SAFETY DATA SHEET

Fluazuron / Fipronil Formulation

SECTION 1. IDENTIFICATION

Product name : Fluazuron / Fipronil Formulation

Manufacturer or supplier's details
Company name of supplier : Merck & Co., Inc
Address : 2000 Galloping Hill Road
          Kenilworth - New Jersey - U.S.A. 07033
Telephone : 908-740-4000
Telefax : 908-735-1496
Emergency telephone : 1-908-423-6000
E-mail address : EHSDATASTEWARD@merck.com

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

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with 29 CFR 1910.1200

Flammable liquids : Category 3
Skin irritation : Category 2
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 1 (Central nervous system, Kidney)

GHS label elements

Hazard pictograms :

Signal Word : Danger
Hazard Statements : H226 Flammable liquid and vapor.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.
H350 May cause cancer.
H360 May damage fertility or the unborn child.
H372 Causes damage to organs (Central nervous system, Kidney) through prolonged or repeated exposure.
Precautionary Statements:  
**Prevention:**  
P201 Obtain special instructions before use.  
P202 Do not handle until all safety precautions have been read and understood.  
P210 Keep away from heat/ sparks/ open flames/ hot surfaces.  
No smoking.  
P233 Keep container tightly closed.  
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.  
P242 Use only non-sparking tools.  
P243 Take precautionary measures against static discharge.  
P260 Do not breathe mist or vapors.  
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.  
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.  

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

**Disposal:**  
P501 Dispose of contents/ container to an approved waste disposal plant.  

Other hazards  
Vapors may form explosive mixture with air.  

### SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Substance / Mixture</th>
<th>Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical name</td>
<td>CAS-No.</td>
</tr>
<tr>
<td>2-(2-Butoxyethoxy)ethanol</td>
<td>112-34-5</td>
</tr>
</tbody>
</table>
SECTION 4. FIRST AID MEASURES

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

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

In case of skin contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

In case of eye contact: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lens, if worn. Get medical attention.

If swallowed: If swallowed, DO NOT induce vomiting. Get medical attention. Rinse mouth thoroughly with water.

Most important symptoms and effects, both acute and delayed: Causes skin irritation. Causes serious eye irritation. May cause respiratory irritation. May cause cancer. May damage fertility or the unborn child. Causes 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.

SECTION 5. FIRE-FIGHTING MEASURES

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

Unsuitable extinguishing media: High volume water jet

Specific hazards during fire fighting: Do not use a solid water stream as it may scatter and spread fire. Flash back possible over considerable distance. Vapors may form explosive mixtures with air. Exposure to combustion products may be a hazard to health.
SAFETY DATA SHEET

Fluazuron / Fipronil Formulation

Hazardous combustion products:
- Carbon oxides
- Nitrogen oxides (NOx)
- Chlorine compounds
- Fluorine compounds
- Sulfur 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 fire-fighters:
- In the event of fire, wear self-contained breathing apparatus.
- Use personal protective equipment.

SECTION 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 spillages cannot be contained.

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

SECTION 7. HANDLING AND STORAGE

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

Local/Total ventilation:
- 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 vapors 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 sensitized individuals should consult their physician regarding working with respiratory irritants or sensitizers.
- 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 labeled containers.
- Store locked up.
- Keep tightly closed.
- Keep in a cool, well-ventilated place.
- Store in accordance with the particular national regulations.
- Keep away from heat and sources of ignition.

Materials to avoid:
- Do not store with the following product types:
  - 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

### SECTIONS 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

#### Ingredients with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type (Form of exposure)</th>
<th>Control parameters / Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-(2-Butoxyethoxy)ethanol</td>
<td>112-34-5</td>
<td>TWA (Inhalable fraction and vapor)</td>
<td>10 ppm (ACGIH)</td>
<td></td>
</tr>
<tr>
<td>N-Methyl-2-pyrrolidone</td>
<td>872-50-4</td>
<td>TWA</td>
<td>10 ppm (US WEEL)</td>
<td></td>
</tr>
<tr>
<td>Ethanol</td>
<td>64-17-5</td>
<td>TWA</td>
<td>1,000 ppm, 1,900 mg/m³ (NIOSH REL)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL</td>
<td>1,000 ppm (ACGIH)</td>
<td></td>
</tr>
<tr>
<td>Fluazuron</td>
<td>86811-58-7</td>
<td>TWA</td>
<td>60 µg/m³ (OEW 3) (OSHA-C1)</td>
<td>Internal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wipe limit</td>
<td>600 µg/ 100 cm² (ACGIH)</td>
<td>Internal</td>
</tr>
</tbody>
</table>
SAFETY DATA SHEET

Fluazuron / Fipronil Formulation

Version 7.0  Revision Date: 03/23/2020  SDS Number: 557858-00009  Date of last issue: 09/13/2019  Date of first issue: 03/15/2016

Fipronil  120068-37-3  TWA  2 µg/m³ (OEB 4)  Internal

Further information: Skin

Wipe limit  20 µg/100 cm²  Internal

Biological occupational exposure limits

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Control parameters</th>
<th>Biological specimen</th>
<th>Sampling time</th>
<th>Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-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., drip-less quick connections). All engineering controls should be implemented by facility design and operated in accordance with GMP principles to protect products, workers, and the environment. Containment technologies suitable for controlling compounds are required to control at source and to prevent migration of the compound to uncontrolled areas (e.g., open-face containment devices). Minimize open handling.

Personal protective equipment

Respiratory protection: General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

Hand protection

Material: Chemical-resistant gloves

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

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

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

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.

### SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>liquid</td>
</tr>
<tr>
<td>Color</td>
<td>light yellow</td>
</tr>
<tr>
<td>Odor</td>
<td>solvent</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>No data available</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>No data available</td>
</tr>
<tr>
<td>Flash point</td>
<td>90 °F / 32 °C</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flammability (liquids)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Upper explosion limit / Upper flammability limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Lower explosion limit / Lower flammability limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative vapor density</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative density</td>
<td>No data available</td>
</tr>
<tr>
<td>Solubility(ies)</td>
<td></td>
</tr>
</tbody>
</table>
SAFETY DATA SHEET

Fluazuron / Fipronil Formulation

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<tr>
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</tr>
</tbody>
</table>

- Water solubility: No data available
- Partition coefficient: n-octanol/water: No data available
- Autoignition temperature: No data available
- Decomposition temperature: No data available
- Viscosity
  - Viscosity, kinematic: No data available
- Explosive properties: Not explosive
- Oxidizing properties: The substance or mixture is not classified as oxidizing.
- Molecular weight: No data available
- Particle size: No data available

SECTION 10. STABILITY AND REACTIVITY

- Reactivity: Not classified as a reactivity hazard.
- Chemical stability: Stable under normal conditions.
- Possibility of hazardous reactions
  - Flammable liquid and vapor.
  - Vapors may form explosive mixture with air.
  - Can react with strong oxidizing agents.
- Conditions to avoid: Heat, flames and sparks.
- Incompatible materials: Oxidizing agents
- Hazardous decomposition products: No hazardous decomposition products are known.

SECTION 11. TOXICOLOGICAL INFORMATION

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: 2,242 mg/kg
  Method: Calculation method
- Acute inhalation toxicity: Acute toxicity estimate: 28.8 mg/l
  Exposure time: 4 h
  Test atmosphere: dust/mist
  Method: Calculation method
- Acute dermal toxicity: Acute toxicity estimate: 3,646 mg/kg
SAFETY DATA SHEET

Fluazuron / Fipronil Formulation

Components:

2-(2-Butoxyethoxy)ethanol:
- Acute oral toxicity: LD50 (Mouse): 2,410 mg/kg
- Acute dermal toxicity: LD50 (Rabbit): 2,764 mg/kg

N-Methyl-2-pyrrolidone:
- Acute oral toxicity: LD50 (Rat): 4,150 mg/kg
- Acute inhalation toxicity: LC50 (Rat): > 5.1 mg/l
  Exposure time: 4 h
  Test atmosphere: dust/mist
  Method: OECD Test Guideline 403
- Acute dermal toxicity: LD50 (Rat): > 5,000 mg/kg

Ethanol:
- Acute oral toxicity: LD50 (Rat): > 5,000 mg/kg
  Method: OECD Test Guideline 401
- Acute inhalation toxicity: LC50 (Rat): 124.7 mg/l
  Exposure time: 4 h
  Test atmosphere: vapor

Fluazuron:
- Acute oral toxicity: LD50 (Rat): > 5,000 mg/kg
  Method: OECD Test Guideline 401
- Acute inhalation toxicity: LC50 (Rat): > 6.0 mg/l
  Exposure time: 4 h
  Test atmosphere: dust/mist
  Method: OECD Test Guideline 403
- Acute dermal toxicity: LD50 (Rat): > 2,000 mg/kg
  Method: OECD Test Guideline 402

Fipronil:
- Acute oral toxicity: LD50 (Rat): 92 mg/kg
- 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

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:
Species  :  Rabbit 
Method  :  OECD Test Guideline 404 
Result  :  No skin irritation

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
SAFETY DATA SHEET

Fluazuron / Fipronil Formulation

<table>
<thead>
<tr>
<th>Species</th>
<th>Fluazuron:</th>
<th>Method</th>
<th>OECD Test Guideline</th>
<th>Result</th>
<th>Method</th>
<th>OECD Test Guideline</th>
<th>Method</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Species</td>
<td>Ethanol:</td>
<td>Rabbit</td>
<td>IRRITATION TO EYES, REVERSING WITHIN 21 DAYS</td>
<td>OECD Test Guideline 405</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Result</td>
<td>Fluazuron:</td>
<td>Mild eye irritation</td>
<td>OECD Test Guideline 405</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Method</td>
<td>Fipronil:</td>
<td>No eye irritation</td>
<td>OECD Test Guideline 405</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>tert-Butyl-4-methoxyphenol:</td>
<td>Species:</td>
<td>Rabbit</td>
<td>Irritation to eyes, reversing within 21 days</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respiratory or skin sensitization</td>
<td>Skin sensitization</td>
<td>Not classified based on available information.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respiratory sensitization</td>
<td>Not classified based on available information.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Components:

2-(2-Butoxyethoxy)ethanol:

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Maximization Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routes of exposure</td>
<td>Skin contact</td>
</tr>
<tr>
<td>Species</td>
<td>Guinea pig</td>
</tr>
<tr>
<td>Result</td>
<td>negative</td>
</tr>
</tbody>
</table>

N-Methyl-2-pyrrolidone:

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Local lymph node assay (LLNA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routes of exposure</td>
<td>Skin contact</td>
</tr>
<tr>
<td>Species</td>
<td>Mouse</td>
</tr>
<tr>
<td>Method</td>
<td>OECD Test Guideline 429</td>
</tr>
<tr>
<td>Result</td>
<td>negative</td>
</tr>
<tr>
<td>Remarks</td>
<td>Based on data from similar materials</td>
</tr>
</tbody>
</table>

Ethanol:

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Local lymph node assay (LLNA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routes of exposure</td>
<td>Skin contact</td>
</tr>
<tr>
<td>Species</td>
<td>Mouse</td>
</tr>
<tr>
<td>Result</td>
<td>negative</td>
</tr>
</tbody>
</table>
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</tbody>
</table>

## Fluazuron:
- **Routes of exposure**: Skin contact
- **Species**: Guinea pig
- **Result**: negative

## Fipronil:
- **Test Type**: Buehler Test
- **Routes of exposure**: Skin contact
- **Species**: Guinea pig
- **Method**: OECD Test Guideline 406
- **Result**: negative

## tert-Butyl-4-methoxyphenol:
- **Test Type**: Human repeat insult patch test (HRIPT)
- **Routes of exposure**: Skin contact
- **Result**: negative

## 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

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

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

Fluazuron:
Genotoxicity in vitro: 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

Genotoxicity in vivo: Test Type: Cytogenetic assay
Species: Hamster
Result: equivocal

Fipronil:
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: Chromosome aberration test in vitro
Method: OECD Test Guideline 473
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: Unscheduled DNA synthesis (UDS) test with mammalian liver cells in vivo
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 486
Result: negative

tert-Butyl-4-methoxyphenol:
Genotoxicity in vitro: Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

Carcinogenicity
May cause cancer.

Components:

N-Methyl-2-pyrrolidone:
Species: Rat
Application Route: Ingestion
Exposure time: 2 Years
Result: negative

Species: Rat
Application Route: inhalation (vapor)
Exposure time: 2 Years
Result: negative

Fluazuron:
Species: Rat
Application Route: Ingestion
Exposure time: 2 Years
Method: OECD Test Guideline 453
Result: negative

Species: Mouse
Application Route: Ingestion
Exposure time: 2 Years
Result: negative

Fipronil:
Species: Mouse
Application Route: Ingestion
Exposure time: 78 weeks
Result: negative
**SAFETY DATA SHEET**

**Fluazuron / Fipronil Formulation**

<table>
<thead>
<tr>
<th>Version</th>
<th>Revision Date:</th>
<th>SDS Number:</th>
<th>Date of last issue:</th>
<th>Date of first issue:</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td>03/23/2020</td>
<td>557858-00009</td>
<td>09/13/2019</td>
<td>03/15/2016</td>
</tr>
</tbody>
</table>

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

**tert-Butyl-4-methoxyphenol:**

<table>
<thead>
<tr>
<th>Species</th>
<th>Hamster</th>
<th>Application Route</th>
<th>Ingestion</th>
<th>Exposure time</th>
<th>24 weeks</th>
<th>Result</th>
<th>positive</th>
</tr>
</thead>
</table>

**Carcinogenicity - Assessment**

**IARC** Group 2B: Possibly carcinogenic to humans  
**tert-Butyl-4-methoxyphenol**  
(butylated hydroxyanisole)  
**OSHA** No component of this product present at levels greater than or equal to 0.1% is on OSHA’s list of regulated carcinogens.

**NTP**  
Reasonably anticipated to be a human carcinogen  
**tert-Butyl-4-methoxyphenol**  
(butylated Hydroxyanisole)  
**Reproductive toxicity**

May damage fertility or 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 fetal development | Test Type: Embryo-fetal development  
Species: Rat  
Application Route: Ingestion  
Result: negative |

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

<p>| Effects on fertility | Test Type: Two-generation reproduction toxicity study |</p>
<table>
<thead>
<tr>
<th></th>
<th>Species: Rat</th>
<th>Application Route: Ingestion</th>
<th>Method: OECD Test Guideline 416</th>
<th>Result: negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effects on fetal development</td>
<td>Test Type: Embryo-fetal development</td>
<td>Species: Rat</td>
<td>Application Route: Ingestion</td>
<td>Result: positive</td>
</tr>
<tr>
<td>Test Type: Fertility/early embryonic development</td>
<td>Species: Rat</td>
<td>Application Route: inhalation (vapor)</td>
<td>Result: positive</td>
<td></td>
</tr>
<tr>
<td>Test Type: Embryo-fetal development</td>
<td>Species: Rabbit</td>
<td>Application Route: Ingestion</td>
<td>Result: positive</td>
<td></td>
</tr>
<tr>
<td>Reproductive toxicity - Assessment</td>
<td>Clear evidence of adverse effects on development, based on animal experiments.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

**Fipronil:**

| Effects on fertility | Test Type: Two-generation reproduction toxicity study | Species: Rat | Application Route: Ingestion | Result: negative |
Effects on fetal development: Test Type: Embryo-fetal development
Species: Rabbit
Application Route: Ingestion
Method: OECD Test Guideline 414
Result: negative

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

Effects on fetal development: Test Type: Embryo-fetal 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
Causes damage to organs (Central nervous system, Kidney) through prolonged or repeated exposure.

Components:
Fipronil:
Routes of exposure: 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.

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
<table>
<thead>
<tr>
<th><strong>Drug</strong></th>
<th><strong>Species</strong></th>
<th><strong>NOAEL</strong></th>
<th><strong>LOAEL</strong></th>
<th><strong>Application Route</strong></th>
<th><strong>Exposure time</strong></th>
<th><strong>Method</strong></th>
<th><strong>Reference</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fluazuron</strong></td>
<td>Rat</td>
<td>169 mg/kg</td>
<td>433 mg/kg</td>
<td>Ingestion</td>
<td>90 Days</td>
<td>OECD Test Guideline 408</td>
<td></td>
</tr>
<tr>
<td><strong>Ethanol</strong></td>
<td>Rat</td>
<td>1,280 mg/kg</td>
<td>3,156 mg/kg</td>
<td>Ingestion</td>
<td>90 Days</td>
<td>OECD Test Guideline 413</td>
<td></td>
</tr>
<tr>
<td><strong>N-Methyl-2-pyrrolidone</strong></td>
<td>Rat, male</td>
<td>169 mg/kg</td>
<td>433 mg/kg</td>
<td>Ingestion</td>
<td>90 Days</td>
<td>OECD Test Guideline 408</td>
<td></td>
</tr>
<tr>
<td><strong>NOAEL</strong></td>
<td>Rat</td>
<td>1,653 mg/kg</td>
<td>3,156 mg/kg</td>
<td>Skin contact</td>
<td>20 Days</td>
<td>OECD Test Guideline 413</td>
<td></td>
</tr>
<tr>
<td><strong>Species</strong></td>
<td>Dog</td>
<td>7.5 mg/kg</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Target Organs**: Liver, Thyroid, Pituitary gland
### LOAEL
<table>
<thead>
<tr>
<th>Application Route</th>
<th>Exposure time</th>
<th>Target Organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingestion</td>
<td>52 Weeks</td>
<td>Liver</td>
</tr>
</tbody>
</table>

**Fipronil:**

<table>
<thead>
<tr>
<th>Species</th>
<th>NOAEL</th>
<th>LOAEL</th>
<th>Application Route</th>
<th>Exposure time</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rabbit</td>
<td>5 mg/kg</td>
<td>10 mg/kg</td>
<td>Skin contact</td>
<td>21 Days</td>
<td>OECD Test Guideline 410</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Species</th>
<th>NOAEL</th>
<th>LOAEL</th>
<th>Application Route</th>
<th>Exposure time</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rat, male</td>
<td>0.059 mg/kg</td>
<td>0.019 mg/kg</td>
<td>Ingestion</td>
<td>89 Weeks</td>
<td>Directive 67/548/EEC, Annex V, B.33.</td>
</tr>
</tbody>
</table>

**tert-Butyl-4-methoxyphenol:**

<table>
<thead>
<tr>
<th>Species</th>
<th>LOAEL</th>
<th>Application Route</th>
<th>Exposure time</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rat</td>
<td>63,000 mg/kg</td>
<td>Ingestion</td>
<td>6 Weeks</td>
<td></td>
</tr>
</tbody>
</table>

**Aspiration toxicity**

Not classified based on available information.

**Experience with human exposure**

**Components:**

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

| Skin contact: Symptoms: | Skin irritation |

### SECTION 12. ECOLOGICAL INFORMATION

**Ecotoxicity**

**Components:**

**2-(2-Butoxyethoxy)ethanol:**

<table>
<thead>
<tr>
<th>Toxicity to fish</th>
<th>LC50 (Lepomis macrochirus (Bluegill sunfish)): 1,300 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time</td>
<td>96 h</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Toxicity to daphnia and other aquatic invertebrates</th>
<th>EC50 (Daphnia magna (Water flea)): &gt; 100 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time</td>
<td>48 h</td>
</tr>
<tr>
<td>Method</td>
<td>OECD Test Guideline 202</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Toxicity to algae/aquatic plants</th>
<th>ErC50 (Desmodesmus subspicatus (green algae)): &gt; 100 mg/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure time</td>
<td>96 h</td>
</tr>
<tr>
<td>Method</td>
<td>OECD Test Guideline 201</td>
</tr>
</tbody>
</table>
### Toxicity to Microorganisms

- **NOEC (Desmodesmus subspicatus (green algae)):** \( \geq 100 \text{ mg/l} \)
  
  Exposure time: 96 h

- **Method:** OECD Test Guideline 201

- **Toxicity:** EC10: \( > 1,995 \text{ mg/l} \)
  
  Exposure time: 30 min

### N-Methyl-2-pyrrolidone

- **Toxicity to Fish**
  
  LC50 (Oncorhynchus mykiss (rainbow trout)): \( > 500 \text{ mg/l} \)
  
  Exposure time: 96 h

- **Toxicity to Daphnia and Other Aquatic Invertebrates**
  
  EC50 (Daphnia magna (Water flea)): \( > 1,000 \text{ mg/l} \)
  
  Exposure time: 24 h

  Method: DIN 38412

- **Toxicity to Algae/Aquatic Plants**
  
  ErC50 (Desmodesmus subspicatus (green algae)): \( 600.5 \text{ mg/l} \)
  
  Exposure time: 72 h

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

- **Toxicity to Daphnia and Other Aquatic Invertebrates (Chronic Toxicity)**
  
  NOEC (Daphnia magna (Water flea)): \( 12.5 \text{ mg/l} \)
  
  Exposure time: 21 d

  Method: OECD Test Guideline 211

- **Toxicity to Microorganisms**
  
  EC50: \( > 600 \text{ mg/l} \)
  
  Exposure time: 30 min

  Method: ISO 8192

### Ethanol

- **Toxicity to Fish**
  
  LC50 (Pimephales promelas (fathead minnow)): \( > 1,000 \text{ mg/l} \)
  
  Exposure time: 96 h

- **Toxicity to Daphnia and Other Aquatic Invertebrates**
  
  EC50 (Ceriodaphnia (water flea)): \( > 1,000 \text{ mg/l} \)
  
  Exposure time: 48 h

- **Toxicity to Algae/Aquatic Plants**
  
  ErC50 (Chlorella vulgaris (Fresh water algae)): \( 275 \text{ mg/l} \)
  
  Exposure time: 72 h

  EC10 (Chlorella vulgaris (Fresh water algae)): \( 11.5 \text{ mg/l} \)
  
  Exposure time: 72 h

- **Toxicity to Daphnia and Other Aquatic Invertebrates (Chronic Toxicity)**
  
  NOEC (Daphnia magna (Water flea)): \( 9.6 \text{ mg/l} \)
  
  Exposure time: 9 d

- **Toxicity to Microorganisms**
  
  EC50 (Pseudomonas putida): \( 6,500 \text{ mg/l} \)
  
  Exposure time: 16 h

### Fluazuron

- **Toxicity to Fish**
  
  LC50 (Cyprinus carpio (Carp)): \( > 9.1 \text{ mg/l} \)
  
  Exposure time: 96 h
Fluazuron / Fipronil Formulation

**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

**Fipronil:**

**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

**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

**Toxicity to microorganisms**
- EC50: > 1,000 mg/l
  - Exposure time: 3 h

**tert-Butyl-4-methoxyphenol:**

**Toxicity to fish**
- LC50: 5.8 mg/l
  - Exposure time: 96 h
  - Method: OECD Test Guideline 203

**Toxicity to daphnia and other aquatic invertebrates**
- EC50 (Daphnia magna (Water flea)): 2.3 mg/l
  - Exposure time: 96 h
  - Method: OECD Test Guideline 202

**Toxicity to algae/aquatic plants**
- EC50 (Pseudokirchneriella subcapitata (green algae)): 5.2 mg/l
  - Exposure time: 72 h
  - Method: OECD Test Guideline 201

**Persistence and degradability**

**Components:**

**2-(2-Butoxyethoxy)ethanol:**

- Biodegradability: Result: Readily biodegradable.
Biodegradation: 85 %
Exposure time: 28 d
Method: OECD Test Guideline 301C

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:

<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>

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 |

Fipronil:

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

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

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

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods
Waste from residues: Dispose of in accordance with local regulations.
Contaminated packaging: Empty containers should be taken to an approved waste handling site for recycling or disposal. Empty containers retain residue and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury and/or death.
If not otherwise specified: Dispose of as unused product.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG
UN number: UN 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)
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.

Domestic regulation
SAFETY DATA SHEET

Fluazuron / Fipronil Formulation

Version 7.0  Revision Date: 03/23/2020  SDS Number: 557858-00009  Date of last issue: 09/13/2019
Date of first issue: 03/15/2016

49 CFR
UN/ID/NA number : UN 1170
Proper shipping name : Ethanol solutions
Class : 3
Packing group : III
Labels : FLAMMABLE LIQUID
ERG Code : 127
Marine pollutant : yes(Fluazuron, Fipronil)

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

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know

CERCLA Reportable Quantity
This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity
This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity
This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Flammable (gases, aerosols, liquids, or solids)
Carcinogenicity
Reproductive toxicity
Specific target organ toxicity (single or repeated exposure)
Skin corrosion or irritation
Serious eye damage or eye irritation

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

<table>
<thead>
<tr>
<th>Component</th>
<th>SARA 313 Code Number</th>
<th>Reporting Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-(2-Butoxyethoxy)ethanol</td>
<td>112-34-5</td>
<td>&gt;= 50 - &lt; 70 %</td>
</tr>
<tr>
<td>N-Methyl-2-pyrrolidone</td>
<td>872-50-4</td>
<td>&gt;= 10 - &lt; 20 %</td>
</tr>
</tbody>
</table>

US State Regulations

Pennsylvania Right To Know

<table>
<thead>
<tr>
<th>Component</th>
<th>UN/ID/NA Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-(2-Butoxyethoxy)ethanol</td>
<td>112-34-5</td>
</tr>
<tr>
<td>Ethanol</td>
<td>64-17-5</td>
</tr>
<tr>
<td>N-Methyl-2-pyrrolidone</td>
<td>872-50-4</td>
</tr>
</tbody>
</table>
California Prop. 65
WARNING: This product can expose you to chemicals including tert-Butyl-4-methoxyphenol, which is/are known to the State of California to cause cancer, and N-Methyl-2-pyrrolidone, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

California List of Hazardous Substances
Ethanol  64-17-5

California Permissible Exposure Limits for Chemical Contaminants
Ethanol  64-17-5
N-Methyl-2-pyrrolidone  872-50-4

The ingredients of this product are reported in the following inventories:
AICS: not determined
DSL: not determined
IECSC: not determined

SECTION 16. OTHER INFORMATION

Further information

NFPA 704:

<table>
<thead>
<tr>
<th>Flammability</th>
<th>Health</th>
<th>Instability</th>
<th>Special hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>2</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

HMIS® IV:

<table>
<thead>
<tr>
<th>HEALTH</th>
<th>FLAMMABILITY</th>
<th>PHYSICAL HAZARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>* 3</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "" represents the absence of a chronic hazard.

Full text of other abbreviations

ACGIH: USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI: ACGIH - Biological Exposure Indices (BEI)
NIOSH REL: USA. NIOSH Recommended Exposure Limits
OSHA Z-1: USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
US WEEL: USA. Workplace Environmental Exposure Levels (WEEL)
ACGIH / TWA: 8-hour, time-weighted average
ACGIH / STEL: Short-term exposure limit
SAFETY DATA SHEET

Fluazuron / Fipronil Formulation

Version: 7.0  
Revision Date: 03/23/2020  
SDS Number: 557858-00009  
Date of last issue: 09/13/2019  
Date of first issue: 03/15/2016

NIOSH REL / TWA: Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
OSHA Z-1 / TWA: 8-hour time weighted average
US WEEL / TWA: 8-hr TWA

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; 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; HMIS - Hazardous Materials Identification System; 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; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; 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; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; 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


Revision Date: 03/23/2020

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.

US / Z8