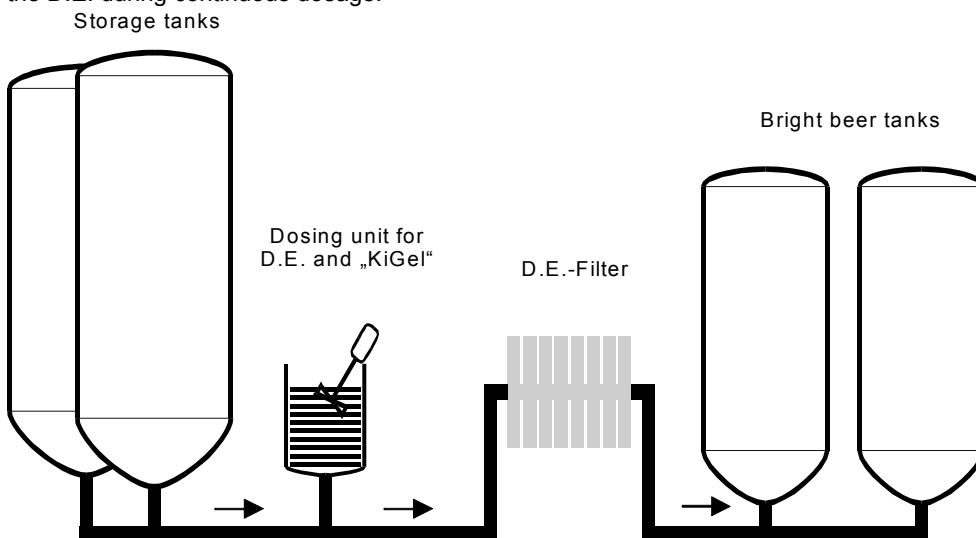


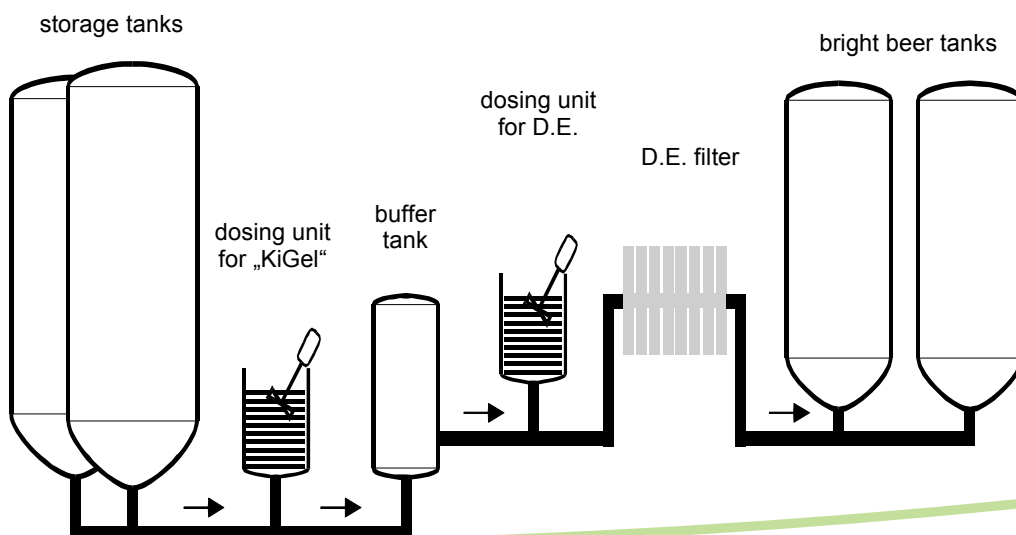
Addition of KiGel® during the D.E. filtration

Stabilization through D.E. filtration is the least problematic and easiest way of improving stability and shelf life of beer. Due to the particle-size distribution and structure of KiGel®-products they possess superb stabilization properties and very good filtration qualities. A partial replacement of D.E. is possible. KiGel®-stabilizers are highly effective, for safety reasons we recommend the addition of 30-50 g KiGel®/m² filter area during last precoat. KiGel® is added together with the D.E. during continuous dosage.



Stabilization using buffer tank

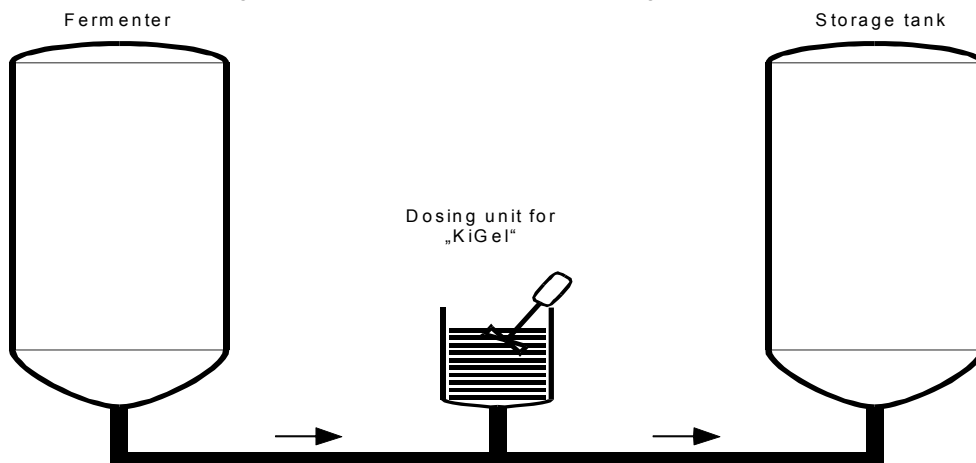
With this method the efficiency of KiGel®-products is optimized and stabilization is more economical. The stabilizer is added to the beer flow through a dosing unit. The dosing unit, as well as the buffer tank, are situated before the D.E. filter to assure a contact time of 15 min for the stabilizer in the beer. Independent of filter capacity and D.E. filtration, KiGel® is dosed into the beer flow in an exactly calculated given amount. The size of the buffer tank should be 50% of the hourly D.E. filter performance.



High quality silica gel for the optimization of chemical and physical stability of beer ways of application in the brewery

Stabilization during transfer

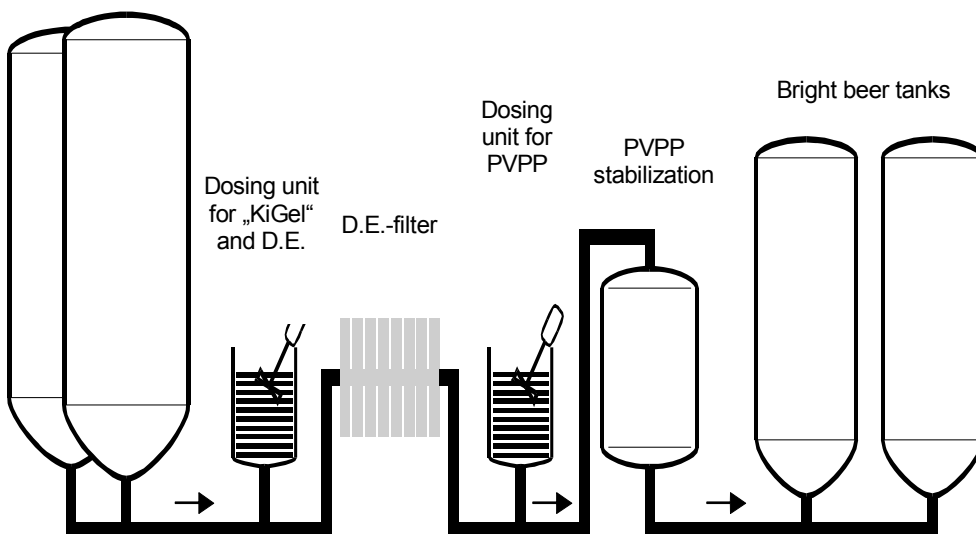
This method of stabilization is used with beers produced by rapid fermentation methods or bad malt quality. Due to the addition of KiGel®, clarification of beer is accelerated and maturation time is shortened. Haze forming protein is adsorbed and filtration inhibiting substances sediment together with KiGel®. Approximately 1/3 of the needed amount of KiGel® is added during the transfer. The rest is added during D.E. - filtration.



Stabilization using KiGel® and PVPP

In the process, high molecular proteins and polyphenols, as reaction partners of chill haze, are removed from the beer. KiGel® is added to the beer along with D.E. during filtration. The filtrate is treated with PVPP. PVPP is then retained in a subsequent stabilizing filter and is regenerated after the filtration. When using PVPP, oxygen rates in the beer should be monitored carefully as oxygen affects flavour stability of the treated beer.

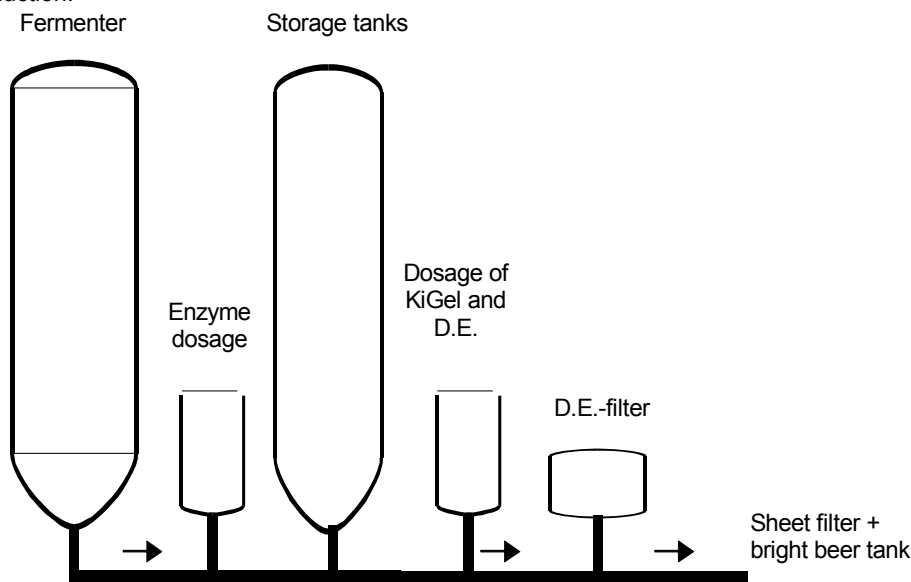
Storage tanks



High quality silica gel for the optimization of chemical and physical stability of beer ways of application in the brewery

Combination of KiGel® and Beerzym Chill*

The combined use of KiGel® and Beerzym Chill is a very efficient stabilization method. The addition of Beerzym Chill reduces the amount of KiGel® by 25 - 50%. Beerzym Chill can be dosed into the filtrate and also into the beer during the transfer from fermenter to storage tank. The dosage is 2-4 g/hl. Addition after filtration is possible together with ascorbic acid*. Due to the longer contact time and the almost complete removal, it is more effective to add Beerzym Chill to the storage tank. Remaining activity is adsorbed with an addition of KiGel® during the filtration. According to the German purity law (Reinheitsgebot) and the beer tax law §9.6 *Beerzym Chill and *ascorbic acid are not allowed for beer production.



KiGel® - high quality silica gel for the optimization of chemical and physical stability

KiGel®-dosages in practical application

The optimal and most effective dosage depends on the parameters of the brewery:

- desired chemical and physical stability
- technology of the brewery
- clarification and filtration-process engineering
- stability of the respective beer variety

SHELF LIFE	CLEAR	HYDRO	MEDI	XERO
3 months	35 g/hl	50 g/hl	40 g/hl	30 g/hl
6 months	55 g/hl	70 g/hl	60 g/hl	50 g/hl
> 12 months	90 g/hl	120 g/hl	100 g/hl	80 g/hl

Indicated dosages are not binding and are guide values for the brewer. Dosages of KiGel® can be reduced when combined with PVPP or enzymes.

KiGel®-stabilizers can be individually applied in the brewery. We will gladly assist with trials and customer service to choose the appropriate products.