

## TECHNICAL INFORMATION SHEET

### GLUCANASE - Enzymes

#### Description

Glucanase is produced from a non-genetically modified culture to food grade, FCC, WHO/FAO, Kosher and Halal standards. It is an FDA approved fungal  $\beta$ -glucanase derived from fermentations of *Trichoderma longibrachiatum* (formerly *Trichoderma reesei*). This product is a cellulase enzyme complex which is standardised on  $\beta$ -glucanase activity, but which also has significant side activities, containing cellulase, hemicellulase activity catalysing the endo-hydrolysis of  $\beta$ -glucans, 1,4  $\beta$ -glucosides and 1,4  $\beta$ -xylans in barley, wheat and other cereal substrates.

- Improved Mash filtration
- Decreased wort viscosity and improved run-off times
- Increased extract
- Improved haze in finished beer

The activity of Glucanase is expressed in  $\beta$ -glucanase activity units. One unit of  $\beta$ -glucanase activity will catalyse the hydrolysis of  $\beta$ -glucan, resulting in the release of 1 micromole of glucose equivalents per minute under assay conditions.

#### Application and rates of use

##### How much of the product to add and where to add it

Glucanase can be used to improve lautering of any grain mash or to improve modification of any malting barley:-

##### Brewhouse

Glucanase should be added directly to the mash at between 0.5kg and 1kg/tonne of grist, depending upon the level of  $\beta$ -glucans present and the composition of the mash.

##### Fermentation

In a fermentation vessel, Glucanase can be used at a rate between 7 and 20ml/hl, dependent upon the gravity of the beer and amount of glucan.

##### Conditioning

In a conditioning tank, Glucanase can be used at a rate between 7.5 and 20ml/hl.

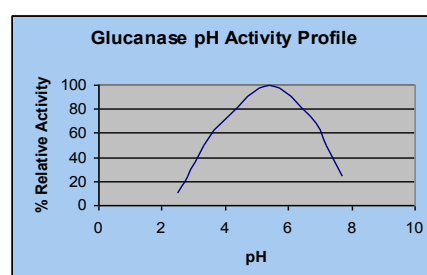
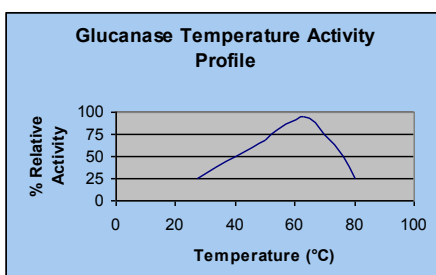
##### Malting

Glucanase should be diluted into the chitting water and sprayed onto the malt at a rate of between 0.05% and 0.2% w/w on barley; or between 0.5 and 2.5 ml/kg barley in the normal volume of chitting water.

##### Temperature and pH characteristics

The enzymic activity of Glucanase is effective in the temperature range from 40°C to 75°C, with the optimum performance at 60°C. The exact temperature optimum will depend on many process variables, such as time, substrate nature and concentration. The enzyme can be inactivated by holding for 10 minutes at a temperature of 85°C. There is no residual enzyme activity after the kettle boil.

The pH range for the activity of Glucanase is approximately from 3.5 - 6.5, with an optimum performance at pH 5.5. The exact pH optimum will depend on process variables, including temperature, time, substrate nature and concentration.



## Guidelines for use

Check that the product is within its shelf life before use

Experiment with additions to determine the minimum effective rates

Read the Safety Data sheet prior to use

Care should be taken to avoid unnecessary skin contact during handling

## Storage & Shelf life

- Store in cool conditions, away from direct sunlight.
- Keep containers sealed when not in use
- Maximum storage temperature: 12°C
- Recommended storage temperature: 5°C
- Minimum storage temperature : 5°C
- The shelf life at the recommended storage temperature is >6 months from date of manufacture
- Under ideal conditions, 95% of enzyme activity will be retained for a period of at least 6 months, after which time a loss may be expected of ca. 1 - 2% per month

## Technical Support

For Health & Safety information on this product, please see the Safety Data Sheet (SDS)

For support and advice on the use of this product, please call or e-mail our Technical Support:-

Telephone:- + 44 (0)115 978 5494

[techsupport@murphyandson.co.uk](mailto:techsupport@murphyandson.co.uk)

For up to date information regarding, Kosher, Halal, Vegetarian, GMO status, or anything not mentioned on this tech sheet please email:-

[compliance@murphyandson.co.uk](mailto:compliance@murphyandson.co.uk) or call +44 (0)115 978 5494

## Specification

Composition	Fungal $\beta$ -glucanase produced from fermentations of <i>Trichoderma longibrachiatum</i> with approved stabilisers and preservatives	
Appearance	A brown liquid	
Odour	Slight odour	
Specific Gravity (@ 20°C)	1.020 $\pm$ 0.01	
pH	5.0 $\pm$ 0.5	
<u>Analysis</u>		
$\beta$ -glucanase Activity (U/ml)	2000 $\pm$ 100	
<u>Microbiological</u>		
Total Plate Count (cfu/g)	< 10,000	
Coliforms (cfu/g)	< 30	
E. coli	Negative in 25g	
Salmonella	Negative in 25g	
<u>Maximum Limits of Impurities</u>		
As (ppm)	3	
Pb (ppm)	10	
Heavy Metals (ppm)	40	

## Regulations

PRODUCT grades are produced from a non-GMO culture. The products are FDA approved, Food Grade and conform too FCC and WHO/FAO standards.

Liquid Glucanase has kosher status.

## Reference

<b>PRODUCT</b>	GLUCANASE	<b>PRODUCT CODE</b>	GLUC
<b>ISSUE No.</b>	2	<b>DATE</b>	20/07/2016
<b>CREATED BY</b>	F.M.Maud	<b>AUTHORISED BY</b>	Dr Christine Fleming