

DELTAZYME RYE

PRODUCT CODE: DG-DRYE

FOOD GRADE PRODUCT

DESCRIPTION

DELTAZYME RYE is a purified enzyme complex system produced by the controlled fermentation of *GRAS microorganisms*. The main enzyme activities consist of *Alpha Amylase*, *Beta Glucanase* and *Protease*. **DELTAZYME RYE** Has been formulated to assist with the high levels of beta glucan found in rye.

PHYSICAL FORM

Dark brown, cloudy liquid, somewhat viscous and free from precipitate.

INGREDIENTS

Beta Glucanase enzyme concentrate
Alpha Amylase enzyme concentrate
Protease enzyme concentrate
Stabilisers

SPECIFICATION

All analytical methods available on request.

Activity

Neutral Protease NPU/ml	:	12,000 (-5% +15%)
Alpha Amylase BAAU/ml	:	50,000 (-5%+15%)
Beta Glucanase BGU/ml	:	500 (-5%+15%)
Xylanase IU/ml	:	3,000 (-5+15%)

Physical

Specific Gravity	:	1.17 g/ml typical
pH	:	5.7 typical

Heavy Metals

Meets FCC specifications for food grade enzymes

Total heavy metals	:	<40 ppm
Lead	:	<10 ppm
Arsenic	:	<3 ppm

Microbiological

T.V.C.	:	<50,000/ml
Coliforms	:	<30 CPU/ml
Salmonella	:	absent in 25g
E coli	:	absent in 25g
Yeast & Moulds	:	<200/ml
TE	:	<30/ml

APPLICATION

DELTAZYME RYE is used in the brewing industry where it is ideally suited to high inclusions of rye in the mash.

DOSE RATE

Our recommended enzyme dose rate is 1.5 kg/tonne rye. The actual dose rate depends on the quality of the raw materials and the amount of other grains in the mash. Therefore, it is always advisable to do preliminary laboratory trials to determine optimum dose rates.

DELTAZYME RYE should be added at the beginning of the mashing process

ACTIVITY PROFILE

The protease activity of **DELTAZYME RYE** has an optimum pH of 6.0. Under brewing conditions the enzyme is very effective at protein hydrolysis over a pH range of 5.0-7.5, and is extremely stable over the pH range 5.0-8.5. The optimum temperature being 55°C.

The alpha amylase activity of **DELTAZYME RYE** has an optimum pH of 7.0 and starch liquefaction occurs over the pH range of 5.5-7.5 under brewing conditions. While the optimal pH of the enzyme is 7.0 rye starch is better hydrolysed at slightly alkali pH (The alpha amylase is extremely stable over a pH range of 5.0-9.0)
The alpha amylase has an optimum temperature of 85°C with extended stability over the range 40°C-90°C.

The beta glucanase activity has an optimum pH of 5.0 and is stable over a pH range of 3.5-7.0. The beta glucanase has an optimum temperature of 70°C and is stable over a temperature range of 40°C-75°C.

Optimum temperature for the Xylanase enzyme is 60°C with extended stability between 50°C-75°C. Optimal pH is 5.0 with an operating range of 4.5-6.5

STORAGE/SHELF LIFE

At temperatures of <20°C **DELTAZYME RYE** will maintain the declared activity for at least 12 months. At lower temperatures the shelf life is considerably improved.

PACKAGING

Standard packaging for **DELTAZYME RYE** is in 25kg drums, 5kg and 1kg containers. However, the product can be repacked to meet specific customer requirements.

Issue No:	Summary of changes made from previous version:	Actioned by:	Authorised by:
4	Change of logo	Chui Choo Tan	Michael Watson