1. PRODUCT AND COMPANY IDENTIFICATION

Chemical product name : Flumethrin (1%) Formulation

Supplier's company name, address and phone number
Company name of supplier : MSD
Address : Kumagaya, Saitama Prefecture, Xicheng 810 MSD Co., Ltd. Menuma factory
Telephone : 048-588-8411
E-mail address : EHSDATASTEWARD@msd.com
Emergency telephone number : +1-908-423-6000

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

2. HAZARDS IDENTIFICATION

GHS classification of chemical product
Flammable liquids : Category 3
Acute toxicity (Oral) : Category 4
Acute toxicity (Dermal) : Category 3
Skin corrosion/irritation : Category 2
Serious eye damage/eye irritation : Category 2
Reproductive toxicity : Category 1B
Specific target organ toxicity - single exposure (Oral) : Category 2 (Systemic toxicity)
Specific target organ toxicity - repeated exposure : Category 2 (Auditory system)
Specific target organ toxicity - repeated exposure (Oral) : Category 2 (Systemic toxicity)
Aspiration hazard : Category 1
Short-term (acute) aquatic hazard : Category 3
Long-term (chronic) aquatic hazard : Category 3
SAFETY DATA SHEET

Flumethrin (1%) Formulation

Version 5.3  Revision Date: 2021/08/27  SDS Number: 4019091-00010  Date of last issue: 2020/11/23  Date of first issue: 2019/02/25

GHS label elements

Hazard pictograms:
- Flammable liquid and vapour
- Harmful if swallowed
- Toxic in contact with skin
- Causes skin irritation
- May be fatal if swallowed and enters airways
- Causes serious eye irritation
- May damage the unborn child
- May cause damage to organs (Systemic toxicity) if swallowed
- May cause damage to organs (Auditory system) through prolonged or repeated exposure
- May cause damage to organs (Systemic toxicity) through prolonged or repeated exposure if swallowed
- Harmful to aquatic life with long lasting effects

Signal word: Danger

Hazard statements:
- H226 Flammable liquid and vapour
- H302 Harmful if swallowed
- H304 May be fatal if swallowed and enters airways
- H311 Toxic in contact with skin
- H315 Causes skin irritation
- H319 Causes serious eye irritation
- H360D May damage the unborn child
- H371 May cause damage to organs (Systemic toxicity) if swallowed
- H373 May cause damage to organs (Auditory system) through prolonged or repeated exposure
- H373 May cause damage to organs (Systemic toxicity) through prolonged or repeated exposure if swallowed
- H412 Harmful to aquatic life with long lasting effects

Precautionary statements:

Prevention:
- P201 Obtain special instructions before use.
- P202 Do not handle until all safety precautions have been read and understood.
- P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- P233 Keep container tightly closed.
- P241 Use explosion-proof electrical/ ventilating/ lighting equipment.
- P242 Use non-sparking tools.
- P243 Take action to prevent static discharges.
- P260 Do not breathe mist or vapours.
- P264 Wash skin thoroughly after handling.
- P270 Do not eat, drink or smoke when using this product.
- P273 Avoid release to the environment.
- P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:
- P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
- P302 + P352 + P312 IF ON SKIN: Wash with plenty of water. Call a POISON CENTER/ doctor if you feel unwell.
- P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with 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 + P311 IF exposed or concerned: Call a POISON CENTER/ doctor.
- P331 Do NOT induce vomiting.
P332 + P313 If skin irritation occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P361 + P364 Take off immediately all contaminated clothing and wash it before reuse.

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

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

Other hazards which do not result in classification
Important symptoms and outlines of the emergency assumed:
Vapours may form explosive mixture with air.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture: Mixture

Components

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>Concentration (% w/w)</th>
<th>ENCS No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paraffin oil</td>
<td>8012-95-1</td>
<td>&gt;= 60 - &lt; 70</td>
<td></td>
</tr>
<tr>
<td>Xylene</td>
<td>1330-20-7</td>
<td>11.5854</td>
<td>3-3, 3-60</td>
</tr>
<tr>
<td>Flumethrin</td>
<td>69770-45-2</td>
<td>&gt;= 1 - &lt; 2.5</td>
<td></td>
</tr>
<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>&gt;= 0.25 - &lt; 1</td>
<td>3-2, 3-60</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

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

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

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

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

If swallowed: If swallowed, DO NOT induce vomiting.
If vomiting occurs have person lean forward. Call a physician or poison control centre immediately. Rinse mouth thoroughly with water. Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed:
- Harmful if swallowed.
- May be fatal if swallowed and enters airways.
- Toxic in contact with skin.
- Causes skin irritation.
- Causes serious eye irritation.
- May damage the unborn child.
- May cause damage to organs if swallowed.
- May cause damage to organs through prolonged or repeated exposure.

Protection of first-aiders:
First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists (see section 8).

Notes to physician:
Treat symptomatically and supportively.

5. FIREFIGHTING MEASURES

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

- Unsuitable extinguishing media:
  - High volume water jet

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

- Hazardous combustion products:
  - Carbon oxides

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

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

6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures:
  - Remove all sources of ignition.
  - Use personal protective equipment.
  - Follow safe handling advice (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.

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

7. HANDLING AND STORAGE

Handling
- 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 vapours. 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.

Avoidance of contact
- Oxidizing agents
- 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.

**Storage**


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

Packaging material: Unsuitable material: None known.

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

#### Threshold limit value and permissible exposure limits for each component in the work environment

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type (Form of exposure)</th>
<th>Control parameters / Reference concentration / Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paraffin oil</td>
<td>8012-95-1</td>
<td>OEL-M (Mist)</td>
<td>3 mg/m³</td>
<td>JP OEL JSOH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (Inhalable particulate matter)</td>
<td>5 mg/m³</td>
<td>ACGIH</td>
</tr>
<tr>
<td>Xylene</td>
<td>1330-20-7</td>
<td>OEL-M</td>
<td>50 ppm 217 mg/m³</td>
<td>JP OEL JSOH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA (Inhalable particulate matter)</td>
<td>5 mg/m³</td>
<td>ACGIH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACL</td>
<td>50 ppm</td>
<td>JP OEL ISHL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OEL-M</td>
<td>50 ppm 217 mg/m³</td>
<td>JP OEL JSOH</td>
</tr>
<tr>
<td>Flumethrin</td>
<td>69770-45-2</td>
<td>TWA</td>
<td>45 µg/m³ (OEL 3)</td>
<td>Internal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL</td>
<td>150 ppm</td>
<td>ACGIH</td>
</tr>
<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>ACL</td>
<td>20 ppm</td>
<td>JP OEL ISHL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OEL-M</td>
<td>50 ppm 188 mg/m³</td>
<td>JP OEL JSOH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>20 ppm</td>
<td>ACGIH</td>
</tr>
</tbody>
</table>

Further information: Group 1: carcinogenic to humans

Further information: Group 2: Substances presumed to cause reproductive toxicity in humans

Further information: Group 3: Substances suspected to cause reproductive toxicity in humans

Further information: Group 1: Substances known to cause reproductive toxicity in humans, Skin absorption
## Biological occupational exposure limits

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Target substance</th>
<th>Biological specimen</th>
<th>Sampling time</th>
<th>Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xylene</td>
<td>1330-20-7</td>
<td>total (o-, m-, p- )methylhippuric acid</td>
<td>Urine</td>
<td>End of shift at end of work-week</td>
<td>800 mg/l</td>
<td>JSOH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Methylhippuric acids</td>
<td>Urine</td>
<td>End of shift (As soon as possible after exposure ceases)</td>
<td>1.5 g/g creatinine</td>
<td>ACGIH BEI</td>
</tr>
<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>Toluene</td>
<td>Blood</td>
<td>Within 2 h prior to end of shift at end of work week</td>
<td>0.6 mg/l</td>
<td>JSOH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Toluene</td>
<td>Urine</td>
<td>Within 2 h prior to end of shift at end of work week</td>
<td>0.06 mg/l</td>
<td>JSOH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Toluene</td>
<td>In blood</td>
<td>Prior to last shift of work-week</td>
<td>0.02 mg/l</td>
<td>ACGIH BEI</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Toluene</td>
<td>Urine</td>
<td>End of shift (As soon as possible after exposure ceases)</td>
<td>0.03 mg/l</td>
<td>ACGIH BEI</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o-Cresol</td>
<td>Urine</td>
<td>End of shift (As soon as possible after exposure ceases)</td>
<td>0.3 mg/g Creatinine</td>
<td>ACGIH BEI</td>
</tr>
</tbody>
</table>

## Engineering measures

Use appropriate engineering controls and manufacturing technologies to control airborne concentrations (e.g., drip-less quick connections). All engineering controls should be implemented by facility design and operated in accordance with GMP principles to protect products, workers, and the environment.
Containment technologies suitable for controlling compounds are required to control at source and to prevent migration of the compound to uncontrolled areas (e.g., open-face containment devices).

Minimize open handling.

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 vapour type

- **Hand protection**: 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.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

- **Physical state**: Aqueous solution
- **Colour**: light brown, yellow
- **Odour**: No data available
- **Odour Threshold**: No data available
- **Melting point/freezing point**: No data available
- **Boiling point, initial boiling point and boiling range**: No data available
- **Flammability (solid, gas)**: Not applicable
- **Flammability (liquids)**: No data available
- **Lower explosion limit and upper explosion limit / flammability limit**: No data available
- **Upper explosion limit / Upper flammability limit**: No data available
SAFETY DATA SHEET

Flumethrin (1%) 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>5.3</td>
<td>2021/08/27</td>
<td>4019091-00010</td>
<td>2020/11/23</td>
<td>2019/02/25</td>
</tr>
</tbody>
</table>

- **Lower explosion limit / Lower flammability limit**: No data available
- **Flash point**: 54 °C
- **Decomposition temperature**: No data available
- **pH**: No data available
- **Evaporation rate**: No data available
- **Auto-ignition temperature**: No data available
- **Viscosity**
  - Viscosity, kinematic: No data available
- **Solubility(ies)**
  - Water solubility: No data available
- **Partition coefficient: n-octanol/water**: Not applicable
- **Vapour pressure**: No data available
- **Density and/or relative density**
  - **Relative density**: No data available
  - **Density**: 0.820 - 0.900 g/cm³
  - **Relative vapour density**: No data available
- **Explosive properties**: Not explosive
- **Oxidizing properties**: The substance or mixture is not classified as oxidizing.
- **Molecular weight**: No data available
- **Particle characteristics**
  - **Particle size**: Not applicable

### 10. STABILITY AND REACTIVITY

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

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

Acute toxicity
Harmful if swallowed. Toxic in contact with skin.

Product:
- Acute oral toxicity: Acute toxicity estimate: 410.05 mg/kg
  Method: Calculation method
- Acute dermal toxicity: Acute toxicity estimate: 410 mg/kg
  Method: Calculation method

Components:

Paraffin oil:
- Acute oral toxicity: LD50 (Rat): > 5,000 mg/kg
- Acute dermal toxicity: LD50 (Rabbit): > 2,000 mg/kg
  Assessment: The substance or mixture has no acute dermal toxicity

Xylene:
- Acute oral toxicity: LD50 (Rat): 3,523 mg/kg
- Acute inhalation toxicity: LC50 (Rat): 27.571 mg/l
  Exposure time: 4 h
  Test atmosphere: vapour
- Acute dermal toxicity: LD50 (Rabbit): > 4,200 mg/kg

Flumethrin:
- Acute oral toxicity: LD50 (Rat): > 20 mg/kg
  LD50 (Mouse): > 20 mg/kg
- Acute inhalation toxicity: LC50 (Rat): > 2,934 mg/l
- Acute dermal toxicity: LD50 (Rat): > 5 mg/kg

Toluene:
- Acute oral toxicity: LD50 (Rat): > 5,000 mg/kg
- Acute inhalation toxicity: LC50 (Rat): 28.1 mg/l
Exposure time: 4 h
Test atmosphere: vapour

Acute dermal toxicity: LD50 (Rabbit): > 5,000 mg/kg

Skin corrosion/irritation
Causes skin irritation.

Components:

Paraffin oil:
Species: Rabbit
Result: No skin irritation

Xylene:
Species: Rabbit
Result: Skin irritation

Flumethrin:
Result: No skin irritation

Toluene:
Species: Rabbit
Result: Skin irritation

Serious eye damage/eye irritation
Causes serious eye irritation.

Components:

Paraffin oil:
Species: Rabbit
Result: No eye irritation

Xylene:
Species: Rabbit
Result: Irritation to eyes, reversing within 21 days

Flumethrin:
Result: Mild eye irritation

Toluene:
Species: Rabbit
Result: No eye irritation
Method: OECD Test Guideline 405
Respiratory or skin sensitisation

Skin sensitisation
Not classified based on available information.

Respiratory sensitisation
Not classified based on available information.

Components:

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

Toluene:
Test Type: Maximisation Test
Exposure routes: Skin contact
Species: Guinea pig
Result: negative

Germ cell mutagenicity
Not classified based on available information.

Components:

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

Genotoxicity in vitro: Test Type: Chromosome aberration test in vitro
Result: negative

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

Genotoxicity in vitro: Test Type: In vitro sister chromatid exchange assay in mammalian cells
Result: negative

Flumethrin:
Genotoxicity in vitro: Test Type: Rodent dominant lethal test (germ cell) (in vivo)
Species: Mouse
Application Route: Skin contact
Result: negative

Genotoxicity in vitro: Test Type: Microbial mutagenesis assay (Ames test)
Test system: Salmonella typhimurium
Result: equivocal

Genotoxicity in vitro: Test Type: Chromosomal aberration
Test system: Chinese hamster ovary cells
Result: positive
Remarks: Not classified due to inconclusive data.

Test Type: Chromosomal aberration
Test system: Human lymphocytes
Result: negative

Test Type: in vitro micronucleus test
Test system: Mouse
Result: negative

Germ cell mutagenicity - Assessment : Weight of evidence does not support classification as a germ cell mutagen.

Toluene:
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: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis)
Species: Rat
Application Route: Intraperitoneal injection
Result: negative

Test Type: Rodent dominant lethal test (germ cell) (in vivo)
Species: Mouse
Application Route: inhalation (vapour)
Method: OECD Test Guideline 478
Result: negative

Carcinogenicity
Not classified based on available information.

Components:

Xylene:
Species : Rat
Application Route : Ingestion
Exposure time : 103 weeks
Result : negative

Flumethrin:
Species : Rat
Application Route : Oral
Exposure time : 2 Years
NOAEL : 0.5 mg/kg body weight
Result : negative

Carcinogenicity - Assessment : Weight of evidence does not support classification as a carcinogen
SAFETY DATA SHEET

Flumethrin (1%) Formulation

Version: 5.3  Revision Date: 2021/08/27  SDS Number: 4019091-00010  Date of last issue: 2020/11/23
Date of first issue: 2019/02/25

Toluene:
Species: Rat
Application Route: inhalation (vapour)
Exposure time: 103 weeks
Result: negative

Species: Mouse
Application Route: Skin contact
Exposure time: 24 Months
Result: negative

Reproductive toxicity
May damage the unborn child.

Components:

Xylene:
Effects on fertility:
Test Type: One-generation reproduction toxicity study
Species: Rat
Application Route: inhalation (vapour)
Result: negative

Effects on foetal development:
Test Type: Embryo-foetal development
Species: Rat
Application Route: inhalation (vapour)
Result: negative

Flumethrin:
Effects on foetal development:
Test Type: Development
Species: Rat
Application Route: Oral
Developmental Toxicity: NOAEL: 0.36 mg/kg body weight
Result: Maternal toxicity observed., Reduced offspring weight gain, foetal abnormalities

Test Type: Development
Species: Rat
Application Route: Oral
Developmental Toxicity: NOAEL: 0.5 mg/kg body weight
Result: Maternal toxicity observed., Skeletal malformations, Reduced foetal weight

Test Type: Development
Species: Rabbit
Application Route: Oral
Developmental Toxicity: NOAEL: 1.7 mg/kg body weight
Result: No teratogenic potential

Reproductive toxicity - Assessment: May damage the unborn child.

Toluene:
Effects on fertility:
Test Type: Two-generation reproduction toxicity study
Species: Rat
Application Route: inhalation (vapour)
Method: OECD Test Guideline 416
Result: negative

Effects on foetal development:
Test Type: Embryo-foetal development
Species: Rat
Application Route: inhalation (vapour)
Result: positive

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

STOT - single exposure
May cause damage to organs (Systemic toxicity) if swallowed.

Components:

Xylene:
Assessment: May cause respiratory irritation.

Flumethrin:
Exposure routes: Oral
Assessment: Causes damage to organs.

Toluene:
Assessment: May cause drowsiness or dizziness.

STOT - repeated exposure
May cause damage to organs (Auditory system) through prolonged or repeated exposure.
May cause damage to organs (Systemic toxicity) through prolonged or repeated exposure if swallowed.

Components:

Xylene:
Exposure routes: inhalation (vapour)
Target Organs: Auditory system
Assessment: Shown to produce significant health effects in animals at concentrations of >0.2 to 1 mg/l/6h/d.

Flumethrin:
Exposure routes: Oral
Assessment: Causes damage to organs through prolonged or repeated exposure.

Toluene:
Exposure routes: Inhalation
Target Organs: Central nervous system
Assessment: May cause damage to organs through prolonged or repeated exposure.
Revised exposure.

Repeated dose toxicity

Components:

Paraffin oil:
Species: Rat, female
LOAEL: 161 mg/kg
Application Route: Ingestion
Exposure time: 90 Days

Xylene:
Species: Rat
LOAEL: > 0.2 - 1 mg/l
Application Route: inhalation (vapour)
Exposure time: 13 Weeks
Remarks: Based on data from similar materials

Flumethrin:
Species: Rat
NOAEL: 0.7 mg/kg
Application Route: Oral
Exposure time: 13 Weeks
Target Organs: digestive system, Skin
Symptoms: decrease in appetite, Skin disorders

Species: Dog
NOAEL: 0.88 mg/kg
Application Route: Oral
Exposure time: 13 Weeks
Target Organs: digestive system, Hair, Skin
Symptoms: decrease in appetite, Skin disorders

Toluene:
Species: Rat
LOAEL: 1.875 mg/l
Application Route: inhalation (vapour)
Exposure time: 6 Months

Species: Rat
NOAEL: 625 mg/kg
Application Route: Ingestion
Exposure time: 13 Weeks

Aspiration toxicity
May be fatal if swallowed and enters airways.
Components:

Paraffin oil:
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.

Xylene:
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.

Toluene:
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:

Toluene:
Inhalation:
Target Organs: Central nervous system
Symptoms: Neurological disorders

12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Paraffin oil:
Toxicity to fish:
LL50 (Scophthalmus maximus (turbot)): > 100 mg/l
Exposure time: 96 h
Test substance: Water Accommodated Fraction
Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates:
EL50 (Acartia tonsa): > 100 mg/l
Exposure time: 48 h
Test substance: Water Accommodated Fraction
Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants:
EL50 (Skeletonema costatum (marine diatom)): > 100 mg/l
Exposure time: 72 h
Test substance: Water Accommodated Fraction
Remarks: Based on data from similar materials

NOELR (Skeletonema costatum (marine diatom)): > 1 mg/l
Exposure time: 72 h
Test substance: Water Accommodated Fraction
Remarks: Based on data from similar materials

Xylene:
Toxicity to fish:
LC50 (Oncorhynchus mykiss (rainbow trout)): 13.5 mg/l
<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exposure time:</strong></td>
<td>96 h</td>
</tr>
<tr>
<td><strong>Toxicity to daphnia and other aquatic invertebrates:</strong></td>
<td>EC50 (Daphnia magna (Water flea)): &gt; 1 - 10 mg/l</td>
</tr>
<tr>
<td></td>
<td>Method: OECD Test Guideline 202</td>
</tr>
<tr>
<td></td>
<td>Remarks: Based on data from similar materials</td>
</tr>
<tr>
<td><strong>Toxicity to algae/aquatic plants:</strong></td>
<td>EC50 (Skeletonema costatum (marine diatom)): 10 mg/l</td>
</tr>
<tr>
<td></td>
<td>Exposure time: 72 h</td>
</tr>
<tr>
<td><strong>Toxicity to fish (Chronic toxicity):</strong></td>
<td>NOEC (Danio rerio (zebra fish)): &gt; 0.1 - &lt; 1 mg/l</td>
</tr>
<tr>
<td></td>
<td>Exposure time: 35 d</td>
</tr>
<tr>
<td></td>
<td>Method: OECD Test Guideline 210</td>
</tr>
<tr>
<td></td>
<td>Remarks: Based on data from similar materials</td>
</tr>
<tr>
<td><strong>Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):</strong></td>
<td>EL10 (Daphnia magna (Water flea)): &gt; 1 - 10 mg/l</td>
</tr>
<tr>
<td></td>
<td>Exposure time: 21 d</td>
</tr>
<tr>
<td></td>
<td>Method: OECD Test Guideline 211</td>
</tr>
<tr>
<td></td>
<td>Remarks: Based on data from similar materials</td>
</tr>
<tr>
<td><strong>Toxicity to microorganisms:</strong></td>
<td>NOEC: &gt; 100 mg/l</td>
</tr>
<tr>
<td></td>
<td>Exposure time: 3 h</td>
</tr>
<tr>
<td></td>
<td>Method: OECD Test Guideline 209</td>
</tr>
<tr>
<td></td>
<td>Remarks: Based on data from similar materials</td>
</tr>
</tbody>
</table>

**Flumethrin:**

- **Toxicity to fish (Chronic toxicity):**
  - NOEC (Danio rerio (zebra fish)): 0.046 mg/l
  - Exposure time: 144 h

- **M-Factor (Chronic aquatic toxicity):**
  - 1

**Toluene:**

- **Toxicity to fish:**
  - LC50 (Oncorhynchus kisutch (coho salmon)): 5.5 mg/l
  - Exposure time: 96 h

- **Toxicity to daphnia and other aquatic invertebrates:**
  - EC50 (Ceriodaphnia dubia (water flea)): 3.78 mg/l
  - Exposure time: 48 h

- **Toxicity to algae/aquatic plants:**
  - NOEC (Skeletonema costatum (marine diatom)): 10 mg/l
  - Exposure time: 72 h

- **Toxicity to fish (Chronic toxicity):**
  - NOEC (Oncorhynchus kisutch (coho salmon)): 1.39 mg/l
  - Exposure time: 40 d

- **Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):**
  - NOEC (Ceriodaphnia dubia (water flea)): 0.74 mg/l
  - Exposure time: 7 d

- **Toxicity to microorganisms:**
  - EC50 (Nitrosomonas sp.): 84 mg/l
  - Exposure time: 24 h
Persistence and degradability

Components:

Xylene:
Biodegradability : Result: Readily biodegradable.
                  Biodegradation: > 70 %
                  Exposure time: 28 d
                  Method: OECD Test Guideline 301F
                  Remarks: Based on data from similar materials

Toluene:
Biodegradability : Result: Readily biodegradable.
                   Biodegradation: 80 %
                   Exposure time: 20 d

Bioaccumulative potential

Components:

Paraffin oil:
Partition coefficient: n-octanol/water : log Pow: > 4
Remarks: Calculation

Xylene:
Partition coefficient: n-octanol/water : log Pow: 3.16
Remarks: Calculation

Flumethrin:
Partition coefficient: n-octanol/water : log Pow: 6.2

Toluene:
Bioaccumulation : Species: Leuciscus idus (Golden orfe)
                  Bioconcentration factor (BCF): 90

Partition coefficient: n-octanol/water : log Pow: 2.73

Mobility in soil
No data available

Hazardous to the ozone layer
Not applicable

Other adverse effects
No data available

13. DISPOSAL CONSIDERATIONS

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

14. TRANSPORT INFORMATION

International Regulations

**UNRTDG**
- UN number: UN 1992
- Proper shipping name: FLAMMABLE LIQUID, TOXIC, N.O.S. (Xylene, Flumethrin)
- Class: 3
- Subsidiary risk: 6.1
- Packing group: III
- Labels: 3 (6.1)

**IATA-DGR**
- UN/ID No.: UN 1992
- Proper shipping name: Flammable liquid, toxic, n.o.s. (Xylene, Flumethrin)
- Class: 3
- Subsidiary risk: 6.1
- Packing group: III
- Labels: Flammable Liquids, Toxic
- Packing instruction (cargo aircraft): 366
- Packing instruction (passenger aircraft): 355

**IMDG-Code**
- UN number: UN 1992
- Proper shipping name: FLAMMABLE LIQUID, TOXIC, N.O.S. (Xylene, Flumethrin)
- Class: 3
- Subsidiary risk: 6.1
- Packing group: III
- Labels: 3 (6.1)
- EmS Code: F-E, S-D
- Marine pollutant: no

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**
Not applicable for product as supplied.

**National Regulations**
Refer to section 15 for specific national regulation.

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

Related Regulations

Fire Service Law
Group 4, Type 2 petroleums, Water insoluble liquid, (1000 litre), Hazardous rank III

Chemical Substance Control Law
Priority Assessment Chemical Substance

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xylene</td>
<td>125</td>
</tr>
<tr>
<td>Toluene</td>
<td>46</td>
</tr>
</tbody>
</table>

Industrial Safety and Health Law

Harmful Substances Prohibited from Manufacture
Not applicable

Harmful Substances Required Permission for Manufacture
Not applicable

Substances Prevented From Impairment of Health
Not applicable

Circular concerning Information on Chemicals having Mutagenicity - Annex 2: Information on Existing Chemicals having Mutagenicity
Not applicable

Circular concerning Information on Chemicals having Mutagenicity - Annex 1: Information on Notified Substances having Mutagenicity
Not applicable

Substances Subject to be Notified Names
Article 57-2 (Enforcement Order Table 9)

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Number</th>
<th>Concentration (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral oil</td>
<td>168</td>
<td>&gt;=60 - &lt;70</td>
</tr>
<tr>
<td>Xylene</td>
<td>136</td>
<td>&gt;=10 - &lt;20</td>
</tr>
<tr>
<td>Toluene</td>
<td>407</td>
<td>&gt;=0.1 - &lt;1</td>
</tr>
</tbody>
</table>

Substances Subject to be Indicated Names
Article 57 (Enforcement Order Article 18)

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral oil</td>
<td>168</td>
</tr>
<tr>
<td>Xylene</td>
<td>136</td>
</tr>
<tr>
<td>Toluene</td>
<td>407</td>
</tr>
</tbody>
</table>

Ordinance on Prevention of Hazards Due to Specified Chemical Substances
Not applicable

Ordinance on Prevention of Lead Poisoning
Not applicable

Ordinance on Prevention of Tetraalkyl Lead Poisoning
Not applicable
### Ordinance on Prevention of Organic Solvent Poisoning
**Organic Solvents Class 2**

### Enforcement Order of the Industrial Safety and Health Law - Attached table 1 (Dangerous Substances)
**Inflammable Substance**

### Poisonous and Deleterious Substances Control Law
**Not applicable**

### Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof

#### Class I Designated Chemical Substances

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Number</th>
<th>Concentration (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>xylene</td>
<td>80</td>
<td>12</td>
</tr>
</tbody>
</table>

### High Pressure Gas Safety Act
**Not applicable**

### Explosive Control Law
**Not applicable**

### Vessel Safety Law
**Flammable liquids (Article 2 and 3 of rules on shipping and storage of dangerous goods and its Attached Table 1)**

### Aviation Law
**Flammable liquid (Article 194 of The Enforcement Rules of Aviation Law and its Attached Table 1)**

### Marine Pollution and Sea Disaster Prevention etc Law
- **Bulk transportation**: Noxious liquid substance (Category Y)
- **Pack transportation**: Not classified as marine pollutant

### Narcotics and Psychotropics Control Act
- **Narcotic or Psychotropic Raw Material (Export / Import Permission)**
  - **Not applicable**
- **Specific Narcotic or Psychotropic Raw Material (Export / Import permission)**
  - **Not applicable**

### Waste Disposal and Public Cleansing Law
**Specially Controlled Industrial Waste**

### The components of this product are reported in the following inventories:
- **AICS**: not determined
- **DSL**: not determined
- **IECSC**: not determined

### 16. OTHER INFORMATION

**Further information**
**Sources of key data used to**: Internal technical data, data from raw material SDSs, OECD
SAFETY DATA SHEET

Flumethrin (1%) Formulation

Version: 5.3  Revision Date: 2021/08/27  SDS Number: 4019091-00010  Date of issue: 2020/11/23

Full text of other abbreviations:

ACGIH : USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI : ACGIH - Biological Exposure Indices (BEI)
JP OEL ISHL : Japan. Administrative Control Levels
JSOH : Occupational exposure limits based on biological monitoring (JSOH).

IC50, EC50 : Lethal Dose to 50% of a test population (Median Lethal Dose); LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); LC50 - Lethal Concentration to 50% of a test population; NO(A)EL - No Observed (Adverse) Effect Concentration; NO(A)EC - No Observed (Adverse) Effect Concentration; RfD - Reference Dose; RfC - Reference Concentration; RvD - Reference Daily Dose; RvC - Reference Concentration; TDI - Tolerable Daily Intake; TDI-2 - Tolerable Daily Intake (24 hr); TDI-8 - Tolerable Daily Intake (8 hr)

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 mate-
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.

JP / EN