

Edible oil in best quality and color

Inline Lovibond® color measurement with OUSAF21



The quality standards are very high when processing edible oil.

Benefits at a glance:

- Continuous measured values that ensure that the production standard is met.
- Real time detection of oils' colors to monitor and control the process.
- Prevention of manual errors.
- Reliable measured data: ideal correlation to the Lovibond® R color measurements.

The color of edible oil is a very important quality parameter. It changes significantly from raw oil to edible oil through every process step. The last process steps decide on the final quality of edible oil. Therefore, inline Lovibond® color measurement mainly takes place in deodorization and if required in the bleaching step, where process pressure is usually lower than 4 bar and temperature about 90 °C.

Challenge

Inline measurements allow monitoring of critical process indicators, such as the color of edible oil, in real time. Inline monitoring means less effort than laboratory measurements and enables therefore effective process control that leads to higher yields in the end. The established measurement methods for quality assurance are laboratory measurements due to historical and legally binding reasons. For animal and vegetable fats and oils the standard

GB/T 22460-2008 (ISO 15305-1998) describes the Lovibond® color value accordingly. Therefore, inline color monitoring of edible oil requires measuring methods comparable to the laboratory color measuring method along with fast response time and reasonable costs. In this Lovibond® method color is determined with a special spectrophotometer using up to 84 different colored glass filters in red, yellow and blue or combinations thereof, which is cost and time intensive. For the production of edible oil, Lovibond® red (Lovibond® R) and yellow (Lovibond® Y) values are relevant. The measured values are expressed in the unit Lovibond®.

Our solution

The OUSAF21 inline photometer can perform inline measurement of absorption due to colored components in the oil that correlate to Lovibond® R, required by ISO 15305-1998. In the range

between 490 nm and 520 nm, the absorbance value can be correlated with the required Lovibond® R value. Therefore, OUSAF21 with 520 nm wavelength and 150 mm optical path length (OPL) is predestinated for this application. Via the application adjustment the correlation table can be stored in the CM44P and then displayed in the desired unit Lovibond®. For example, the measuring range for Lovibond® R is between 0.5 and 15 Lovibond® R. If required, the Lovibond® Y value can also be measured with an Endress+Hauser sensor. In

this case the measuring station must be extended by adding the process photometer OUSAF22. In the first weeks after commissioning it is advisable to compare the inline measurement and the laboratory method accurately to setup a correction equation in order to optimize the application adjustment at the best.

Results

Compared to lab instruments, an inline photometer provides continuous color measured values that ensure that the production standard is

met. The customer profits from real time detection of the oils' color to monitor and control the bleaching and deodorization processes. The quality of edible oil and the process safety are assured because influences through manual errors and operators' lack of experience are eliminated. In field trials OUSAF21 inline photometer has proven its suitability for Lovibond® R color measurement equivalent. Its application adjusted measured values show an ideal correlation to the Lovibond® R color measurements from laboratories.



Optical sensor for the measurement of low color concentrations OUSAF21

Components:

- Transmitter Liquiline CM44P-AAFIHP1M01A1F010BAAA+AK*1
- OUSAF21-DOCOD1D1D4A1A *2
- Cable CUK80-4E15A *2
- Optional: OUSAF22 to measure Lovibond® Y

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