

## Product Description

Beerzym ALFA-BETA is a liquid special enzyme for the hydrolysis of starch in beer brewing with adjuncts in high amounts. The enzyme is produced from a specially selected strain of *Aspergillus oryzae*. The main activity of the enzyme is based on a liquefying  $\alpha$ -amylase (1,4- $\alpha$ -D-glucan-glucanohydrolase: EC.3.2.1.1.) and a saccharifying  $\beta$ -amylase (1,4- $\alpha$ -D-glucan-glucanohydrolase: EC.3.2.1.2.).

Beerzym ALFA-BETA is tested by specialized laboratories for purity and quality.

**Fungal  $\alpha$ -amylase  
for starch  
hydrolysis in beer  
production with  
adjuncts in high  
amounts**

## Aim of Treatment

Liquefaction of the gelatinised, degraded starch and at the same time saccharification of the liquefied starch to maltose in brewing mashes at temperatures up to or as of 70 °C (158 °F).

## Product and Effect

As an endo-enzyme the  $\alpha$ -amylase of Beerzym ALFA-BETA hydrolyzes 1,4- $\alpha$ -D-glycosidic bonds within the starch molecule. At the same time, the  $\beta$ -amylase as an exo-enzyme gradually splits off maltose units, starting from the non-reducing end of the carbohydrate chain. Products formed hereby are maltose, malto-oligosaccharides and  $\alpha$ -limit dextrines.

## Dosage

Beerzym ALFA-BETA is needed in the brewing process when, due to the utilization of high quantities of adjuncts (sorghum, rice, corn), the diastatic power of the malt portion is not sufficient to hydrolyze the starch. The dosage of the enzyme depends on the quality of the raw material, the temperature and the reaction time.

Guide value: 150-300 ml/ton adjunct

## Application

Dilute Beerzym ALFA-BETA with cold water. In case of infusion mashing the enzyme dilution is added into the mash tun or into the mash copper after mashing or milling in, if necessary, in combination with the liquefying bacterial  $\alpha$ -amylase Beerzym AMYL. When using a cereal cooker for mash degradation, first starch liquefaction is performed by thermostable bacterial  $\alpha$ -amylases, for instance Beerzym AMYL HT or Beerzym AMYL ST. Only after recooling Beerzym ALFA-BETA is added for starch hydrolysis at temperatures as of 70 °C (158 °F). Beerzym ALFA-BETA is active within the pH-range of the mash up to 70 °C (158 °F).

## Storage

Beerzym ALFA-BETA keeps its declared activity up to 36 months if stored optimally (0-10 °C/32-50 °F). Higher storage temperatures result in a shorter shelf life. Temperatures above 25 °C (77 °F) are to be avoided. Reseal opened packagings tightly and use up as soon as possible.

- please turn over -

## General Characteristics

Enzyme characteristics: the activity range of the enzyme is between pH 3.0-7.0, the optimum is at pH 5.0 in the presence of substrate and calcium. The temperature range is between 25 °C and 70 °C (77 °F and 158 °F), the optimum is at 50 °C (122 °F). In the presence of higher starch concentrations, calcium and optimal pH-value the temperature optimum increases to 60 °C (140 °F).

The diagrammes 1 and 2 show the influence of temperature and pH-value on the enzyme activity of Beerzym ALFA-BETA.

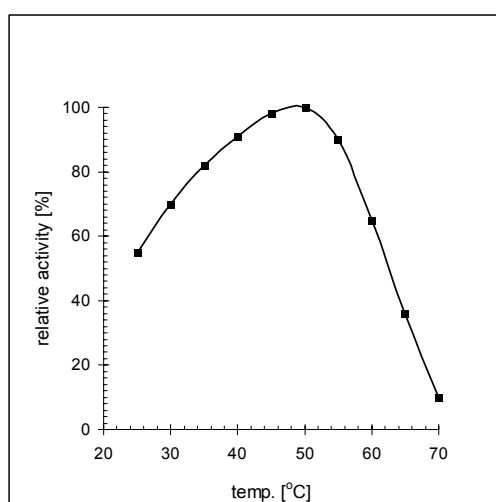


Fig 1: Influence of temperature on activity  
(10% soluble starch; pH 5.0).

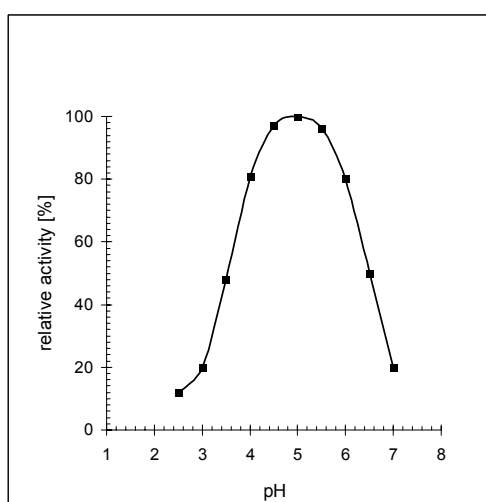


Fig 2: Influence of pH-value on activity  
(10% soluble starch; 50 °C/122 °F).

### Please note:

When applying Beerzym ALFA-BETA the food regulations of the individual countries currently in force have to be adhered to.