

Brewtan® B

Prestabilisation of beer end of boiling Application fact-sheet

• INTRODUCTION

Nowadays, physico-chemical beer stabilisation is essential, as colloidal and flavour stability is considered worldwide as a quality label of beer, both among brewers as consumers. Beer should be enjoyable to drink, have a delightful flavour, attractive colour and good clarity even after transport to the other side of the world or after storage for months in supermarkets.

Brewtan® B is a high quality tannic acid grade. It reacts with the more acid proteins in wort. It is a cost effective technical aid and an easy to use prestabiliser. *Brewtan® B* increases hot break during boiling, whirlpool yield with a more compact cone and improves the antioxidant power of the beer. This results in an increased colloidal stability.

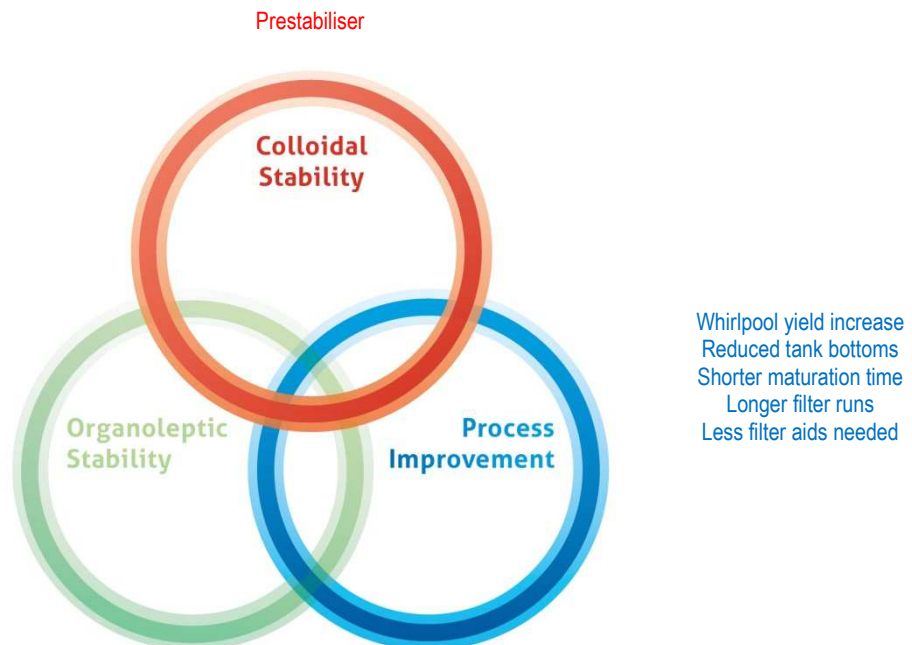


Figure 1.: Properties of *Brewtan® B* at the end of boiling

• APPLICATION END OF BOILING

>> Practical implementation

Required equipment

Stainless steel equipment is recommended because dissolved iron from ordinary steel equipment forms a dark blue complex with gallotannins.

The use of *Brewtan® B* in boiling does not require specific equipment, and investments are negligible, except when *Brewtan® B* is dosed to a wort boiler under pressure or proportionally during transfer to whirlpool.

Preparation, dosing & sequence of addition

Typical dosage levels of *Brewtan® B* at the end of boiling range between 1,5 - 4 g/hl. The quantity of

Brewtan[®] B used is expressed relative to the amount of final 100% malt 12°P beer. The amount of added adjuncts and the gravity of the beer have to be taken into account.

Clear solutions are obtained by slowly adding *Brewtan*[®] B to the brewing water while stirring to prevent lumps. We recommend a concentration of 10%, lower concentrations give higher addition volumes and higher concentrations present the risk of local overdose.

This solution is added to the copper just (5-10 minutes) before transfer to the whirlpool (or centrifuge) or proportionally during transfer to the whirlpool, it is important that the *Brewtan*[®] B solution is completely mixed with boiled wort in order to obtain a good pre-stabilisation.

Impact of raw materials

Malt with a protein content of 9-12% is good brewery malt, lower than 9% gives foam problems, more than 12% gives very unstable beers. Malt with high nitrogen content gives a lower brewhouse yield, will result in more soluble proteins and thus also more haze formation in the final beer. *Brewtan*[®] B can help to correct fluctuations in malt quality by eliminating these excessive amounts of proteins.

Brewtan[®] B in combination with copper finings

Brewtan[®] B can also be used in combination with copper finings provided the right order of addition is maintained. This means that copper finings must be added after *Brewtan*[®] B. A simultaneous addition can result in neither copper finings nor *Brewtan*[®] B performing properly.

• IMPACT OF BREWTAN[®] B USE

>> Impact on colloidal stability

In order to study the impact on colloidal stability two tests were performed, for each test 4 beers were brewed.

- One test performed without stabilisation
- One test performed with 6 g/hl *Brewtan*[®] B 5 minutes before transfer to the whirlpool

On these samples a Chapon test was performed using following conditions: 100 ml beer together with 8 ml ethanol is placed 1 hour at -5°C. EBC is measured. It was found that the use of 6 g/hl *Brewtan*[®] B increases colloidal stability by approximately 20%.

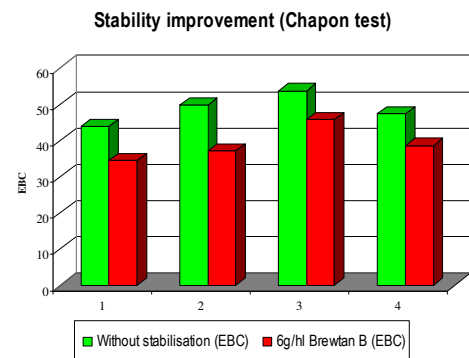


Figure 2.: Stability improvement (Chapon test)

Amount <i>Brewtan</i> [®] B	Forcing test 4 days at 50°C (EBC)
0 g/hl (reference)	12
1,5 g/hl	11,8
3 g/hl	3,8
5 g/hl	2,9

Table 1.: Results forcing test

In further tests 4 brews were made with increasing amounts of *Brewtan*[®] B in the range 0 - 5 g/hl on finished beer. The results of the forcing test show a much better colloidal stability for the beers treated with *Brewtan*[®] B upwards from 3 g/hl.

>> **Impact on organoleptic stability**

Impact on reducing or anti-oxidant power

The reducing or anti-oxidant power of beer is already established in the wort, due to formation of reducing bonds, melanoidins and reduction products during boiling. During the fermentation process anti-oxidant power of the wort remains almost unchanged.

It thus is critical that a sufficiently high reducing power is already established very early in the process. By adding *Brewtan® B* at the end of boiling an increase in reducing or anti-oxidant power of the wort in the range of 20 to 35% can be accomplished.

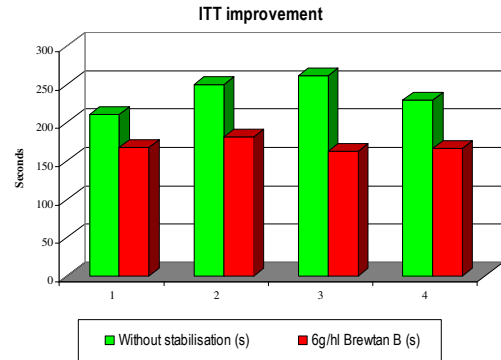


Figure 3.: ITT improvement

Impact on colour (EBC)

Without stabilisation (EBC)	6 g/hl <i>Brewtan® B</i> (EBC)
4	3
3,5	2,5

Table 2.: Impact on colour

The use of *Brewtan® B* at end of boiling has a positive effect on the colour of the fresh beer and on colour stability. This is correlated with the reducing or anti-oxidant capacity of the beer (ITT values). Indeed the addition of 6 g/hl *Brewtan® B* to a pilot scale brew of a lager type beer had a marked impact on colour stability.

>> **Impact on process improvements**

Several case studies in breweries have shown following benefits of *Brewtan® B* at the end of boiling:

- **Whirlpool**
The yield of the whirlpool increases, clearer wort after whirlpool is obtained with a better dryness of the whirlpool cone (between 5 and 15% drier). The cone itself is more compact with approximately 10% higher dry material content.
- **Maturation**
Reduced bottoms (up to 40%) in cylindro-conical tanks and shorter maturation times. Less bottoms means less beer loss and savings can be achieved due to reduced volumes of bottoms which have to be tankered away. Shorter maturation times represent an increase in maturation capacity.
- **Filtration**
Increased length of filter runs (up to 35%) and decrease in the amount of filter aid needed. Longer filter runs mean less filter operations, less CIP's translating in less energy consumption and operational hours and thus more filter capacity. Less filter aid also means a saving in raw material and disposal cost of spent filter-aid / filter cakes.

Overall there is a reduced consumption of processing aids, stabilisers and filter aids. It can be used in combination with PVPP and new filtration technologies.

• **OVERVIEW**

Figure 4. shows the different ways of incorporating gallotannins into the brewing process. This allows brewers to choose the most appropriate product for their requirements; it is also possible to combine two or more of these methods to give a combination of process and stability benefits.

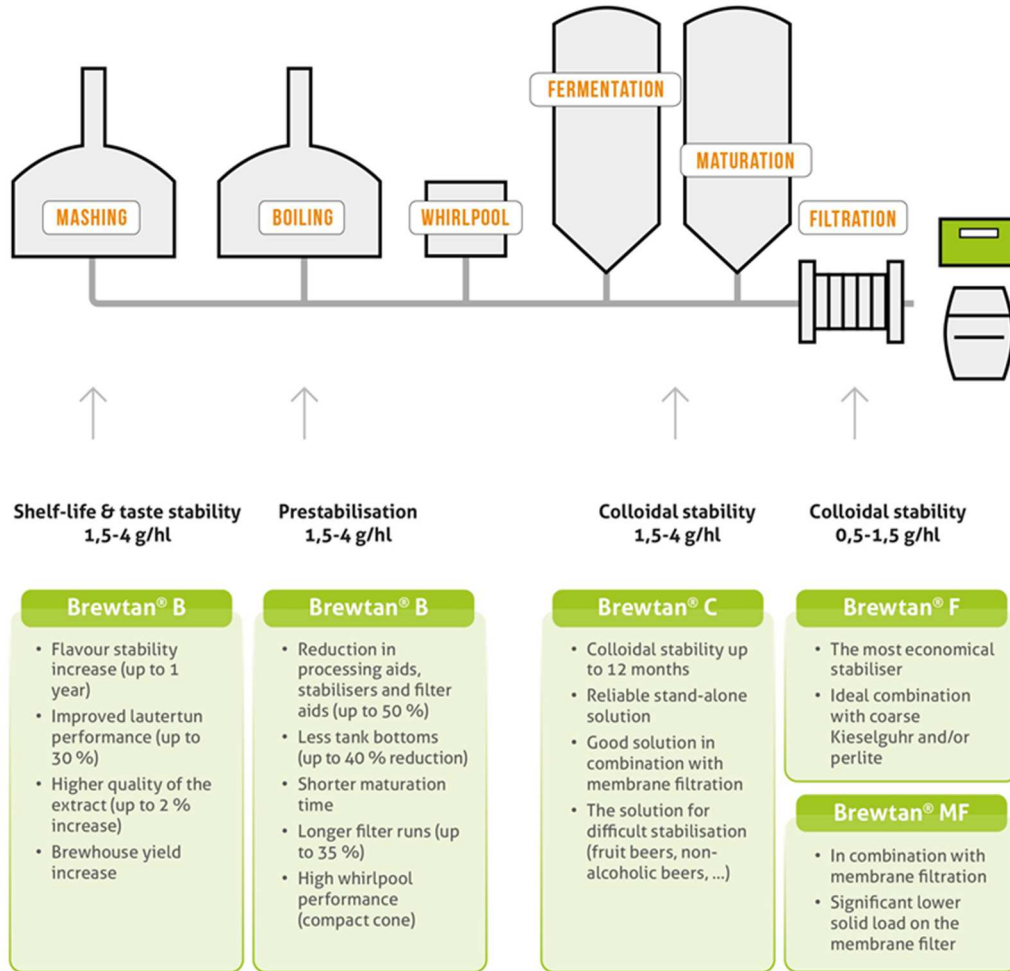


Figure 4.: *Brewtan®*, your natural beer stabiliser

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