SECTION 1. IDENTIFICATION

Product name : Deltamethrin (2.5%) Formulation
Other means of identification : No data available

Manufacturer or supplier’s details
Company name of supplier : Merck & Co., Inc
Address : 126 E. Lincoln Avenue, Rahway, New Jersey U.S.A. 07065
Telephone : 908-740-4000
Emergency telephone : 1-908-423-6000
E-mail address : EHSDATATESTeward@merck.com

Recommended use of the chemical and restrictions on use
Recommended use : Veterinary product
Restrictions on use : Not applicable

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the Hazardous Products Regulations
Flammable liquids : Category 3
Skin irritation : Category 2
Serious eye damage : Category 1
Skin sensitization : Sub-category 1A
Germ cell mutagenicity : Category 1B
Carcinogenicity : Category 1B
Reproductive toxicity : Category 2
Specific target organ toxicity - single exposure : Category 3
Specific target organ toxicity - repeated exposure (Oral) : Category 1 (Central nervous system, Immune system)
Specific target organ toxicity - repeated exposure (Inhalation) : Category 1 (Central nervous system)
Aspiration hazard : Category 1

GHS label elements
SAFETY DATA SHEET
Deltamethrin (2.5%) Formulation

Version 3.10  Revision Date: 04/04/2023  SDS Number: 2656105-00013  Date of last issue: 10/01/2022  Date of first issue: 03/29/2018

Hazard pictograms:
- Flammable liquid and vapor
- Health hazard: skin
- Health hazard: eye
- Other hazard: safety

Signal Word: Danger

Hazard Statements:
- H226 Flammable liquid and vapor.
- H304 May be fatal if swallowed and enters airways.
- H315 Causes skin irritation.
- H317 May cause an allergic skin reaction.
- H318 Causes serious eye damage.
- H336 May cause drowsiness or dizziness.
- H340 May cause genetic defects.
- H350 May cause cancer.
- H361 Suspected of damaging fertility or the unborn child.
- H372 Causes damage to organs (Central nervous system, Immune system) through prolonged or repeated exposure if swallowed.
- H372 Causes damage to organs (Central nervous system) through prolonged or repeated exposure if inhaled.

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, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- 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.
- P272 Contaminated work clothing should not be allowed out of the workplace.
- P280 Wear protective gloves, protective clothing, eye protection and face protection.

Response:
- P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER.
- P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
- P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a doctor if you feel unwell.
- P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER.
- P308 + P313 IF exposed or concerned: Get medical attention.
- P331 Do NOT induce vomiting.
- P333 + P313 If skin irritation or rash occurs: Get medical attention.
- P362 + P364 Take off contaminated clothing and wash it before
SAFETY DATA SHEET

Deltamethrin (2.5%) Formulation

Version 3.10 Revision Date: 04/04/2023 SDS Number: 2656105-00013 Date of last issue: 10/01/2022 Date of first issue: 03/29/2018

reuse.

Storage:
P405 Store locked up.

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

Other hazards
Cutaneous sensations may occur, such as burning or stinging on the face and mucosae. However, these sensations cause no lesions and are of a transitory nature (max. 24 hours). Vapors may form explosive mixture with air.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Common Name/Synonym</th>
<th>CAS-No.</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solvent naphtha (petroleum), light aromatic</td>
<td>No data available</td>
<td>64742-95-6</td>
<td>&gt;= 30 - &lt; 60 *</td>
</tr>
<tr>
<td>Cottonseed oil</td>
<td>No data available</td>
<td>8001-29-4</td>
<td>&gt;= 30 - &lt; 60 *</td>
</tr>
<tr>
<td>Benzenesulfonic acid, C10-13-alkyl derivs., calcium salts</td>
<td>No data available</td>
<td>Not Assigned</td>
<td>&gt;= 1 - &lt; 5 *</td>
</tr>
<tr>
<td>4-Nonylphenol, branched, ethoxylated</td>
<td>No data available</td>
<td>127087-87-0</td>
<td>&gt;= 1 - &lt; 5 *</td>
</tr>
<tr>
<td>Deltamethrin (ISO)</td>
<td>No data available</td>
<td>52918-63-5</td>
<td>&gt;= 1 - &lt; 5 *</td>
</tr>
<tr>
<td>2,6-Di-tert-butyl-p-cresol</td>
<td>Phenol, 2,6-bis(1,1-dimethylethyl)-4-methyl-</td>
<td>128-37-0</td>
<td>&gt;= 1 - &lt; 5 *</td>
</tr>
</tbody>
</table>

* Actual concentration or concentration range is withheld as a trade secret

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
## SAFETY DATA SHEET

### Deltamethrin (2.5%) 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>3.10</td>
<td>04/04/2023</td>
<td>2656105-00013</td>
<td>10/01/2022</td>
<td>03/29/2018</td>
</tr>
</tbody>
</table>

#### If swallowed:
- For at least 15 minutes.
- If easy to do, remove contact lens, if worn.
- Get medical attention immediately.
- If swallowed, DO NOT induce vomiting.
- If vomiting occurs have person lean forward.
- Call a physician or poison control center immediately.
- Rinse mouth thoroughly with water.
- Never give anything by mouth to an unconscious person.

#### Most important symptoms and effects, both acute and delayed:
- May be fatal if swallowed and enters airways.
- Causes skin irritation.
- May cause an allergic skin reaction.
- Causes serious eye damage.
- May cause drowsiness or dizziness.
- May cause genetic defects.
- May cause cancer.
- Suspected of damaging fertility or the unborn child.
- Causes damage to organs through prolonged or repeated exposure if swallowed.
- Causes damage to organs through prolonged or repeated exposure if inhaled.
- This product contains a pyrethroid.
- Pyrethroid poisoning should not be confused with carbamate or organophosphate poisoning.

#### 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.

#### Hazardous combustion products:
- Carbon oxides
- Nitrogen oxides (NOx)
- Bromine compounds
- Sulfur oxides
- Metal 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:
- In the event of fire, wear self-contained breathing apparatus.
for fire-fighters 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 (see section 7) and personal protective equipment recommendations (see section 8).

Environmental precautions:
- Avoid release to the environment.
- 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.
- Use explosion-proof electrical, ventilating and lighting equipment.

Advice on safe handling:
- Do not get on skin or clothing.
- Do not breathe mist or vapors.
- Do not swallow.
- Do not get in eyes.
- Wash skin thoroughly after handling.
- Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment.
- Non-sparking tools should be used.
- Keep container tightly closed.
- Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Take precautionary measures against static discharges.
Do not eat, drink or smoke when using this product.
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
  - Self-reactive substances and mixtures
  - 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
  - Very acutely toxic substances and mixtures

**SECTION 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>Solvent naphtha (petroleum), light aromatic</td>
<td>64742-95-6</td>
<td>TWA</td>
<td>200 mg/m³ (total hydrocarbon vapor)</td>
<td>CA AB OEL</td>
</tr>
<tr>
<td>Cottonseed oil</td>
<td>8001-29-4</td>
<td>TWA</td>
<td>200 mg/m³ (total hydrocarbon vapor)</td>
<td>ACGIH</td>
</tr>
<tr>
<td>Deltamethrin (ISO)</td>
<td>52918-63-5</td>
<td>TWAEV (Mist)</td>
<td>10 mg/m³</td>
<td>CA QC OEL</td>
</tr>
</tbody>
</table>

Further information: DSEN, Skin

<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>Wipe limit</td>
<td>150 µg/100 cm²</td>
<td>Internal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TWA (Vapour and inhalable aerosols)</td>
<td>2 mg/m³</td>
<td>CA AB OEL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TWAEV (Inhalable fraction and vapour)</td>
<td>2 mg/m³</td>
<td>CA QC OEL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TWA (Inhalable fraction and vapour)</td>
<td>2 mg/m³</td>
<td>ACGIH</td>
<td></td>
<td></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. Use explosion-proof electrical, ventilating and lighting equipment.

### 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

#### Eye protection

- **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

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

- **Remarks**: 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. Contaminated work clothing should not be allowed out of the workplace. 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
### Appearance
- Liquid

### Color
- Yellow

### Odor
- No data available

### Odor Threshold
- No data available

### pH
- 4 - 5

### Melting point/freezing point
- < -5 °C

### Initial boiling point and boiling range
- No data available

### Flash point
- 40 °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

### Density
- 0.917 - 0.919 g/cm³

### Solubility(ies)
- Water solubility: partly miscible

### Partition coefficient: n-octanol/water
- Not applicable

### 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.
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: > 2,000 mg/kg
Method: Calculation method

Acute inhalation toxicity: Acute toxicity estimate: > 5 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

Components:

Solvent naphtha (petroleum), light aromatic:
Acute oral toxicity: LD50 (Rat): > 5,000 mg/kg

Acute inhalation toxicity: LC50 (Rat): > 5.61 mg/l
Exposure time: 4 h
Test atmosphere: vapor

Acute dermal toxicity: LD50 (Rabbit): > 2,000 mg/kg

Cottonseed oil:
Acute oral toxicity: LD50 (Rat): > 5,000 mg/kg

Benzenesulfonic acid, C10-13-alkyl derivs., calcium salts:
### Acute oral toxicity
- **LD₅₀ (Rat):** 4,445 mg/kg

### Acute dermal toxicity
- **LD₅₀ (Rat):** > 2,000 mg/kg
  - **Method:** OECD Test Guideline 402
  - **Remarks:** Based on data from similar materials

#### 4-Nonylphenol, branched, ethoxylated:
- **Acute oral toxicity:** LD₅₀ (Rat): > 2,000 mg/kg

#### Deltamethrin (ISO):
- **Acute oral toxicity:**
  - LD₅₀ (Rat): 66.7 mg/kg
  - LD₅₀ (Rat): 9 - 139 mg/kg
  - LD₅₀ (Mouse): 19 - 34 mg/kg
- **Acute inhalation toxicity:**
  - LC₅₀ (Rat): 0.8 mg/l
  - **Exposure time:** 2 h
  - **Test atmosphere:** dust/mist
- **Acute dermal toxicity:**
  - LD₅₀ (Rabbit): 2,000 mg/kg
  - LD₅₀ (Rat): > 800 mg/kg
- **Acute toxicity (other routes of administration):**
  - LD₅₀ (Rat): 2.5 mg/kg
  - **Application Route:** Intravenous
  - LD₅₀ (Mouse): 10 mg/kg
    - **Application Route:** Intraperitoneal

#### 2,6-Di-tert-butyl-p-cresol:
- **Acute oral toxicity:**
  - LD₅₀ (Rat): > 6,000 mg/kg
  - **Method:** OECD Test Guideline 401
- **Acute dermal toxicity:**
  - LD₅₀ (Rat): > 2,000 mg/kg
  - **Method:** OECD Test Guideline 402
  - **Assessment:** The substance or mixture has no acute dermal toxicity

### Skin corrosion/irritation
- Causes skin irritation.

### Components:

#### Solvent naphtha (petroleum), light aromatic:
- **Species:** Rabbit
- **Method:** OECD Test Guideline 404
- **Result:** Skin irritation

#### Benzenesulfonic acid, C10-13-alkyl derivs., calcium salts:
- **Species:** Rabbit
- **Method:** OECD Test Guideline 404
Result : Skin irritation

4-Nonylphenol, branched, ethoxylated:
Species : Rabbit
Method : OECD Test Guideline 404
Result : No skin irritation
Remarks : Based on data from similar materials

Deltamethrin (ISO):
Species : Rabbit
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

Serious eye damage/eye irritation
Causes serious eye damage.

Components:
Solvent naphtha (petroleum), light aromatic:
Species : Rabbit
Result : No eye irritation
Method : OECD Test Guideline 405

Benzenesulfonic acid, C10-13-alkyl derivs., calcium salts:
Species : Rabbit
Result : Irreversible effects on the eye
Method : OECD Test Guideline 405

4-Nonylphenol, branched, ethoxylated:
Species : Rabbit
Result : No eye irritation
Method : OECD Test Guideline 405
Remarks : Based on data from similar materials

Deltamethrin (ISO):
Species : Rabbit
Result : Moderate eye irritation

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
# Deltamethrin (2.5%) Formulation

<table>
<thead>
<tr>
<th>Component</th>
<th>Test Type</th>
<th>Routes of exposure</th>
<th>Species</th>
<th>Result</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory or skin sensitization</td>
<td>Buehler Test</td>
<td>Skin contact</td>
<td>Guinea pig</td>
<td>negative</td>
<td></td>
</tr>
<tr>
<td>Skin sensitization</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>May cause an allergic skin reaction.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respiratory sensitization</td>
<td></td>
<td></td>
<td></td>
<td>Not classified</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>based on available information.</td>
<td></td>
</tr>
</tbody>
</table>

## Components:

### Solvent naphtha (petroleum), light aromatic:

- **Test Type**: Buehler Test
- **Routes of exposure**: Skin contact
- **Species**: Guinea pig
- **Result**: negative

### Cottonseed oil:

- **Test Type**: Human repeat insult patch test (HRIPT)
- **Routes of exposure**: Skin contact
- **Result**: negative
- **Remarks**: Based on data from similar materials

### Benzenesulfonic acid, C10-13-alkyl derivs., calcium salts:

- **Test Type**: Magnusson-Kligman-Test
- **Routes of exposure**: Skin contact
- **Species**: Guinea pig
- **Method**: OECD Test Guideline 406
- **Remarks**: Based on data from similar materials

### 4-Nonylphenol, branched, ethoxylated:

- **Test Type**: Maximization Test
- **Routes of exposure**: Skin contact
- **Species**: Guinea pig
- **Result**: negative
- **Remarks**: Based on data from similar materials

### Deltamethrin (ISO):

- **Test Type**: Maximization Test
- **Routes of exposure**: Dermal
- **Species**: Guinea pig
- **Result**: negative
- **Test Type**: Human repeat insult patch test (HRIPT)
- **Routes of exposure**: Dermal
- **Species**: Humans
- **Result**: positive

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

- **Test Type**: Human repeat insult patch test (HRIPT)
- **Routes of exposure**: Skin contact
- **Species**: Humans
- **Result**: negative
Germ cell mutagenicity
May cause genetic defects.

Components:

Solvent naphtha (petroleum), light aromatic:
Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

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

Genotoxicity in vivo : Test Type: Sister chromatid exchange analysis in spermatogonia
Species: Mouse
Application Route: Intraperitoneal injection
Result: positive

Germ cell mutagenicity - Assessment : Positive result(s) from in vivo heritable germ cell mutagenicity tests in mammals

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

Benzenesulfonic acid, C10-13-alkyl derivs., calcium salts:
Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Result: negative
Remarks: Based on data from similar materials

4-Nonylphenol, branched, ethoxylated:
Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: negative
Remarks: Based on data from similar materials

Test Type: Chromosome aberration test in vitro
Method: OECD Test Guideline 473
Result: negative
Remarks: Based on data from similar materials

Test Type: In vitro mammalian cell gene mutation test
Method: OECD Test Guideline 476
Result: negative
Remarks: Based on data from similar materials

Deltamethrin (ISO):
Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Result: negative
Deltamethrin (2.5%) Formulation

Test Type: DNA Repair
Test system: Escherichia coli
Result: negative

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

Test Type: In vitro mammalian cell gene mutation test
Test system: Chinese hamster lung cells
Concentration: LOAEL: 20 mg/kg
Result: positive

Genotoxicity in vivo:
Test Type: Micronucleus test
Species: Mouse
Application Route: Oral
Result: negative

Test Type: dominant lethal test
Species: Mouse
Application Route: Oral
Result: negative

Test Type: sister chromatid exchange assay
Species: Mouse
Cell type: Bone marrow
Application Route: Oral
Result: negative

2,6-Di-tert-butyl-p-cresol:
Genotoxicity in vitro:
Test Type: Bacterial reverse mutation assay (AMES)
Result: negative

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

Test Type: Chromosome aberration test in vitro
Result: negative

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

Carcinogenicity
May cause cancer.

Components:
Solvent naphtha (petroleum), light aromatic:
Species: Mouse
Application Route: Skin contact
Exposure time: 2 Years
Result : positive

Carcinogenicity - Assessment : Sufficient evidence of carcinogenicity in animal experiments

**Deltamethrin (ISO):**

<table>
<thead>
<tr>
<th>Species</th>
<th>Mouse, male and female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Route</td>
<td>oral (feed)</td>
</tr>
<tr>
<td>Exposure time</td>
<td>104 weeks</td>
</tr>
<tr>
<td>NOAEL</td>
<td>8 mg/kg body weight</td>
</tr>
<tr>
<td>LOAEL</td>
<td>4 mg/kg body weight</td>
</tr>
<tr>
<td>Result</td>
<td>positive</td>
</tr>
<tr>
<td>Target Organs</td>
<td>Lymph nodes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Species</th>
<th>Rat, male and female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Route</td>
<td>oral (feed)</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>Dog, male and female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Route</td>
<td>oral (feed)</td>
</tr>
<tr>
<td>Exposure time</td>
<td>2 Years</td>
</tr>
<tr>
<td>NOAEL</td>
<td>1 mg/kg body weight</td>
</tr>
<tr>
<td>Result</td>
<td>negative</td>
</tr>
</tbody>
</table>

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

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

**Reproductive toxicity**

Suspected of damaging fertility or the unborn child.

**Components:**

**Solvent naphtha (petroleum), light aromatic:**

<table>
<thead>
<tr>
<th>Effects on fertility</th>
<th>Test Type: Reproduction/Developmental toxicity screening test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Species: Rat</td>
<td></td>
</tr>
<tr>
<td>Application Route: inhalation (vapor)</td>
<td></td>
</tr>
<tr>
<td>Result: negative</td>
<td></td>
</tr>
</tbody>
</table>

| Effects on fetal development                 | Test Type: Embryo-fetal development                             |
| Species: Rat                                 |                                                               |
| Application Route: inhalation (vapor)        |                                                               |
| Result: negative                             |                                                               |

**4-Nonylphenol, branched, ethoxylated:**

| Reproductive toxicity - Assessment           | Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments. |

**Deltamethrin (ISO):**
### Effects on fertility

- **Test Type:** Three-generation reproduction toxicity study  
  - **Species:** Rat  
  - **Application Route:** oral (feed)  
  - **Early Embryonic Development:** NOAEL: 50 mg/kg body weight  
  - **Symptoms:** No effects on fertility, Embryo-fetal toxicity  
  - **Remarks:** Significant toxicity observed in testing

- **Test Type:** Two-generation reproduction toxicity study  
  - **Species:** Rat  
  - **Application Route:** Oral  
  - **Early Embryonic Development:** LOAEL: 84 - 149 mg/kg body weight  
  - **Symptoms:** No effects on fertility, Embryo-fetal toxicity

- **Test Type:** Fertility  
  - **Species:** Rat, male  
  - **Application Route:** Oral  
  - **Fertility:** LOAEL: 1 mg/kg body weight  
  - **Symptoms:** Effects on fertility  
  - **Target Organs:** Testes

### Effects on fetal development

- **Test Type:** Development  
  - **Species:** Mouse  
  - **Application Route:** oral (gavage)  
  - **Developmental Toxicity:** LOAEL: 1 mg/kg body weight  
  - **Result:** Skeletal malformations  
  - **Remarks:** Maternal toxicity observed

- **Test Type:** Development  
  - **Species:** Rat, female  
  - **Developmental Toxicity:** NOAEL: 10 mg/kg body weight  
  - **Symptoms:** No effects on fetal development

- **Test Type:** Development  
  - **Species:** Rabbit, female  
  - **Application Route:** oral (gavage)  
  - **Developmental Toxicity:** NOAEL: 16 mg/kg body weight  
  - **Symptoms:** No effects on fetal development

### Reproductive toxicity - Assessment

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

### 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:** Rat  
  - **Application Route:** Ingestion  
  - **Result:** negative
STOT-single exposure
May cause drowsiness or dizziness.

Components:
Solvent naphtha (petroleum), light aromatic:
Assessment: May cause drowsiness or dizziness.

Deltamethrin (ISO):
Assessment: May cause respiratory irritation.

STOT-repeated exposure
Causes damage to organs (Central nervous system, Immune system) through prolonged or repeated exposure if swallowed.
Causes damage to organs (Central nervous system) through prolonged or repeated exposure if inhaled.

Components:
Deltamethrin (ISO):
Routes of exposure: Ingestion
Target Organs: Central nervous system, Immune system
Assessment: Causes damage to organs through prolonged or repeated exposure.

Routes of exposure: Inhalation (dust/mist/fume)
Target Organs: Central nervous system
Assessment: Causes damage to organs through prolonged or repeated exposure.

2,6-Di-tert-butyl-p-cresol:
Assessment: No significant health effects observed in animals at concentrations of 100 mg/kg bw or less.

Repeated dose toxicity

Components:
Solvent naphtha (petroleum), light aromatic:
Species: Rat
LOAEL: 500 mg/kg
Application Route: Ingestion
Exposure time: 28 Days

4-Nonylphenol, branched, ethoxylated:
Species: Rat
LOAEL: 150 mg/kg
Application Route: Ingestion
Exposure time: 90 Days
Method: OPPTS 870.3100
Remarks: Based on data from similar materials
Deltamethrin (ISO):
- **Species**: Rat, male and female
- **NOAEL**: 1 mg/kg
- **LOAEL**: 2.5 mg/kg
- **Application Route**: Oral
- **Exposure time**: 13 Weeks
- **Target Organs**: Nervous system
- **Symptoms**: Hyperexcitability

Species: Rat
- **NOAEL**: 3 mg/m³
- **Application Route**: Inhalation (dust/mist/fume)
- **Exposure time**: 2 wk / 5 d/wk / 6 h/d
- **Symptoms**: Local irritation, respiratory tract irritation

Species: Dog
- **NOAEL**: 0.1 mg/kg
- **LOAEL**: 1 mg/kg
- **Application Route**: Oral
- **Exposure time**: 13 Weeks
- **Target Organs**: Nervous system
- **Symptoms**: Dilatation of the pupil, Vomiting, Tremors, Diarrhea, Salivation

Species: Rat
- **NOAEL**: 14 mg/kg
- **LOAEL**: 54 mg/kg
- **Application Route**: Oral
- **Exposure time**: 91 d
- **Target Organs**: Nervous system

Species: Mouse
- **NOAEL**: 6 mg/kg
- **Application Route**: Oral
- **Exposure time**: 12 Weeks
- **Target Organs**: Immune system
- **Symptoms**: Immune system effects

2,6-Di-tert-butyl-p-cresol:
- **Species**: Rat
- **NOAEL**: 25 mg/kg
- **Application Route**: Ingestion
- **Exposure time**: 22 Months

**Aspiration toxicity**
May be fatal if swallowed and enters airways.

**Product:**
The substance or mixture is known to cause human aspiration toxicity hazards or has to be regarded as if it causes a human aspiration toxicity hazard.
Components:

Solvent naphtha (petroleum), light aromatic:
The substance or mixture is known to cause human aspiration toxicity hazards or has to be regarded as if it causes a human aspiration toxicity hazard.

Experience with human exposure

Components:

Deltamethrin (ISO):

**Inhalation**
- Symptoms: respiratory tract irritation, Dizziness, Sweating, Headache, Nausea, Vomiting, anorexia, Fatigue, tingling, Palpitation, Blurred vision, muscle twitching

**Skin contact**
- Symptoms: Skin irritation, Erythema, pruritis, Headache, Nausea, Vomiting, Dizziness, tingling, Sweating, muscle twitching, Blurred vision, Fatigue, anorexia, Allergic reactions

**Ingestion**
- Symptoms: muscle pain, Small pupils

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Solvent naphtha (petroleum), light aromatic:

**Toxicity to fish**
- LC50 (Pimephales promelas (fathead minnow)): 8.2 mg/l
  - Exposure time: 96 h
  - Test substance: Water Accommodated Fraction

**Toxicity to daphnia and other aquatic invertebrates**
- EL50 (Daphnia magna (Water flea)): 4.5 mg/l
  - Exposure time: 48 h
  - Test substance: Water Accommodated Fraction
  - Method: OECD Test Guideline 202

**Toxicity to algae/aquatic plants**
- EL50 (Pseudokirchneriella subcapitata (microalgae)): 3.1 mg/l
  - Exposure time: 96 h
  - Test substance: Water Accommodated Fraction
  - Method: OECD Test Guideline 201

  NOELR (Pseudokirchneriella subcapitata (microalgae)): 0.5 mg/l
  - Exposure time: 96 h
  - Test substance: Water Accommodated Fraction
  - Method: OECD Test Guideline 201

**Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)**
- NOELR (Daphnia magna (Water flea)): 2.6 mg/l
  - Exposure time: 21 d
  - Test substance: Water Accommodated Fraction
  - Method: OECD Test Guideline 211

**Cottonseed oil:**

**Toxicity to fish**
- LC50 : > 100 mg/l
  - Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates: 
- LC50: > 100 mg/l
  Exposure time: 48 h
  Remarks: Based on data from similar materials

Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants:
- EC50: > 100 mg/l
  Exposure time: 72 h
  Remarks: Based on data from similar materials

NOEC: > 10 - 100 mg/l
Exposure time: 72 h
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):
- NOEC: > 0.1 - 1 mg/l
  Exposure time: 21 d
  Remarks: Based on data from similar materials

Benzenesulfonic acid, C10-13-alkyl derivs., calcium salts:
Toxicity to fish:
- LC50: 1 - < 10 mg/l
  Exposure time: 96 h
  Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates:
- EC50 (Daphnia magna (Water flea)): > 1 - 10 mg/l
  Exposure time: 48 h
  Method: OECD Test Guideline 202
  Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants:
- ErC50 (Pseudokirchneriella subcapitata (green algae)): > 10 - 100 mg/l
  Exposure time: 96 h
  Remarks: Based on data from similar materials

NOEC (Pseudokirchneriella subcapitata (green algae)): > 0.1 - 1 mg/l
Exposure time: 96 h
Remarks: Based on data from similar materials

Toxicity to fish (Chronic toxicity):
- NOEC (Oncorhynchus mykiss (rainbow trout)): > 0.1 - 1 mg/l
  Exposure time: 72 d
  Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):
- NOEC (Daphnia magna (Water flea)): > 1 mg/l
  Exposure time: 21 d
  Remarks: Based on data from similar materials

4-Nonylphenol, branched, ethoxylated:
Toxicity to fish:
- LC50 (Oryzias latipes (Orange-red killifish)): 8.2 mg/l
  Exposure time: 96 h

Deltamethrin (ISO):
Toxicity to fish:
- LC50 (Cyprinodon variegatus (sheepshead minnow)): 0.00048 mg/l
Toxicity to daphnia and other aquatic invertebrates:

- EC50 (Mysidopsis bahia (opossum shrimp)): 0.0037 µg/l
  Exposure time: 48 h
- EC50 (Daphnia magna (Water flea)): 0.0035 mg/l
  Exposure time: 48 h
- LC50 (Gammarus fasciatus (freshwater shrimp)): 0.0003 µg/l
  Exposure time: 96 h

Toxicity to algae/aquatic plants:

- EC50 (Pseudokirchneriella subcapitata (green algae)): > 9.1 mg/l
  Exposure time: 72 h
  Method: OECD Test Guideline 201
  Remarks: No toxicity at the limit of solubility.

Toxicity to fish (Chronic toxicity):

- NOEC (Pimephales promelas (fathead minnow)): 0.000022 mg/l
  Exposure time: 36 d
- NOEC (Pimephales promelas (fathead minnow)): 0.000017 mg/l
  Exposure time: 260 d

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
  Method: OECD Test Guideline 201

Toxicity to fish (Chronic toxicity):

- NOEC (Oryzias latipes (Japanese medaka)): 0.053 mg/l
  Exposure time: 30 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

Toxicity to microorganisms:
EC50: > 10,000 mg/l
Exposure time: 3 h
Method: OECD Test Guideline 209

Persistence and degradability

Components:

Solvent naphtha (petroleum), light aromatic:
Biodegradability:
Result: Inherently biodegradable.
Biodegradation: 94 %
Exposure time: 25 d

Cottonseed oil:
Biodegradability:
Result: Readily biodegradable.
Remarks: Based on data from similar materials

Benzenesulfonic acid, C10-13-alkyl derivs., calcium salts:
Biodegradability:
Result: Readily biodegradable.
Biodegradation: 100 %
Exposure time: 28 d
Method: OECD Test Guideline 301B

4-Nonylphenol, branched, ethoxylated:
Biodegradability:
Result: Not readily biodegradable.

Deltamethrin (ISO):
Stability in water:
Hydrolysis: 0 % (30 d)

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:

Benzenesulfonic acid, C10-13-alkyl derivs., calcium salts:
Partition coefficient: n-octanol/water:
log Pow: 2.89

4-Nonylphenol, branched, ethoxylated:
Bioaccumulation:
Species: Fish
Bioconcentration factor (BCF): < 100
Remarks: Based on data from similar materials
Deltamethrin (ISO):

Bioaccumulation: Species: Lepomis macrochirus (Bluegill sunfish)
Bioconcentration factor (BCF): 1,800

Partition coefficient: n-octanol/water: log Pow: 4.6

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

Mobility in soil:

Components:

Deltamethrin (ISO):
Distribution among environmental compartments: log Koc: 7.2

Other adverse effects:
No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods:

Waste from residues: Dispose of in accordance with local regulations.
Do not dispose of waste into sewer.

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 3295
Proper shipping name: HYDROCARBONS, LIQUID, N.O.S.
Class: 3
Packing group: III
Labels: 3

IATA-DGR
UN/ID No.: UN 3295
Proper shipping name: Hydrocarbons, liquid, n.o.s.
Class: 3
Packing group: III
Labels: Flammable Liquids
SAFETY DATA SHEET

Deltamethrin (2.5%) Formulation

Packing instruction (cargo aircraft) : 366
Packing instruction (passenger aircraft) : 355

IMDG-Code
UN number : UN 3295
Proper shipping name : HYDROCARBONS, LIQUID, N.O.S. (Deltamethrin (ISO), 2,6-Di-tert-butyl-p-cresol)
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

TDG
UN number : UN 3295
Proper shipping name : HYDROCARBONS, LIQUID, N.O.S.
Class : 3
Packing group : III
Labels : 3
ERG Code : 128
Marine pollutant : yes (Deltamethrin (ISO), 2,6-Di-tert-butyl-p-cresol)

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

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

SECTION 16. OTHER INFORMATION

Full text of other abbreviations
ACGIH : USA. ACGIH Threshold Limit Values (TLV)
CA BC OEL : Canada. British Columbia OEL
CA QC OEL : Québec. Regulation respecting occupational health and safety, Schedule 1, Part 1: Permissible exposure values for air-
Deltamethrin (2.5%) Formulation

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

Revision Date: 04/04/2023
Date format: mm/dd/yyyy

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.