SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name: Fenbendazole (20%) Liquid Formulation

Manufacturer or supplier's details
Company: MSD
Address: Rua Coronel Bento Soares, 530 Cruzeiro - Sao Paulo - Brazil CEP 12730-340
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 in accordance with ABNT NBR 14725 Standard
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 in accordance with ABNT NBR 14725 Standard
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.
SAFETY DATA SHEET

Fenbendazole (20%) Liquid Formulation

Version 3.4  
Revision Date: 12.10.2021  
SDS Number: 508602-00013  
Date of last issue: 23.03.2020  
Date of first issue: 10.02.2016

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.

Other hazards which do not result in classification

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture: Mixture

Components

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No.</th>
<th>Classification</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
</table>
| fenbendazole        | 43210-67-9 | Reproductive toxicity, Category 2  
|                     |          | Specific target organ toxicity - repeated exposure (Oral) (Liver, Lymph nodes, Stomach, Nervous system), Category 2  
|                     |          | Short-term (acute) aquatic hazard, Category 1  
|                     |          | Long-term (chronic) aquatic hazard, Category 1 | >= 20 - < 25 |
| Benzyl alcohol      | 100-51-6 | Acute toxicity (Oral), Category 4  
|                     |          | Acute toxicity (Inhalation), Category 4  
|                     |          | Eye irritation, Category 2A | >= 1 - < 5 |

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 spillages 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 mist or 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.

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.

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>
</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: 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.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance: suspension
- Color: white to off-white
- Odor: No data available
- 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: No data available
Partition coefficient: n-octanol/water: No data available
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

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

SECTION 11. TOXICOLOGICAL INFORMATION

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

Acute toxicity
Not classified based on available information.

Product:
Acute oral toxicity: Acute toxicity estimate: > 5.000 mg/kg
   Method: Calculation method
Acute inhalation toxicity: Acute toxicity estimate: > 10 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

Components:
fenbendazole:
Acute oral toxicity: LD50 (Rat): > 10.000 mg/kg
LD50 (Mouse): > 10.000 mg/kg

Benzyl alcohol:
Acute oral toxicity: LD50 (Rat): 1.620 mg/kg

Acute inhalation toxicity: LC50 (Rat): > 4.178 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403

Skin corrosion/irritation
Not classified based on available information.

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

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

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

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

Benzyl alcohol:
Species: Rabbit
Result: Irritation to eyes, reversing within 21 days
Method: OECD Test Guideline 405
Respiratory or skin sensitization

Skin sensitization
Not classified based on available information.

Respiratory sensitization
Not classified based on available information.

Components:

Benzyl alcohol:
Test Type: Maximization Test
Routes of exposure: Skin contact
Species: Guinea pig
Method: OECD Test Guideline 406
Result: negative

Germ cell mutagenicity
Not classified based on available information.

Components:

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

Genotoxicity in vitro: Test Type: DNA Repair
Result: negative

Genotoxicity in vitro: Test Type: Chromosomal aberration
Result: negative

Genotoxicity in vitro: Test Type: in vitro test
Test system: mouse lymphoma cells
Metabolic activation: Metabolic activation
Result: equivocal

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

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

Carcinogenicity
Not classified based on available information.

Components:

dfenbendazole:
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**

---

### Benzyl alcohol:

- **Species**: Mouse
- **Application Route**: Ingestion
- **Exposure time**: 103 weeks
- **Method**: OECD Test Guideline 451
- **Result**: negative

---

### 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.

### Benzyl alcohol:

#### Effects on fertility

**Test Type:** Fertility/early embryonic development  
**Species:** Rat  
**Application Route:** Ingestion  
**Result:** negative  
**Remarks:** Based on data from similar materials

#### Effects on fetal development

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

### STOT-single exposure

Not classified based on available information.

### 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.

### 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 Overview

<table>
<thead>
<tr>
<th>Component</th>
<th>Exposure Period</th>
<th>Organ System</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fenbendazole</td>
<td>90 Days</td>
<td>Central nervous system</td>
<td>Tremors</td>
</tr>
<tr>
<td>Species</td>
<td>Dog</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOAEL</td>
<td>4 mg/kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOAEL</td>
<td>8 mg/kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure time</td>
<td>6 Months</td>
<td>Stomach, Lymph nodes, Nervous system</td>
<td></td>
</tr>
</tbody>
</table>

#### Benzyl Alcohol

<table>
<thead>
<tr>
<th>Component</th>
<th>Exposure Period</th>
<th>Organ System</th>
<th>Route</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzyl Alcohol</td>
<td>28 Days</td>
<td></td>
<td>Inhalation (dust/mist/fume)</td>
<td></td>
</tr>
<tr>
<td>Species</td>
<td>Rat</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOAEL</td>
<td>1,072 mg/l</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Application Route</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Method</td>
<td>OECD Test Guideline 412</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**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

### 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
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Date of first issue: 10.02.2016

M-Factor (Chronic aquatic toxicity)  :  10

Benzyl alcohol:
Toxicity to fish  :  LC50 (Pimephales promelas (fathead minnow)): 460 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates  :  EC50 (Daphnia magna (Water flea)): 230 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants  :  EC50 (Pseudokirchneriella subcapitata (green algae)): 770 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

NOEC (Pseudokirchneriella subcapitata (green algae)): 310 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)  :  NOEC (Daphnia magna (Water flea)): 51 mg/l
Exposure time: 21 d
Method: OECD Test Guideline 211

Persistence and degradability

Components:

Benzyl alcohol:
Biodegradability  :  Result: Readily biodegradable.
Biodegradation: 92 - 96 %
Exposure time: 14 d

Bioaccumulative potential

Components:

fenbendazole:
Bioaccumulation  :  Species: Lepomis macrochirus (Bluegill sunfish)
Bioconcentration factor (BCF): 240

Partition coefficient: n-octanol/water  :  log Pow: 2,3

Benzyl alcohol:
Partition coefficient: n-octanol/water  :  log Pow: 1,05

Mobility in soil

Components:

fenbendazole:
Distribution among environmental compartments  :  log Koc: 4,37
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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
- Packing instruction (cargo aircraft): 964
- Packing instruction (passenger aircraft): 964
- Environmentally hazardous: yes

IMDG-Code
- UN number: UN 3082
- Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (fenbendazole)
- Class: 9
- Packing group: III
- Labels: 9
- EmS Code: F-A, S-F
- Marine pollutant: yes

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

Domestic regulation

ANTT
- UN number: UN 3082
- Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID,
SECTION 15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture
National List of Carcinogenic Agents for Humans - (LINACH) : Not applicable

Brazil. List of chemicals controlled by the Federal Police : Not applicable

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

AIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); 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; ERG - Emergency Response Guide; 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 Chemi-
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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.

BR / Z8