SAFETY DATA SHEET

Caspofungin Formulation

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Caspofungin Formulation

Manufacturer or supplier's details
Company : MSD
Address : Avenida Tanner de Melo, Quadra 10 Lote 4A, Galpão A Parque Industrial Vice Presidente José Alencar Aparecida de Goias – GO, Brazil
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 : Pharmaceutical

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification in accordance with ABNT NBR 14725 Standard
Serious eye damage : Category 1
Effects on or via lactation
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 : Danger
Hazard Statements : H318 Causes serious eye damage. H362 May cause harm to breast-fed children. H410 Very toxic to aquatic life with long lasting effects.
Precautionary Statements : Prevention:
Response:
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
P391 Collect spillage.

Other hazards which do not result in classification
May form explosive dust-air mixture during processing, handling or other means.

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>
<tbody>
<tr>
<td>Caspofungin</td>
<td>179463-17-3</td>
<td>Serious eye damage, Category 1 Effects on or via lactation, Short-term (acute) aquatic hazard, Category 1 Long-term (chronic) aquatic hazard, Category 1</td>
<td>&gt;= 30 - &lt; 50</td>
</tr>
<tr>
<td>Sucrose</td>
<td>57-50-1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acetic acid</td>
<td>64-19-7</td>
<td>Flammable liquids, Category 3 Acute toxicity (Oral), Category 5 Skin corrosion, Category 1A Serious eye damage, Category 1</td>
<td>&gt;= 1 - &lt; 3</td>
</tr>
</tbody>
</table>

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 : Get medical attention.
In case of skin contact : Wash with water and soap. Get medical attention.
In case of eye contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lens, if worn. Get medical attention immediately.
If swallowed : Get medical attention.
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Most important symptoms and effects, both acute and delayed: Causes serious eye damage. May cause harm to breast-fed children.

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 firefighting: Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard. 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. Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillovers cannot be contained.

Methods and materials for containment and cleaning up: Sweep up or vacuum up spillage and collect in suitable container for disposal. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration. 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: Static electricity may accumulate and ignite suspended dust causing an explosion. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres.

Local/Total ventilation: Use only with adequate ventilation.

Advice on safe handling:
- Avoid contact during pregnancy and while nursing.
- Do not breathe dust.
- Do not swallow.
- Do not get in eyes.
- Avoid prolonged or repeated contact with skin.
- Wash skin thoroughly after handling.
- Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment.
- Keep container tightly closed.
- Minimize dust generation and accumulation.
- Keep container closed when not in use.
- Keep away from heat and sources of ignition.
- Take precautionary measures against static discharges.
- Do not eat, drink or smoke when using this product.
- Take care to prevent spills, waste and minimize release to the environment.

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.

Conditions for safe storage:
- Keep in properly labeled containers.
- Keep tightly closed.
- 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>Caspofungin</td>
<td>179463-17-3</td>
<td>TWA</td>
<td>100 µg/m³ (OEB 2)</td>
<td>Internal</td>
</tr>
<tr>
<td>Sucrose</td>
<td>57-50-1</td>
<td>TWA</td>
<td>10 mg/m³</td>
<td>ACGIH</td>
</tr>
<tr>
<td>Acetic acid</td>
<td>64-19-7</td>
<td>LT</td>
<td>8 ppm 20 mg/m³</td>
<td>BR OEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>10 ppm</td>
<td>ACGIH</td>
</tr>
</tbody>
</table>

Further information: Degree of harmfulness: medium
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<table>
<thead>
<tr>
<th>Engineering measures</th>
<th>STEL</th>
<th>15 ppm</th>
<th>ACGIH</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Engineering measures**: Ensure adequate ventilation, especially in confined areas. Minimize workplace exposure concentrations. Apply measures to prevent dust explosions. Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment).

**Personal protective equipment**

**Respiratory protection**: If adequate local exhaust ventilation is not available or exposure assessment demonstrates exposures outside the recommended guidelines, use respiratory protection.

**Filter type**: Combined particulates and organic vapor type

**Hand protection**

**Material**: Chemical-resistant gloves

**Remarks**: Choose gloves to protect hands against chemicals depending on the concentration specific to place of work. Breakthrough time is not determined for the product. Change gloves often! For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer. Wash hands before breaks and at the end of workday.

**Eye protection**: Wear the following personal protective equipment: Chemical resistant goggles must be worn. If splashes are likely to occur, wear: Face-shield

**Skin and body protection**: Select appropriate protective clothing based on chemical resistance data and an assessment of the local exposure potential. Skin contact must be avoided by using impervious protective clothing (gloves, aprons, boots, etc).

### SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance**: powder

**Color**: off-white

**Odor**: No data available

**Odor Threshold**: No data available

**pH**: No data available

**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) : May form explosive dust-air mixture during processing, handling or other means.

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

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

Minimum ignition energy : 100 - 300 mJ

30 - 100 mJ

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 : May form explosive dust-air mixture during processing, handling or other means. Can react with strong oxidizing agents.

Conditions to avoid : Heat, flames and sparks. Avoid dust formation.
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

Components:

Caspofungin:
Acute oral toxicity: LD50 (Mouse): > 2.000 mg/kg
Acute toxicity (other routes of administration): LD50 (Mouse): 19 mg/kg
Application Route: Intravenous

LD50 (Rat): 38 mg/kg
Application Route: Intravenous

Sucrose:
Acute oral toxicity: LD50 (Rat): 29.700 mg/kg

Acetic acid:
Acute oral toxicity: LD50 (Rat): > 2.000 - 5.000 mg/kg
Remarks: Based on data from similar materials
Acute inhalation toxicity: Assessment: Corrosive to the respiratory tract.
Acute dermal toxicity: LD50 (Rabbit): > 5.000 mg/kg
Remarks: Based on data from similar materials

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

Components:

Caspofungin:
Species: Rabbit
Result: Mild skin irritation

Acetic acid:
Species: Rabbit
Result: Corrosive after 3 minutes or less of exposure

**Serious eye damage/eye irritation**
Causes serious eye damage.

**Components:**

**Caspofungin:**
- **Species:** Rabbit
- **Result:** Irreversible effects on the eye
- **Method:** Bovine cornea (BCOP)

**Acetic acid:**
- **Species:** Rabbit
- **Result:** Irreversible effects on the eye

**Respiratory or skin sensitization**

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

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

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

**Components:**

**Caspofungin:**
- Genotoxicity in vitro:
  - Test Type: Chromosomal aberration
    - Test system: Chinese hamster ovary cells
    - Result: negative
  - Test Type: Bacterial reverse mutation assay (AMES)
    - Result: negative
  - Test Type: Alkaline elution assay
    - Test system: rat hepatocytes
    - Result: negative
  - Test Type: In vitro mammalian cell gene mutation test
    - Test system: Chinese hamster fibroblasts
    - Result: negative

- Genotoxicity in vivo:
  - Test Type: Chromosomal aberration
    - Species: Mouse
    - Cell type: Bone marrow
    - Result: negative

**Sucrose:**
- Genotoxicity in vitro:
  - Test Type: In vitro mammalian cell gene mutation test
    - Result: negative
### Acetic acid:

**Genotoxicity in vitro**
- 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
- Test Type: In vitro mammalian cell gene mutation test
  - Result: equivocal
  - Remarks: Based on data from similar materials

**Genotoxicity in vivo**
- Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
  - Species: Rat
  - Application Route: Inhalation (vapor)
  - Result: negative
  - Remarks: Based on data from similar materials

### Carcinogenicity
Not classified based on available information.

### Components:

**Acetic acid:**
- Species: Mouse
- Application Route: Skin contact
- Exposure time: 32 weeks
- Result: negative

**Reproductive toxicity**
May cause harm to breast-fed children.

### Components:

**Caspofungin:**
- **Effects on fertility**
  - Test Type: Fertility
  - Species: Rat, male and female
  - Application Route: Intravenous injection
  - Fertility: NOAEL Parent: 5 mg/kg body weight
  - Result: No effects on fertility and early embryonic development were detected.

- **Effects on fetal development**
  - Test Type: Embryo-fetal development
  - Species: Rat
  - Application Route: Intravenous injection
  - General Toxicity Maternal: LOAEL: 5 mg/kg body weight
  - Embryo-fetal toxicity: NOAEL F1: 2 mg/kg body weight
  - Symptoms: Abnormalities of the musculoskeletal system.
  - Result: Embryotoxic effects and adverse effects on the offspring were detected.
Test Type: Development
Species: Rabbit
Application Route: Intravenous injection
General Toxicity Maternal: NOAEL: 3 mg/kg body weight
Developmental Toxicity: NOAEL F1: >= 6 mg/kg body weight
Result: Embryotoxic effects and adverse effects on the offspring were detected.

Reproductive toxicity - Assessment:
Studies indicating a hazard to babies during the lactation period

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

STOT-single exposure
Not classified based on available information.

STOT-repeated exposure
Not classified based on available information.

Repeated dose toxicity

Components:

Caspofungin:
Species: Monkey
NOAEL: 2 mg/kg
LOAEL: 5 mg/kg
Application Route: Intravenous
Exposure time: 27 Weeks
Number of exposures: daily
Target Organs: Liver

Species: Rat
LOAEL: 1,8 mg/kg
Application Route: Intravenous
Exposure time: 27 Weeks
Symptoms: Swelling of tissue

Species: Rat
NOAEL: 2 mg/kg
LOAEL: 5 mg/kg
Application Route: Intravenous
Exposure time: 14 Weeks
Number of exposures: daily
Symptoms: Swelling of tissue

Acetic acid:
Species: Rat
NOAEL: 290 mg/kg
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Application Route: Ingestion
Exposure time: 8 Weeks

Aspiration toxicity
Not classified based on available information.

Components:
Caspofungin:
No aspiration toxicity classification

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:
Caspofungin:
Toxicity to fish: LC50 (Pimephales promelas (fathead minnow)): 2,4 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates: EC50 (Daphnia magna (Water flea)): 22,6 mg/l
Exposure time: 48 h

Toxicity to algae/aquatic plants: EC50 (Pseudokirchneriella subcapitata (green algae)): 0,1 mg/l
Exposure time: 72 h

NOEC (Pseudokirchneriella subcapitata (green algae)): 0,05 mg/l
Exposure time: 72 h

M-Factor (Acute aquatic toxicity): 10

Toxicity to fish (Chronic toxicity):
NOEC (Pimephales promelas (fathead minnow)): 0,084 mg/l
Exposure time: 32 d
Method: OECD Test Guideline 210

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):
NOEC (Daphnia magna (Water flea)): 0,67 mg/l
Exposure time: 21 d
Method: OECD Test Guideline 211

M-Factor (Chronic aquatic toxicity): 1

Toxicity to microorganisms:
EC50: > 127 mg/l
Exposure time: 3 h
Test Type: Respiration inhibition
Method: OECD Test Guideline 209

NOEC: 38 mg/l
Exposure time: 3 h
Test Type: Respiration inhibition
Method: OECD Test Guideline 209
Acetic acid:

Toxicity to fish

LC50 (Oncorhynchus mykiss (rainbow trout)): > 100 mg/l
Exposure time: 96 h
Remarks: Based on data from similar materials

Exposure time: 48 h
Method: OECD Test Guideline 202
Remarks: Based on data from similar materials

Exposure time: 21 d
Method: OECD Test Guideline 204

Exposure time: 21 d
Method: OECD Test Guideline 204

Exposure time: 16 h

Persistence and degradability

Components:

Caspofungin:

Biodegradability: Result: Not readily biodegradable.
Biodegradation: 71.9 %
Exposure time: 28 d
Method: OECD Test Guideline 302B

Stability in water: Degradation half life (DT50): 2.8 h

Acetic acid:

Biodegradability: Result: Readily biodegradable.
Biodegradation: 96 %
Exposure time: 20 d

Bioaccumulative potential

Components:

Caspofungin:

Partition coefficient: n-octanol/water: log Pow: -1.6

Sucrose:
Partition coefficient: n-octanol/water: Pow: < 1

**Acetic acid:**
Partition coefficient: n-octanol/water: log Pow: -0.17

**Mobility in soil**
No data available

**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 3077
- Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Caspofungin)
- Class: 9
- Packing group: III
- Labels: 9

**IATA-DGR**
- UN/ID No.: UN 3077
- Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Caspofungin)
- Class: 9
- Packing group: III
- Labels: Miscellaneous
- Packing instruction (cargo aircraft): 956
- Packing instruction (passenger aircraft): 956
- Environmentally hazardous: yes

**IMDG-Code**
- UN number: UN 3077
- Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Caspofungin)
- 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 3077
Proper shipping name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Caspofungin)

Class : 9
Packing group : III
Labels : 9
Hazard Identification Number : 90

**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.

**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 : Acetic acid

**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**
ACGIH : USA. ACGIH Threshold Limit Values (TLV)
BR OEL : Brazil. NR 15 - Unhealthy activities and operations
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