

TECHNICAL INFORMATION SHEET:

KETTLEKLEER GRANULES - KETTLE FININGS

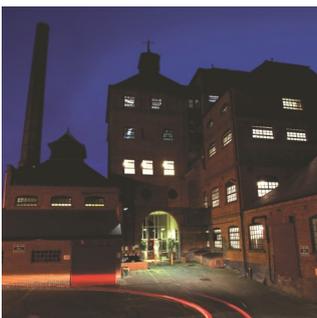
PRODUCT NAME:**KETTLEKLEER
GRANULES****PRODUCT CODE:****KETT****COMMODITY CODE:****13023900****PACKAGING:****2 AND 20 KG**

Description

Kettlekleer Granules are a blend of naturally occurring brewery approved seaweed materials used for reducing protein in beer. Consistency of performance is provided by quality control checks of every batch for wort trub formation.

Benefits

- Brilliant clarity of your cold wort - Kettlekleer achieves clarity by precipitating virtually all haze material from cold worts and giving extensive cold break formation
- Reduced costs of beer processing - Kettlekleer reduces costs by removing fine proteinaceous particles, simplifying downstream fining, filtration and beer stabilisation
- Energy savings from reduced boiling times - Kettlekleer will maintain performance even with reduced boiling times
- Keeps trub in kettle - Kettlekleer is optimised to give cohesive trub formation in the kettle
- Consistent beer fining - Kettlekleer cleans up wort particles content giving more consistent beer for racking
- Prolonged beer shelf-life - Kettlekleer removes substantial quantities of proteinaceous haze-precursor material without affecting head retention

**TECHNICAL SUPPORT**tel: +44 (0) 115 978 5494 | e: techsupport@murphyandson.co.uk**REGULATORY COMPLIANCE INFORMATION**Refer to the **Product Specification Sheet** or contact us on
tel: +44 (0) 115 978 5494 | e: compliance@murphyandson.co.uk**HEALTH & SAFETY INFORMATION**Refer to the **Safety Data Sheet (SDS)**

Principle

The active ingredient in Kettlekleer is a polysaccharide called carrageenan which is derived from seaweed. Carrageenan in solution is negatively charged, owing to the sulphate groups along the polysaccharide backbone. It is these charged sites which interact with wort proteins.

In solution at temperatures above 65°C, the carrageenan has a random coil structure. As the wort cools the carrageenan takes a much more compact and ordered helical structure which is thought to drag the protein particles together to form aggregates. The aggregates, having a larger particle radius, settle faster.

Kettle finings are added in the kettle only to allow the carrageenan to dissolve. Wort proteins react with carrageenan as the wort cools and settle as a cold break during fermentation to be removed along with the excess yeast.

The removal of particles and protein from wort has been demonstrated by microscopic examination of pre-filtered beers and protein assay.

As the levels of kettle finings increase, the fine particle counts decrease. It should be noted that the particles below two microns are mostly responsible for blinding filter pores.

Since Kettle Finings remove both particulate and soluble protein, and soluble protein is a component of chill haze, it is unsurprising that the colloidal stability of kettle fined beers is enhanced.

Guidelines for use

- Check that the product is within its shelf life before use
- Ensure that the product is dispersed into the wort and does not stick to the walls of the kettle or be drawn up the stack with the steam
- Carry out optimisation trials to determine the correct rate of use
- Read the Safety Data Sheet prior to use
- DO NOT open the kettle to make the addition unless the boil has been temporarily turned off
- DO NOT add the product significantly earlier or later than the recommended time

Application and rates of use

Kettleleer Granules should be added to the kettle 10 minutes prior to the end of the boil. This allows the granules to dissolve and disperse the carrageenan into the wort. Should Kettleleer be added early in the boil, then degradation of the polymer may occur and product efficiency is lost. The reaction between wort proteins and carrageenan is pH dependant and occurs at an optimum pH of 5.3. Below pH 4.4, the reaction does not occur and little benefit is gained from using Kettle finings.

Kettle finings optimisation procedure

The exact rate for a given wort will vary according to the brewery, the recipe and the types of malt and adjuncts used. Typical rates vary from a range of 0.75g to 4.8g per hl , but a kettle finings optimisation should be carried out to determine this more accurately. Rates of use should be checked when you change supplier or move to new seasons malt.

When the dose rate increases, the clarity improves, but the level of sediment increases. Over-fining will give rise to beer losses in fermentation vessel. The optimisation procedure is as follows:

- Make up a solution of kettle finings by dissolving 1g of carrageenan product in a litre of boiling water. (This gives a 0.1% solution)
- Label seven 100 ml measuring cylinders in 5 ppm increments, including a 0 ppm control up to 30ppm
- Add a range of finings rates to the 100ml measuring cylinders using a 10ml pipette (0.5 ml of kettle finings solution = 5ppm).
- Take a wort sample (approx. 2L) 15 minutes before the end of the boil and just before the addition of kettle finings.
- Fill the measuring cylinders with the hot wort to the 100ml mark.
- Record the wort clarity and appearance of the hot break.
- Cool by immersion in cold water in the bucket for 20 minutes.
- Allow to settle for 2 – 4 hrs and observe the appearance of the cold break, recording

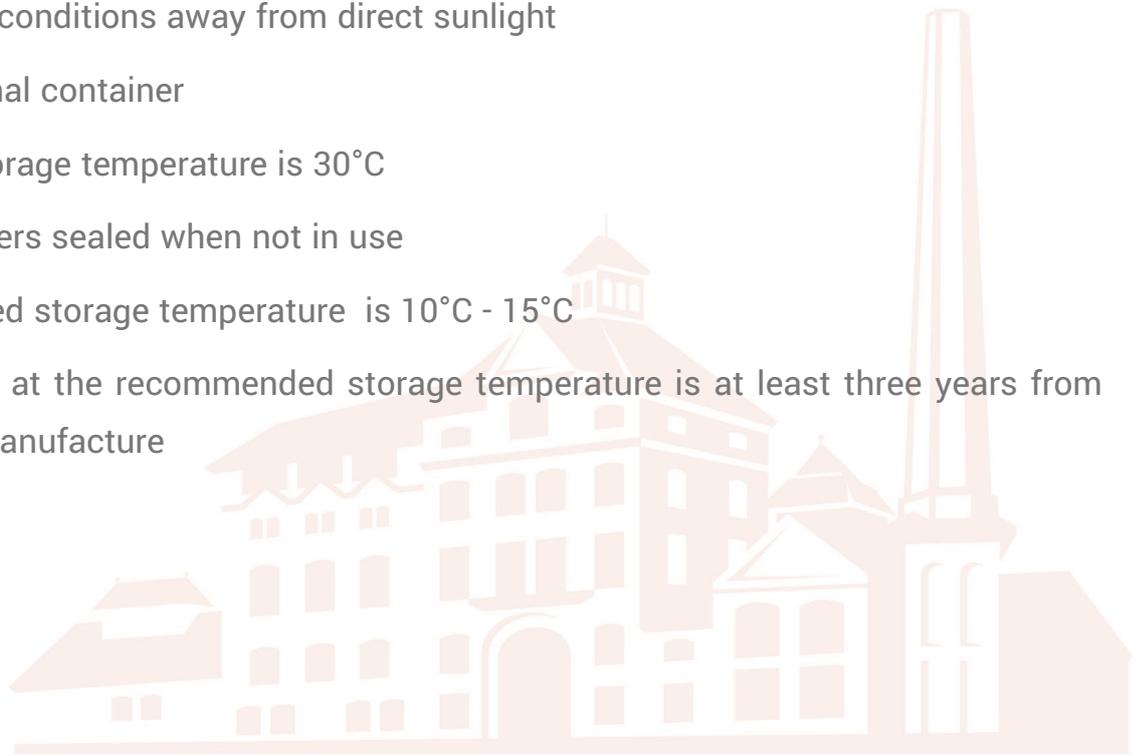
the wort clarity and cold break volume.

- Allow to stand for a full 24 hours to get a final result.
- Decide on the optimum rate of kettle finings addition for the beer in question, there should be bright clear wort and compact sediment.

Kettle Optimisation Kits can be purchased from Murphy and Son Ltd

Storage and shelf life

- Store in cool conditions away from direct sunlight
- Keep in original container
- Maximum storage temperature is 30°C
- Keep containers sealed when not in use
- Recommended storage temperature is 10°C - 15°C
- The shelf life at the recommended storage temperature is at least three years from the date of manufacture



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