adverse effects on the offspring were detected only at high maternally toxic doses</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Test Type: Embryo-foetal development Species: Rabbit Application Route: Oral General Toxicity Maternal: LOAEL: 3 mg/kg body weight Embryo-foetal toxicity: NOAEL: 3 mg/kg body weight Result: Embryotoxic effects and adverse effects on the offspring were detected only at high maternally toxic doses</td>
</tr>
</tbody>
</table>

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

1-Deoxy-1-(methylamino)-D-glucitol 2-[2-methyl-3-(perfluoromethyl)anilino]nicotinate:

Assessment: May cause respiratory irritation.

STOT - repeated exposure

May cause damage to organs (Gastrointestinal tract, Kidney, Blood) through prolonged or repeated exposure.

Components:

1-Deoxy-1-(methylamino)-D-glucitol 2-[2-methyl-3-(perfluoromethyl)anilino]nicotinate:

Target Organs: Gastrointestinal tract, Kidney, Blood
Assessment: Causes damage to organs through prolonged or repeated exposure.

Repeated dose toxicity

Components:

L-menthol:

Species: Mouse
NOAEL: 1,250 mg/kg
Application Route: Ingestion
Exposure time: 91 Days
Method: OECD Test Guideline 408
Remarks: Based on data from similar materials

2-Pyrrolidone:

Species: Rat
NOAEL: 207 mg/kg
Application Route: Ingestion
Exposure time: 3 Months
Method: OECD Test Guideline 408

1-Deoxy-1-(methylamino)-D-glucitol 2-[2-methyl-3-(perfluoromethyl)anilino]nicotinate:

Species: Rat
NOAEL: 2 mg/kg
LOAEL: < 4 mg/kg
Application Route: Oral
Exposure time: 6 w
Target Organs: Gastrointestinal tract

Species: Rat
NOAEL: 1 mg/kg
Application Route: Oral
Exposure time: 1 y
Target Organs: Gastrointestinal tract, Kidney

Species: Monkey
NOAEL: 15 mg/kg
Application Route: Oral
Exposure time: 90 d
SAFETY DATA SHEET

Flunixin Liquid Formulation

Version 6.0    Revision Date: 2020/03/23    SDS Number: 437368-00013    Date of last issue: 2019/12/12
Date of first issue: 2016/01/28

Target Organs: Gastrointestinal tract, Blood

<table>
<thead>
<tr>
<th>Species</th>
<th>LOAEL</th>
<th>Application Route</th>
<th>Exposure time</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rabbit</td>
<td>80 mg/kg</td>
<td>Dermal</td>
<td>21 d</td>
<td>Severe irritation</td>
</tr>
</tbody>
</table>

Species: Dog
LOAEL: 11 mg/kg
Application Route: Oral
Exposure time: 9 d
Target Organs: Gastrointestinal tract
Symptoms: Vomiting

Aspiration toxicity
Not classified based on available information.

Experience with human exposure

Components:

1-Deoxy-1-(methylamino)-D-glucitol 2-[2-methyl-3-(perfluoromethyl)anilino]nicotinate:

<table>
<thead>
<tr>
<th>Inhalation</th>
<th>Skin contact</th>
<th>Eye contact</th>
<th>Ingestion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptoms: respiratory tract irritation</td>
<td>Symptoms: Skin irritation</td>
<td>Symptoms: Severe irritation</td>
<td>Symptoms: Gastrointestinal disturbance, bleeding, hypertension, Kidney disorders</td>
</tr>
</tbody>
</table>

12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

L-menthol:

<table>
<thead>
<tr>
<th>Toxicity to fish</th>
<th>Toxicity to daphnia and other aquatic invertebrates</th>
<th>Toxicity to algae/aquatic plants</th>
</tr>
</thead>
</table>
### Toxicity to microorganisms

<table>
<thead>
<tr>
<th>Test Type</th>
<th>EC50: 237 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time (h)</td>
<td>96</td>
</tr>
<tr>
<td>Method</td>
<td>OECD Test Guideline 209</td>
</tr>
</tbody>
</table>

### 2-Pyrrolidone:

#### Toxicity to fish

<table>
<thead>
<tr>
<th>Test Type</th>
<th>LC50 (Danio rerio (zebra fish)): &gt; 4,600 - 10,000 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time (h)</td>
<td>96</td>
</tr>
<tr>
<td>Method</td>
<td>OECD Test Guideline 203</td>
</tr>
</tbody>
</table>

#### Toxicity to daphnia and other aquatic invertebrates

<table>
<thead>
<tr>
<th>Test Type</th>
<th>EC50 (Daphnia magna (Water flea)): &gt; 500 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time (h)</td>
<td>48</td>
</tr>
<tr>
<td>Method</td>
<td></td>
</tr>
</tbody>
</table>

#### Toxicity to algae/aquatic plants

<table>
<thead>
<tr>
<th>Test Type</th>
<th>ErC50 (Desmodesmus subspicatus (green algae)): &gt; 500 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time (h)</td>
<td>72</td>
</tr>
<tr>
<td>Method</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Type</th>
<th>EC10 (Desmodesmus subspicatus (green algae)): 22.2 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time (h)</td>
<td>72</td>
</tr>
<tr>
<td>Method</td>
<td></td>
</tr>
</tbody>
</table>

#### Toxicity to microorganisms

<table>
<thead>
<tr>
<th>Test Type</th>
<th>EC50: &gt; 1,000 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time (h)</td>
<td>30 min</td>
</tr>
<tr>
<td>Method</td>
<td>OECD Test Guideline 209</td>
</tr>
</tbody>
</table>

### 1-Deoxy-1-(methylamino)-D-glucitol 2-[2-methyl-3-(perfluoromethyl)anilino]nicotinate:

#### Toxicity to fish

<table>
<thead>
<tr>
<th>Test Type</th>
<th>LC50 (Lepomis macrochirus (Bluegill sunfish)): 28 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time (h)</td>
<td>96</td>
</tr>
<tr>
<td>Method</td>
<td>FDA 4.11</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Type</th>
<th>LC50 (Oncorhynchus mykiss (rainbow trout)): 5.5 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time (h)</td>
<td>96</td>
</tr>
<tr>
<td>Method</td>
<td>FDA 4.11</td>
</tr>
</tbody>
</table>

#### Toxicity to daphnia and other aquatic invertebrates

<table>
<thead>
<tr>
<th>Test Type</th>
<th>EC50 (Daphnia magna (Water flea)): 15 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time (h)</td>
<td>48</td>
</tr>
<tr>
<td>Method</td>
<td>FDA 4.08</td>
</tr>
</tbody>
</table>

#### Toxicity to algae/aquatic plants

<table>
<thead>
<tr>
<th>Test Type</th>
<th>NOEC (Microcystis aeruginosa (blue-green algae)): 97 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time (d)</td>
<td>13</td>
</tr>
<tr>
<td>Method</td>
<td>FDA 4.01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Type</th>
<th>NOEC (Selenastrum capricornutum (green algae)): 96 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time (d)</td>
<td>12</td>
</tr>
<tr>
<td>Method</td>
<td></td>
</tr>
</tbody>
</table>

### Persistence and degradability

#### Components:

**L-menthol:**

<table>
<thead>
<tr>
<th>Biodegradability</th>
<th>Result: Readily biodegradable.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biodegradation</td>
<td>64 %</td>
</tr>
<tr>
<td>Exposure time (d)</td>
<td>28</td>
</tr>
<tr>
<td>Method</td>
<td>OECD Test Guideline 301D</td>
</tr>
</tbody>
</table>

---

15 / 20
12. BIODEGRADABILITY

- **2-Pyrrolidone**: Result: Readily biodegradable.
  Remarks: Based on data from similar materials

- **1-Deoxy-1-(methylamino)-D-glucitol 2-[2-methyl-3-(perfluoromethyl)anilino]nicotinate**: Hydrolysis: 0 % (28 d)

### Bioaccumulative potential

#### Components:

- **L-menthol**
  - Bioaccumulation: Species: Cyprinus carpio (Carp)
    - Bioconcentration factor (BCF): 0.5 - 15
    - Exposure time: 6 Weeks
    - Method: OECD Test Guideline 305
    - Remarks: Based on data from similar materials
  - Partition coefficient: n-octanol/water: log Pow: 3.15

- **2-Pyrrolidone**
  - Partition coefficient: n-octanol/water: log Pow: -0.71
    - Method: OECD Test Guideline 107

- **1-Deoxy-1-(methylamino)-D-glucitol 2-[2-methyl-3-(perfluoromethyl)anilino]nicotinate**
  - Partition coefficient: n-octanol/water: log Pow: 1.34

#### Mobility in soil

**Components**:

- **1-Deoxy-1-(methylamino)-D-glucitol 2-[2-methyl-3-(perfluoromethyl)anilino]nicotinate**
  - Distribution among environmental compartments: log Koc: 1.92

### Hazardous to the ozone layer

Not applicable

### 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.
SAFETY DATA SHEET

Flunixin Liquid Formulation

Version 6.0  Revision Date: 2020/03/23  SDS Number: 437368-00013  Date of last issue: 2019/12/12  Date of first issue: 2016/01/28

14. TRANSPORT INFORMATION

International Regulations

UNRTDG
Not regulated as a dangerous good

IATA-DGR
Not regulated as a dangerous good

IMDG-Code
Not regulated as a dangerous good

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

National Regulations
Refer to section 15 for specific national regulation.

15. REGULATORY INFORMATION

Related Regulations

Fire Service Law
Not applicable to dangerous materials / designated flammables.

Chemical Substance Control Law
Not applicable for Specified Chemical Substance, Monitoring Chemical Substance and Priority Assessment Chemical Substance.

Industrial Safety and Health Law

Harmful Substances Prohibited from Manufacture
Not applicable

Harmful Substances Required Permission for Manufacture
Not applicable

Substances Prevented From Impairment of Health
Not applicable

Circular concerning Information on Chemicals having Mutagenicity - Annex 2: Information on Existing Chemicals having Mutagenicity
Not applicable

Circular concerning Information on Chemicals having Mutagenicity - Annex 1: Information on Notified Substances having Mutagenicity
Not applicable

Substances Subject to be Notified Names
Not applicable

Substances Subject to be Indicated Names
Not applicable

Ordinance on Prevention of Hazards Due to Specified Chemical Substances
Not applicable
Ordinance on Prevention of Lead Poisoning
Not applicable

Ordinance on Prevention of Tetraalkyl Lead Poisoning
Not applicable

Ordinance on Prevention of Organic Solvent Poisoning
Not applicable

Enforcement Order of the Industrial Safety and Health Law - Attached table 1 (Dangerous Substances)
Not applicable

Poisonous and Deleterious Substances Control Law
Not applicable

Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof
Not applicable

High Pressure Gas Safety Act
Not applicable

Explosive Control Law
Not applicable

Vessel Safety Law
Not regulated as a dangerous good

Aviation Law
Not regulated as a dangerous good

Marine Pollution and Sea Disaster Prevention etc Law
Bulk transportation : Not classified as noxious liquid substance
Pack transportation : Not classified as marine pollutant

Narcotics and Psychotropics Control Act
Narcotic or Psychotropic Raw Material (Export / Import Permission)
Not applicable
Specific Narcotic or Psychotropic Raw Material (Export / Import permission)
Not applicable

Waste Disposal and Public Cleansing Law
Industrial waste

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

Flunixin Liquid Formulation

Version 6.0  Revision Date: 2020/03/23  SDS Number: 437368-00013  Date of last issue: 2019/12/12

16. OTHER INFORMATION

Further information

Sources of key data used to compile the Safety Data Sheet:

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

Date format: yyyy/mm/dd

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 Standardisation; 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; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; 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; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; 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; WHMIS - Workplace Hazardous Materials Information System

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.

JP / EN