SAFETY DATA SHEET

Fenbendazole Paste Formulation

SECTION 1. IDENTIFICATION

Product name: Fenbendazole Paste Formulation

Manufacturer or supplier’s details

Company: MSD
Address: Talcahuano 750, 6th floor, Ciudad Autonoma
Buenos Aires, Argentina C1013AAP
Telephone: 908-740-4000
Emergency telephone: 1-908-423-6000
E-mail address: EHSDATASTEWARD@msd.com

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

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification
Reproductive toxicity: Category 2
Specific target organ toxicity - repeated exposure (Oral): Category 2 (Liver, Lymph nodes, Stomach, Nervous system)
Short-term (acute) aquatic hazard: Category 1
Long-term (chronic) aquatic hazard: Category 1

GHS label elements
Hazard pictograms: 

Signal Word: Warning

Hazard Statements:
H361fd Suspected of damaging fertility. Suspected of damaging the unborn child.
H373 May cause damage to organs (Liver, Lymph nodes, Stomach, Nervous system) through prolonged or repeated exposure if swallowed.
H410 Very toxic 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.
P260 Do not breathe vapors.
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.

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

Other hazards which do not result in classification
None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Substance / Mixture</th>
<th>Components</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chemical name</td>
</tr>
<tr>
<td></td>
<td>fenbendazole</td>
</tr>
<tr>
<td></td>
<td>Glycerine</td>
</tr>
<tr>
<td></td>
<td>Ethanol#</td>
</tr>
<tr>
<td></td>
<td>Diethyl malonate#</td>
</tr>
<tr>
<td></td>
<td>2-Furaldehyde#</td>
</tr>
<tr>
<td></td>
<td>Cinnamaldehyde#</td>
</tr>
<tr>
<td></td>
<td>Isovaleraldehyde#</td>
</tr>
<tr>
<td></td>
<td>Acetaldehyde#</td>
</tr>
<tr>
<td></td>
<td>Trans-hex-2-en-1-ol#</td>
</tr>
</tbody>
</table>

# Voluntarily-disclosed non-hazardous substance

SECTION 4. FIRST AID MEASURES

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

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

In case of skin contact: In case of contact, immediately flush skin with 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.

Most important symptoms and effects, both acute and delayed: Suspected of damaging fertility. Suspected of damaging the unborn child. May cause damage to organs through prolonged or repeated exposure if swallowed.

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

Notes to physician: Treat symptomatically and supportively.

SECTION 5. FIRE-FIGHTING MEASURES

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

Unsuitable extinguishing media: None known.

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

Hazardous combustion products: Carbon oxides

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

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

SECTION 6. ACCIDENTAL RELEASE MEASURES

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

Environmental precautions: Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Prevent spreading over a wide area (e.g., by containment or oil barriers). Retain and dispose of contaminated wash water. Local authorities should be advised if significant spills cannot be contained.

Methods and materials for containment and cleaning up: Soak up with inert absorbent material. For large spills, provide diking or other appropriate containment to keep material from spreading. If diked material can be pumped, store recovered material in appropriate container.
Clean up remaining materials from spill with suitable absorbent.
Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable. Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

SECTION 7. HANDLING AND STORAGE

Technical measures: See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.
Local/Total ventilation: Use only with adequate ventilation.
Advice on safe handling: Do not breathe vapors.
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.

Conditions for safe storage: Keep in properly labeled containers.
Store locked up.
Store in accordance with the particular national regulations.

Materials to avoid: Do not store with the following product types:
Strong oxidizing agents

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type (Form of exposure)</th>
<th>Control parameters / Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>fenbendazole</td>
<td>43210-67-9</td>
<td>TWA</td>
<td>100 µg/m³ (OEB 2)</td>
<td>Internal</td>
</tr>
<tr>
<td>Glycerine</td>
<td>56-81-5</td>
<td>CMP (Mist)</td>
<td>10 mg/m³</td>
<td>AR OEL</td>
</tr>
<tr>
<td>Ethanol</td>
<td>64-17-5</td>
<td>CMP</td>
<td>1.000 ppm</td>
<td>AR OEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL</td>
<td>1.000 ppm</td>
<td>ACGIH</td>
</tr>
<tr>
<td>2-Furaldehyde</td>
<td>98-01-1</td>
<td>CMP</td>
<td>2 ppm</td>
<td>AR OEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>0.2 ppm</td>
<td>ACGIH</td>
</tr>
<tr>
<td>Acetaldehyde</td>
<td>75-07-0</td>
<td>CMP-C</td>
<td>25 ppm</td>
<td>AR OEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C</td>
<td>25 ppm</td>
<td>ACGIH</td>
</tr>
</tbody>
</table>

Further information:
A4 - Not classifiable as a human carcinogen
A3 - Confirmed animal carcinogen with unknown relevance to humans, Skin
Biological occupational exposure limits

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Control parameters</th>
<th>Biological specimen</th>
<th>Sampling time</th>
<th>Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Furaldehyde</td>
<td>98-01-1</td>
<td>total furoic acid</td>
<td>Urine</td>
<td>End of shift</td>
<td>200 mg/g Creatinine</td>
<td>AR BEI</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Furoic acid</td>
<td>Urine</td>
<td>End of shift</td>
<td>200 mg/l</td>
<td>ACGIH BEI</td>
</tr>
</tbody>
</table>

Engineering measures:
Use appropriate engineering controls and manufacturing technologies to control airborne concentrations (e.g., dripless 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

- **Respiratory protection**: If adequate local exhaust ventilation is not available or exposure assessment demonstrates exposures outside the recommended guidelines, use respiratory protection.
- **Filter type**: Combined particulates and organic vapor type
- **Hand protection Material**: Chemical-resistant gloves
- **Eye protection**: 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.**
- **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.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

- **Appearance**: paste
- **Color**: white to off-white
- **Odor**: cinnamon-like
Odor Threshold : No data available
pH : 6 - 8
Melting point/freezing point : No data available
Initial boiling point and boiling range : No data available
Flash point : No data available
Evaporation rate : No data available
Flammability (solid, gas) : Not applicable
Flammability (liquids) : No data available
Upper explosion limit / Upper flammability limit : No data available
Lower explosion limit / Lower flammability limit : No data available
Vapor pressure : No data available
Relative vapor density : No data available
Relative density : No data available
Density : No data available
Solubility(ies) : 
Water solubility : insoluble
Partition coefficient: n-octanol/water : Not applicable
Autoignition temperature : No data available
Decomposition temperature : No data available
Viscosity : 
Viscosity, kinematic : No data available
Explosive properties : Not explosive
Oxidizing properties : The substance or mixture is not classified as oxidizing.
Molecular weight : No data available
Particle size : No data available

SECTION 10. STABILITY AND REACTIVITY
**SAFETY DATA SHEET**

**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>

**Reactivity**
- Not classified as a reactivity hazard.

**Chemical stability**
- Stable under normal conditions.

**Possibility of hazardous reactions**
- Can react with strong oxidizing agents.

**Conditions to avoid**
- None known.

**Incompatible materials**
- Oxidizing agents

**Hazardous decomposition products**
- No hazardous decomposition products are known.

## SECTION 11. TOXICOLOGICAL INFORMATION

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

**Acute toxicity**
Not classified based on available information.

### Components:

#### fenbendazole:
- **Acute oral toxicity**
  - LD50 (Rat): > 10.000 mg/kg
  - LD50 (Mouse): > 10.000 mg/kg

#### Glycerine:
- **Acute oral toxicity**
  - LD50 (Rat): > 5.000 mg/kg

- **Acute dermal toxicity**
  - LD50 (Guinea pig): > 5.000 mg/kg

#### Ethanol:
- **Acute oral toxicity**
  - LD50 (Rat): > 5.000 mg/kg
    - Method: OECD Test Guideline 401

- **Acute inhalation toxicity**
  - LC50 (Rat): 124,7 mg/l
    - Exposure time: 4 h
    - Test atmosphere: vapor

#### 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 inhalation toxicity**
  - LC50 (Rat): 1 mg/l
    - Exposure time: 4 h
    - Test atmosphere: vapor
Acute dermal toxicity: LD50 (Rat): > 2,000 mg/kg  
Method: OECD Test Guideline 402  
Assessment: The substance or mixture has no acute dermal toxicity

Cinnamaldehyde:  
Acute oral toxicity: LD50 (Rat): 2,200 mg/kg  
Acute dermal toxicity: LD50 (Rabbit): 1,260 mg/kg

Isovaleraldehyde:  
Acute oral toxicity: LD50 (Rat): 5,740 mg/kg  
Acute inhalation toxicity: LC50 (Rat): 42,7 mg/l  
Exposure time: 4 h  
Test atmosphere: vapor  
Acute dermal toxicity: LD50 (Rabbit): 2,534 mg/kg

Acetaldehyde:  
Acute oral toxicity: LD50 (Rat): 661 mg/kg  
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

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

Cinnamaldehyde:
Species: human skin
Result: Skin irritation

Isovaleraldehyde:
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

Glycerine:
Species: Rabbit
Result: No eye irritation

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

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

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

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

Components:

Ethanol:
Test Type: Local lymph node assay (LLNA)
Routes of exposure: Skin contact
Species: Mouse
Result: negative

Diethyl malonate:
Test Type: Buehler Test
Routes of exposure: Skin contact
Species: Guinea pig
Method: OECD Test Guideline 406
Result: negative
Remarks: Based on data from similar materials
**2-Furaldehyde:**
- **Test Type:** Maximization Test
- **Routes of exposure:** Skin contact
- **Species:** Guinea pig
- **Method:** OECD Test Guideline 406
- **Result:** negative

**Cinnamaldehyde:**
- **Test Type:** Local lymph node assay (LLNA)
- **Routes of exposure:** Skin contact
- **Species:** Mouse
- **Result:** positive

**Assessment:** Probability or evidence of low to moderate skin sensitization rate in humans

**Isovaleraldehyde:**
- **Test Type:** Maximization Test
- **Routes of exposure:** Skin contact
- **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 sensitization rate in humans

**Acetaldehyde:**
- **Test Type:** Maximization Test
- **Routes of exposure:** Skin contact
- **Species:** Guinea pig
- **Method:** OECD Test Guideline 406
- **Result:** negative

**Trans-hex-2-en-1-ol:**
- **Test Type:** Local lymph node assay (LLNA)
- **Routes of exposure:** Skin contact
- **Species:** Mouse
- **Method:** OECD Test Guideline 429
- **Result:** negative
- **Remarks:** Based on data from similar materials

**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 test  
Test system: mouse lymphoma cells  
Metabolic activation: Metabolic activation  
Result: equivocal

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

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

Test Type: Chromosome aberration test in vitro  
Result: negative

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

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

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

Genotoxicity in vivo: Test Type: Rodent dominant lethal test (germ cell) (in vivo)  
Species: Mouse  
Application Route: Ingestion  
Result: equivocal

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
### SAFETY DATA SHEET

**Fenbendazole Paste Formulation**

<table>
<thead>
<tr>
<th>Test Type:</th>
<th>Result:</th>
</tr>
</thead>
<tbody>
<tr>
<td>In vitro mammalian cell gene mutation test</td>
<td>positive</td>
</tr>
<tr>
<td>Chromosome aberration test in vitro Method: OECD Test Guideline 473</td>
<td>positive</td>
</tr>
<tr>
<td>DNA damage and repair, unscheduled DNA synthesis in mammalian cells (in vitro)</td>
<td>positive</td>
</tr>
<tr>
<td>In vitro sister chromatid exchange assay in mammalian cells</td>
<td>positive</td>
</tr>
</tbody>
</table>

### Genotoxicity in vivo

<table>
<thead>
<tr>
<th>Test Type:</th>
<th>Result:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unscheduled DNA synthesis (UDS) test with mammalian liver cells in vivo Species: Rat Application Route: Ingestion</td>
<td>negative</td>
</tr>
<tr>
<td>Transgenic rodent somatic cell gene mutation assay Species: Mouse Application Route: Ingestion</td>
<td>negative</td>
</tr>
</tbody>
</table>

### Cinnamaldehyde:

<table>
<thead>
<tr>
<th>Test Type:</th>
<th>Result:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bacterial reverse mutation assay (AMES)</td>
<td>negative</td>
</tr>
<tr>
<td>In vitro mammalian cell gene mutation test</td>
<td>negative</td>
</tr>
<tr>
<td>Chromosome aberration test in vitro</td>
<td>negative</td>
</tr>
</tbody>
</table>

### Genotoxicity in vivo

<table>
<thead>
<tr>
<th>Test Type:</th>
<th>Result:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay) Species: Mouse Application Route: Ingestion</td>
<td>negative</td>
</tr>
<tr>
<td>Remarks: Based on data from similar materials</td>
<td></td>
</tr>
<tr>
<td>Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay) Species: Mouse Application Route: Intraperitoneal injection</td>
<td>negative</td>
</tr>
<tr>
<td>Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis) Species: Mouse Application Route: Ingestion</td>
<td>negative</td>
</tr>
</tbody>
</table>
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

Genotoxicity in vitro: 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

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
SAFETY DATA SHEET

Fenbendazole Paste Formulation

Version 5.2  Revision Date: 27.08.2021  SDS Number: 899079-00016  Date of last issue: 09.04.2021
Date of first issue: 16.09.2016

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
Application Route: oral (feed)
Exposure time: 2 Years
NOAEL: 405 mg/kg body weight
Result: negative

Species: Rat
Application Route: Oral
Exposure time: 2 Years
NOAEL: 5 mg/kg body weight
Result: negative
Target Organs: Lymph nodes, Liver

Glycerine:
Species: Rat
Application Route: Ingestion
Exposure time: 2 Years
Result: negative

2-Furaldehyde:
Species: Mouse
Application Route: Ingestion
Exposure time: 103 weeks
Method: OECD Test Guideline 451
Result: positive
Remarks: The mechanism or mode of action is not relevant in humans.

Species: Hamster
Application Route: inhalation (vapor)
Exposure time: 52 weeks
Result: negative

Species: Mouse
Application Route: Skin contact
Exposure time: 47 weeks
Result: positive

Carcinogenicity - Assessment: Limited evidence of carcinogenicity in animal studies

Cinnamaldehyde:
Species: Rat
Application Route: Ingestion
Exposure time: 106 weeks
Result: negative
Remarks: Based on data from similar materials

Species: Mouse
Application Route: Intraperitoneal injection
Exposure time: 24 weeks
Result: negative

Isovaleraldehyde:
Species: Rat
Application Route: inhalation (vapor)
Exposure time: 2 Years
Result: negative
Remarks: Based on data from similar materials

Acetaldehyde:
Species: Rat
Application Route: Inhalation
Exposure time: 121 weeks
Result: positive

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: Test Type: Three-generation reproduction toxicity study
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 fetal development
Test Type: 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-fetal development
Species: Rabbit
Application Route: Oral
Developmental Toxicity: NOAEL: 25 mg/kg body weight
Result: Fetotoxicity.

Test Type: Embryo-fetal development
Species: Rabbit
Application Route: Oral
Developmental Toxicity: LOAEL: 63 mg/kg body weight

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

Glycerine:
Effects on fertility
Test Type: Two-generation reproduction toxicity study
Species: Rat
Application Route: Ingestion
Result: negative

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

Ethanol:
Effects on fertility
Test Type: Two-generation reproduction toxicity study
Species: Mouse
Application Route: Ingestion
Result: negative

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 fetal 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 fetal development: Test Type: Embryo-fetal development
Species: Rat
Application Route: Ingestion
Result: negative

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

Acetaldehyde:
Effects on fetal development: Test Type: Embryo-fetal 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 fetal development: Test Type: Embryo-fetal development
Species: Rat
Application Route: Ingestion
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 (Liver, Lymph nodes, Stomach, Nervous system) through prolonged or repeated exposure if swallowed.

Components:

fenbendazole:
Routes of exposure : 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
LOAEL : 1.600 mg/kg
Application Route : Oral
Exposure time : 90 Days
Target Organs : Central nervous system
Symptoms : Tremors
Species : Dog
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Version 5.2  Revision Date: 27.08.2021  SDS Number: 899079-00016  Date of last issue: 09.04.2021
Date of first issue: 16.09.2016

NOAEL: 4 mg/kg  LOAEL: 8 mg/kg
Exposure time: 6 Months  Target Organs: Stomach, Lymph nodes, Nervous system

Glycerine:
Species: Rat  NOAEL: 0.167 mg/l  LOAEL: 0.622 mg/l
Application Route: Inhalation (dust/mist/fume)  Exposure time: 13 Weeks

Species: Rat  NOAEL: 8.000 - 10.000 mg/kg
Application Route: Ingestion  Exposure time: 13 Weeks
Species: Rabbit  NOAEL: 5.040 mg/kg
Application Route: Skin contact  Exposure time: 45 Weeks

Ethanol:
Species: Rat  NOAEL: 1.280 mg/kg  LOAEL: 3.156 mg/kg
Application Route: Ingestion  Exposure time: 90 Days

Species: Rat  NOAEL: 53 mg/kg
Application Route: Ingestion  Exposure time: 13 Weeks

2-Furaldehyde:
Species: Rat  NOAEL: 200 mg/kg
Application Route: Ingestion  Exposure time: 12 Weeks

Cinnamaldehyde:
Species: Rat  NOAEL: 125 mg/kg  LOAEL: 675 mg/kg
Application Route: Ingestion  Exposure time: 28 Days

Species: Rat
NOAEL : 0,3 mg/kg
LOAEL : 1 mg/kg
Application Route : inhalation (vapor)
Exposure time : 13 Weeks

**Trans-hex-2-en-1-ol:**
Species : Rat
NOAEL : > 100 mg/kg
Application Route : Ingestion
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

**Experience with human exposure**

**Components:**
fenbendazole: Ingestion : Symptoms: Rapid respiration, Salivation, anorexia, Diarrhea

**SECTION 12. ECOLOGICAL INFORMATION**

**Ecotoxicity**

**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 (Daphnia magna (Water flea)): 0,0015 mg/l Exposure time: 21 Days Method: OECD Test Guideline 211

M-Factor (Chronic aquatic toxicity) : 10

**Glycerine:**
Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 54.000 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates:
EC50 (Daphnia magna (Water flea)): 1.955 mg/l
Exposure time: 48 h

Toxicity to microorganisms:
NOEC (Pseudomonas putida): > 10.000 mg/l
Exposure time: 16 h
Method: DIN 38 412 Part 8

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

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): 6.500 mg/l
Exposure time: 16 h

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:
NOEC (Microcystis aeruginosa (blue-green algae)): 2,7 mg/l
plants

Exposure time: 8 d

Toxicity to fish (Chronic toxicity):

NOEC (Danio rerio (zebra fish)): 0.33 mg/l
Exposure time: 12 d

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

NOEC (Daphnia magna (Water flea)): 1.9 mg/l
Exposure time: 21 d
Method: OECD Test Guideline 211

Toxicity to microorganisms:

EC50: 760 mg/l
Exposure time: 30 min
Method: OECD Test Guideline 209

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

Persistence and degradability

Components:

Glycerine:
- Biodegradability: Result: Readily biodegradable.
- Biodegradation: 92 %
- Exposure time: 30 d
- Method: OECD Test Guideline 301D

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
Method: OECD Test Guideline 301B

Isovaleraldehyde:
Biodegradability: Result: Not readily biodegradable.
Biodegradation: 49.5 %
Exposure time: 28 d
Method: OECD Test Guideline 301D

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

Bioaccumulative potential

Components:

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

Glycerine:
Partition coefficient: n-octanol/water: log Pow: -1.75

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

Trans-hex-2-en-1-ol:
Partition coefficient: n-octanol/water: log Pow: 1,61
Remarks: Calculation

Mobility in soil
Components:
fenbendazole:
Distribution among environmental compartments: log Koc: 4,37

Other adverse effects
No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods
Waste from residues: Dispose of in accordance with local regulations.
Contaminated packaging: Empty containers should be taken to an approved waste handling site for recycling or disposal.
If not otherwise specified: Dispose of as unused product.

SECTION 14. TRANSPORT INFORMATION

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

IATA-DGR
UN/ID No.: UN 3082
Proper shipping name: Environmentally hazardous substance, liquid, n.o.s. (fenbendazole)
Class: 9
Packing group: III
Labels: Miscellaneous
SECTION 15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture
Argentina. Carcinogenic Substances and Agents Registry. : Not applicable
Control of precursors and essential chemicals for the preparation of drugs. : Ethanol

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

SECTION 16. OTHER INFORMATION

Further information

Full text of other abbreviations
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ACGIH : USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI : ACGIH - Biological Exposure Indices (BEI)
AR BEI : Argentina. Biological Exposure Indices
AR OEL : Argentina. Occupational Exposure Limits

ACGIH / TWA : 8-hour, time-weighted average
ACGIH / STEL : Short-term exposure limit
ACGIH / C : Ceiling limit
AR OEL / CMP : TLV (Threshold Limit Value)
AR OEL / CMP-C : Ceiling value

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.

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