

## Improving Beer Clarification

1 B 4.4.4.1 · SH  
04/2008

**The quest for improved filter performance should not end with a kieselguhr consumption of 120 g/hl. Reduced storage times and storage capacity made possible by faster clarification, further reduction in filtration aid consumption and increased filter performance are arguments for further technological optimization. This issue, therefore, should no longer be limited to beers which are difficult to filter.**

### What Advantages does BECOSOL 30 Offer?

In order to meet the requirements of the Food and Beer Tax law the solution is BECOSOL 30, a 30 % anionic silicon dioxide solution. When BECOSOL 30 is added to beer, it forms continuously growing agglomerates whose pore width and adsorption performance are defined by the surrounding medium. Therefore, the reaction intensity of BECOSOL 30 with different beers varies depending on the composition of the beer. Due to their charge, the agglomerates flocculate together with trub and cold-sensitive protein contained in the beer.

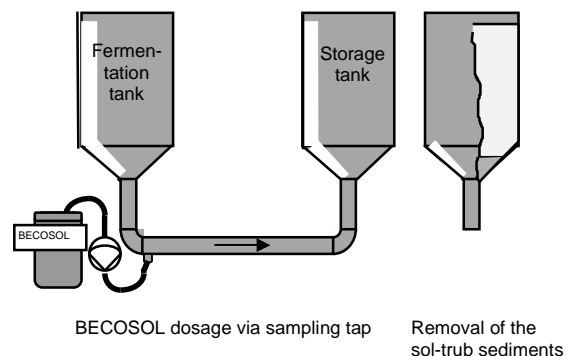
### How should BECOSOL 30 be Used?

A precondition for the reproducibility of laboratory tests in practice is the correct addition and uniform distribution of BECOSOL 30 in the beer:

BECOSOL 30 should be added to the moving beer stream in a uniform fashion via the sampling tap into the beer pipe, preferably using a diaphragm pump. Other pumps are less suitable. This process should occur during transfer from the fermentation tank to the storage tank. The introduction of silica sol into the storage tank or spraying onto the berry surface using a spray head have not proved successful.

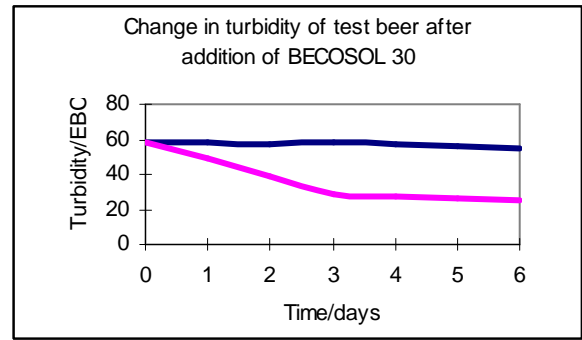
BECOSOL 30 can be diluted with water in equal parts in order to improve the pump efficiency. After dosing, the pump must be rinsed thoroughly with water. Low temperatures encourage flocculation and speed up sedimentation. The sediment is removed in regular intervals, so that only clarified supernatant liquid is filtered. Any sediment reaching the filtration stage would cause immediate blockage. Due care and attention is required during subsequent separation, because the high shear forces can destroy the agglomerates which have formed resulting in increased turbidity.

The required BECOSOL 30 quantity is between 30 – 50 ml/100 l. This leads to an increase in sedimentation speed during cold storage from approximately 0.5 m/day to 4 – 7 m/day.



BECOSOL dosage via sampling tap

Removal of the sol-trub sediments



— without BECOSOL  
— with BECOSOL

### Preliminary Tests

The efficiency of BECOSOL 30 can be tested in the laboratory in a glass cylinder with beer that is ready for filtration (test to be carried out in a refrigerator). The clarification efficiency can be monitored visually, or preferably by measuring the EBC turbidity units of the supernatant liquid over a period of two to three days.

The improvement of filterability can be measured using a permeameter in an experiment similar to the measurement of permeability. First the untreated, unfiltered liquid is measured and then the drawn-off supernatant liquid of the beer in the glass cylinder, to which BECOSOL 30 has been added, is measured. 10 grams of fine guhr are added in order to simulate precoat filtration (test conditions 0 °C; isobaric pressure depending on beer type: 1 – 2 bar; round filter used: Schleicher & Schuell 604). Improved filtration can be expected if the treated beer yields a higher filtrate quantity than the untreated beer (measurement in min).

All information is given to the best of our knowledge. However, the validity of the information cannot be guaranteed for every application, working practice and operating condition. Misuse of the product will result in all warranties being voided. Reproduction, even in part, is permitted only with reference to the source. Subject to change in the interest of technical progress.