

## Product Description

Beerzym PENTA is a special liquid enzyme for the degradation of pentosan and glucan in original wort, green and finished beer. The enzyme is produced from a specially selected strain of *Trichoderma spec.* The main activities of the enzyme are based on different hemicellulases (hemicellulase: endo-1,4- $\beta$ -D-mannanase: EC.3.2.1.78, endo-1,4- $\beta$ -D-xylanase: EC 3.2.1.8, endo-1,3- $\beta$ -D-xylanase: EC 3.2.1.32 and exo-1,4- $\beta$ -D-xylosidase: EC 3.2.1.37) and  $\beta$ -glucanases (endo-1,3(4)- $\beta$ -D-glucanase: EC 3.2.1.6 and endo-1,4- $\beta$ -glucanase: EC 3.2.1.4). Beerzym PENTA is tested by specialized laboratories for purity and quality.

## Aim of Treatment

Degradation of pentosan and glucan for lowering of viscosity and improvement of filtration of top-fermented beers (e.g. wheat beer).

## Product and Effect

As an endo-enzyme Beerzym PENTA hydrolyzes 1,4- $\beta$ -glycosidic bonds in hemicelluloses and pentosans (arabinoxylan), as well as in cellulose, lichenins and other glucans, which occur especially in barley, wheat and rye. In this process pentoses and hexoses are split off.

## Dosage

Beerzym PENTA is needed in the brewing process when, due to the utilization of wheat and rye malt, unsatisfactory results in the course of lautering and filtration of the beer are obtained or are to be expected. The dosage of the enzyme depends on the quality of the raw material, the temperature and the reaction time.

Guide value: 2 - 5 ml/100 l original wort  
3 -10 ml/100 l green beer  
8 -20 ml/100 l finished beer

## Application

Dilute Beerzym PENTA with cold water. Dosage of the enzyme dilution to the wort before fermentation, to the green beer during tunnage or to the finished beer in the tank. At standard temperatures, Beerzym PENTA activity is slowed down in the wort, green and finished beer. The lowered activity due to temperature is however taken into consideration by including the contact time into the calculation of the dosage.

## Storage

Beerzym PENTA 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 -

**Fungal  
pentosanase and  
 $\beta$ -glucanase for  
the degradation of  
filtration inhibiting  
colloids in the  
production of top-  
fermented beers**

## General Characteristics

Enzyme characteristics: the activity range of the enzyme is between pH 2.5 and pH 6.5, the optimum is at pH 4.5. The temperature range is between 4 °C (39.2 °F) and 65 °C (149 °F) for the pentosanase (xylanase) and between 15 °C (59 °F) and 75 °C (167 °F) for the  $\beta$ -glucanase, the temperature optimum is at 50 °C (122 °F) for the pentosanase (xylanase) and at 70 °C (158 °F) for the  $\beta$ -glucanase.

The diagrammes 1 and 2 show the influence of temperature and pH-value on the enzyme activity of the pentosanase (xylanase), the diagrammes 3 and 4 show the influence of temperature and pH-value on the enzyme activity of the  $\beta$ -glucanase of Beerzym PENTA.

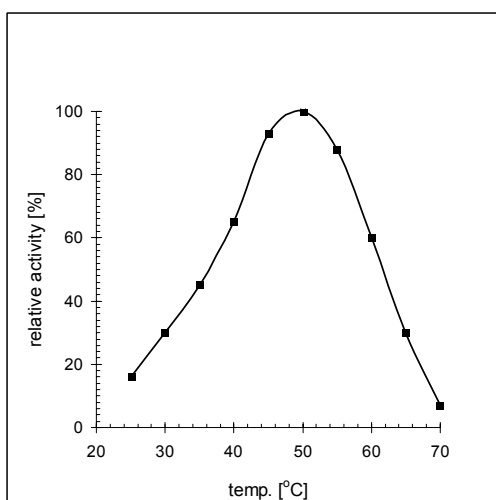


Fig. 1: Influence of temperature on the activity of pentosanase (xylan, pH 4.5).

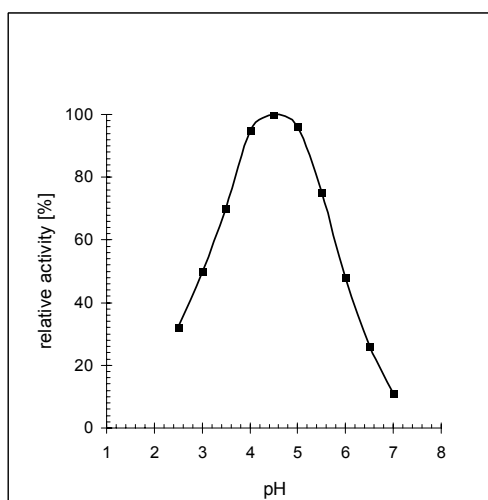


Fig. 2: Influence of pH-value on the activity of pentosanase (xylan, 50 °C/122 °F).

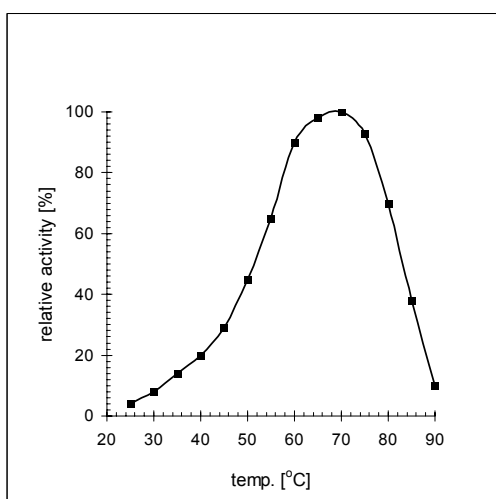


Fig. 3: Influence of temperature on  $\beta$ -glucanase activity (barley- $\beta$ -glucan, pH 4.5).

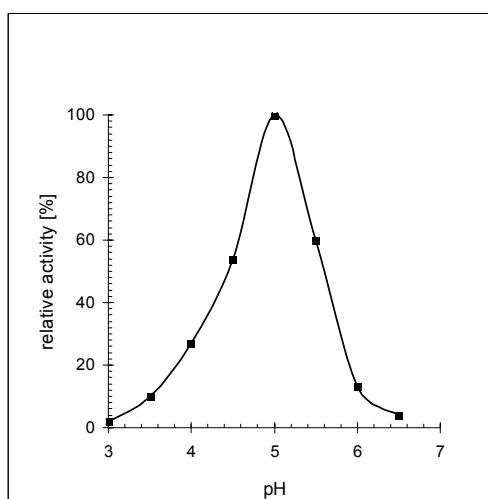


Fig. 4: Influence of pH-value on  $\beta$ -glucanase activity (barley- $\beta$ -glucan, 50 °C/122 °F).

### Please note:

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

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