1 Identification

· Product name
· Trade name: Alcalase® 2.4L FG
· Item number: 06-3110
· Details of the supplier of the safety data sheet
· Manufacturer/Supplier:
Strem Chemicals, Inc.
7 Mulliken Way
NEWBURYPORT, MA 01950
USA
info@strem.com
· Information department: Technical Department
· Emergency telephone number:
EMERGENCY: CHEMTREC: +1 (800) 424-9300
During normal opening times: +1 (978) 499-1600

2 Hazard(s) identification

· Classification of the substance or mixture

Eye Irrit. 2A  H319 Causes serious eye irritation.

· Label elements
· GHS label elements The product is classified and labeled according to the Globally Harmonized System (GHS).
· Hazard pictograms

· Signal word Warning
· Hazard-determining components of labeling:
Subtilisin
· Hazard statements
H319 Causes serious eye irritation.
· Precautionary statements
P235  Keep cool.
P262  Do not get in eyes, on skin, or on clothing.
P280  Wear protective gloves/protective clothing/eye protection/face protection.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
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.
Trade name: Alcalase® 2.4L FG

- Classification system:
  - NFPA ratings (scale 0 - 4)
    - Health = 1
    - Fire = 0
    - Reactivity = 0

- HMIS-ratings (scale 0 - 4)
  - HEALTH
    - Health = *1
  - FIRE
    - Fire = 0
  - REACTIVITY
    - Reactivity = 0

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

3 Composition/information on ingredients

- Chemical characterization: Mixtures
- Description: Mixture of the substances listed below with nonhazardous additions.

- Dangerous components:

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Substance</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>56-81-5</td>
<td>Glycerol</td>
<td>50.0%</td>
</tr>
<tr>
<td>9014-01-1</td>
<td>Subtilisin</td>
<td>9.0%</td>
</tr>
</tbody>
</table>

4 First-aid measures

- Description of first aid measures
- After inhalation: Supply fresh air; consult doctor in case of complaints.
- After skin contact: Generally the product does not irritate the skin.
- After eye contact:
  - Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- After swallowing: If symptoms persist consult doctor.
- Information for doctor:
- Most important symptoms and effects, both acute and delayed: No further relevant information available.
- Indication of any immediate medical attention and special treatment needed: No further relevant information available.

5 Fire-fighting measures

- Extinguishing media
- Suitable extinguishing agents:
  - CO2, extinguishing 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.
- Advice for firefighters
- Protective equipment: No special measures required.
6 Accidental release measures

- Personal precautions, protective equipment and emergency procedures: Not required.
- Environmental precautions:
  Dilute with plenty of water.
  Do not allow to enter sewers/surface or ground water.
- Methods and material for containment and cleaning up:
  Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
  Dispose contaminated material as waste according to item 13.
- Reference to other sections
  See Section 7 for information on safe handling.
  See Section 8 for information on personal protection equipment.
  See Section 13 for disposal information.

7 Handling and storage

- Handling:
  - Precautions for safe handling: No special precautions are necessary if used correctly.
  - Information about protection against explosions and fires: No special measures required.
- Conditions for safe storage, including any incompatibilities
  - Storage: Keep cool.
  - 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:
    Keep receptacle tightly sealed.
    DO NOT FREEZE
  - Recommended storage temperature: Store at temperatures not exceeding 4 °C.
- Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

- Additional information about design of technical systems: No further data; see item 7.
- Control parameters
  - Components with limit values that require monitoring at the workplace:
    | Component | Long-term value | Short-term value |
    |-----------|----------------|-----------------|
    | 56-81-5 glycerol | 15* 5** mg/m³ | 0.00006* mg/m³ |
    | mist | *total dust **respirable fraction | *60-min |
    | Tolerated Limit Value (TLV) | TLV withdrawn-insufficient data human occup. exp. | Ceiling limit value: 0.00006 mg/m³ as 100% crystalline active pure enzyme |
    | 9014-01-1 Subtilisin |

- Additional information: The lists that were valid during the creation were used as basis.
Trade name: Alcalase® 2.4L FG

Immediately remove all soiled and contaminated clothing. 
Wash hands before breaks and at the end of work. 
Avoid contact with the eyes. 
Avoid contact with the eyes and skin. 
- **Breathing equipment:** Not required. 
- **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. As the product is a preparation of several substances, the resistance 
of the glove material can not be calculated in advance and has therefore to be checked prior to the application. 
- **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:**

![Tightly sealed goggles]

9 Physical and chemical properties

- **Information on basic physical and chemical properties**
- **General Information**
- **Appearance:**
  - **Form:** Liquid
  - **Color:** Brown
- **Odor:** Characteristic
- **Odor threshold:** Not determined.
- **pH-value:** Not determined.

- **Change in condition**
  - **Melting point/Melting range:** Undetermined.
  - **Boiling point/Boiling range:** Undetermined.

- **Flash point:** Not applicable.
- **Flammability (solid, gaseous):** Not determined.
- **Ignition temperature:** 400 °C (752 °F)
- **Decomposition temperature:** Not determined.
- **Auto igniting:** Product is not selfigniting.
- **Danger of explosion:** Product does not present an explosion hazard.
### Trade name: Alcalase® 2.4L FG

- **Explosion limits:**
  - Lower: 0.9 Vol %
  - Upper: 0.0 Vol %

- **Vapor pressure at 20 °C (68 °F):** 23 hPa (17 mm Hg)

- **Density at 20 °C (68 °F):** 1.17 g/cm³ (9.764 lbs/gal)
  - Relative density: Not determined.
  - Vapor density: Not determined.
  - Evaporation rate: Not determined.

- **Solubility in / Miscibility with Water:** Fully miscible.

- **Partition coefficient (n-octanol/water):** Not determined.

- **Viscosity:**
  - Dynamic: Not determined.
  - Kinematic: Not determined.

- **Solvent content:**
  - Organic solvents: 50.0 %
  - Water: 41.0 %
  - VOC content: 0.0 g/l / 0.00 lb/gl

- **Other information:** No further relevant information available.

### 10 Stability and reactivity

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

### 11 Toxicological information

- **Information on toxicological effects**
- **Acute toxicity:**
  - **LD/LC50 values that are relevant for classification:**
    - 9014-01-1 Subtilisin
    - Oral LD50 3700 mg/kg (rat)

- **Primary irritant effect:**
  - **on the skin:** No irritant effect.
  - **on the eye:** Irritating effect.
  - **Sensitization:** No sensitizing effects known.

- **Additional toxicological information:**
  The product shows the following dangers according to internally approved calculation methods for preparations: Irritant

(Contd. on page 6)
## 12 Ecological information

- **Toxicity**
  - **Aquatic toxicity:** No further relevant information available.
  - **Persistence and degradability** No further relevant information available.
  - **Behavior in environmental systems:**
    - **Bioaccumulative potential** No further relevant information available.
    - **Mobility in soil** No further relevant information available.
  - **Additional ecological information:**
    - **General notes:**
      - Water hazard class 1 (Self-assessment): slightly hazardous for water
      - Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
    - **Results of PBT and vPvB assessment**
      - **PBT:** Not applicable.
      - **vPvB:** Not applicable.
    - **Other adverse effects** No further relevant information available.

## 13 Disposal considerations

- **Waste treatment methods**
  - **Recommendation:**
    - Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

- **Uncleaned packagings:**
  - **Recommendation:** Disposal must be made according to official regulations.
  - **Recommended cleansing agent:** Water, if necessary with cleansing agents.

## 14 Transport information

- **UN-Number**
  - **DOT, ADN, IMDG, IATA** not regulated

- **UN proper shipping name**
  - **DOT, ADN, IMDG, IATA** not regulated

- **Transport hazard class(es)**
  - **DOT, ADN, IMDG, IATA** not regulated
  - **Class** not regulated

- **Packing group**
  - **DOT, IMDG, IATA** not regulated

(Contd. on page 7)
Safety Data Sheet  
according to OSHA HCS  

Trade name: Alcalase® 2.4L FG  

- Environmental hazards: Not applicable.  
- Special precautions for user: Not applicable.  
- Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable.  
- UN "Model Regulation": not regulated  

15 Regulatory information  

- Safety, health and environmental regulations/legislation specific for the substance or mixture  
  - Sara  
    - Section 355 (extremely hazardous substances): None of the ingredients is listed.  
    - Section 313 (Specific toxic chemical listings): None of the ingredients is listed.  
  - TSCA (Toxic Substances Control Act): All ingredients are listed.  
  - Proposition 65  
    - Chemicals known to cause cancer: None of the ingredients is listed.  
    - Chemicals known to cause reproductive toxicity for females: None of the ingredients is listed.  
    - Chemicals known to cause reproductive toxicity for males: None of the ingredients is listed.  
    - Chemicals known to cause developmental toxicity: None of the ingredients is listed.  
  
- Carcinogenic categories  
  - EPA (Environmental Protection Agency) None of the ingredients is listed.  
  - TLV (Threshold Limit Value established by ACGIH) None of the ingredients is listed.  
  - NIOSH-Ca (National Institute for Occupational Safety and Health) None of the ingredients is listed.  
  - GHS label elements: The product is classified and labeled according to the Globally Harmonized System (GHS).  
  - Hazard pictograms  

GHS07  

- Signal word: Warning  

- Hazard-determining components of labeling: Subtilisin  

(Contd. on page 8)
Hazard statements
H319 Causes serious eye irritation.

Precautionary statements
P235 Keep cool.
P262 Do not get in eyes, on skin, or on clothing.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
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.

National regulations:
Water hazard class: Water hazard class 1 (Self-assessment): slightly hazardous for water.
Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

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 SDS: Technical Department.
Contact: Technical Director
Date of preparation / last revision 07/30/2016 / -

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
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
Eye Irrit. 2A: Serious eye damage/eye irritation, Hazard Category 2A