

# Enzymation

## Panzym AG XXL

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### Efficient Degradation of Starch for Fruit and Vegetable Processing

#### Description

Panzym AG XXL is an amyloglucosidase produced through submerge fermentation. The main activities of Panzym AG XXL is an amyloglucosidase that degrades alpha 1.4 and alpha 1.6 compounds into soluble starch and dextrin. Amylase AG XXL additionally hydrolyzes great quantities of alpha 1.4 glycoside compounds of amylose and amylopectin.

Apple and pear juices produced in the fruit juice trade can contain large quantities of starch, particularly during the beginning of the harvest. In order to produce clear fruit juices, this starch must be hydrolyzed to prevent secondary hazing in the concentrate.

#### Application and Effect

Panzym AG XXL is dosed according to the starch concentration level in the fruits, which varies depending on the season. Starch causes problems clarifying and filtering juices and can lead to secondary hazing in the finished product. Any starch must be degraded prior to storage in order to produce clear juice or concentrate. The largely crystalline starch contained in the fruit is dissolved (gelatinized) during the heat treatment (at temperatures exceeding 55 – 60 °C in an aroma system during the pasteurizing and concentrating processes). Dissolved starch can be degraded enzymatically (with Panzym AG XXL for example). An iodine test should be used to track starch identification and degradation.

- ▶ Determining the total starch: Heat 10 ml of juice to more than 80 °C (not necessary if the sample is removed directly from the aroma system) and cool to room temperature.
- ▶ Determining the colloidal dissolved starch: In order to determine the enzymatically degradable, colloidal dissolved starch in unheated juice, the sample must be filtered to remove gelatinized grains of starch.
- ▶ Carefully pour approximately 1 ml of an iodine solution on the surface of the juice without mixing and determine the color by the boundary layer (reaction zone).

(Iodine solution: Solution of 1 gram of iodine and 10 grams potassium iodide in 1 liter of water)

#### Evaluation:

1. No change in the color of the iodine solution (red brown)  
= no starch.
2. The color of the iodine solution turns brown.  
= partially hydrolyzed starch.
3. The color of the iodine solution turns blue, dark blue, or black.  
= starch.

#### The advantages of Panzym AG XXL:

- ▶ Acid-stable fungal amylase for effective starch degradation
- ▶ High glucoamylase activity at a low pH value
- ▶ Very high resistance to heat at 70 °C over a period of several hours
- ▶ Optimum temperature at 65 °C
- ▶ Lower dosage

#### Recommended Dosage

Application	Dosage
Juice after the aroma system or heat treatment	0.2 – 3 ml/100 l

#### Activity and Stability

pH value range and temperature profile of Panzym AG XXL:

pH value range: 3.0 – 4.0, optimum at 4.0

Temperature range: 10 – 70 °C over a period of several hours, optimum 65 °C

#### Enzyme Application

The Panzym AG XXL product should be mixed in cold, clean water at a ratio of 1:5 to 1:10. It can then be added in the enzymation tank while it is being filled or to the flow of product by means of a dosing system.

#### Temperature

Due to the diminished enzymic activity, avoid temperatures below 10 °C.

## Safety and Purity

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Panzym AG XXL complies with the FAO/WHO (JECFA and FCC) specifications for enzymes in the food industry. Application of the product poses no hazard to health if used as directed and processed properly.

Panzym AG XXL is produced according to the self-cloning process and is classified as a non-genetically modified product in accordance with the German Gene Technology Law (implementing Council Directive 90/219/EEC), the Austrian Gene Technology Law (BGBl 510/1994), and Swiss regulations (Ordinance on the Release into the Environment of Organisms SR 14.911).

Panzym AG XXL has a standard activity of 300 AGU/ml. Descriptions of the methods of analysis and the EEC Safety Data Sheets are available on request.

Panzym AG XXL is filled aseptically following sterile filtration and is therefore virtually germ-free. Panzym AG XXL is a brownish liquid enzyme preparation that is free of preservatives, has a density of approximately 1.2 g/ml and a typical odor of fermented products.

## Storage

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It is recommended to store the product with the packaging intact away from sunlight at a temperature of 0 to 10 °C. The product is formulated for optimum stability. Nevertheless, the activity of enzymes gradually diminishes over time. Excessively long periods of storage and/or adverse conditions including high temperatures could necessitate increasing the dosage.

## Delivery Information

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25-liter polyethylene canisters

Article number 95.220.250

HS customs tariff: 3507 90 90

## Certified Quality

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Panzym AG XXL is produced by Novozymes Switzerland AG, Neumatt, CH-4243 Dittingen and is constantly monitored during the production process for consistently high product quality. These inspections include wide-ranging technical functional criteria as well as safeness in accordance with relevant laws governing production of foods. Strict controls are additionally carried out immediately prior to and during final packaging.



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