

## TECHNICAL INFORMATION SHEET

### MAGICOL 250AS—ISINGLASS FININGS

#### Description

MAGICOL 250AS is a powdered isinglass that can be dissolved to make ready-for-use isinglass solution for treatment of brewery conditioned beers.

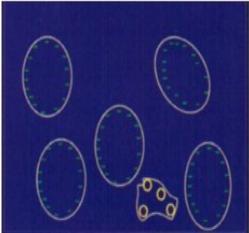
#### Benefits

- A traditional and natural product
- Blended specifically for clarifying yeast from beer
- Large saving in both cooling energy costs and capital investment may be achieved by shorter conditioning tank residence time
- Filter performance is enhanced
- Enhances beer foam stability
- The most concentrated form of isinglass; lowest cost in use, very long shelf life in comparison to other forms of isinglass.
- Can be used for both types of beer; cask conditioned or brewery conditioned beers, ideal for where facilities for separate products are not available.

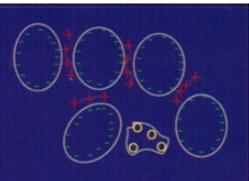
#### Principle

Isinglass has for many years, been used as a clarification agent for beer. The active ingredient is the protein molecule collagen. Collagen is very sensitive and is denatured at moderate temperatures into gelatine which has little or no fining activity. This has significant implications for the manufacture and storage of isinglass finings.

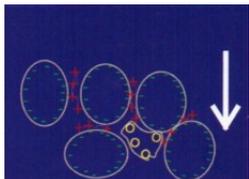
#### Reaction Mechanism



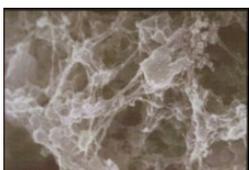
Unfinned, unfiltered beer may be thought of as consisting of negatively charged yeast cells and uncharged non-microbiological particles in a buffered alcoholic solution.



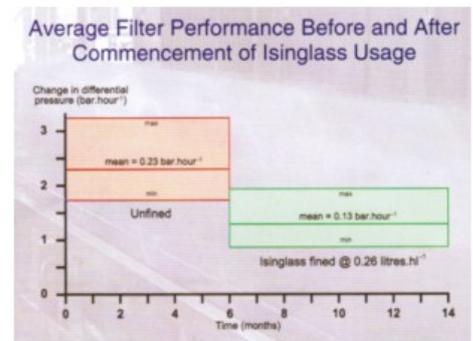
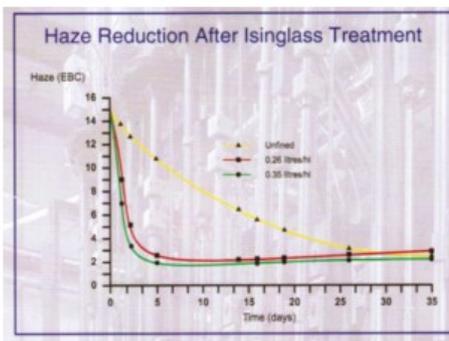
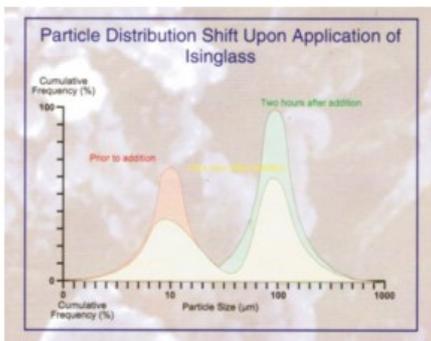
Positively charged isinglass is attracted to the yeast cell walls which possess a negative charge and adheres the cells together, thereby increasing the floc radius.



According to Stokes' Law the larger aggregates settle faster; as they do, they enmesh the uncharged protein particles.



The left electron micrograph shows the entanglement of yeast cells amongst collagen fibres.



The shift in particle size is a rapid reaction and is for the most part complete within two hours. The rapid settlement of yeast and protein is seen by a rapid decrease in beer haze such that conditioning time can be reduced to as short as 3 days.

Very large savings in both cooling energy costs and capital investment in tankage may be made as a result of shorter conditioning time that can be gained by treatment with isinglass; filter performance is also enhanced. Faster filter throughput, lower differential filter pressures and a greater beer volume through the filter between recharge/cleaning are all obtainable.

## Application

How to dilute and mix the product

Before it can be used, the product must be dissolved in water.

Method - High Shear Mixing

- Set up a mixing tank with a high shear mixer (e.g. Silverson, Greaves)
- Fill the mixing tank with water at a temperature of 10 to 14°C
- Turn on the mixer
- Add to the tank the Magicol 250AS at a rate of 6g/litre of water
- Mix until the tank contents appear to be homogeneous
- Leave to stand for several hours and then mix again for a short time
- Repeat the previous step until solubilisation is complete

Depending on the shear strength of the mixer, the product can take quite a long time to dissolve. If it has only partially solubilised by the time the solution is used, reduced fining efficiency will be the result. For best performance, make up the solution 96 hours in advance, stirring occasionally. At the end of the mixing process, the tank will contain ready-for-use isinglass. If kept at the recommended storage temperature of 10 to 14°C, this solution will have a shelf life of 6 weeks. It is however advised that isinglass solutions are prepared more frequently, once per week being typical.

### (a) Where and when to add Isinglass to cask conditioned beer

Isinglass can be added at one of several points. See also section (b) Using isinglass with auxiliary finings:-

#### Into the beer main feeding the racking heads

This method is combined with proportional metering to ensure the correct rate of addition. If the distance to the racking head is short, a static mixer should be used.

#### Into the cask as part of the racking process

Ready-for-use isinglass is metered into the beer as it fills the cask. The turbulence of the filling process ensures good mixing.

#### Into the cask before the cask is filled

The appropriate quantity of ready-for-use isinglass is put into the cask before filling. Mixing can be poor if the filling rate is slow and further agitation is then recommended.

#### Into the cask after it has been filled

The least reliable method as mixing is then totally dependent on agitation or rolling of the cask after filling. With full casks and little head space, effective mixing of the isinglass takes much more agitation than is generally realised.

### (b) Using isinglass with auxiliary fining in cask conditioned beer

With many cask conditioned beers, the best clarity is achieved by using an auxiliary fining product such as **Alginex**, **Cellabrite**, **Finings Adjunct** or **Superkleer** in combination with isinglass. These products enhance the action of the isinglass. Auxiliary finings can be added at one of several points:-

#### Into the fermentation vessel

In order to avoid the difficulties of mixing auxiliary and isinglass finings in cask, the auxiliary can be added to the fermentation vessel. The addition should be made at the end of fermentation, just as the vessel goes onto chill. In most cases, the residual fermentation and convection currents on cooling are sufficient to mix the product. With larger vessels, it is recommended to recirculate the tank contents if possible or to rouse with CO<sub>2</sub> from the tank bottom.

#### Into beer main feeding the racking heads

This method is combined with proportional metering to ensure the correct rate of addition. Typically, the auxiliary is added first with a static mixer positioned between the addition point and the isinglass addition point downstream. If the distance to the racking head is short, another static mixer should be used after the isinglass.

### **Into the cask before it is filled**

The appropriate quantity of auxiliary is put into the cask before filling. If the filling rate is fast and turbulent, isinglass can then be added towards the end of the fill or after.

\*N.B. Auxiliary finings should not be mixed with isinglass prior to mixing with beer more than approximately 30 minutes, it is unlikely that all of the beer will be contacted by isinglass in its active form and the finings will be poor.

### **Into the MV/CT after it has been filled**

The least reliable method as mixing is then totally dependent on agitation or worse still, diffusion. Injection of the required amount of finings at the bottom of the tank followed by gas rousing can however be effective.

#### **(c) Where and when to add Isinglass to brewery conditioned beer**

Isinglass solution is best added during the transfer of beer from Fermentation Vessel (FV) to Maturation Vessel (MV) or Conditioning Tank (CT):-

##### **Into the beer main with proportional metering and static mixing**

The correct rate of finings addition is ensured by metering by the beer flow rate. Good mixing is ensured by inserting into the main a static mixer element. A long run to the MV/CT with bends, can substitute for a mixer.

##### **Into the beer main during the majority of the beer transfer**

About 10% of the beer to be transferred should be run and then the finings injected at such a rate to ensure it has all been added by the time 90% of the transfer has been completed. The remaining 10% of beer can then be transferred to flush through.

##### **Into the MV/CT before the beer is transferred**

Mixing in this case will be good at the start, but will be significantly worse once the vessel has filled. If the transfer rate is slow and takes

## **Rates of Use**

### **(a) For cask conditioned beer**

The exact rate for a given beer will vary according to the brewery, the recipe and the types of yeasts and adjuncts used. If isinglass rates are too high the sediment will be fluffy and voluminous, causing wastage and poor filtration. Most cask conditioned beers will require additional rates of between 1ml and 4ml of isinglass to 300ml beer. Yeast count and quality will also affect the isinglass performance. Observations have shown that providing yeast counts are maintained within reasonable limits, (0.5-3.0 x 10<sup>6</sup> cell/ml), satisfactory finings performance is obtained. Very low yeast counts can result in poorly developed flocs which are easily disturbed. Isinglass finings optimisations should be carried out to determine this more accurately.

Optimisation guides can be obtained from Murphy and Son Ltd. Yeast count and viability kits can also be purchased from Murphy and Son Ltd.

### **(b) For brewery conditioned beer**

Most beers will require addition rates of between 1ml and 4ml of isinglass to 300ml beer . The exact rate will depend amongst other things upon whether or not kettle finings have been used in the brewhouse, the degree of yeast flocculation, the residence time on chill at the end of fermentation and the strength of the beer. For brewery conditioned beers, it is not necessary to achieve bright beer in the fining process; a haze value of ca. EBC 4 usually sufficiently low to permit good filtration. Excessive additions of isinglass finings will not harm beer, but losses will increase due to large volumes of tank bottoms.

## **Guidelines for use**

- Check that the product is within its shelf life before use
- Remember that isinglass solutions are temperature sensitive
- Carry out optimisation trials to determine the correct rate of use, adding too much isinglass can cause tank bottoms to become very loose with high losses.
- Do not mix auxiliary and isinglass finings before they are added to beer, it is advised NOT to add isinglass before auxiliary finings—it rarely works
- 200 litres and IBC's must be mixed before use
- Read the Material Safety Data sheet prior to use

## **Regulations**

This product is classed as acceptable for use in food 'Report on the Review of Additives and Processing Aids used in the Production of Beer' (FAC/REP/26).

Sulphur dioxide and sulphites at concentrations of more than 10 mg/kg or 10 mg/l expressed as SO<sub>2</sub>

must be labelled as allergenic (**European Directive (2003/89/EC)**)

## Specification

COMPOSITION	A blend of milled isinglass 30% citric acid
APPEARANCE	An off-white coarse powder
ODOUR	Slight characteristic odour
<u>Analysis</u>	Aqueous solution 6g /litre
Total Nitrogen (%)	14% minimum
Total Soluble Nitrogen (ppm)	610-720
pH	2.7 - 3.3
Sulphur dioxide (ppm)	90– 150 (SODIUM METABISULPHATE)
Flavour	Does not adversely affect beer flavour
Dessication Loss	<18%
Ash	<8%

### Microbiological

Total plate count (cfu/ml) <10,000

### Maximum Limits of impurities

As (ppm)	3
Pb (ppm)	5
Cu (ppm)	50
Zn (ppm)	25
Cu + Zn (ppm)	50
Hg (ppm)	1

## 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

## Storage & Shelf life

- Store in cool conditions away from direct sunlight
- Keep in original container
- Keep containers sealed when not in use
- Maximum storage temperature is 15°C
- Recommended storage temperature is 5°C - 14°C
- Minimum storage temperature is 1°C
- Do not allow the product to freeze
- The shelf life at the recommended storage temperature is 8 weeks from the date of manufacture
- The product may separate slightly on storage; remix before use especially if using 1000 and 200 litres IBC

PRODUCT	Magicol 250AS	PRODUCT CODE	MLAS
ISSUE No.	2.0	DATE	19/06/2017
CREATED BY	F.M.Maud	AUTHORISED BY	Dr Christine Fleming

