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

1.1 Product identifier
- Trade name: Bis(6,6,7,7,8,8,8-heptafluoro-2,2-dimethyl-3,5-octanedionate)barium Ba(FOD)2
- Item number: 56-8400
- CAS Number: 36885-31-1

1.2 Relevant identified uses of the substance or mixture and uses advised against
No further relevant information available.

1.3 Details of the supplier of the safety data sheet
- Manufacturer/Supplier: Strem Chemicals, Inc.
  7 Mulliken Way
  NEWBURYPORT, MA 01950
  USA
  info@strem.com
- Further information obtainable from: Technical Department
- Emergency telephone number:
  EMERGENCY: CHEMTREC: +1 (800) 424-9300
  During normal opening times: +1 (978) 499-1600

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture
- Classification according to Regulation (EC) No 1272/2008
  Acute Tox. 4 H302 Harmful if swallowed.

2.2 Label elements
- Labelling according to Regulation (EC) No 1272/2008
  The substance is classified and labelled according to the CLP regulation.
- Hazard pictograms

2.3 Signal word Warning

2.4 Hazard-determining components of labelling:
- Bis(6,6,7,7,8,8,8-heptafluoro-2,2-dimethyl-3,5-octanedionate)barium [Ba(FOD)2]
- Hazard statements
  H302 Harmful if swallowed.
- Precautionary statements
  P101 If medical advice is needed, have product container or label at hand.
  P102 Keep out of reach of children.
  P103 Read label before use.
  P231 Handle under inert gas.
  P280 Wear protective gloves/protective clothing/eye protection/face protection.
  P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
  P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Trade name: Bis(6,6,7,7,8,8,8-heptafluoro-2,2-dimethyl-3,5-octanedionate)barium Ba(FOD)\textsubscript{2}

P403+P233 Store in a well-ventilated place. Keep container tightly closed.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

2.3 Other hazards
- Results of PBT and vPvB assessment
  - PBT: Not applicable.
  - vPvB: Not applicable.

SECTION 3: Composition/information on ingredients

3.1 Chemical characterisation: Substances
- CAS No. Description
  36885-31-1 Bis(6,6,7,7,8,8,8-heptafluoro-2,2-dimethyl-3,5-octanedionate)barium [Ba(FOD)\textsubscript{2}]

SECTION 4: First aid measures

4.1 Description of first aid measures
- General information:
  Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
- After inhalation: Supply fresh air; consult doctor in case of complaints.
- After skin contact: Immediately rinse with water.
- After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.
- After swallowing: Call for a doctor immediately.

4.2 Most important symptoms and effects, both acute and delayed
No further relevant information available.

4.3 Indication of any immediate medical attention and special treatment needed
No further relevant information available.

SECTION 5: Firefighting measures

5.1 Extinguishing media
- Suitable extinguishing agents:
  CO\textsubscript{2}, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- Special hazards arising from the substance or mixture
  No further relevant information available.

5.3 Advice for firefighters
- Protective equipment: No special measures required.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
- Not required.

6.2 Environmental precautions:
  Do not allow product to reach sewage system or any water course.
  Inform respective authorities in case of seepage into water course or sewage system.

6.3 Methods and material for containment and cleaning up:
  Dispose contaminated material as waste according to item 13.
  Ensure adequate ventilation.

6.4 Reference to other sections
  See Section 7 for information on safe handling.
  See Section 8 for information on personal protection equipment.
SECTION 7: Handling and storage

- 7.1 Precautions for safe handling: Ensure good ventilation/exhaustion at the workplace.
- Information about fire - and explosion protection: No special measures required.
- 7.2 Conditions for safe storage, including any incompatibilities
  - Storage:
    - Requirements to be met by storerooms and receptacles: No special requirements.
    - Information about storage in one common storage facility: Not required.
    - Further information about storage conditions: None.
- 7.3 Specific end use(s): No further relevant information available.

SECTION 8: Exposure controls/personal protection

- Additional information about design of technical facilities: No further data; see item 7.
- 8.1 Control parameters
  - Ingredients with limit values that require monitoring at the workplace: Not required.
  - Additional information: The lists valid during the making were used as basis.
- 8.2 Exposure controls
  - Personal protective equipment:
    - General protective and hygienic measures: Wash hands before breaks and at the end of work.
    - Respiratory protection:
      In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use self-contained respiratory protective device.
  - Protection of hands:

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

- Material of gloves
  The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
- Penetration time of glove material
  The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
- Eye protection: Safety glasses

- 9.1 Information on basic physical and chemical properties
  - General Information
    - Appearance:
      - Form: Powder
      - Colour: Whitish
    - Odour: Undistinguishable.
    - Odour threshold: Not determined.
  - pH-value: Not applicable.
Trade name: Bis(6,6,7,7,8,8-heptafluoro-2,2-dimethyl-3,5-octanedionate)barium Ba(FOD)2

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in condition</td>
<td></td>
</tr>
<tr>
<td>Melting point/Melting range:</td>
<td>194-198 °C</td>
</tr>
<tr>
<td>Boiling point/Boiling range:</td>
<td>dec.280-300subl °C</td>
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<tr>
<td>Flash point:</td>
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<tr>
<td>Flammability (solid, gaseous):</td>
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<tr>
<td>Ignition temperature:</td>
<td></td>
</tr>
<tr>
<td>Decomposition temperature:</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Self-igniting:</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Danger of explosion:</td>
<td>Product does not present an explosion hazard.</td>
</tr>
<tr>
<td>Explosion limits:</td>
<td></td>
</tr>
<tr>
<td>Lower:</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Upper:</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Vapour pressure:</td>
<td>subl.210° hPa</td>
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<tr>
<td>Density:</td>
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</tr>
<tr>
<td>Relative density:</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Vapour density:</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Evaporation rate:</td>
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</tr>
<tr>
<td>Solubility in / Miscibility with water:</td>
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</tr>
<tr>
<td>Partition coefficient (n-octanol/water):</td>
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<tr>
<td>Viscosity:</td>
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<tr>
<td>Dynamic:</td>
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</tr>
<tr>
<td>Kinematic:</td>
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<tr>
<td>Solvent content:</td>
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<td>Organic solvents:</td>
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<tr>
<td>VOC (EC)</td>
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<tr>
<td>Solids content:</td>
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<tr>
<td>9.2 Other information</td>
<td>No further relevant information available.</td>
</tr>
</tbody>
</table>

SECTION 10: Stability and reactivity

- **10.1 Reactivity** No further relevant information available.
- **10.2 Chemical stability**
- **Thermal decomposition / conditions to be avoided**: No decomposition if used according to specifications.
- **10.3 Possibility of hazardous reactions** No dangerous reactions known.
- **10.4 Conditions to avoid** No further relevant information available.
- **10.5 Incompatible materials** No further relevant information available.
- **10.6 Hazardous decomposition products**: No dangerous decomposition products known.

SECTION 11: Toxicological information

- **11.1 Information on toxicological effects**
  - **Acute toxicity**
    Harmful if swallowed.
Trade name: Bis(6,6,7,7,8,8,8-heptafluoro-2,2-dimethyl-3,5-octanedionato)barium Ba(FOD)2

- **Primary irritant effect:**
- **Skin corrosion/irritation** Based on available data, the classification criteria are not met.
- **Serious eye damage/irritation** Based on available data, the classification criteria are not met.
- **Respiratory or skin sensitisation** Based on available data, the classification criteria are not met.
- **CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction)**
  - **Germ cell mutagenicity** Based on available data, the classification criteria are not met.
  - **Carcinogenicity** Based on available data, the classification criteria are not met.
  - **Reproductive toxicity** Based on available data, the classification criteria are not met.
- **STOT-single exposure** Based on available data, the classification criteria are not met.
- **STOT-repeated exposure** Based on available data, the classification criteria are not met.
- **Aspiration hazard** Based on available data, the classification criteria are not met.

**SECTION 12: Ecological information**

- **12.1 Toxicity**
  - **Aquatic toxicity:** No further relevant information available.
- **12.2 Persistence and degradability** No further relevant information available.
- **12.3 Bioaccumulative potential** No further relevant information available.
- **12.4 Mobility in soil** No further relevant information available.
- **Additional ecological information:**
  - **General notes:** Not known to be hazardous to water.
- **12.5 Results of PBT and vPvB assessment**
  - **PBT:** Not applicable.
  - **vPvB:** Not applicable.
- **12.6 Other adverse effects** No further relevant information available.

**SECTION 13: Disposal considerations**

- **13.1 Waste treatment methods**
- **Recommendation**
  - Must not be disposed together with household garbage. Do not allow product to reach sewage system.
- **Uncleaned packaging:**
- **Recommendation:** Disposal must be made according to official regulations.

**SECTION 14: Transport information**

- **14.1 UN-Number**
  - ADR, IMDG, IATA: UN1564
- **14.2 UN proper shipping name**
  - ADR: 1564 BARIUM COMPOUND, N.O.S.
  - IMDG: BARIUM COMPOUND, N.O.S.
  - IATA: Barium compounds, n.o.s.
14.3 Transport hazard class(es)
   ADR, IMDG
      · Class 6
      · Label 6.1

14.4 Packing group
   ADR, IMDG, IATA
      III

14.5 Environmental hazards:
   Marine pollutant: No

14.6 Special precautions for user
   Not applicable.
   · EMS Number: F-A,S-A
   · Stowage Category A

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code
   Not applicable.

Transport/Additional information:
   ADR
      · Limited quantities (LQ) 5 kg
      · Excepted quantities (EQ) Code: E1
         Maximum net quantity per inner packaging: 30 g
         Maximum net quantity per outer packaging: 1000 g
   IMDG
      · Limited quantities (LQ) 5kg
      · Excepted quantities (EQ) Code: E1
         Maximum net quantity per inner packaging: 30 g
         Maximum net quantity per outer packaging: 1000 g
   UN "Model Regulation":
      UN 1564 BARIUM COMPOUND, N.O.S., 6.1, III

SECTION 15: Regulatory information
   15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
   · Directive 2012/18/EU
   · Named dangerous substances - ANNEX I Substance is not listed.
   · Chemical safety assessment: A Chemical Safety Assessment has not been carried out.
SECTION 16: Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· Department issuing MSDS: Technical Department.
· Contact: Technical Director

Abbreviations and acronyms:
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
GHS: Globally Harmonised System of Classification and Labelling of Chemicals
CAS: Chemical Abstracts Service (division of the American Chemical Society)
VOC: Volatile Organic Compounds (USA, EU)
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
Acute Tox. 4: Acute toxicity, Hazard Category 4