

Phytogenic proteinase to improve the Kolbach index in brewing mashes and the chillproofing and protein stability of finished beer

Product Description

Beerzym CHILL is a special liquid enzyme to increase the degree of protein modification (Kolbach index) in brewing mashes and for chillproofing of finished beer, active in the temperature range between 4 °C (39.2 °F) and 70 °C (158 °F). The enzyme is produced from the latex of *Carica papaya* (papaya melons). The main activities of the enzyme are papain and chymopapain (peptidyl-peptidhydrolases: EC 3.4.22.2). Beerzym CHILL is tested by specialized laboratories for purity and quality.

Aim of Treatment

In the mash, improvement of extract yield and degree of protein modification (Kolbach index), which leads to a better foam stability/head retention. Additionally the chillproofing is improved by application of the enzyme to the mash. When applied in unfiltered and filtered beer, Beerzym CHILL results in an improved chill and protein stability of the beer.

Product and Effect

As an endoenzyme Beerzym CHILL hydrolyzes proteins, peptides, amides and esters, in particular, when alkaline amino acids or leucine or glycine are included in the bonds. Preferably high-molecular, easily coagulable proteins are cleaved into medium-molecular proteins, peptides and amino acids.

Dosage

Beerzym CHILL is necessary in beer brewing when problems in the quality of the beer are to be expected, due to seasonal conditions affecting the malt used, or when part of the malt is replaced by adjunct (e.g. barley, rice, corn). The dosage of the enzyme depends on the quality of the raw material, the temperature and the reaction time.

Guide value: 20 - 80 mL/ton malt

- 1 - 3 mL/100 L during fermentation
- 2 - 4 mL/100 L in beer during storage/in ageing
- 1 - 2 mL/100 L in filtration

Application

Dilute Beerzym CHILL with cold water. The enzyme dilution is added directly after milling and mashing in of the malt and/or the adjunct into the mash tun or the mash copper. In the pH-range of the mash, the enzyme is active practically throughout the entire mashing duration. During the subsequent wort boiling Beerzym CHILL is completely inactivated. In case of an application in unfiltered beer, dosage is best made together with the yeast, i.e., at fermentation start. Thus medium-molecular proteins are directly degraded to alpha-amino nitrogen (FAN) and, at the same time, serve as elementary yeast nutrient. An addition to the beer in the storage cellar or also during filtration results in a slowed down Beerzym CHILL effectiveness, however, the lowered activity due to temperature is considered by including the contact time into the calculation of the dosage so that a good chill stability is also assured at low temperatures. Due to its high isoelectric point the enzyme protein as such does not flocculate in the pH-range of the beer and therefore does not lead to turbidity. The enzyme remains active even after pasteurisation. Only after approx. 4 weeks of storage of the beer there is, as a result of the denaturation of the enzyme protein, no longer any proteolytic activity detectable.

Storage

Optimal storage is at 0-10 °C/32-50 °F. Higher storage temperatures lead to reduced shelf life. Avoid temperatures above 25 °C (77 °F). Reseal opened packagings tightly and use up soon.

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General Characteristics

Enzyme characteristics: the activity range of the enzyme is between pH 3.5 and 10.5, the optimum is at pH 7.5 in the presence of substrate and reductants. The temperature range of the enzyme is between 4 °C (39.2 °F) and 85 °C (185 °F), the optimum is at 60-70 °C (140-158 °F) in the presence of substrate and reductants. The diagrammes 1 and 2 show the influence of temperature and pH-value on the enzyme activity of Beerzym CHILL.

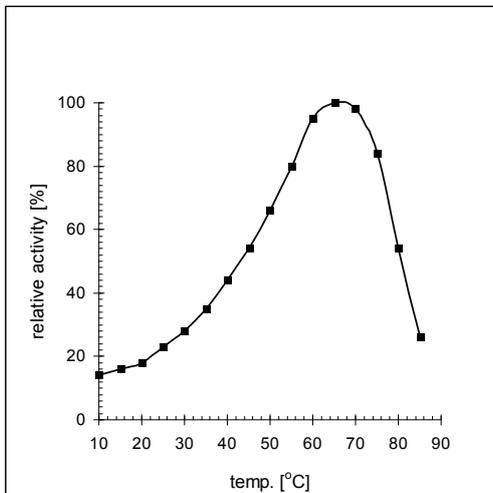


Fig 1: Influence of temperature on activity
(2 % casein solution; pH 6.0).

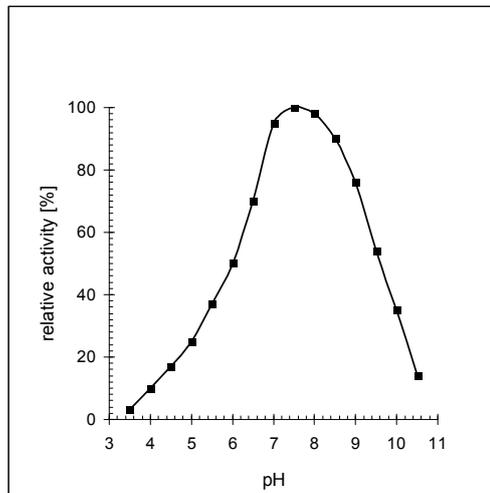


Fig 2: Influence of pH-value on activity
(2 % casein solution; 40 °C (104 °F)).

Please note:

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