

Color Measurement in Hot Wort

In the brewhouse of the brewery

The color of the wort is influenced by various factors during the brewing process (raw materials, brewing time, etc.) and is therefore subject to certain fluctuations. As the wort color significantly influences the color of the subsequent beer, it must be checked by the laboratory after each brew. In-line monitoring is particularly suitable for this purpose.

Brewhouses usually operate in three shifts, which means that samples often have to be taken at times when the brewery laboratory is not occupied. Inline monitoring is therefore ideal for this measurement. Due to the fact that the beer wort to be measured only has a slight turbidity at the outlet of the whirlpool, it makes sense to install the Sigrist ColorPlus 2 colorimeter between the outlet of the whirlpool and the plate cooler. The ColorPlus 2 measures the color at a wavelength of 430 nm and the turbidity at a second, color-insensitive wavelength. This measurement set-up is exactly the same as the set-up in the brewery laboratory and therefore enables measurement values suitable for quality assurance.

The Solution

The ColorPlus measures the color/absorbance online at two different wavelengths of 430 and 700 nm. The turbidity can be compensated for by selecting the appropriate wavelength. The modular design of the device makes it possible to meet the needs of a wide variety of installation situations and different measuring ranges. In many cases, a standard housing such as VARINLINE® is used. A wide range of analog and digital interfaces allow simple system integration and control.

The Customer Benefit

A modern brewhouse can produce 12 brews per day. This means that around 60 samples, sample prepara-

tions, laboratory measurements and the entry of the measured values into the laboratory data system are required each week. The laboratory staff can be deployed for more demanding tests in the laboratory.

Technical Details

The device measures according to the absorption principle in accordance with EBC/MEBAK. Control units based on optical reference filters can easily be used for regular device checks. It is operated intuitively via the intelligent SiCon control unit using touchscreen technology and a color display. The display optionally shows values, graphics, status and alarm information. An internal data memory enables the visualization of measurement data over the last 32 days.

Typical Application

Color measurement in hot wort between the whirlpool and the plate cooler. Advantages of the measuring point:

- The hot wort no longer changes color there
- The hot trub has been largely separated from the whirlpool and the remaining turbidity can be compensated for by the colorimeter.



The diagram illustrates a beer production process with the following stages and components:

- Brewhouse:**
 - Malt addition:** Malt is added to the Mash tun.
 - Water addition:** Water is added to the Mash tun.
 - Hop addition:** Hops are added to the Wort pan.
 - Mash tun:** The first stage of the brewing process.
 - Lauter tun:** The second stage of the brewing process.
 - Wort pan:** The third stage of the brewing process.
 - Whirlpool:** The fourth stage of the brewing process.
- Fermenting cellar:**
 - Wort cooler:** The wort is cooled before entering the Fermentation/Storage tank.
 - Yeast dosing:** Yeast is added to the Fermentation/Storage tank.
 - Fermentation / Storage tank:** The beer is fermented and stored.
- Bottling station:**
 - Storage tank:** The beer is stored before bottling.
 - Filter cell:** The beer is filtered before bottling.
 - Blending Unit:** The beer is blended before bottling.
 - Filling station:** The beer is filled into bottles.
 - Laboratory:** The beer is analyzed in the laboratory.

The diagram also includes a legend for the sensors and actuators:

- T:** Turbidity
- P:** Phase detection
- C:** Color

Two circular insets provide close-up views of the ColorPlus 2 at kieselguhr filter and the Color sensor at the blending system.