Beerzym® CHILL

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 which increases the degree of protein modification (Kolbach index) in malting and in brewing mashes. It is also used for chill proofing finished beer. Beerzym® CHILL is active in a temperature range between 4 °C (39.2 °F) and 70 °C (158 °F). The main components of Beerzym® CHILL are the enzymes papain and chymopapain (peptidyl-peptidhydrolases: EC 3.4.22.2).
When used in malting, Beerzym® CHILL increases the protease activity, raising the levels of Free Amino Nitrogen (FAN) and the Kolbach index of the finished malt. It also reduces the germination time with no change in malt quality. When added to the mash, Beerzym® CHILL improves extract yield and increases the degree of protein modification, leading to better head retention in packaged beer. Additionally, chill proofing and protein stability are improved. When applied in unfiltered and filtered beer, Beerzym® CHILL results in improved chill and protein stability, lengthening shelf life.
As an endoenzyme, Beerzym® CHILL hydrolyzes proteins, peptides, amides, and esters by reacting with the alkaline amino acid, leucine, or glycine segments of the molecule. High molecular weight, easily coagulable proteins are cleaved into smaller medium sized proteins, peptides, and amino acids.

The activity range of the enzyme is between pH 3.5 and 10.5, with the optimum at pH 7.5 in the presence of substrates and reductants. The temperature range of the enzyme is between 4 °C (39.2° F) and 85 °C (185 °F), with the optimum at 60 - 70 °C (140 - 158 °F) in the presence of substrates and reductants.

Please follow all federal, state, and local rules, and regulations when applying Beerzym® CHILL.

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.

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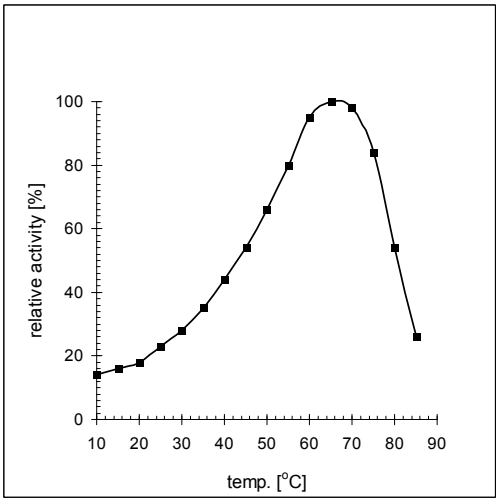

Fig 1: Influence of temperature on activity (2 % casein solution; pH 6.0).

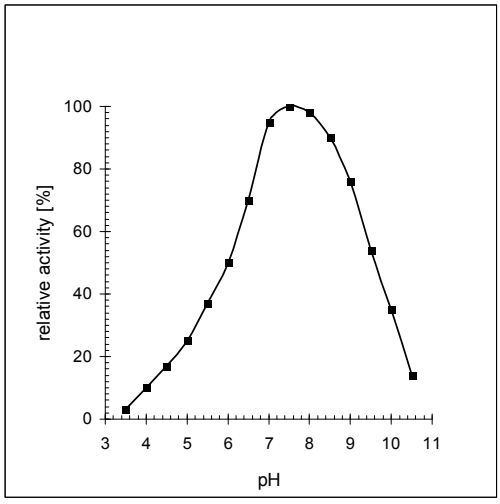

Fig 2: Influence of pH-value on activity (2 % casein solution; 40 °C (104 °F)).

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Dosage

In malting, Beerzym® CHILL reduces germination times and improves protein modification. It can also be used during a problematic crop year to improve overall malt quality. Ideally, Beerzym® CHILL is diluted with cold water and dosed into the spray water when the moisture content of the barley is at 36 - 40 %. The recommended dosage is 50 - 80 milliliters per metric ton.

Beerzym® CHILL is added in the brewing process when beer quality problems are expected, the barley crop year and malt quality are below expectations, or when part of the malt is replaced by adjuncts (e.g. barley, rice, corn). The dosage of Beerzym® CHILL depends on the quality of the raw material, the point of application in the brewing process, the temperature, and the reaction time.

Recommended points of addition:

During mashing, add 20 - 80 mL per 1,000 kg of grist (9 - 36 mL/1,000 lbs.). Dilute Beerzym® CHILL with cold water and add directly after milling when mashing into the mash tun. In the pH-range of the mash, the enzyme is active throughout the entire cycle. It is denatured and inactivated during the wort boil.

During fermentation, add 1 - 3 mL/hL (1 - 4 mL/bbl.) of Beerzym® CHILL to the wort directly with the yeast during pitching. When added at this point, Beerzym® CHILL will protect against chill haze, and will also degrade medium molecular proteins into Free Amino Nitrogen (FAN), a yeast nutrient.

During storage/aging, add 1 - 4 mL/hL (1 - 5 mL/bbl.) of Beerzym® CHILL to the beer or during filtration at a rate of 1 - 2 mL/hL (1 - 2 m/bbl.). Due to the cold temperatures at this point, the activity of Beerzym® CHILL is reduced and a longer contact time is required. The recommended concentrations take this into account. Beerzym® CHILL has a high isoelectric point and the enzymes do not flocculate in the pH range of beer, therefore no increase in turbidity is caused, even at low temperatures. Beerzym® CHILL is also not denatured by pasteurization and will remain active for approximately 4 weeks after packaging.

Storage

Optimal storage is between 0 - 10° C (32 - 50° F). Higher storage temperatures may lead to reduced shelf life. Avoid temperatures above 25° C (77° F). Close containers tightly and use the enzyme preparation as quickly as possible.

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