SAFETY DATA SHEET

Fluazuron / Fipronil Formulation

Version 4.0  Revision Date: 2020/03/23  SDS Number: 557849-00009  Date of last issue: 2019/09/13

Date of first issue: 2016/03/15

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: Fluazuron / Fipronil Formulation

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

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

2. HAZARDS IDENTIFICATION

GHS Classification
Flammable liquids: Category 3
Skin corrosion/irritation: Category 2
Serious eye damage/eye irritation: Category 2A
Carcinogenicity: Category 1B
Reproductive toxicity: Category 1B
Specific target organ toxicity - single exposure: Category 3
Specific target organ toxicity - repeated exposure: Category 2 (Central nervous system, Kidney)
Short-term (acute) aquatic hazard: Category 1
Long-term (chronic) aquatic hazard: Category 1

GHS label elements
# SAFETY DATA SHEET

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<table>
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<th>Revision Date</th>
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</tbody>
</table>

## Hazard pictograms

- ![Flammable](image1.png)
- ![Skin Irritation](image2.png)
- ![Eye Irritation](image3.png)
- ![Toxic to Aquatic Life](image4.png)

## Signal word

**Danger**

## Hazard statements

- **H226** Flammable liquid and vapour.
- **H315** Causes skin irritation.
- **H319** Causes serious eye irritation.
- **H335** May cause respiratory irritation.
- **H350** May cause cancer.
- **H360D** May damage the unborn child.
- **H373** May cause damage to organs (Central nervous system, Kidney) through prolonged or repeated exposure.
- **H410** Very toxic to aquatic life with long lasting effects.

## 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.
- **P271** Use only outdoors or in a well-ventilated area.
- **P273** Avoid release to the environment.
- **P280** Wear protective gloves/ protective clothing/ eye protection/ face protection.

**Response:**

- **P303 + P361 + P353** IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
- **P304 + P340 + P312** IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
- **P305 + P351 + P338** IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- **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 + P364** Take off contaminated clothing and wash it before reuse.
- **P391** Collect spillage.

## Storage:

[Add any additional storage instructions here.]
SAFETY DATA SHEET

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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.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-(2-Butoxyethoxy)ethanol</td>
<td>112-34-5</td>
<td>&gt;= 60 - &lt;= 100</td>
</tr>
<tr>
<td>N-Methyl-2-pyrrolidone</td>
<td>872-50-4</td>
<td>&gt;= 10 - &lt; 20</td>
</tr>
<tr>
<td>Ethanol</td>
<td>64-17-5</td>
<td>&gt;= 10 - &lt; 30</td>
</tr>
<tr>
<td>Fluazuron</td>
<td>86811-58-7</td>
<td>&gt;= 2.5 - &lt; 10</td>
</tr>
<tr>
<td>Fipronil (ISO)</td>
<td>120068-37-3</td>
<td>&gt;= 1 - &lt; 2.5</td>
</tr>
<tr>
<td>2,6-Di-tert-butyl-p-cresol</td>
<td>128-37-0</td>
<td>&gt;= 0.025 - &lt; 0.25</td>
</tr>
<tr>
<td>tert-butyl-4-methoxyphenol</td>
<td>25013-16-5</td>
<td>&gt;= 0.1 - &lt; 0.25</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. 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 cause respiratory irritation. May cause cancer. 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

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
Nitrogen oxides (NOx)
Chlorine compounds
Fluorine compounds
Sulphur oxides

Specific extinguishing methods:

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

Special protective equipment for firefighters:

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

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:

Remove all sources of ignition.
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 spills cannot be contained.

Methods and materials for containment and cleaning up:

Non-sparking tools should be used.
Soak up with inert absorbent material.
Suppress (knock down) gases/vapours/mists with a water spray jet.
For large spills, provide dyking or other appropriate containment to keep material from spreading. If dyked material can be pumped, store recovered material in appropriate container.
Clean up remaining materials from spill with suitable absorbent.
Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable.
Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

7. HANDLING AND STORAGE

Technical measures : See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.
Local/Total ventilation : If sufficient ventilation is unavailable, use with local exhaust ventilation.
If advised by assessment of the local exposure potential, use only in an area equipped with explosion-proof exhaust ventilation.
Advice on safe handling : Do not 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.
Already sensitised individuals should consult their physician regarding working with respiratory irritants or sensitisers.
Keep away from heat and sources of ignition.
Take precautionary measures against static discharges.
Take care to prevent spills, waste and minimize release to the environment.

Conditions for safe storage : Keep in properly labelled containers.
Keep tightly closed.
Keep in a cool, well-ventilated place.
Store in accordance with the particular national regulations.
Keep away from heat and sources of ignition.

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

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters
## Components

<table>
<thead>
<tr>
<th>CAS-No.</th>
<th>Value type</th>
<th>Control parameters / Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>112-34-5</td>
<td>TWA (Inhalable fraction and vapor)</td>
<td>10 ppm</td>
<td>ACGIH</td>
</tr>
<tr>
<td>128-37-0</td>
<td>Wipe limit</td>
<td>20 μg/100 cm²</td>
<td>Internal</td>
</tr>
<tr>
<td>120068-37-3</td>
<td>TWA</td>
<td>2 μg/m³ (OEB 4)</td>
<td>Internal</td>
</tr>
<tr>
<td>128-37-0</td>
<td>NAB</td>
<td>10 mg/m³</td>
<td>ID OEL</td>
</tr>
<tr>
<td>86811-58-7</td>
<td>TWA</td>
<td>60 μg/m³ (OEB 3)</td>
<td>Internal</td>
</tr>
</tbody>
</table>

Further information: Adopted in Year 1996, Upper respiratory tract irritation.

Further information: Adopted in Year 1996, Not classified as carcinogenic to humans. Not enough data to classify these materials as carcinogenic to humans or animals.

## 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-Methyl-2-pyrrolidone</td>
<td>872-50-4</td>
<td>5-Hydroxy-N-methyl-2-pyrrolidone</td>
<td>Urine</td>
<td>End of shift (As soon as possible after exposure ceases)</td>
<td>100 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., dripless quick connections).
- All engineering controls should be implemented by facility design and operated in accordance with GMP principles to protect products, workers, and the environment.
- Containment technologies suitable for controlling compounds are required to control at source and to prevent migration of the compound to uncontrolled areas (e.g., open-face containment devices).
- Minimize open handling.

## Personal protective equipment

### Respiratory protection
- If adequate local exhaust ventilation is not available or exposure assessment demonstrates exposures outside the recommended guidelines, use respiratory protection.
- Filter type
- Hand protection
- Combined particulates and organic vapour type
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Material : Chemical-resistant gloves

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

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

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

Hygiene measures : If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place. When using do not eat, drink or smoke. Wash contaminated clothing before re-use. The effective operation of a facility should include review of engineering controls, proper personal protective equipment, appropriate degowning and decontamination procedures, industrial hygiene monitoring, medical surveillance and the use of administrative controls.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : liquid

Colour : light yellow

Odour : solvent-like

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 : 32 °C

Evaporation rate : No data available

Flammability (solid, gas) : Not applicable

Flammability (liquids) : Not applicable

Upper explosion limit / Upper flammability limit : No data available
10. STABILITY AND REACTIVITY

Reactivity: Not classified as a reactivity hazard.

Chemical stability: Stable under normal conditions.

Possibility of hazardous reactions:
- Flammable liquid and vapour.
- Vapours may form explosive mixture with air.
- Can react with strong oxidizing agents.

Conditions to avoid: Heat, flames and sparks.

Incompatible materials: Oxidizing agents

Hazardous decomposition products: No hazardous decomposition products are known.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure:
- Inhalation
- Skin contact
- Ingestion
- Eye contact

Acute toxicity:
Not classified based on available information.

Product:
SAFETY DATA SHEET

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<td><strong>Acute inhalation toxicity</strong></td>
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<tr>
<td><strong>Exposure time</strong></td>
</tr>
<tr>
<td><strong>Test atmosphere</strong></td>
</tr>
<tr>
<td><strong>Method</strong></td>
</tr>
<tr>
<td><strong>Acute dermal toxicity</strong></td>
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<td><strong>Acute oral toxicity</strong></td>
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</table>
### Acute inhalation toxicity
- **LC50 (Rat):** 0.36 mg/l
- **Exposure time:** 4 h
- **Test atmosphere:** dust/mist

### Acute dermal toxicity
- **LD50 (Rabbit):** 354 mg/kg

### 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

### tert-butyl-4-methoxyphenol:
- **Acute oral toxicity**: LD50 (Rat): 2,000 mg/kg
- **Acute dermal toxicity**: LD50 (Rabbit): > 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:

#### 2-(2-Butoxyethoxy)ethanol:
- **Species**: Rabbit
- **Method**: OECD Test Guideline 404
- **Result**: Mild skin irritation

#### N-Methyl-2-pyrrolidone:
- **Result**: Skin irritation

#### Ethanol:
- **Species**: Rabbit
- **Method**: OECD Test Guideline 404
- **Result**: No skin irritation

#### Fluazuron:
- **Species**: Rabbit
- **Method**: OECD Test Guideline 404
- **Result**: No skin irritation

#### Fipronil (ISO):
- **Species**: Rabbit
- **Method**: OECD Test Guideline 404
- **Result**: No skin irritation
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

tert-butyl-4-methoxyphenol:
Result : Skin irritation

**Serious eye damage/eye irritation**
Causes serious eye irritation.

**Components:**

2-(2-Butoxyethoxy)ethanol:
Species : Rabbit
Result : Irritation to eyes, reversing within 21 days

N-Methyl-2-pyrrolidone:
Species : Rabbit
Result : Irritation to eyes, reversing within 21 days

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

Fluazuron:
Species : Rabbit
Result : Mild eye irritation
Method : OECD Test Guideline 405

Fipronil (ISO):
Species : Rabbit
Result : No eye irritation
Method : OECD Test Guideline 405

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

tert-butyl-4-methoxyphenol:
Species : Rabbit
Result : Irritation to eyes, reversing within 21 days
# SAFETY DATA SHEET

## Fluazuron / Fipronil Formulation

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</table>

### Respiratory or skin sensitisation

**Skin sensitisation**
- Not classified based on available information.

**Respiratory sensitisation**
- Not classified based on available information.

### Components:

**2-(2-Butoxyethoxy)ethanol:**
- **Test Type:** Maximisation Test
- **Exposure routes:** Skin contact
- **Species:** Guinea pig
- **Result:** negative

**N-Methyl-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

**Ethanol:**
- **Test Type:** Local lymph node assay (LLNA)
- **Exposure routes:** Skin contact
- **Species:** Mouse
- **Result:** negative

**Fluazuron:**
- **Exposure routes:** Skin contact
- **Species:** Guinea pig
- **Result:** negative

**Fipronil (ISO):**
- **Test Type:** Buehler Test
- **Exposure routes:** Skin contact
- **Species:** Guinea pig
- **Method:** OECD Test Guideline 406
- **Result:** negative

**2,6-Di-tert-butyl-p-cresol:**
- **Test Type:** Human repeat insult patch test (HRIPT)
- **Exposure routes:** Skin contact
- **Species:** Humans
- **Result:** negative

**tert-butyl-4-methoxyphenol:**
- **Test Type:** Human repeat insult patch test (HRIPT)
- **Exposure routes:** Skin contact
Germ cell mutagenicity
Not classified based on available information.

Components:

2-(2-Butoxyethoxy)ethanol:
- 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: Mouse
    - Application Route: Ingestion
    - Result: negative

N-Methyl-2-pyrrolidone:
- Genotoxicity in vitro:
  - Test Type: Bacterial reverse mutation assay (AMES)
    - Method: OECD Test Guideline 471
    - Result: negative
  - Test Type: In vitro mammalian cell gene mutation test
    - Method: OECD Test Guideline 476
    - Result: negative
  - Test Type: DNA damage and repair, unscheduled DNA synthesis in mammalian cells (in vitro)
    - Result: negative

- Genotoxicity in vivo:
  - Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
    - Species: Mouse
    - Application Route: Ingestion
    - Method: OECD Test Guideline 474
    - Result: negative
  - Test Type: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis)
    - Species: Hamster
    - Application Route: Ingestion
    - Method: OECD Test Guideline 475
    - Result: negative

Ethanol:
- Genotoxicity in vitro:
  - Test Type: In vitro mammalian cell gene mutation test
    - Result: negative
### Genotoxicity in vivo

**Fluazuron**:
- Test Type: Rodent dominant lethal test (germ cell) (in vivo)
- Species: Mouse
- Application Route: Ingestion
- Result: equivocal

**Fipronil (ISO)**:
- Test Type: Bacterial reverse mutation assay (AMES)
  - Method: OECD Test Guideline 471
  - Result: negative

### Genotoxicity in vitro

**Fluazuron**:
- Test Type: Bacterial reverse mutation assay (AMES)
  - Result: negative
- Test Type: DNA Repair
  - Result: negative
- Test Type: In vitro mammalian cell gene mutation test
  - Result: negative

**Fipronil (ISO)**:
- Test Type: Bacterial reverse mutation assay (AMES)
  - Method: OECD Test Guideline 471
  - Result: negative
- Test Type: In vitro mammalian cell gene mutation test
  - Method: OECD Test Guideline 476
  - Result: negative
- Test Type: Chromosome aberration test in vitro
  - Method: OECD Test Guideline 473
  - Result: negative

**2,6-Di-tert-butyl-p-cresol**:
- Test Type: Bacterial reverse mutation assay (AMES)
  - Result: negative
### Fluazuron / Fipronil Formulation

<table>
<thead>
<tr>
<th>Test Type: In vitro mammalian cell gene mutation test</th>
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<tr>
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### Genotoxicity in vivo

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<tr>
<th>Test Type: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis)</th>
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<tbody>
<tr>
<td>Species: Rat</td>
</tr>
<tr>
<td>Application Route: Ingestion</td>
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### Genotoxicity in vitro

<table>
<thead>
<tr>
<th>tert-butyl-4-methoxyphenol</th>
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</tr>
<tr>
<td>Result: negative</td>
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### Carcinogenicity

May cause cancer.

### Components:

#### N-Methyl-2-pyrrolidone:

<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>2 Years</td>
</tr>
<tr>
<td>Result</td>
<td>negative</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Species</th>
<th>Rat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Route</td>
<td>ingestion (vapour)</td>
</tr>
<tr>
<td>Exposure time</td>
<td>2 Years</td>
</tr>
<tr>
<td>Result</td>
<td>negative</td>
</tr>
</tbody>
</table>

#### Fluazuron:

<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>2 Years</td>
</tr>
<tr>
<td>Method</td>
<td>OECD Test Guideline 453</td>
</tr>
<tr>
<td>Result</td>
<td>negative</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Species</th>
<th>Mouse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Route</td>
<td>Ingestion</td>
</tr>
<tr>
<td>Exposure time</td>
<td>2 Years</td>
</tr>
<tr>
<td>Result</td>
<td>negative</td>
</tr>
</tbody>
</table>

#### Fipronil (ISO):

<table>
<thead>
<tr>
<th>Species</th>
<th>Mouse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Route</td>
<td>Ingestion</td>
</tr>
<tr>
<td>Exposure time</td>
<td>78 weeks</td>
</tr>
<tr>
<td>Result</td>
<td>negative</td>
</tr>
</tbody>
</table>
SAFETY DATA SHEET

Fluazuron / Fipronil Formulation

Species: Rat
Application Route: Ingestion
Exposure time: 104 weeks
Result: positive
Remarks: The mechanism or mode of action is not relevant in humans.

2,6-Di-tert-butyl-p-cresol:
Species: Rat
Application Route: Ingestion
Exposure time: 22 months
Result: negative

tert-butyl-4-methoxyphenol:
Species: Hamster
Application Route: Ingestion
Exposure time: 24 weeks
Result: positive

Species: Rat
Application Route: Ingestion
Exposure time: 12 months
Result: positive

Carcinogenicity - Assessment: Sufficient evidence of carcinogenicity in animal experiments

Reproductive toxicity
May damage the unborn child.

Components:

2-(2-Butoxyethoxy)ethanol:
Effects on fertility: Test Type: One-generation reproduction toxicity study
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 415
Result: negative

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

N-Methyl-2-pyrrolidone:
Effects on fertility: Test Type: Two-generation reproduction toxicity study
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 416
Result: negative

Effects on foetal development: Test Type: Embryo-foetal development
Species: Rat
**Application Route:** Ingestion  
**Method:** OECD Test Guideline 414  
**Result:** positive

**Test Type:** Fertility/early embryonic development  
**Species:** Rat  
**Application Route:** inhalation (vapour)  
**Result:** positive

**Test Type:** Embryo-foetal development  
**Species:** Rabbit  
**Application Route:** Ingestion  
**Result:** positive

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

### Ethanol:

**Effects on fertility:**  
**Test Type:** Two-generation reproduction toxicity study  
**Species:** Mouse  
**Application Route:** Ingestion  
**Result:** negative

### Fluazuron:

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

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

**Test Type:** Embryo-foetal development  
**Species:** Rabbit  
**Application Route:** Ingestion  
**Method:** OECD Test Guideline 414  
**Result:** negative

### Fipronil (ISO):

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

**Effects on foetal development:**  
**Test Type:** Embryo-foetal development  
**Species:** Rabbit  
**Application Route:** Ingestion  
**Method:** OECD Test Guideline 414  
**Result:** negative
**2,6-Di-tert-butyl-p-cresol:**

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

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

**tert-butyl-4-methoxyphenol:**

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

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

**Reproductive toxicity - Assessment:**

Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.

**STOT - single exposure**

May cause respiratory irritation.

**Components:**

**N-Methyl-2-pyrrolidone:**

Assessment: May cause respiratory irritation.

**STOT - repeated exposure**

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

**Components:**

**Fipronil (ISO):**

| Exposure routes | Ingestion  
| Target Organs | Central nervous system, Kidney  
| Assessment | Shown to produce significant health effects in animals at concentrations of 10 mg/kg bw or less. |

**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:

2-(2-Butoxyethoxy)ethanol:

Species: Rat
NOAEL: 250 mg/kg
LOAEL: 1,000 mg/kg
Application Route: Ingestion
Exposure time: 90 Days
Method: OECD Test Guideline 408

Species: Rat
NOAEL: >= 0.094 mg/l
Application Route: inhalation (vapour)
Exposure time: 90 Days
Method: OECD Test Guideline 413

Species: Rat
NOAEL: >= 2,000 mg/kg
Application Route: Skin contact
Exposure time: 90 Days

N-Methyl-2-pyrrolidone:

Species: Rat, male
NOAEL: 169 mg/kg
LOAEL: 433 mg/kg
Application Route: Ingestion
Exposure time: 90 Days
Method: OECD Test Guideline 408

Species: Rat
NOAEL: 0.5 mg/l
LOAEL: 1 mg/l
Application Route: inhalation (dust/mist/fume)
Exposure time: 96 Days
Method: OECD Test Guideline 413

Species: Rabbit
NOAEL: 826 mg/kg
LOAEL: 1,653 mg/kg
Application Route: Skin contact
Exposure time: 20 Days

Ethanol:

Species: Rat
NOAEL: 1,280 mg/kg
LOAEL: 3,156 mg/kg
Application Route: Ingestion
Exposure time: 90 Days

Fluazuron:

Species: Rat
<table>
<thead>
<tr>
<th>LOAEL</th>
<th>240 mg/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Route</td>
<td>Ingestion</td>
</tr>
<tr>
<td>Exposure time</td>
<td>13 Weeks</td>
</tr>
<tr>
<td>Target Organs</td>
<td>Liver, Thyroid, Pituitary gland</td>
</tr>
</tbody>
</table>

- **Species**: Rat
- **NOAEL**: 10 mg/kg
- **LOAEL**: 100 mg/kg
- **Application Route**: Skin contact
- **Exposure time**: 3 Weeks

- **Species**: Dog
- **NOAEL**: 7.5 mg/kg
- **LOAEL**: 110 mg/kg
- **Application Route**: Ingestion
- **Exposure time**: 52 Weeks
- **Target Organs**: Liver

**Fipronil (ISO):**

- **Species**: Rabbit
- **NOAEL**: 5 mg/kg
- **LOAEL**: 10 mg/kg
- **Application Route**: Skin contact
- **Exposure time**: 21 Days
- **Method**: OECD Test Guideline 410

- **Species**: Rat, male
- **NOAEL**: 0.059 mg/kg
- **LOAEL**: 0.019 mg/kg
- **Application Route**: Ingestion
- **Exposure time**: 89 Weeks

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

- **Species**: Rat
- **NOAEL**: 25 mg/kg
- **Application Route**: Ingestion
- **Exposure time**: 22 Months

**tert-butyl-4-methoxyphenol:**

- **Species**: Rat
- **LOAEL**: 63,000 mg/kg
- **Application Route**: Ingestion
- **Exposure time**: 6 Weeks

**Aspiration toxicity**

Not classified based on available information.

**Experience with human exposure**

**Components:**

N-Methyl-2-pyrrolidone:
12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

2-(2-Butoxyethoxy)ethanol:

- **Toxicity to fish**: LC50 (Lepomis macrochirus (Bluegill sunfish)): 1,300 mg/l
  Exposure time: 96 h

- **Toxicity to daphnia and other aquatic invertebrates**: EC50 (Daphnia magna (Water flea)): > 100 mg/l
  Exposure time: 48 h
  Method: OECD Test Guideline 202

- **Toxicity to algae/aquatic plants**: ErC50 (Desmodesmus subspicatus (green algae)): > 100 mg/l
  Exposure time: 96 h
  Method: OECD Test Guideline 201

  NOEC (Desmodesmus subspicatus (green algae)): >= 100 mg/l
  Exposure time: 96 h
  Method: OECD Test Guideline 201

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

N-Methyl-2-pyrrolidone:

- **Toxicity to fish**: LC50 (Oncorhynchus mykiss (rainbow trout)): > 500 mg/l
  Exposure time: 96 h

- **Toxicity to daphnia and other aquatic invertebrates**: EC50 (Daphnia magna (Water flea)): > 1,000 mg/l
  Exposure time: 24 h
  Method: DIN 38412

- **Toxicity to algae/aquatic plants**: ErC50 (Desmodesmus subspicatus (green algae)): 600.5 mg/l
  Exposure time: 72 h

  EC10 (Desmodesmus subspicatus (green algae)): 92.6 mg/l
  Exposure time: 72 h

- **Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)**: NOEC (Daphnia magna (Water flea)): 12.5 mg/l
  Exposure time: 21 d
  Method: OECD Test Guideline 211

- **Toxicity to microorganisms**: EC50: > 600 mg/l
  Exposure time: 30 min
  Method: ISO 8192

Ethanol:

- **Toxicity to fish**: LC50 (Pimephales promelas (fathead minnow)): > 1,000 mg/l
  Exposure time: 96 h
### Toxicity to daphnia and other aquatic invertebrates
- **EC50** (Ceriodaphnia (water flea)): > 1,000 mg/l
- Exposure time: 48 h

### Toxicity to algae/aquatic plants
- **ErC50** (Chlorella vulgaris (Fresh water algae)): 275 mg/l
  - Exposure time: 72 h
- **EC10** (Chlorella vulgaris (Fresh water algae)): 11.5 mg/l
  - Exposure time: 72 h

### Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)
- **NOEC** (Daphnia magna (Water flea)): 9.6 mg/l
  - Exposure time: 9 d

### Toxicity to microorganisms
- **EC50** (Pseudomonas putida): 6,500 mg/l
  - Exposure time: 16 h

### Fluazuron:

#### Toxicity to fish
- **LC50** (Cyprinus carpio (Carp)): > 9.1 mg/l
  - Exposure time: 96 h

#### Toxicity to daphnia and other aquatic invertebrates
- **EC50** (Daphnia sp. (water flea)): 0.0006 mg/l
  - Exposure time: 48 h

#### Toxicity to algae/aquatic plants
- **NOEC** (Raphidocelis subcapitata (freshwater green alga)): 27.9 mg/l
  - Exposure time: 72 h

#### M-Factor (Acute aquatic toxicity)
- 1,000

#### M-Factor (Chronic aquatic toxicity)
- 1,000

### Fipronil (ISO):

#### Toxicity to fish
- **LC50** (Lepomis macrochirus (Bluegill sunfish)): 85.2 µg/l
  - Exposure time: 96 h

#### Toxicity to daphnia and other aquatic invertebrates
- **LC50** (Mysidopsis bahia (opossum shrimp)): 0.14 µg/l
  - Exposure time: 96 h

#### Toxicity to algae/aquatic plants
- **EC50** (Desmodesmus subspicatus (green algae)): 68 µg/l
  - Exposure time: 96 h
  - Method: OECD Test Guideline 201
- **NOEC** (Desmodesmus subspicatus (green algae)): 40 µg/l
  - Exposure time: 96 h
  - Method: OECD Test Guideline 201

#### M-Factor (Acute aquatic toxicity)
- 1,000

#### Toxicity to fish (Chronic toxicity)
- **NOEC** (Cyprinodon variegatus (sheepshead minnow)): 2.9 µg/l
  - Exposure time: 35 d

#### Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)
- **NOEC** (Mysidopsis bahia (opossum shrimp)): 0.0077 µg/l
  - Exposure time: 28 d
### 2,6-Di-tert-butyl-p-cresol:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicity to fish</td>
<td>LC50 (Danio rerio (zebra fish)): &gt; 0.57 mg/l</td>
</tr>
<tr>
<td>Exposure time</td>
<td>96 h</td>
</tr>
<tr>
<td>Toxicity to daphnia and other aquatic invertebrates</td>
<td>EC50 (Daphnia magna (Water flea)): 0.48 mg/l</td>
</tr>
<tr>
<td>Exposure time</td>
<td>48 h</td>
</tr>
<tr>
<td>Method</td>
<td>OECD Test Guideline 202</td>
</tr>
<tr>
<td>Toxicity to algae/aquatic plants</td>
<td>ErC50 (Pseudokirchneriella subcapitata (green algae)): &gt; 0.24 mg/l</td>
</tr>
<tr>
<td>Exposure time</td>
<td>72 h</td>
</tr>
<tr>
<td>Method</td>
<td>OECD Test Guideline 201</td>
</tr>
<tr>
<td>NOEC (Pseudokirchneriella subcapitata (green algae)): 0.24 mg/l</td>
<td></td>
</tr>
<tr>
<td>Exposure time</td>
<td>72 h</td>
</tr>
<tr>
<td>Method</td>
<td>OECD Test Guideline 201</td>
</tr>
</tbody>
</table>

### tert-butyl-4-methoxyphenol:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicity to fish</td>
<td>LC50: 5.8 mg/l</td>
</tr>
<tr>
<td>Exposure time</td>
<td>96 h</td>
</tr>
<tr>
<td>Method</td>
<td>OECD Test Guideline 203</td>
</tr>
<tr>
<td>Toxicity to daphnia and other aquatic invertebrates</td>
<td>EC50 (Daphnia magna (Water flea)): 2.3 mg/l</td>
</tr>
<tr>
<td>Exposure time</td>
<td>96 h</td>
</tr>
<tr>
<td>Method</td>
<td>OECD Test Guideline 202</td>
</tr>
<tr>
<td>Toxicity to algae/aquatic plants</td>
<td>EC50 (Pseudokirchneriella subcapitata (green algae)): 5.2 mg/l</td>
</tr>
<tr>
<td>Exposure time</td>
<td>72 h</td>
</tr>
<tr>
<td>Method</td>
<td>OECD Test Guideline 201</td>
</tr>
</tbody>
</table>
Persistence and degradability

Components:

2-(2-Butoxyethoxy)ethanol:

<table>
<thead>
<tr>
<th>Biodegradability</th>
<th>Result: Readily biodegradable.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biodegradation</td>
<td>85 %</td>
</tr>
<tr>
<td>Exposure time</td>
<td>28 d</td>
</tr>
<tr>
<td>Method</td>
<td>OECD Test Guideline 301C</td>
</tr>
</tbody>
</table>

N-Methyl-2-pyrrolidone:

<table>
<thead>
<tr>
<th>Biodegradability</th>
<th>Result: Readily biodegradable.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biodegradation</td>
<td>73 %</td>
</tr>
<tr>
<td>Exposure time</td>
<td>28 d</td>
</tr>
<tr>
<td>Method</td>
<td>OECD Test Guideline 301C</td>
</tr>
</tbody>
</table>

Ethanol:

<table>
<thead>
<tr>
<th>Biodegradability</th>
<th>Result: Readily biodegradable.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biodegradation</td>
<td>84 %</td>
</tr>
<tr>
<td>Exposure time</td>
<td>20 d</td>
</tr>
</tbody>
</table>

Fipronil (ISO):

<table>
<thead>
<tr>
<th>Biodegradability</th>
<th>Result: Not readily biodegradable.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biodegradation</td>
<td>47 %</td>
</tr>
<tr>
<td>Exposure time</td>
<td>28 d</td>
</tr>
<tr>
<td>Method</td>
<td>OECD Test Guideline 301B</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Biodegradability</th>
<th>Result: Not readily biodegradable.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biodegradation</td>
<td>4.5 %</td>
</tr>
<tr>
<td>Exposure time</td>
<td>28 d</td>
</tr>
<tr>
<td>Method</td>
<td>OECD Test Guideline 301C</td>
</tr>
</tbody>
</table>

Bioaccumulative potential

Components:

2-(2-Butoxyethoxy)ethanol:

| Partition coefficient n-octanol/water | log Pow: 1 |

N-Methyl-2-pyrrolidone:

| Partition coefficient n-octanol/water | log Pow: -0.46 |

Ethanol:

| Partition coefficient n-octanol/water | log Pow: -0.35 |

Fluazuron:

| Partition coefficient n-octanol/water | log Pow: 5.1 |
SAFETY DATA SHEET

Fluazuron / Fipronil Formulation

Fipronil (ISO):

Bioaccumulation: Species: Lepomis macrochirus (Bluegill sunfish)
Bioconcentration factor (BCF): 321

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

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

tert-butyl-4-methoxyphenol:

Partition coefficient: n-octanol/water: log Pow: 2.8

Mobility in soil
No data available

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. 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.

14. TRANSPORT INFORMATION

International Regulations

UNRTDG
UN number: UN 1170
Proper shipping name: ETHANOL SOLUTION
Class: 3
Packing group: III
Labels: 3

IATA-DGR
UN/ID No.: UN 1170
Proper shipping name: Ethanol solution
Class: 3
Packing group: III
Labels: Flammable Liquids
Packing instruction (cargo aircraft): 366
Packing instruction (passenger aircraft) : 355

IMDG-Code
UN number : UN 1170
Proper shipping name : ETHANOL SOLUTION (Fluazuron, Fipronil (ISO))

Class : 3
Packing group : III
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.

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

15. REGULATORY INFORMATION

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

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

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

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

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

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

Fluazuron / Fipronil Formulation

Version 4.0 Revision Date: 2020/03/23 SDS Number: 557849-00009 Date of last issue: 2019/09/13 Date of first issue: 2016/03/15

IECSC : not determined

16. OTHER INFORMATION

Further information

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
ACGIH : USA, ACGIH Threshold Limit Values (TLV)
ACGIH BEI : ACGIH - Biological Exposure Indices (BEI)
ID OEL : Indonesia. Occupational Exposure Limits

ACGIH / TWA : 8-hour, time-weighted average
ACGIH / STEL : Short-term exposure limit
ID OEL / NAB : Long term exposure limit

AICS - Australian Inventory of Chemical Substances; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median 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
SAFETY DATA SHEET

Fluazuron / Fipronil Formulation

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