SIGRIST
PROCESS-PHOTOMETER

Application report

Turbidity after Whirlpool

In the process of beer production, it is important to measure turbidity at the outlet of the whirlpool. If the hot break contained in the wort is minimized, flavour stability of the finished beer can be positively influenced. The hot break should therefore be separated as completely as possible and the process should be monitored by turbidity measurement.

Benefits

The main benefit of the separation of hot break lies in a positive effect on the main fermentation, i.e. the yeast is not burdened with hot break. In addition, off-flavours (unpleasant bitter flavour) can be avoided in the finished beer. Another benefit is the positive influence on the chemical-physical stability of the beer. That means an improved flavour and foam stability and that an undesired darker colour is avoided.

Thus, the aim is to separate the hot break as completely as possible.

Typical application

The separation of hot break can be carried out in different ways: in a whirlpool, a wort filter or a separator. For all methods, the measurement of turbidity is necessary.

Today the most commonly used separation method is the whirlpool: In the whirlpool, the so-called tea-cup effect is made use of. The wort is pumped into the whirlpool in such a manner that it rotates (tangential inflow). As a result, the hot break which had formed in the prior wort boiling process deposits in the middle of the whirlpool as a trub cone. This hot break mainly consists of protein and hop (200 – 400 g / hl).

After a whirlpool rest of about 15 minutes (during which time the trub cone forms), the wort is drained from the whirlpool. This is carried out with several decantings at different heights (top, middle, bottom) (s. example). In this, it has to be ensured that the trub cone remains undisturbed and is not carried along with the wort (collapse of the trub cone).

A typical turbidity here is between 0-100 EBC and can increase sharply prior to the complete draining of the whirlpool. In this case, the flow velocity has to be reduced or the wort has to be pumped into a separate container.

Whirlpool with trub cone

If one concludes from the turbidity values that the consistency of the trub cone is generally not good, measures in the operation of the brewhouse or in the quality of the raw materials have to be carried out.

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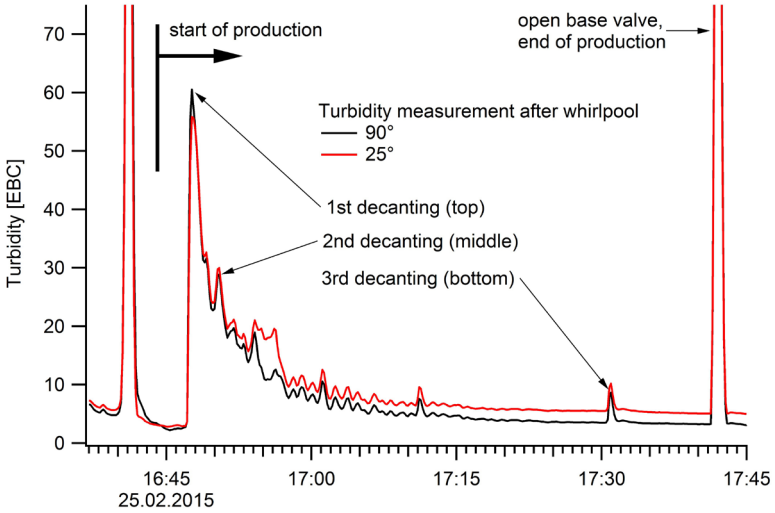
Practical measurement (example):



Process of hot break separation at the measuring point after the whirlpool

Cost-benefit analysis

1) The benefits lie in an improved chemical-physical stability of the beer and a somewhat shorter primary fermentation (as it is faster). Fermentation can possibly be shortened by one day, which has a positive effect on the overall output.
2) Monitoring turbidity can ensure that the wort remains in the whirlpool as briefly as necessary. This has a positive effect on the quality due to the lower thermal strain and will increase the output of the brewhouse.

SIGRIST product and configuration for this application:

- TurbiGuard (signal output calibration in EBC
- Optionally: SICON control unit

Parameter adjustments:

- Limit formation of the mA signal in the PLC (provided by the customer)

Advantages of the SIGRIST TurbiGuard

- LED light source, only 2 W power consumption
- No purge air required
- Sealless design
- Extremely low maintenance costs

TurbiGuard

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