SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier
Trade name: Fenbendazole Paste Formulation

1.2 Relevant identified uses of the substance or mixture and uses advised against
Use of the Substance/Mixture: Veterinary product

1.3 Details of the supplier of the safety data sheet
Company: MSD Kilsheelan Clonmel Tipperary, IE
Telephone: 353-51-601000
E-mail address of person responsible for the SDS: EHSDATASTEWARD@msd.com

1.4 Emergency telephone number
1-908-423-6000

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture
Classification (REGULATION (EC) No 1272/2008)
Reproductive toxicity, Category 2 H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.
Specific target organ toxicity - repeated exposure, Category 2 H373: May cause damage to organs through prolonged or repeated exposure.
Short-term (acute) aquatic hazard, Category 1 H400: Very toxic to aquatic life.
Long-term (chronic) aquatic hazard, Category 1 H410: Very toxic to aquatic life with long lasting effects.

2.2 Label elements
Labelling (REGULATION (EC) No 1272/2008)
Hazard pictograms:

Signal word: Warning
Hazard statements: H361fd Suspected of damaging fertility. Suspected of damaging the unborn child.

H373 May cause damage to organs through prolonged or repeated exposure.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements:

Prevention:
P201 Obtain special instructions before use.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P391 Collect spillage.

Storage:
P405 Store locked up.

Hazardous components which must be listed on the label:
fenbendazole

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Ecological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Toxicological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>EC-No.</th>
<th>Index-No.</th>
<th>Registration number</th>
<th>Classification</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>fenbendazole</td>
<td>43210-67-9</td>
<td>256-145-7</td>
<td></td>
<td></td>
<td>Repr. 2; H361fd STOT RE 2; H373 (Liver, Lymph nodes, Stomach, Nervous system) Aquatic Acute 1; H400 Aquatic Chronic 1; H410 M-Factor (Acute)</td>
<td>&gt;= 10 - &lt;= 18.75</td>
</tr>
</tbody>
</table>
SAFETY DATA SHEET
according to Regulation (EC) No. 1907/2006

Fenbendazole Paste Formulation

Version: 7.2
Revision Date: 27.08.2021
SDS Number: 899090-00016
Date of last issue: 09.04.2021
Date of first issue: 16.09.2016

<table>
<thead>
<tr>
<th>Substance</th>
<th>CAS Registry Numbers</th>
<th>R phrases</th>
<th>A phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol#</td>
<td>64-17-5 200-578-6 603-002-00-5</td>
<td>Flam. Liq. 2; H225 Eye Irrit. 2; H319 specific concentration limit Eye Irrit. 2; H319 &gt;= 50 %</td>
<td>&lt;= 0.04</td>
</tr>
<tr>
<td>Diethyl malonate#</td>
<td>105-53-3 203-305-9</td>
<td>Eye Irrit. 2; H319</td>
<td>&lt;= 0.006</td>
</tr>
<tr>
<td>2-Furaldehyde#</td>
<td>98-01-1 202-627-7 605-010-00-4</td>
<td>Flam. Liq. 3; H226 Acute Tox. 3; H301 Acute Tox. 2; H330 Acute Tox. 4; H312 Skin Irrit. 2; H315 Eye Irrit. 2; H319 Carc. 2; H351 STOT SE 3; H335 Aquatic Chronic 3; H412</td>
<td>&lt;= 0.006</td>
</tr>
<tr>
<td>Cinnamaldehyde#</td>
<td>104-55-2 203-213-9</td>
<td>Acute Tox. 4; H312 Skin Irrit. 2; H315 Eye Irrit. 2; H319 Skin Sens. 1B; H317</td>
<td>&lt;= 0.002</td>
</tr>
<tr>
<td>Isovaleraldehyde#</td>
<td>590-86-3 209-691-5</td>
<td>Flam. Liq. 2; H225 Eye Irrit. 2; H319 Skin Sens. 1B; H317 STOT SE 3; H335 Aquatic Chronic 2; H411</td>
<td>&lt;= 0.002</td>
</tr>
<tr>
<td>Acetaldehyde#</td>
<td>75-07-0 200-836-8</td>
<td>Flam. Liq. 1; H224 Acute Tox. 4; H302</td>
<td>&lt;= 0.0002</td>
</tr>
</tbody>
</table>

Acute toxicity estimate
Acute oral toxicity: 108 mg/kg
Acute inhalation toxicity (vapour): 1 mg/l
Acute dermal toxicity: 1,100 mg/kg

Acute toxicity estimate
Acute oral toxicity: 108 mg/kg
Acute inhalation toxicity (vapour): 1 mg/l
Acute dermal toxicity: 1,100 mg/kg
SAFETY DATA SHEET  
according to Regulation (EC) No. 1907/2006

Fenbendazole Paste 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>
</table>

| 605-003-00-6 | 661 mg/kg | 605-003-00-6 | 661 mg/kg |

Eye Irrit. 2; H319  
Muta. 2; H341  
Carc. 1B; H350  
STOT SE 3; H335  

Acute toxicity estimate  
Acute oral toxicity: <= 0.0002

Trans-hex-2-en-1-ol#  
213-191-2  
928-95-0  
Skin Corr. 1B; H314  
Eye Dam. 1; H318  
EUH071

For explanation of abbreviations see section 16.  
# Voluntarily-disclosed non-hazardous substance

SECTION 4: First aid measures

4.1 Description of 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.

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).

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

In case of skin contact: In case of contact, immediately flush skin with soap and 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: Flush eyes with water as a precaution.  
Get medical attention if irritation develops and persists.

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

4.2 Most important symptoms and effects, both acute and delayed

Risks: Suspected of damaging fertility. Suspected of damaging the unborn child.  
May cause damage to organs through prolonged or repeated exposure.
4.3 Indication of any immediate medical attention and special treatment needed

Treatment: Treat symptomatically and supportively.

SECTION 5: Firefighting measures

5.1 Extinguishing media

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

Unsuitable extinguishing media: None known.

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting: Exposure to combustion products may be a hazard to health.

Hazardous combustion products: Carbon oxides

5.3 Advice for firefighters

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

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.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions:
- Use personal protective equipment.
- Follow safe handling advice (see section 7) and personal protective equipment recommendations (see section 8).

6.2 Environmental precautions

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.
6.3 Methods and material for containment and cleaning up

Methods for cleaning up: Soak up with inert absorbent material. 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.

6.4 Reference to other sections
See sections: 7, 8, 11, 12 and 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

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

Local/Total ventilation: Use only with adequate ventilation.

Advice on safe handling: Do not breathe vapours.
Do not swallow.
Avoid contact with eyes.
Avoid prolonged or repeated contact with skin.
Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment
Take care to prevent spills, waste and minimize release to the environment.

Hygiene measures: If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place. When using do not eat, drink or smoke. Wash contaminated clothing before re-use.
The effective operation of a facility should include review of engineering controls, proper personal protective equipment, appropriate degowning and decontamination procedures, industrial hygiene monitoring, medical surveillance and the use of administrative controls.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers: Keep in properly labelled containers. Store locked up. Store in accordance with the particular national regulations.

Advice on common storage: Do not store with the following product types: Strong oxidizing agents

7.3 Specific end use(s)

Specific use(s): No data available
SECTION 8: Exposure controls/personal protection

8.1 Control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type (Form of exposure)</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>fenbendazole</td>
<td>43210-67-9</td>
<td>TWA</td>
<td>100 µg/m3 (OEB 2)</td>
<td>Internal</td>
</tr>
<tr>
<td>Propylene glycol</td>
<td>57-55-6</td>
<td>OELV - 8 hrs (TWA) (particles)</td>
<td>150 ppm</td>
<td>IE OEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OELV - 8 hrs (TWA) (total (vapour and particles))</td>
<td>470 ppm</td>
<td></td>
</tr>
<tr>
<td>Ethanol</td>
<td>64-17-5</td>
<td>OELV - 15 min (STEL)</td>
<td>1,000 ppm</td>
<td>IE OEL</td>
</tr>
<tr>
<td>2-Furaldehyde</td>
<td>98-01-1</td>
<td>OELV - 15 min (STEL)</td>
<td>5 ppm</td>
<td>IE OEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>20 mg/m3</td>
<td></td>
</tr>
<tr>
<td>Acetaldehyde</td>
<td>75-07-0</td>
<td>OELV - 15 min (STEL)</td>
<td>25 ppm</td>
<td>IE OEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>45 mg/m3</td>
<td></td>
</tr>
</tbody>
</table>

Further information: Substances which have the capacity to penetrate intact skin when they come in contact with it, and be absorbed into the body

- Propylene glycol: OELV - 8 hrs (TWA) 2 ppm 8 mg/m3 IE OEL
- Ethanol: OELV - 8 hrs (TWA) 2 ppm 8 mg/m3 IE OEL

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

<table>
<thead>
<tr>
<th>Substance name</th>
<th>End Use</th>
<th>Exposure routes</th>
<th>Potential health effects</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propylene glycol</td>
<td>Workers</td>
<td>Inhalation</td>
<td>Long-term local effects</td>
<td>10 mg/m3</td>
</tr>
<tr>
<td></td>
<td>Workers</td>
<td>Inhalation</td>
<td>Long-term systemic effects</td>
<td>168 mg/m3</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Inhalation</td>
<td>Long-term local effects</td>
<td>10 mg/m3</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Inhalation</td>
<td>Long-term systemic effects</td>
<td>50 mg/m3</td>
</tr>
<tr>
<td>Glycerine</td>
<td>Workers</td>
<td>Inhalation</td>
<td>Long-term local effects</td>
<td>56 mg/m3</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Ingestion</td>
<td>Long-term systemic effects</td>
<td>229 mg/kg bw/day</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Inhalation</td>
<td>Long-term local effects</td>
<td>33 mg/m3</td>
</tr>
<tr>
<td>Ethanol</td>
<td>Workers</td>
<td>Inhalation</td>
<td>Long-term systemic effects</td>
<td>950 mg/m3</td>
</tr>
<tr>
<td></td>
<td>Workers</td>
<td>Skin contact</td>
<td>Long-term systemic effects</td>
<td>343 mg/kg bw/day</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Inhalation</td>
<td>Long-term systemic effects</td>
<td>114 mg/m3</td>
</tr>
<tr>
<td></td>
<td>Consumers</td>
<td>Skin contact</td>
<td>Long-term systemic effects</td>
<td>206 mg/kg</td>
</tr>
</tbody>
</table>
### Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

<table>
<thead>
<tr>
<th>Substance name</th>
<th>Environmental Compartment</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propylene glycol</td>
<td>Fresh water</td>
<td>260 mg/l</td>
</tr>
<tr>
<td></td>
<td>Freshwater - intermittent</td>
<td>183 mg/l</td>
</tr>
<tr>
<td></td>
<td>Marine water</td>
<td>26 mg/l</td>
</tr>
<tr>
<td></td>
<td>Sewage treatment plant</td>
<td>20000 mg/l</td>
</tr>
<tr>
<td></td>
<td>Fresh water sediment</td>
<td>572 mg/kg dry weight (d.w.)</td>
</tr>
<tr>
<td></td>
<td>Marine sediment</td>
<td>57.2 mg/kg dry weight (d.w.)</td>
</tr>
<tr>
<td></td>
<td>Soil</td>
<td>50 mg/kg dry weight (d.w.)</td>
</tr>
<tr>
<td>Glycerine</td>
<td>Fresh water</td>
<td>0.885 mg/l</td>
</tr>
<tr>
<td></td>
<td>Marine water</td>
<td>0.0885 mg/l</td>
</tr>
<tr>
<td></td>
<td>Intermittent use/release</td>
<td>8.85 mg/l</td>
</tr>
<tr>
<td></td>
<td>Sewage treatment plant</td>
<td>1000 mg/l</td>
</tr>
<tr>
<td></td>
<td>Fresh water sediment</td>
<td>3.3 mg/kg dry</td>
</tr>
</tbody>
</table>
### Exposure controls

#### 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. Laboratory operations do not require special containment.

#### Personal protective equipment

<table>
<thead>
<tr>
<th>Compound</th>
<th>Medium</th>
<th>Concentration (d.w.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Furaldehyde</td>
<td>Fresh water</td>
<td>0.033 mg/l</td>
</tr>
<tr>
<td></td>
<td>Freshwater - intermittent</td>
<td>0.027 mg/l</td>
</tr>
<tr>
<td></td>
<td>Marine water</td>
<td>0.003 mg/l</td>
</tr>
<tr>
<td></td>
<td>Sewage treatment plant</td>
<td>7.6 mg/l</td>
</tr>
<tr>
<td></td>
<td>Fresh water sediment</td>
<td>0.12 mg/kg dry weight</td>
</tr>
<tr>
<td></td>
<td>Marine sediment</td>
<td>0.012 mg/kg dry weight</td>
</tr>
<tr>
<td></td>
<td>Soil</td>
<td>2.6 mg/kg dry weight</td>
</tr>
<tr>
<td></td>
<td>Oral (Secondary Poisoning)</td>
<td>35.3 mg/kg food</td>
</tr>
<tr>
<td>Cinnamaldehyde</td>
<td>Fresh water</td>
<td>0.021 mg/l</td>
</tr>
<tr>
<td></td>
<td>Marine water</td>
<td>0.002 mg/l</td>
</tr>
<tr>
<td></td>
<td>Freshwater - intermittent</td>
<td>0.21 mg/l</td>
</tr>
<tr>
<td></td>
<td>Sewage treatment plant</td>
<td>7.1 mg/l</td>
</tr>
<tr>
<td></td>
<td>Fresh water sediment</td>
<td>0.021 mg/kg dry weight</td>
</tr>
<tr>
<td></td>
<td>Marine sediment</td>
<td>0.002 mg/kg dry weight</td>
</tr>
<tr>
<td></td>
<td>Soil</td>
<td>0.004 mg/kg dry weight</td>
</tr>
</tbody>
</table>

8.2 Exposure controls

**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. Laboratory operations do not require special containment.

**Personal protective equipment**

- **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.
Hand protection
Material: Chemical-resistant gloves

Skin and body protection
Work uniform or laboratory coat.

Respiratory protection
If adequate local exhaust ventilation is not available or exposure assessment demonstrates exposures outside the recommended guidelines, use respiratory protection.
Equipment should conform to I.S. EN 14387
Filter type: Combined particulates and organic vapour type (A-P)

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state: paste
Colour: white to off-white
Odour: cinnamon-like
Odour Threshold: No data available

Melting point/freezing point: No data available
Initial boiling point and boiling range: 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
Flash point: No data available
Auto-ignition temperature: No data available
Decomposition temperature: No data available
pH: 6 - 8
Viscosity
Viscosity, kinematic: No data available

Solubility(ies)
Water solubility: insoluble

Partition coefficient: n-octanol/water: Not applicable
Vapour pressure: No data available
Relative density: No data available
Density: No data available
Relative vapour density : No data available

Particle characteristics
Particle size : No data available

9.2 Other information
Explosives : Not explosive
Oxidizing properties : The substance or mixture is not classified as oxidizing.
Evaporation rate : No data available
Molecular weight : No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
Not classified as a reactivity hazard.

10.2 Chemical stability
Stable under normal conditions.

10.3 Possibility of hazardous reactions
Hazardous reactions : Can react with strong oxidizing agents.

10.4 Conditions to avoid
Conditions to avoid : None known.

10.5 Incompatible materials
Materials to avoid : Oxidizing agents

10.6 Hazardous decomposition products
No hazardous decomposition products are known.

SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008
Information on likely routes of exposure :
Inhalation
Skin contact
Ingestion
Eye contact

Acute toxicity
Not classified based on available information.

Components:
fenbendazole:
Acute oral toxicity : LD50 (Rat): > 10,000 mg/kg
LD50 (Mouse): > 10,000 mg/kg

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

**Diethyl malonate:**
- **Acute oral toxicity**: LD50 (Rat): > 5,000 mg/kg
- **Acute dermal toxicity**: LD50 (Rat): > 2,000 mg/kg
  Method: OECD Test Guideline 402
  Remarks: Based on data from similar materials

**2-Furaldehyde:**
- **Acute oral toxicity**: LD50 (Rat): 108 mg/kg
  Method: OECD Test Guideline 401
  Acute toxicity estimate: 108 mg/kg
  Method: Calculation method
- **Acute inhalation toxicity**: LC50 (Rat): 1 mg/l
  Exposure time: 4 h
  Test atmosphere: vapour
  Acute toxicity estimate: 1 mg/l
  Test atmosphere: vapour
  Method: Calculation method
- **Acute dermal toxicity**: Acute toxicity estimate: 1,100 mg/kg
  Method: Expert judgement
  Remarks: Based on harmonised classification in EU regulation 1272/2008, Annex VI

**Cinnamaldehyde:**
- **Acute oral toxicity**: LD50 (Rat): 2,200 mg/kg
- **Acute dermal toxicity**: LD50 (Rabbit): 1,260 mg/kg
  Acute toxicity estimate: 1,260 mg/kg
  Method: Calculation method

**Isovaleraldehyde:**
- **Acute oral toxicity**: LD50 (Rat): 5,740 mg/kg
- **Acute inhalation toxicity**: LC50 (Rat): 42.7 mg/l
Fenbendazole Paste Formulation

Exposure time: 4 h
Test atmosphere: vapour

Acute dermal toxicity: LD50 (Rabbit): 2,534 mg/kg

**Acetaldehyde:**
Acute oral toxicity: LD50 (Rat): 661 mg/kg
Acute toxicity estimate: 661 mg/kg
Method: Calculation method

Acute dermal toxicity: LD50 (Rabbit): 3,540 mg/kg

**Trans-hex-2-en-1-ol:**
Acute oral toxicity: LD50 (Rat): 3,500 mg/kg
Acute inhalation toxicity: Assessment: Corrosive to the respiratory tract.
Acute dermal toxicity: LD50 (Rabbit): 4,500 mg/kg

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

**Components:**

**fenbendazole:**
Species: Rabbit
Result: No skin irritation

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

**Diethyl malonate:**
Species: Rabbit
Result: No skin irritation

**2-Furaldehyde:**
Result: Skin irritation
Remarks: Based on harmonised classification in EU regulation 1272/2008, Annex VI

**Cinnamaldehyde:**
Species: Human skin
Result: Skin irritation

**Isovaleraldehyde:**
Fenbendazole Paste Formulation

Species: Rabbit
Method: OECD Test Guideline 404
Result: Mild skin irritation

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

Trans-hex-2-en-1-ol:
Species: reconstructed human epidermis (RhE)
Method: OECD Test Guideline 431
Result: Corrosive after 3 minutes to 1 hour of exposure

Serious eye damage/eye irritation
Not classified based on available information.

Components:
fenbendazole:
Species: Rabbit
Result: No eye irritation

Ethanol:
Species: Rabbit
Method: OECD Test Guideline 405
Result: Irritation to eyes, reversing within 21 days

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

2-Furaldehyde:
Species: Rabbit
Method: OECD Test Guideline 405
Result: Irritation to eyes, reversing within 21 days

Cinnamaldehyde:
Species: Rabbit
Method: OECD Test Guideline 405
Result: Irritation to eyes, reversing within 21 days

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

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

Trans-hex-2-en-1-ol:
Result: Irreversible effects on the eye
Remarks: Based on skin corrosivity.

Respiratory or skin sensitisation
Skin sensitisation
Not classified based on available information.
Respiratory sensitisation
Not classified based on available information.

Components:

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

Diethyl malonate:
Test Type: Buehler Test
Exposure routes: Skin contact
Species: Guinea pig
Method: OECD Test Guideline 406
Result: negative
Remarks: Based on data from similar materials

2-Furaldehyde:
Test Type: Maximisation Test
Exposure routes: Skin contact
Species: Guinea pig
Method: OECD Test Guideline 406
Result: negative

Cinnamaldehyde:
Test Type: Local lymph node assay (LLNA)
Exposure routes: Skin contact
Species: Mouse
Result: positive
Assessment: Probability or evidence of low to moderate skin sensitisation rate in humans

Isovaleraldehyde:
Test Type: Maximisation Test
Exposure routes: Skin contact
### Fenbendazole Paste 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>
</table>

- **Species**: Guinea pig
- **Method**: OECD Test Guideline 406
- **Result**: positive
- **Remarks**: Based on data from similar materials
- **Assessment**: Probability or evidence of low to moderate skin sensitisation rate in humans

### Acetaldehyde:
- **Test Type**: Maximisation Test
- **Method**: OECD Test Guideline 406
- **Result**: negative

### Trans-hex-2-en-1-ol:
- **Test Type**: Local lymph node assay (LLNA)
- **Method**: OECD Test Guideline 429
- **Result**: negative
- **Remarks**: Based on data from similar materials

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

### Components:

#### fenbendazole:
- **Genotoxicity in vitro**
  - **Test Type**: Bacterial reverse mutation assay (AMES)
    - **Result**: negative
  - **Test Type**: DNA Repair
    - **Result**: negative
  - **Test Type**: Chromosomal aberration
    - **Result**: negative
  - **Test Type**: in vitro assay
  - **Test system**: mouse lymphoma cells
  - **Metabolic activation**: Metabolic activation
    - **Result**: equivocal

#### Ethanol:
- **Genotoxicity in vitro**
  - **Test Type**: In vitro mammalian cell gene mutation test
    - **Result**: negative
  - **Test Type**: Bacterial reverse mutation assay (AMES)
    - **Result**: negative
- **Genotoxicity in vivo**
  - **Test Type**: Rodent dominant lethal test (germ cell) (in vivo)
Species: Mouse  
Application Route: Ingestion  
Result: equivocal

**Diethyl malonate:**  
Genotoxicity in vitro  
: Test Type: Bacterial reverse mutation assay (AMES)  
Result: negative  
Test Type: Chromosome aberration test in vitro  
Method: OECD Test Guideline 473  
Result: negative  
Remarks: Based on data from similar materials

**2-Furaldehyde:**  
Genotoxicity in vitro  
: Test Type: Bacterial reverse mutation assay (AMES)  
Method: OECD Test Guideline 471  
Result: negative  
Test Type: In vitro mammalian cell gene mutation test  
Result: positive  
Test Type: Chromosome aberration test in vitro  
Method: OECD Test Guideline 473  
Result: positive  
Test Type: DNA damage and repair, unscheduled DNA synthesis in mammalian cells (in vitro)  
Result: positive  
Test Type: In vitro sister chromatid exchange assay in mammalian cells  
Result: positive

Genotoxicity in vivo  
: Test Type: Unscheduled DNA synthesis (UDS) test with mammalian liver cells in vivo  
Species: Rat  
Application Route: Ingestion  
Result: negative  
Test Type: Transgenic rodent somatic cell gene mutation assay  
Species: Mouse  
Application Route: Ingestion  
Result: negative

**Cinnamaldehyde:**  
Genotoxicity in vitro  
: Test Type: Bacterial reverse mutation assay (AMES)  
Result: negative  
Test Type: In vitro mammalian cell gene mutation test  
Result: negative
Fenbendazole Paste Formulation

Genotoxicity in vivo:

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

- Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
  Species: Mouse
  Application Route: Ingestion
  Result: negative
  Remarks: Based on data from similar materials

- Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
  Species: Mouse
  Application Route: Intraperitoneal injection
  Result: negative

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

- Test Type: Unscheduled DNA synthesis (UDS) test with mammalian liver cells in vivo
  Species: Rat
  Application Route: Ingestion
  Result: negative

Isovaleraldehyde:

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: DNA damage and repair, unscheduled DNA synthesis in mammalian cells (in vitro)
  Result: positive
  Remarks: Based on data from similar materials

Acetaldehyde:

Genotoxicity in vitro:

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

- Test Type: In vitro mammalian cell gene mutation test
  Result: positive
Fenbendazole Paste Formulation

Test Type: Chromosome aberration test in vitro
Result: positive

Test Type: in vitro micronucleus test
Result: positive

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

Test Type: DNA damage and repair, unscheduled DNA synthesis in mammalian cells (in vitro)
Result: positive

Genotoxicity in vivo:

Test Type: In vivo micronucleus test
Species: Rat
Application Route: Intraperitoneal injection
Result: positive

Test Type: Mammalian bone marrow sister chromatid exchange
Species: Mouse
Application Route: Intraperitoneal injection
Result: positive

Germ cell mutagenicity: Assessment
Positive result(s) from in vivo mammalian somatic cell mutagenicity tests.

Trans-hex-2-en-1-ol:

Genotoxicity in vitro

Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: negative

Test Type: in vitro micronucleus test
Method: OECD Test Guideline 487
Result: negative

Genotoxicity in vivo

Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Mouse
Application Route: Intraperitoneal injection
Method: OECD Test Guideline 474
Result: negative
Remarks: Based on data from similar materials

Carcinogenicity
Not classified based on available information.

Components:

fenbendazole:
Species: Mouse
### Fenbendazole Paste Formulation

<table>
<thead>
<tr>
<th>Application Route</th>
<th>Exposure time</th>
<th>NOAEL</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>oral (feed)</td>
<td>2 Years</td>
<td>405 mg/kg body weight</td>
<td>negative</td>
</tr>
<tr>
<td>Species</td>
<td>Rat</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Application Route</th>
<th>Exposure time</th>
<th>NOAEL</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>2 Years</td>
<td>5 mg/kg body weight</td>
<td>negative</td>
</tr>
<tr>
<td>Target Organs</td>
<td>Lymph nodes, Liver</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 2-Furaldehyde:

<table>
<thead>
<tr>
<th>Species</th>
<th>Application Route</th>
<th>Exposure time</th>
<th>Method</th>
<th>Result</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mouse</td>
<td>Ingestion</td>
<td>103 weeks</td>
<td>OECD Test Guideline 451</td>
<td>positive</td>
<td>The mechanism or mode of action is not relevant in humans.</td>
</tr>
<tr>
<td>Species</td>
<td>inhalation (vapour)</td>
<td>52 weeks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Result</td>
<td>negative</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Cinnamaldehyde:

<table>
<thead>
<tr>
<th>Species</th>
<th>Application Route</th>
<th>Exposure time</th>
<th>Result</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rat</td>
<td>Ingestion</td>
<td>106 weeks</td>
<td>negative</td>
<td>Based on data from similar materials</td>
</tr>
<tr>
<td>Species</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Application Route</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Result</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Isovaleraldehyde:

<table>
<thead>
<tr>
<th>Species</th>
<th>Application Route</th>
<th>Exposure time</th>
<th>Result</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rat</td>
<td>inhalation (vapour)</td>
<td>2 Years</td>
<td>negative</td>
<td>Based on data from similar materials</td>
</tr>
<tr>
<td>Species</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Application Route</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Result</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Fenbendazole Paste Formulation

### Acetaldehyde:

<table>
<thead>
<tr>
<th>Species</th>
<th>Rat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Route</td>
<td>Inhalation</td>
</tr>
<tr>
<td>Exposure time</td>
<td>121 weeks</td>
</tr>
<tr>
<td>Result</td>
<td>positive</td>
</tr>
</tbody>
</table>

**Carcinogenicity - Assessment:** Sufficient evidence of carcinogenicity in animal experiments

**Reproductive toxicity**

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

### Components:

#### fenbendazole:

**Effects on fertility**

- **Species:** Rat
- **Application Route:** oral (feed)
- **General Toxicity - Parent:** NOAEL: 15 mg/kg body weight
- **Fertility - LOAEL:** 45 mg/kg body weight
- **Result:** Effects on fertility

**Effects on foetal development**

- **Species:** Dog, female
- **Application Route:** Oral
- **Developmental Toxicity - LOAEL:** 100 mg/kg body weight
- **Result:** Embryotoxic effects and adverse effects on the offspring were detected. No teratogenic effects

Test Type: Embryo-foetal development
- **Species:** Rabbit
- **Application Route:** Oral
- **Developmental Toxicity - NOAEL:** 25 mg/kg body weight
- **Result:** Fetotoxicity

Test Type: Embryo-foetal development
- **Species:** Rat
- **Application Route:** Oral
- **Developmental Toxicity - NOAEL:** 63 mg/kg body weight

Test Type: Embryo-foetal development
- **Species:** Rat
- **Application Route:** Oral
- **Developmental Toxicity - NOAEL:** 120 mg/kg body weight
- **Result:** No effects on foetal development

**Reproductive toxicity - Assessment**

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

#### Ethanol:

**Effects on fertility**

- **Test Type:** Two-generation reproduction toxicity study
- **Species:** Mouse
Diethyl malonate:
Effects on fertility: Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 422
Result: negative
Remarks: Based on data from similar materials

Effects on foetal development: Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 422
Result: negative
Remarks: Based on data from similar materials

2-Furaldehyde:
Effects on foetal development: Test Type: Embryo-foetal development
Species: Rat
Application Route: Ingestion
Result: negative

Cinnamaldehyde:
Effects on foetal development: Test Type: Embryo-foetal development
Species: Mouse
Application Route: Ingestion
Result: negative

Acetaldehyde:
Effects on foetal development: Test Type: Embryo-foetal development
Species: Rat
Application Route: Ingestion
Result: negative

Trans-hex-2-en-1-ol:
Effects on fertility: Test Type: Combined repeated dose toxicity study with the reproduction/developmental toxicity screening test
Species: Rat
Application Route: Ingestion
Method: OECD Test Guideline 422
Result: negative
Remarks: Based on data from similar materials

Effects on foetal development: Test Type: Embryo-foetal development
Species: Rat
Application Route: Ingestion
## Fenbendazole Paste 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>
</table>

Method: OECD Test Guideline 414  
Result: negative  
Remarks: Based on data from similar materials

### STOT - single exposure
Not classified based on available information.

#### Components:

**2-Furaldehyde:**  
Assessment: May cause respiratory irritation.

**Isovaleraldehyde:**  
Assessment: May cause respiratory irritation.

**Acetaldehyde:**  
Assessment: May cause respiratory irritation.

### STOT - repeated exposure
May cause damage to organs through prolonged or repeated exposure.

#### Components:

**fenbendazole:**  
Exposure routes: Ingestion  
Target Organs: Liver, Lymph nodes, Stomach, Nervous system  
Assessment: May cause damage to organs through prolonged or repeated exposure.

**2-Furaldehyde:**  
Assessment: No significant health effects observed in animals at concentrations of 100 mg/kg bw or less.

### Repeated dose toxicity

#### Components:

**fenbendazole:**  
Species: Rat  
LOAEL: 500 mg/kg  
Application Route: Oral  
Exposure time: 2 Weeks  
Target Organs: Kidney, Liver

Species: Rat  
NOAEL: > 2,500 mg/kg  
Application Route: Oral  
Exposure time: 30 Days  
Remarks: No significant adverse effects were reported

Species: Rat
# Fenbendazole Paste Formulation

**SAFETY DATA SHEET**

according to Regulation (EC) No. 1907/2006

**Version**: 7.2  
**Revision Date**: 27.08.2021  
**SDS Number**: 899090-00016  
**Date of last issue**: 09.04.2021  
**Date of first issue**: 16.09.2016

<table>
<thead>
<tr>
<th>Substance</th>
<th>LOAEL</th>
<th>Application Route</th>
<th>Exposure time</th>
<th>Target Organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOAEL</td>
<td>1,600 mg/kg</td>
<td>Oral</td>
<td>90 Days</td>
<td>Central nervous system</td>
</tr>
<tr>
<td>Target Organs</td>
<td>Central nervous system</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Symptoms</td>
<td>Tremors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Species</td>
<td>Dog</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substance</th>
<th>NOAEL</th>
<th>Application Route</th>
<th>Exposure time</th>
<th>Target Organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOAEL</td>
<td>4 mg/kg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOAEL</td>
<td>8 mg/kg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure time</td>
<td>6 Months</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Target Organs</td>
<td>Stomach, Lymph nodes, Nervous system</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Symptoms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Species</td>
<td></td>
<td></td>
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</table>

**Ethanol:**

<table>
<thead>
<tr>
<th>Substance</th>
<th>Species</th>
<th>NOAEL</th>
<th>Application Route</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>Rat</td>
<td>1,280 mg/kg</td>
<td>Ingestion</td>
<td>90 Days</td>
</tr>
</tbody>
</table>

**2-Furaldehyde:**

<table>
<thead>
<tr>
<th>Substance</th>
<th>Species</th>
<th>NOAEL</th>
<th>Application Route</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Furaldehyde</td>
<td>Rat</td>
<td>53 mg/kg</td>
<td>Ingestion</td>
<td>13 Weeks</td>
</tr>
</tbody>
</table>

**Cinnamaldehyde:**

<table>
<thead>
<tr>
<th>Substance</th>
<th>Species</th>
<th>NOAEL</th>
<th>Application Route</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cinnamaldehyde</td>
<td>Rat</td>
<td>200 mg/kg</td>
<td>Ingestion</td>
<td>12 Weeks</td>
</tr>
</tbody>
</table>

**Acetaldehyde:**

<table>
<thead>
<tr>
<th>Substance</th>
<th>Species</th>
<th>NOAEL</th>
<th>Application Route</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetaldehyde</td>
<td>Rat</td>
<td>125 mg/kg</td>
<td>Ingestion</td>
<td>28 Days</td>
</tr>
<tr>
<td>LOAEL</td>
<td>675 mg/kg</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Species</th>
<th>Rat</th>
<th>NOAEL</th>
<th>Application Route</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>0.3 mg/kg</td>
<td>inhalation (vapour)</td>
<td>13 Weeks</td>
</tr>
</tbody>
</table>

**Trans-hex-2-en-1-ol:**

<table>
<thead>
<tr>
<th>Substance</th>
<th>Species</th>
<th>NOAEL</th>
<th>Application Route</th>
<th>Exposure time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trans-hex-2-en-1-ol</td>
<td>Rat</td>
<td>&gt; 100 mg/kg</td>
<td>Ingestion</td>
<td></td>
</tr>
</tbody>
</table>
Exposure time : 98 Days
Remarks : Based on data from similar materials

Aspiration toxicity
Not classified based on available information.

Components:
fenbendazole:
No aspiration toxicity classification

11.2 Information on other hazards
Endocrine disrupting properties

Product:
Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Experience with human exposure
Components:
fenbendazole:
Ingestion : Symptoms: Rapid respiration, Salivation, anorexia, Diarrhoea

SECTION 12: Ecological information

12.1 Toxicity
Components:
fenbendazole:
Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): > 7.5 mg/l
Exposure time: 96 h
Remarks: No toxicity at the limit of solubility

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 0.008 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

M-Factor (Acute aquatic toxicity) : 100

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 0.0015 mg/l
Exposure time: 21 Days
Species: Daphnia magna (Water flea)
Method: OECD Test Guideline 211

M-Factor (Chronic aquatic) : 10
toxicity)

**Ethanol:**

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): > 1,000 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Ceriodaphnia (water flea)): > 1,000 mg/l
Exposure time: 48 h

Toxicity to algae/aquatic plants : ErC50 (Chlorella vulgaris (Fresh water algae)): 275 mg/l
Exposure time: 72 h

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

Toxicity to microorganisms : EC50 (Pseudomonas putida): 6,500 mg/l
Exposure time: 16 h

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 9.6 mg/l
Exposure time: 9 d
Species: Daphnia magna (Water flea)

**Diethyl malonate:**

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 12 - 17 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 179 mg/l
Exposure time: 48 h

Toxicity to algae/aquatic plants : ErC50 (Desmodesmus subspicatus (green algae)): > 800 mg/l
Exposure time: 72 h

EC10 (Desmodesmus subspicatus (green algae)): 115 mg/l
Exposure time: 72 h

Toxicity to microorganisms : EC50 (Pseudomonas putida): 3,097 mg/l
Exposure time: 16 h
Method: DIN 38 412 Part 8

**2-Furaldehyde:**

Toxicity to fish : EC50 (Leuciscus idus (Golden orfe)): 29 mg/l
Exposure time: 48 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 29 mg/l
Exposure time: 24 h

Toxicity to algae/aquatic plants : NOEC (Microcystis aeruginosa (blue-green algae)): 2.7 mg/l
Exposure time: 8 d

Toxicity to microorganisms : EC50 : 760 mg/l
Exposure time: 30 min
Method: OECD Test Guideline 209
Toxicity to fish (Chronic toxicity): NOEC: 0.33 mg/l
Exposure time: 12 d
Species: Danio rerio (zebra fish)

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity): NOEC: 1.9 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Method: OECD Test Guideline 211

**Cinnamaldehyde:**

Toxicity to fish: LC50 (Danio rerio (zebra fish)): 4.15 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): 3.21 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants: ErC50 (Chlorella vulgaris (Fresh water algae)): 16.09 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

Toxicity to microorganisms: EC50: 71 mg/l
Exposure time: 3 h
Method: ISO 8192

**Isovaleraldehyde:**

Toxicity to fish: LC50 (Pimephales promelas (fathead minnow)): 3.25 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): 177 mg/l
Exposure time: 48 h

Toxicity to algae/aquatic plants: ErC50 (Desmodesmus subspicatus (green algae)): 137.37 mg/l
Exposure time: 96 h
EC10 (Desmodesmus subspicatus (green algae)): 101.83 mg/l
Exposure time: 96 h

Toxicity to microorganisms: EC10 (Pseudomonas putida): 310 mg/l
Exposure time: 17 h
Method: DIN 38 412 Part 8

**Acetaldehyde:**

Toxicity to fish: LC50 (Pimephales promelas (fathead minnow)): 30.8 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): 57.4 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

**Toxicity to algae/aquatic plants**
- ErC50 (Pseudokirchneriella subcapitata (green algae)): > 100 mg/l
  - Exposure time: 72 h
  - Method: OECD Test Guideline 201

EC10 (Pseudokirchneriella subcapitata (green algae)): > 100 mg/l
- Exposure time: 72 h
- Method: OECD Test Guideline 201

**Trans-hex-2-en-1-ol:**

**Toxicity to fish**
- LC50 (Oncorhynchus mykiss (rainbow trout)): > 100 mg/l
  - Exposure time: 96 h
  - Method: OECD Test Guideline 203
  - Remarks: Based on data from similar materials

**Toxicity to daphnia and other aquatic invertebrates**
- EC50 (Daphnia magna (Water flea)): 163 mg/l
  - Exposure time: 48 h
  - Method: OECD Test Guideline 202

**Toxicity to algae/aquatic plants**
- ErC50 (Pseudokirchneriella subcapitata (green algae)): 226 mg/l
  - Exposure time: 72 h
  - Method: OECD Test Guideline 201

**12.2 Persistence and degradability**

**Components:**

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

**Diethyl malonate:**
- Biodegradability: Result: Readily biodegradable.
  - Biodegradation: 99 %
  - Exposure time: 28 d

**2-Furaldehyde:**
- Biodegradability: Result: Readily biodegradable.
  - Biodegradation: 93.5 %
  - Exposure time: 14 d

**Cinnamaldehyde:**
- Biodegradability: Result: Readily biodegradable.
  - Biodegradation: 100 %
  - Exposure time: 28 d
Isovaleraldehyde:
Biodegradability: Result: Not readily biodegradable.
   Biodegradation: 49.5 %
   Exposure time: 28 d
   Method: OECD Test Guideline 301B

Acetaldehyde:
Biodegradability: Result: Readily biodegradable.
   Biodegradation: 80 %
   Exposure time: 14 d
   Method: OECD Test Guideline 301C

Trans-hex-2-en-1-ol:
Biodegradability: Result: Readily biodegradable.
   Remarks: Based on data from similar materials

12.3 Bioaccumulative potential

Components:
fenbendazole:
Bioaccumulation: Species: Lepomis macrochirus (Bluegill sunfish)
   Bioconcentration factor (BCF): 240
   Partition coefficient: n-octanol/water
   log Pow: 2.3

Ethanol:
Partition coefficient: n-octanol/water
   log Pow: -0.35

Diethyl malonate:
Partition coefficient: n-octanol/water
   log Pow: 0.96

2-Furaldehyde:
Partition coefficient: n-octanol/water
   log Pow: 0.83
   Remarks: Calculation

Cinnamaldehyde:
Partition coefficient: n-octanol/water
   log Pow: 2.107

Isovaleraldehyde:
Partition coefficient: n-octanol/water
   log Pow: 1.5

Acetaldehyde:
Partition coefficient: n-octanol/water
   log Pow: 0.45
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12.4 Mobility in soil

Components:
fenbendazole:
Distribution among environmental compartments:
log Koc: 4.37

12.5 Results of PBT and vPvB assessment

Product:
Assessment: This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Endocrine disrupting properties

Product:
Assessment: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects
No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods
Product: Dispose of in accordance with local regulations.
According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities.
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

14.1 UN number or ID number
ADN: UN 3082
ADR: UN 3082
RID: UN 3082
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IMDG : UN 3082
IATA : UN 3082

14.2 UN proper shipping name

ADN : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (fenbendazole)
ADR : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (fenbendazole)
RID : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (fenbendazole)
IMDG : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (fenbendazole)
IATA : Environmentally hazardous substance, liquid, n.o.s. (fenbendazole)

14.3 Transport hazard class(es)

ADN : 9
ADR : 9
RID : 9
IMDG : 9
IATA : 9

14.4 Packing group

ADN
Packing group : III
Classification Code : M6
Hazard Identification Number : 90
Labels : 9

ADR
Packing group : III
Classification Code : M6
Hazard Identification Number : 90
Labels : 9
Tunnel restriction code : (-)

RID
Packing group : III
Classification Code : M6
Hazard Identification Number : 90
Labels : 9

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

IATA (Cargo)
Packing instruction (cargo aircraft) : 964
Packing instruction (LQ) : Y964
Packing group : III
Labels : Miscellaneous

IATA (Passenger)
Packing instruction (passenger aircraft) : 964
Packing instruction (LQ) : Y964
Packing group : III
Labels : Miscellaneous

14.5 Environmental hazards

ADN
Environmentally hazardous : yes

ADR
Environmentally hazardous : yes

RID
Environmentally hazardous : yes

IMDG
Marine pollutant : yes

IATA (Passenger)
Environmentally hazardous : yes

IATA (Cargo)
Environmentally hazardous : yes

14.6 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.

14.7 Maritime transport in bulk according to IMO instruments
Remarks : Not applicable for product as supplied.

SECTION 15: Regulatory information

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

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, preparations and articles (Annex XVII) : Conditions of restriction for the following entries should be considered:
Number on list 3
REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59).
Regulation (EC) No 1005/2009 on substances that deplete the ozone layer : Not applicable
Regulation (EU) 2019/1021 on persistent organic pollutants (recast) : Not applicable
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Regulation (EC) No 649/2012 of the European Parliament and the Council concerning the export and import of dangerous chemicals: Not applicable

REACH - List of substances subject to authorisation (Annex XIV): Not applicable


Other regulations:
Take note of Directive 92/85/EEC regarding maternity protection or stricter national regulations, where applicable.
Take note of Directive 94/33/EC on the protection of young people at work or stricter national regulations, where applicable.

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

15.2 Chemical safety assessment
A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information

Other information: Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

Full text of H-Statements
H224: Extremely flammable liquid and vapour.
H225: Highly flammable liquid and vapour.
H226: Flammable liquid and vapour.
H301: Toxic if swallowed.
H302: Harmful if swallowed.
H312: Harmful in contact with skin.
H314: Causes severe skin burns and eye damage.
H315: Causes skin irritation.
H317: May cause an allergic skin reaction.
H318: Causes serious eye damage.
H319: Causes serious eye irritation.
H330: Fatal if inhaled.
H335: May cause respiratory irritation.
H341: Suspected of causing genetic defects.
H350: May cause cancer.
H351: Suspected of causing cancer.
H361fd: Suspected of damaging fertility. Suspected of damaging the unborn child.
H373: May cause damage to organs through prolonged or repeated
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exposure if swallowed.
H400 : Very toxic to aquatic life.
H410 : Very toxic to aquatic life with long lasting effects.
H411 : Toxic to aquatic life with long lasting effects.
H412 : Harmful to aquatic life with long lasting effects.
EUH071 : Corrosive to the respiratory tract.

Full text of other abbreviations
Acute Tox. : Acute toxicity
Aquatic Acute : Short-term (acute) aquatic hazard
Aquatic Chronic : Long-term (chronic) aquatic hazard
Carc. : Carcinogenicity
Eye Dam. : Serious eye damage
Eye Irrit. : Eye irritation
Flam. Liq. : Flammable liquids
Muta. : Germ cell mutagenicity
Repr. : Reproductive toxicity
Skin Corr. : Skin corrosion
Skin Irrit. : Skin irritation
Skin Sens. : Skin sensitisation
STOT RE : Specific target organ toxicity - repeated exposure
STOT SE : Specific target organ toxicity - single exposure
IE OEL : Ireland. List of Chemical Agents and Occupational Exposure Limit Values - Schedule 1
IE OEL / OELV - 8 hrs (TWA) : Occupational exposure limit value (8-hour reference period)
IE OEL / OELV - 15 min (STEL) : Occupational exposure limit value (15-minute reference period)

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; 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; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; 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; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; 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; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Re-
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Sources of key data used to compile the Safety Data Sheet:

Classification of the mixture:
- Repr. 2: H361fd
- STOT RE 2: H373
- Aquatic Acute 1: H400
- Aquatic Chronic 1: H410

Classification procedure:
- Calculation method

Further information:
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.

IE / EN