

Turbidity after Lauter Tun

The new TurBiScat PM 40 can be used for a variety of applications in the brewery due to the combined 90° / 25° measurements and the optional color measurement. The following application report looks at turbidity measurement in the brewhouse, especially at the outlet of the lauter tun, where the basis for an optimal beer is delivered.

In recent years, climate change has resulted in lower malting barley harvests and arable land is increasingly being used for the steadily growing demand for renewable raw materials for energy production. Therefore, an optimal process for the utilization of the raw materials is required.

The Solution

The work in the brewhouse – consisting of mashing, lautering to separate solids from liquids and wort boiling – is the heart of every brewing process. The turbidity measurement is installed at the outlet of the lauter tun and serves to optimally utilize the mash and provide the basis for high-quality beer. The device typically measures turbidity in the medium to higher range. Turbidity values around 30 EBC are considered typical.

To the lautering process: After the mashing work has been completed, the mash (mixture of husks and sugar solution) is pumped from the mash tun into the lauter tun. The latter has a bottom made of slotted plates through which the liquid phase can leave the lauter tun. The husks form a kind of filter cake. As this layer (spent grains cake) becomes increasingly dense after some time, it is loosened up by a slowly rotating chopping unit.

The turbidity measurement has two functions. At the beginning, the optimal starting time of the lautering process must be found. Because the filter layer is only

formed gradually by the settling of the husks, the turbidity is high at the beginning of the lautering process. Therefore, the wort is pumped in a circuit (so-called turbid wort pumping) until turbidity has reached a sufficiently low starting value (approx. < 50 EBC). Then the actual lautering begins. This is where the second measuring operation takes place to ensure that the turbidity remains below 30 EBC for 80% of the lautering time. Higher turbidity results in an increased input of unwanted substances with correspondingly unfavorable effects on further processing (especially filterability) and the stability of the beer.

The diagram shows the typical course of a lautering process. The drop in turbidity at the beginning is the

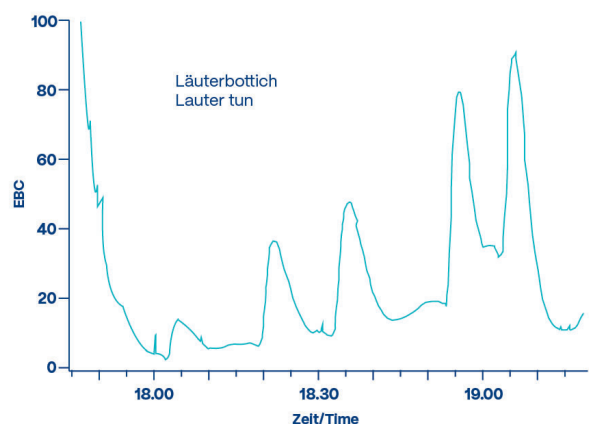


Diagram showing the course of a lautering process



The TurBiScat PM 40

turbidity pumping. This is followed by the low turbidity during the lautering process. The peaks are the deep cuts of the chopping unit to loosen up the filter cake.

The Customer Benefit

The benefits are most obvious in the areas of filtration and shelf life. A beer that had optimal turbidity values during lautering enables an economical filtration process due to a long filter life. As far as shelf life is concerned, a low turbidity of the finished beer has a positive effect in the forcing test. The number of possible warm days until the 2 EBC limit is reached will be higher, which means a longer chemical-physical shelf life.

Technical Details

- MEBAK/EBC – compliant 25° scattered light turbidity measurement: This device corresponds to the generally valid MEBAK recommendation in terms of the measuring principle. This is the best way to obtain evaluable and comparable results. The guarantee values of brewhouse builders refer to the 25° forward scattered light measurement.
- Designed for mounting on standard VARINLINE® housings
- Easy installation, as no separate control unit is needed any more
- Customer-friendly configuration via smart phone
- The integrated display shows measured values, status messages or even histories directly at the

Did you know?

The TurBiScat PM 40 has an integrated display. However, it is also available with a detached display unit for measuring points that are difficult to see.

point of measurement (remote display optionally available)

- LED technology, only 4 W power consumption, the already low consumption of the predecessor has been halved again
- Sealless design with sapphire glasses
- Extremely low maintenance costs
- No purge air necessary
- Recalibration with secondary standard, no need of formazine
- Besides 0/4 ... 20 mA interfaces, a number of different bus interfaces are available

Typical Application

Measurement in the lautering process with scattered light measurement 25°, transmission of the mA analogue signal or the digital data via various bus systems to the customer's PLC. Evaluation and control of the lautering process via the PLC.

Practical Measuring Tasks (Examples)

The TurBiScat PM 40 can also be used for turbidity measurement on kieselguhr and other filters, in the blending plant and in the bottling plant.