SAFETY DATA SHEET

Fluazuron / Fipronil Formulation

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Fluazuron / Fipronil Formulation

Manufacturer or supplier’s details

Company : MSD

Address : Rua Coronel Bento Soares, 530
          Cruzeiro - Sao Paulo - Brazil  CEP 12730-340

Telephone : 908-740-4000

Emergency telephone : 1-908-423-6000

E-mail address : EHSDATASTEWARD@msd.com

Telefax : 908-735-1496

Recommended use of the chemical and restrictions on use

Recommended use : Veterinary product

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification in accordance with ABNT NBR 14725 Standard

Flammable liquids : Category 3

Acute toxicity (Oral) : Category 5

Acute toxicity (Dermal) : Category 5

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 2 (Central nervous system, Kidney)

Short-term (acute) aquatic hazard : Category 1

Long-term (chronic) aquatic hazard : Category 1
GHS label elements in accordance with ABNT NBR 14725 Standard

**Signal Word**: Danger

**Hazard Statements**:
- H226 Flammable liquid and vapor.
- H303 + H313 May be harmful if swallowed or in contact with skin.
- 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.
  - P210 Keep away from heat/ sparks/ open flames/ hot surfaces.
  - No smoking.
  - P273 Avoid release to the environment.
  - P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

- **Response**:
  - P312 Call a POISON CENTER/ doctor if you feel unwell.
  - P391 Collect spillage.

**Other hazards which do not result in classification**
Vapors may form explosive mixture with air.

### SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Substance / Mixture</th>
<th>Mixture</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Components</strong></td>
<td></td>
</tr>
<tr>
<td>Chemical name</td>
<td>CAS-No.</td>
</tr>
<tr>
<td>2-(2-Butoxyethoxy)ethanol</td>
<td>112-34-5</td>
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<tr>
<td>N-Methyl-2-pyrrolidone</td>
<td>872-50-4</td>
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<td></td>
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<tr>
<td>Substance</td>
<td>CAS Number</td>
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<td>----------------------------</td>
<td>------------</td>
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<tr>
<td>Ethanol</td>
<td>64-17-5</td>
</tr>
<tr>
<td>Fluazuron</td>
<td>86811-58-7</td>
</tr>
<tr>
<td>Fipronil</td>
<td>120068-37-3</td>
</tr>
<tr>
<td>2,6-Di-tert-butyl-p-cresol</td>
<td>128-37-0</td>
</tr>
<tr>
<td>tert-Butyl-4-methoxyphenol</td>
<td>25013-16-5</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**

May be harmful if swallowed or in contact with skin. 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.

### 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
**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. |
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 sensizers.
Keep away from heat and sources of ignition.
Take precautionary measures against static discharges.
Take care to prevent spills, waste and minimize release to the environment.

Hygiene measures : 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.

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

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters
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Components | CAS-No. | Value type (Form of exposure) | Control parameters / Permissible concentration | Basis |
---|---|---|---|---|
2-(2-Butoxyethoxy)ethanol | 112-34-5 | TWA (Inhalable fraction and vapor) | 10 ppm | ACGIH |
Ethanol | 64-17-5 | LT | 780 ppm 1.480 mg/m³ | BR OEL |
Fluazuron | 86811-58-7 | TWA | 60 µg/m³ (OEB 3) | Internal |
Fipronil | 120068-37-3 | TWA | 2 µg/m³ (OEB 4) | Internal |
2,6-Di-tert-butyl-p-cresol | 128-37-0 | TWA (Inhalable fraction and vapor) | 2 mg/m³ | ACGIH |

Further information:
Degree of harmfulness: minimum
STEL 1.000 ppm ACGIH

Biological occupational exposure limits

| Components | CAS-No. | Control parameters | Biological specimen | Sampling time | Permissible concentration | Basis |
---|---|---|---|---|---|---|
N-Methyl-2-pyrrolidone | 872-50-4 | 5-Hydroxy-N-methyl-2-pyrrolidone | Urine | End of shift (As soon as possible after exposure ceases) | 100 mg/l | ACGIH BEI |

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:
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 vapor type
Hand protection:
Material:
Chemical-resistant gloves
Remarks: Consider double gloving. Take note that the product is flammable, which may impact the selection of hand protection.

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

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

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: liquid
Color: light yellow
Odor: solvent
Odor 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
Lower explosion limit / Lower flammability limit: No data available
Vapor pressure: No data available
Relative vapor density: No data available
Relative density: No data available
Solubility(ies):
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Date of first issue: 15.03.2016

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
May be harmful if swallowed or in contact with skin.

Product:
Acute oral toxicity : Acute toxicity estimate: 2.242 mg/kg
  Method: Calculation method
Acute inhalation toxicity : Acute toxicity estimate: > 10 mg/l
  Exposure time: 4 h
  Test atmosphere: dust/mist
  Method: Calculation method
Acute dermal toxicity : Acute toxicity estimate: 3.646 mg/kg
  Method: Calculation method
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

**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
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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:
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
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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:
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

Respiratory or skin sensitization

Skin sensitization
Not classified based on available information.

Respiratory sensitization
Not classified based on available information.

Components:

2-(2-Butoxyethoxy)ethanol:
Test Type: Maximization Test
Routes of exposure: Skin contact
Species : Guinea pig
Result : negative

N-Methyl-2-pyrrolidone:
Test Type : Local lymph node assay (LLNA)
Routes of exposure : 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)
Routes of exposure : Skin contact
Species : Mouse
Result : negative

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

2,6-Di-tert-butyl-p-cresol:
Test Type : Human repeat insult patch test (HRIPT)
Routes of exposure : Skin contact
Species : Humans
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

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

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

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

Test Type: Chromosome aberration test in vitro  
Result: negative

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

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

Fipronil:
- Species: Mouse
  Application Route: Ingestion
  Exposure time: 78 weeks
  Result: negative

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

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

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

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

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

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

tert-Butyl-4-methoxyphenol:

Effects on fertility: Test Type: One-generation reproduction toxicity study
Species: Rat
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
May cause 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.

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 (vapor)
Exposure time: 90 Days
Method: OECD Test Guideline 413
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| 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
| LOAEL | 240 mg/kg
| Application Route | Ingestion
| Exposure time | 13 Weeks
| Target Organs | Liver, Thyroid, Pituitary gland

| 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
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Fipronil:

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

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:

Skin contact: Symptoms: Skin irritation

SECTION 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
**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

- **NOEC (Desmodesmus subspicatus (green algae))**: 40 µg/l
  - Exposure time: 96 h
  - Method: OECD Test Guideline 201

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

- **1.000**

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

- **1.000**

**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

**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

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

- **10.000**

**Toxicity to microorganisms**

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

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

**Toxicity to fish**

- **LC₅₀ (Danio rerio (zebra fish))**: > 0.57 mg/l
  - Exposure time: 96 h

**Toxicity to daphnia and other aquatic invertebrates**

- **EC₅₀ (Daphnia magna (Water flea))**: 0.48 mg/l
  - Exposure time: 48 h
  - Method: OECD Test Guideline 202

**Toxicity to algae/aquatic plants**

- **ErC₅₀ (Pseudokirchneriella subcapitata (green algae))**: > 0.24 mg/l
  - Exposure time: 72 h
Method: OECD Test Guideline 201

NOEC (Pseudokirchneriella subcapitata (green algae)): 0,24 mg/l
Exposure time: 72 h

M-Factor (Acute aquatic toxicity): 1

Toxicity to fish (Chronic toxicity):

NOEC (Oryzias latipes (Japanese medaka)): 0,053 mg/l
Exposure time: 30 d
Method: OECD Test Guideline 210

Exposure time: 30 d
Method: OECD Test Guideline 201

Exposure time: 21 d
Method: OECD Test Guideline 210

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

NOEC (Daphnia magna (Water flea)): 0,316 mg/l

Exposure time: 21 d
Method: OECD Test Guideline 210

Exposure time: 28 d
Method: OECD Test Guideline 301C

Toxicity to microorganisms:

EC50: > 10.000 mg/l
Exposure time: 3 h
Method: OECD Test Guideline 209

tert-Butyl-4-methoxyphenol:

Toxicity to fish:

LC50: 5,8 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

Exposure time: 96 h
Method: OECD Test Guideline 202

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:

Biodegradability: Result: Readily biodegradable.
Biodegradation: 73 %
Exposure time: 28 d
Method: OECD Test Guideline 301C

Ethanol:
Biodegradability: Result: Readily biodegradable.
Biodegradation: 84 %
Exposure time: 20 d

Fipronil:
Biodegradability: Result: Not readily biodegradable.
Biodegradation: 47 %
Exposure time: 28 d
Method: OECD Test Guideline 301B

2,6-Di-tert-butyl-p-cresol:
Biodegradability: Result: Not readily biodegradable.
Biodegradation: 4,5 %
Exposure time: 28 d
Method: OECD Test Guideline 301C

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
Method: OECD Test Guideline 107

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

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

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

National List of Carcinogenic Agents for Humans - (LINACH)

Group 2B: Possibly carcinogenic to humans
tert-Butyl-4-methoxyphenol 25013-16-5

Brazil. List of chemicals controlled by the Federal Police: Ethanol

International Regulations

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

AICS: not determined

DSL: not determined

IECSC: not determined
SAFETY DATA SHEET

Fluazuron / Fipronil Formulation

ACGIH / TWA : 8-hour, time-weighted average
ACGIH / STEL : Short-term exposure limit
BR OEL / LT : Up to 48 hours/week

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.