

## Savinase CLEA

- **Bacillus clausii protease**
- **Effective under high alkaline conditions**
- **Immobilized as Cross-Linked Enzyme Aggregate**



Savinase<sup>®</sup> is a protease commercialised by Novozymes. Proteases catalyse the hydrolysis of peptide bonds or are used in peptide synthesis. The proprietary CLEA<sup>®</sup> methodology has been applied to create a highly active immobilised preparation of this protease that is stable against auto-proteolysis, common for proteases.

### CLEA Methodology

Our proprietary methodology to immobilize enzymes as Cross-Linked Enzyme Aggregates (CLEAs) consists of covalent cross linking of precipitated enzymes. This efficient and economically attractive method yields immobilized biocatalysts that do not include support material and therefore have a very high activity per unit volume.

## Product Properties

<b>Product Type:</b>	Immobilized form of Savinase <sup>®</sup> , protease from <i>Bacillus lentus</i> . Immobilized as a Cross-Linked Enzyme Aggregate (CLEA).
<b>Formulation:</b>	Powder, CLEA-ST: Standard; CLEA-OM: Organic medium; CLEA-UF: Ultra fine particles
<b>Enzyme Type:</b>	Savinase <sup>®</sup> , Subtilisin, serine endoprotease EC 3.4.21.62
<b>Natural Reaction:</b>	Peptide synthesis and breakdown
<b>Substrate Specificity:</b>	Non-specific. Neutral or acidic amino acids preferred
<b>Typical activity:</b>	CLEA-ST: 300-400 Units/gram* CLEA-OM: 300-400 units/gram* CLEA-UF: 300-400 inits/gram*

\* 1 unit will catalyse the formation of 1µmol N-acetylglycine acid from N-acetylglycine ethyl ester at 40°C and pH 7.5

Savinase<sup>®</sup> is a registered trademark of Novozymes A/S; CLEA<sup>®</sup> is a registered trademark of CLEA Technologies BV.

# Specific Product Specification

## Savinase CLEA

### Applications

Proteases are used in a wide variety of applications in the laundry and food industry. In organic synthesis they are used in peptide synthesis and for the production of enantiopure alcohols, amines or acids via ester synthesis or hydrolysis. Savinase is specifically effective under high alkaline conditions.

### Storage and Stability

The Savinase CLEA® is best stored in a cool and dry environment. Storage at 4 °C is recommended. Under these conditions the Savinase CLEA® retains its activity for at least 12 months.

### Formulations

Savinase CLEA is available in three formulations. The standard CLEA and a formulation that is optimized for use in organic media. Besides a formulation with ultra fine particles is available as CLEA-UF, which has shown itself very efficient in surface treatment of for instance wool fibers.

#### **Savinase CLEA-ST:**

Standard formulation of Alcalase CLEA

#### **Savinase CLEA-OM:**

Formulation optimized for use in organic media

#### **Savinase CLEA-UF:**

CLEAs with a ultra fine particle size

### Pricing and Availability

Savinase CLEA is available in the formulations that are described before. The available quantities range from 10 kU to giga unit scale. Please inquire for availability, lead times and prices.

### References

1. Sheldon, Roger A; Sorgedragger, Menno; Janssen, Michiel H. A. **Use of Cross-linked Enzyme aggregates (CLEAs) for performing biotransformations**. *Chimica oggi, Chemistry Today* 2007, 25(1), 48-52.
2. Sheldon, R. A; Schoevaart, R; Van Langen, L.M. **Cross-linked enzyme aggregates (CLEAs): A novel and versatile method for enzyme immobilization (a review)**. *Biocatalysis and Biotransformation* 2005, 23(3/4), 141-147.
3. Sheldon, Roger A; Schoevaart, R; van Langen, Luuk M. **CLEAs: An effective technique for enzyme immobilization**. *Specialty Chem.* 2003, July/August, 40-42.
4. Cao, Linqiu; van Langen, Luuk; Sheldon, Roger A. **Immobilised enzymes: carrier-bound or carrier-free?** *Curr. Opin. Biotechnol.* 2003, 14, 387-394.