SAFETY DATA SHEET

Deltamethrin (1%) Formulation

SECTION 1. IDENTIFICATION

Product name: Deltamethrin (1%) 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
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 the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Eye irritation: Category 2A
Skin sensitization: Category 1
Reproductive toxicity: Category 2
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)

GHS label elements
Hazard pictograms: !
Signal Word: Danger

Hazard Statements:
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.
H361fd Suspected of damaging fertility. Suspected of damaging 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.
P260 Do not breathe mist or vapors.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P272 Contaminated work clothing must not be allowed out of the workplace.
P280 Wear protective gloves, protective clothing, eye protection and face protection.

Response:
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
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 attention.
P333 + P313 If skin irritation or rash occurs: Get medical attention.
P337 + P313 If eye irritation persists: Get medical attention.
P363 Wash contaminated clothing before reuse.

Storage:
P405 Store locked up.

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

Other hazards
None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Substance / Mixture</th>
<th>Components</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chemical name</td>
<td>CAS-No.</td>
</tr>
<tr>
<td></td>
<td>Cyclohexanone</td>
<td>108-94-1</td>
</tr>
<tr>
<td></td>
<td>Deltamethrin (ISO)</td>
<td>52918-63-5</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.
Remove contaminated clothing and shoes.
Get medical attention.
Wash clothing before reuse.
Thoroughly clean shoes before reuse.

In case of eye contact:
In case of contact, immediately flush eyes with plenty of water.
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 cause an allergic skin reaction.
Causes serious eye irritation.
Suspected of damaging fertility.
Suspected of damaging 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.

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

None known.

Specific hazards during fire fighting

Exposure to combustion products may be a hazard to health.

Hazardous combustion products

Carbon oxides
Nitrogen oxides (NOx)
Bromine compounds

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

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.

3 / 20
Methods and materials for containment and cleaning up:
Soak up with inert absorbent material.
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.

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.
Do not eat, drink or smoke when using this product.
Take care to prevent spills, waste and minimize release to the environment.

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

Advice on safe handling:
Do not get on skin or clothing.
Do not breathe 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.
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 in accordance with the particular national regulations.

Materials to avoid:
Do not store with the following product types:
Strong oxidizing agents
Organic peroxides
 Explosives
Gases

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>Cyclohexanone</td>
<td>108-94-1</td>
<td>TWA</td>
<td>20 ppm</td>
<td>ACGIH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL</td>
<td>50 ppm</td>
<td>ACGIH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>25 ppm 100 mg/m³</td>
<td>NIOSH REL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>50 ppm 200 mg/m³</td>
<td>OSHA Z-1</td>
</tr>
</tbody>
</table>
SAFETY DATA SHEET

Deltamethrin (1%) Formulation

<table>
<thead>
<tr>
<th>Version</th>
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</thead>
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**Deltamethrin (ISO) 52918-63-5**

**TWA** 15 µg/m³ (OEB 3) Internal

Further information: DSEN, Skin Wipe limit 150 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>Cyclohexanone 108-94-1</td>
<td>1,2-Cyclohexanediol</td>
<td>Urine</td>
<td>End of shift at end of work-week</td>
<td>80 mg/l</td>
<td>ACGIH BEI</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cyclohexanol</td>
<td>Urine</td>
<td>End of shift (As soon as possible after exposure ceases)</td>
<td>8 mg/l</td>
<td>ACGIH BEI</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.

### 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**

Chemical-resistant gloves

**Remarks**

Consider double gloving.

**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. 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 : No data available
Melting point/freezing point : No data available
Initial boiling point and boiling range : No data available
Flash point : No data available
Evaporation rate : No data available
Flammability (solid, gas) : Not applicable
Flammability (liquids) : No data available
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
SAFETY DATA SHEET

Deltamethrin (1%) Formulation

Relative density : No data available
Density : 0.85 - 0.95 g/cm³
Solubility(ies)
  Water solubility : No data available
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.
Molecular weight : No data available
Particle size : Not applicable

SECTION 10. STABILITY AND REACTIVITY

Reactivity : Not classified as a reactivity hazard.
Chemical stability : Stable under normal conditions.
Possibility of hazardous reactions : Can react with strong oxidizing agents.
Conditions to avoid : None known.
Incompatible materials : Oxidizing agents
Hazardous decomposition products : No hazardous decomposition products are known.

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: > 5,000 mg/kg
  Method: Calculation method
Acute inhalation toxicity : Acute toxicity estimate: 167.26 mg/l
  Exposure time: 4 h
**SAFETY DATA SHEET**

**Deltamethrin (1%) Formulation**

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

- Test atmosphere: vapor
  - Method: Calculation method

**Acute dermal toxicity**
- Acute toxicity estimate: > 5,000 mg/kg
  - Method: Calculation method

**Components:**

**Cyclohexanone:**
- **Acute oral toxicity**
  - LD50 (Rat): 1,620 mg/kg

- **Acute inhalation toxicity**
  - Acute toxicity estimate: 11 mg/l
    - Exposure time: 4 h
    - Test atmosphere: vapor
    - Method: Expert judgment

- **Acute dermal toxicity**
  - LD50 (Rabbit): > 1,000 - 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

**Skin corrosion/irritation**
- Not classified based on available information.

**Components:**

**Cyclohexanone:**
- **Species**
  - Rabbit
- **Method**
  - OECD Test Guideline 404
- **Result**
  - Skin irritation

**Deltamethrin (ISO):**
- **Species**
  - Rabbit
- **Result**
  - No skin irritation
Deltamethrin (1%) Formulation

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

**Components:**

**Cyclohexanone:**
- **Species:** Rabbit
- **Result:** Irreversible effects on the eye

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

**Respiratory or skin sensitization**

**Skin sensitization**
May cause an allergic skin reaction.

**Respiratory sensitization**
Not classified based on available information.

**Components:**

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

**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

**Germ cell mutagenicity**
Not classified based on available information.

**Components:**

**Cyclohexanone:**
- **Genotoxicity in vitro:**
  - **Test Type:** Bacterial reverse mutation assay (AMES)
    - **Method:** OECD Test Guideline 471
    - **Result:** negative
  - **Test Type:** DNA damage and repair, unscheduled DNA synthesis in mammalian cells (in vitro)
    - **Result:** negative
Deltamethrin (1%) Formulation

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Method</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>In vitro mammalian cell gene mutation test</td>
<td>OECD Test Guideline 476</td>
<td>negative</td>
</tr>
</tbody>
</table>

**Genotoxicity in vivo**

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Application Route</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rodent dominant lethal test (germ cell) (in vivo)</td>
<td>Inhalation (vapor)</td>
<td>negative</td>
</tr>
</tbody>
</table>

Deltamethrin (ISO):

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacterial reverse mutation assay (AMES)</td>
<td>negative</td>
</tr>
</tbody>
</table>

**Test Type**

| DNA Repair | Escherichia coli | negative |

| Chromosomal aberration | Chinese hamster ovary cells | negative |

| In vitro mammalian cell gene mutation test | Chinese hamster lung cells | positive |

**Genotoxicity in vivo**

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Species</th>
<th>Application Route</th>
<th>Exposure time</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micronucleus test</td>
<td>Mouse</td>
<td>Oral</td>
<td>104 weeks</td>
<td>negative</td>
</tr>
</tbody>
</table>

| dominant lethal test | Mouse | Oral | negative |

| sister chromatid exchange assay | Mouse | Bone marrow | Oral | negative |

**Carcinogenicity**

Not classified based on available information.

**Components:**

**Cyclohexanone:**

<table>
<thead>
<tr>
<th>Species</th>
<th>Application Route</th>
<th>Exposure time</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mouse</td>
<td>Ingestion</td>
<td>104 weeks</td>
<td>negative</td>
</tr>
</tbody>
</table>
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</tbody>
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**Deltamethrin (ISO):**

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

**Species:** Rat, male and female

**Application Route:** oral (feed)

**Exposure time:** 2 Years

**Result:** negative

**Species:** Dog, male and female

**Application Route:** oral (feed)

**Exposure time:** 2 Years

**NOAEL:** 1 mg/kg body weight

**Result:** negative

**IARC**

No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

**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**

No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

**Reproductive toxicity**

Suspected of damaging fertility. Suspected of damaging the unborn child.

**Components:**

**Cyclohexanone:**

**Effects on fertility**

- Test Type: Two-generation reproduction toxicity study
- Species: Rat
- Application Route: inhalation (vapor)
- Result: negative

**Effects on fetal development**

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

**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.

STOT-single exposure  
Not classified based on available information.

Components:

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
SAFETY DATA SHEET

Deltamethrin (1%) Formulation

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.

Repeated dose toxicity

Components:

Cyclohexanone:
- Species: Rat
- NOAEL: 143 mg/kg
- Application Route: Ingestion
- Exposure time: 90 Days
- Method: OECD Test Guideline 408

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
- LOAEL: 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

Aspiration toxicity
Not classified based on available information.

Components:

Cyclohexanone:
The substance or mixture causes concern owing to the assumption that 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:

Cyclohexanone:

Toxicity to fish: LC50 (Pimephales promelas (fathead minnow)): 527 - 732 mg/l Exposition time: 96 h Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): 800 mg/l Exposition time: 24 h

Toxicity to algae/aquatic plants: EC50 (Desmodesmus subspicatus (green algae)): > 100 mg/l Exposition time: 72 h Method: OECD Test Guideline 201 Remarks: Based on data from similar materials

NOEC (Desmodesmus subspicatus (green algae)): > 1 mg/l Exposition time: 72 h Method: OECD Test Guideline 201 Remarks: Based on data from similar materials

Toxicity to microorganisms: EC50: > 1,000 mg/l Exposition time: 30 min Method: OECD Test Guideline 209
Deltamethrin (ISO):

Toxicity to fish: LC50 (Cyprinodon variegatus (sheepshead minnow)): 0.00048 mg/l
Exposure time: 96 h

LC50 (Oncorhynchus mykiss (rainbow trout)): 0.00039 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates:

EC50 (Mysis,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

Ecotoxicity:

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

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

NOEC (Daphnia magna (Water flea)): 0.0041 µg/l
Exposure time: 21 d

Persistence and degradability

Components:

Cyclohexanone:

Biodegradability: Result: Readily biodegradable.
Biodegradation: 90 - 100 %
Exposure time: 28 d
Method: OECD Test Guideline 301F

Deltamethrin (ISO):

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

Bioaccumulative potential

Components:

Cyclohexanone:

Partition coefficient: n-Log Pow: 0.86
Deltamethrin (1%) Formulation

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

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

Mobility in soil

Components:

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.
Contaminated packaging: Empty containers should be taken to an approved waste handling site for recycling or disposal.
If not otherwise specified: Dispose of as unused product.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG
UN number: UN 3082
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(Deltamethrin (ISO))
Class: 9
Packing group: III
Labels: 9

IATA-DGR
UN/ID No.: UN 3082
Proper shipping name: Environmentally hazardous substance, liquid, n.o.s. (Deltamethrin (ISO))
Class: 9
Packing group: III
Labels: Miscellaneous
Packing instruction (cargo aircraft): 964
Packing instruction (passenger aircraft): 964
Environmentally hazardous: yes

IMDG-Code
UN number: UN 3082
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Deltamethrin (ISO))

Class: 9
Packing group: III
Labels: 9
EmS Code: F-A, S-F
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

49 CFR
UN/ID/NA number: UN 3082
Proper shipping name: Environmentally hazardous substance, liquid, n.o.s. (Deltamethrin (ISO))
Class: 9
Packing group: III
Labels: CLASS 9
ERG Code: 171
Marine pollutant: yes (Deltamethrin (ISO))
Remarks: Above applies only to containers over 119 gallons or 450 liters.
Above applies only to containers over 119 gallons or 450 liters., Shipment by ground under DOT is non-regulated; however it may be shipped per the applicable hazard classification to facilitate multi-modal transport involving ICAO (IATA) or IMO.

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

CERCLA Reportable Quantity

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Component RQ (lbs)</th>
<th>Calculated product RQ (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclohexanone</td>
<td>108-94-1</td>
<td>5000</td>
<td>171821</td>
</tr>
</tbody>
</table>

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:
- Respiratory or skin sensitization
- Reproductive toxicity
- Specific target organ toxicity (single or repeated exposure)
- Serious eye damage or eye irritation
SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

US State Regulations

Pennsylvania Right To Know

<table>
<thead>
<tr>
<th>Chemical</th>
<th>CAS Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soya oil</td>
<td>8001-22-7</td>
</tr>
<tr>
<td>Isopropyl myristate</td>
<td>110-27-0</td>
</tr>
<tr>
<td>Cyclohexanone</td>
<td>108-94-1</td>
</tr>
<tr>
<td>Acetic acid</td>
<td>64-19-7</td>
</tr>
</tbody>
</table>

California List of Hazardous Substances

<table>
<thead>
<tr>
<th>Chemical</th>
<th>CAS Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclohexanone</td>
<td>108-94-1</td>
</tr>
</tbody>
</table>

California Permissible Exposure Limits for Chemical Contaminants

<table>
<thead>
<tr>
<th>Chemical</th>
<th>CAS Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclohexanone</td>
<td>108-94-1</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>NFPA 704:</th>
<th>HMIS® IV:</th>
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<tbody>
<tr>
<td></td>
<td>HEALTH 3</td>
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<tr>
<td>Flammability</td>
<td>FLAMMABILITY 1</td>
</tr>
<tr>
<td>Instability</td>
<td>PHYSICAL HAZARD 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)
Deltamethrin (1%) Formulation

<table>
<thead>
<tr>
<th>Version</th>
<th>Revision Date</th>
<th>SDS Number</th>
<th>Date of last issue: 09/11/2020</th>
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</thead>
<tbody>
<tr>
<td>2.0</td>
<td>08/27/2021</td>
<td>6328816-00002</td>
<td>Date of first issue: 09/11/2020</td>
</tr>
</tbody>
</table>

NIOSH REL : USA. NIOSH Recommended Exposure Limits
OSHA Z-1 : USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
ACGIH / TWA : 8-hour, time-weighted average
ACGIH / STEL : Short-term exposure limit
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

AIIC - Australian Inventory of Industrial Chemicals; 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; RoP - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals 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: 08/27/2021

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