DENAGARD 12.5 % SOLUTION

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

   Identification of the substance or mixture
   Substance No. : 000070002048
   NAH Substance Code : A-20002 A
   Trade name : DENAGARD 12.5 % SOLUTION
   DENAGARD SOLUTION BUvable
   Product name : ASF307 SOL 12.5
   Company : Novartis Animal Health Inc.
   Schwarzwaldallee 215
   CH - 4058 Basel
   Switzerland
   Telephone : +41616971111
   Contact person : Phone (office hours) +41 61 697 30 65
   E-mail address : msds.nah@novartis.com
   Emergency information
   Emergency telephone number : Phone (24 h) +41 61 696 33 33
   Emergency information : concerning transport see emergency phone number in the shipping documents
   concerning storage see emergency phone number of local Novartis organization

2. HAZARDS IDENTIFICATION

   Risk advice to man and the environment
   Potential health effects : May cause eye and skin irritation.
   Potential environmental effects : Do not flush into surface water or sanitary sewer system.

3. COMPOSITION/INFORMATION ON INGREDIENTS

   Chemical nature
   Use : Antibiotic
   Type of preparation : Solution vet. use
   Active ingredient : ASF 307 Tiamulin fumarate

   Hazardous components

<table>
<thead>
<tr>
<th>Identification</th>
<th>CAS-No.</th>
<th>Symbol(s)</th>
<th>Hazard pictograms</th>
<th>R-phrase(s)</th>
<th>Concentration (% w/w)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tiamulin fumarate</td>
<td>55297-96-6</td>
<td>Xn</td>
<td>GHS07</td>
<td>R36/37, H319, H335</td>
<td>12.20</td>
</tr>
<tr>
<td>Ethanol</td>
<td>64-17-5</td>
<td>F</td>
<td>GHS02</td>
<td>R11, H225</td>
<td>5.00 - 10.00</td>
</tr>
</tbody>
</table>

   For the full text of the R-phrases mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

   General advice : If you feel unwell, seek medical advice (show the label where possible). When symptoms persist or in all cases of doubt seek medical advice.
   Inhalation : Not a hazard under normal use conditions.
   Skin contact : Wash off immediately with soap and plenty of water.
   Eye contact : Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
   Ingestion : If accidentally swallowed obtain immediate medical attention. Rinse mouth with water. Drink water as a precaution.

   Notes to physician
   Poisoning Symptoms : No information available.
   Antidote : No specific antidote is known! Apply symptomatic therapy.
5. FIRE-FIGHTING MEASURES

Combustibility: yes
Suitable extinguishing media: Dry powder, foam, carbon dioxide (CO2) or water spray (do not use water jet).
Special protective equipment for fire-fighters: In the event of fire, wear self-contained breathing apparatus.
Further information: Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Swiss Fire Prevention Code: F4 L

6. ACCIDENTAL RELEASE MEASURES

Methods for cleaning up: Refer to protective measures listed in sections 7 and 8.
Cover up product with absorptive material such as sand, soil, diatomaceous earth, etc.
Pick up and transfer to properly labelled containers.
Dispose of in an incinerator approved for chemicals.
Treat contaminated surfaces with water.
Spilled product cannot be used further and must be disposed of.
If safe disposal is not possible, contact the manufacturer, the dealer or the local representative.

Additional advice: Do not flush into surface water or sanitary sewer system.

7. HANDLING AND STORAGE

Handling
Safe handling advice: Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes and clothing.
: In addition to the measures taken usually in the chemical works like splashproof filling and measuring equipment (including vapour stripping) further personal protection measures may have to be implemented to avoid possible contact with the product.

Storage
Novartis storage class: 21.1
Storage temperature: min. 2 °C - max. 25 °C
Other data: Store the product in closed original containers.
Protect from light.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Identification</th>
<th>CAS-No.</th>
<th>Exposure limit(s)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tiamulin fumarate</td>
<td>55297-96-6</td>
<td>0.2 mg/m 3</td>
<td>Novartis Internal Exposure Limit (NPIEL) 8 h TWA Moderately hazardous substance</td>
</tr>
</tbody>
</table>

Protective measures: The use of technical measures should always have priority over the use of personal protective equipment.

Personal protective equipment
Open handling
Respiratory protection: No personal respiratory protective equipment normally required.
Hand protection: Gloves
Eye protection: Safety glasses
DENAGARD 12.5 % SOLUTION

Skin and body protection: Choose body protection according to the amount and concentration of the dangerous substance at the work place. Heavy duty cotton or synthetic fabric working clothes (e.g. overalls). Lab coat

Hygiene measures: Wash hands before breaks and at the end of workday. Shower or bathe at the end of working. Change clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form: liquid, aqueous solution
Colour: colourless - slightly yellowish
Odour: slight, alcoholic
Density: ca.1.2 g/ml
pH: 3.7 - 4.3
Flash point: Remarks: Solution contains >70 % water

10. STABILITY AND REACTIVITY

Chemical Stability: Stable under normal conditions.

11. TOXICOLOGICAL INFORMATION

Acute oral toxicity: LD50 > 2,000 mg/kg
Species: rat
Remarks: Derived from the active ingredient(s)

Further information: May cause eye and skin irritation. Derived from the active ingredient(s)

12. ECOLOGICAL INFORMATION

Ecotoxicity effects
Toxicity to fish: Remarks: no data available
Toxicity to daphnia: Remarks: no data available

Behaviour in environmental compartments
Elimination information (persistence and degradability)
Biodegradability: no data available

13. DISPOSAL CONSIDERATIONS

Product: Refer to protective measures listed in sections 7 and 6. Soak up with absorptive material such as sand, soil, diatomaceous earth, etc. Pick up and transfer to properly labelled containers. Dispose of in an incinerator approved for chemicals. In accordance with internal, local and national regulations. Spilled product cannot be used further and must be disposed of. If safe disposal is not possible, contact the manufacturer, the dealer or the local representative.

Contaminated packaging: Damaged Containers: Place original containers in specially marked larger ones. Check possibilities of recycling large empty containers, drums and barrels. Check possibilities of recycling not contaminated packaging material. Dispose of empty containers in an incinerator approved for chemicals. In accordance with internal, local and national regulations.
14. TRANSPORT INFORMATION

Transport Condition: Transport + intermediate storage <=40°C

ADR/RID
- UN number: FREE
- Class: Not classified as dangerous good

IMDG
- UN number: FREE
- Class: Not classified as dangerous good

ICAO/IATA
- UN number: FREE
- Class: Not classified as dangerous good

Postal delivery - Switzerland: 1 allowed

15. REGULATORY INFORMATION

Classification according to EU Directives 67/548/EEC or 1999/45/EC

Labelling
- Symbol(s): ---
- The product is not subject of Directive 1999/45 EEC. classification not required

National legislation
- Weight limit (Switzerland - StFV): 200,000 kg

16. OTHER INFORMATION

Text of R-phrases mentioned in Section 3
- R36/37: Irritating to eyes and respiratory system.
- R11: Highly flammable.
- H319: Causes serious eye irritation.
- H335: May cause respiratory irritation.
- H225: Highly flammable liquid and vapour.

Changes since the last version are highlighted in the margin. This version replaces all previous versions.

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 given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.