SensoTech
In liquids, we set the measure.

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FIELD REPORT

It pays off

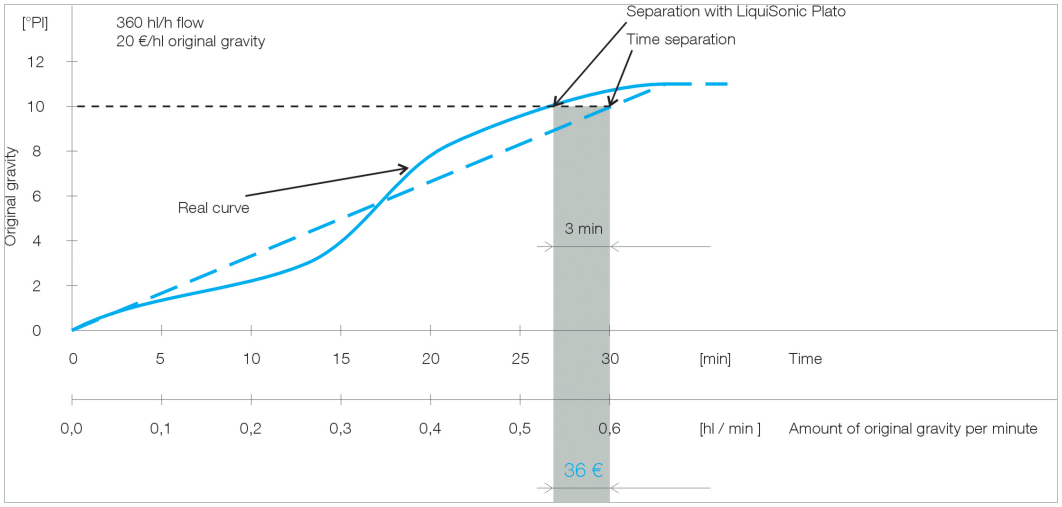
Phase separation at the beer filter

Inline measuring devices for analyzing the different steps of the brewing process are increasingly to be found in modern breweries. Starting in the lauter tun and the subsequent wort pan above the filter up to the filler, the precise inline measuring technology contributes significantly to quality assurance and cost saving.

After the mashing and lautering process, the wort is produced during the boiling process and by adding hops. In the following step, the wort is filled in tanks to develop its own flavor during the fermentation. Though the beer is now brewed, however, last turbidity constituents such as yeast and proteins must be dissolved in filter streets to achieve the final unique flavor and the absolute clarity. In detail, the contaminated liquid (unfiltrate) is separated during the filtration through a filter aid into the filtrate and the filter residues. For example, sieves, metal or textile fabrics as well as filter layers. One of the most common filter forms is the sheet filter, which is composed of plates with filter layers. The filter layers consist of celluloses and Kieselguhr that run the filtration.

Inline measurement ensures beer quality

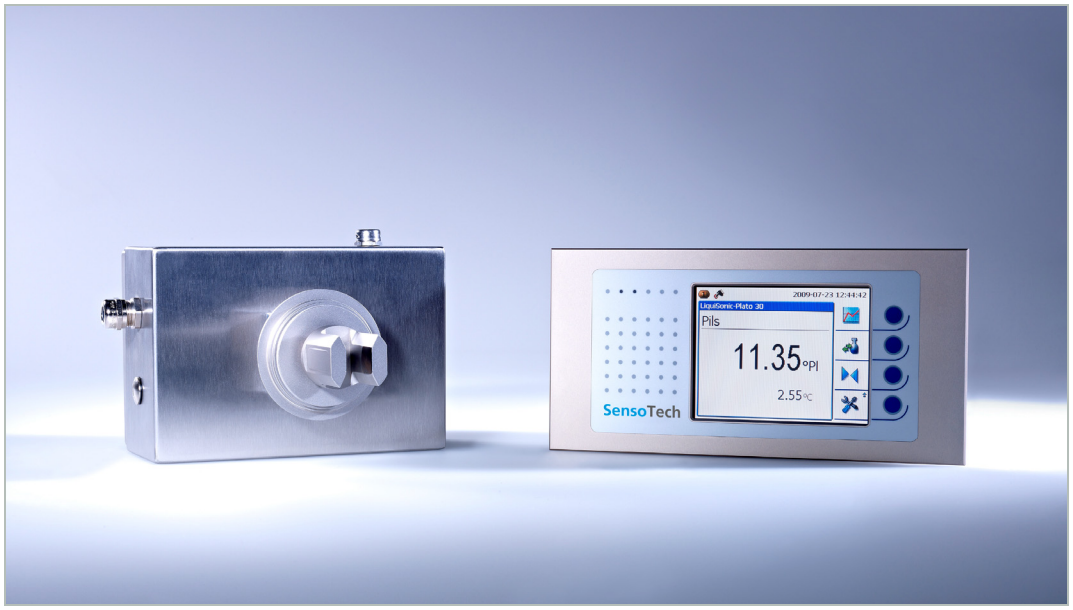
During the filtration, first/last runnings occur, as the filter aids are applied with degassed water for precoating in the beginning of the filtration. After the filtration the filter aids are rinsed with water for cleaning purposes of the filter. First/last runnings have a lower content of original gravity and would distort the beer when blending. Using an inline original gravity measurement after the filtration for the separation of first/last running from the unfiltered beer ensures the quality of the beer. For example, to achieve the required minimum original gravity during the initiation, a time control must be long enough and therefore it switches to the pressure tank after 30min. But an inline original gravity measurement shows that the required original gravity will be already achieved 3min earlier. Consequently, important hectoliters can be saved. That means a DN80 pipeline with a flow rate of 360hl/h contains approx. 0.6hl of original gravity after 30min. Furthermore, 3min effects cost savings of 36euro if the price for the original gravity is 20euro/hl. In case of 200 filtrations per year, this corresponds to a profit of 7,200euro/year.



Cost savings when using LiquiSonic® Plato at the beer filter

In addition, a measuring system can be installed before the filter in the pipeline of the unfiltrate to add exactly the first/last running beer to the unfiltered beer. Then it is possible to return the first/last runnings into the product cycle.

A latest measuring method with a high accuracy is the sonic velocity measurement. SensoTech offers the LiquiSonic® Plato system, which is able to measure the concentration of a process liquid by means of the temperature and sonic velocity. This inline measuring system has already proven itself several times in different steps of the brewing process.



Inline measuring system LiquiSonic® Plato

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Hygienic and bypass-free installation

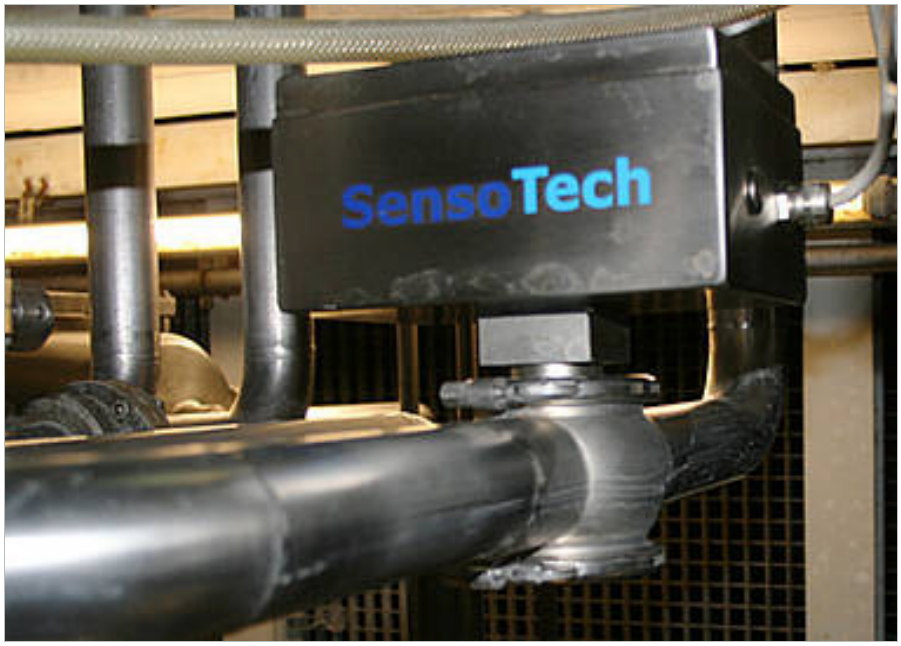
The system consists of maximum four sensors and one evaluation unit (controller). The sensors are always made of stainless steel, run maintenance-free and meet the requirements to hygienic and bypass-free installation conditions. The controller analyzes and visualizes the measuring data and displays immediately the determined concentration of the original gravity after the installation of the complete measuring system. The trend chart feature allows following initial and shutdown processes. The trend chart is combined with an internal data memory that stores up to 15,000 datasets. In addition, the trend chart enables to check previous processes subsequently. It is furthermore possible to exchange data with higher-level systems. That means the controller can be easily integrated via Profibus DP, for example, into automation processes. Beside the transfer of measuring values, a product selection can also be realized for all sensors via Profibus DP.

Quality control and environmental protection realized

Various LiquiSonic® Plato systems are installed for example in the Colbitzer Heidebrauerei that has always combined brewing tradition with innovative standards. Using the latest brewing and analyzing technology for a continuous quality control ensures everyday that the Colbitzer beer types can be filled with their best flavor in barrels and bottles. The Colbitzer Heidebrauerei has realized different projects; on the one hand, they realized an extensive modernization including both technological and economical advantages, and on the other they invested into the expansion of the bottle filling line with the latest technology. Not only the improved performance, but also the efficiency convince.

The brewery is also working on realizing quality control and environmental protection by saving energy and raw materials at the filter. The Colbitzer Heidebrauerei uses a Kieselguhr and sheet filter. In the first part, the filter aid Kieselguhr separates the process and removes yeast cells and other turbidity constituents from the beer. The second filtration is a so-called fine filtration with filter layers.

“It was our aim to increase the efficiency of our process operations at the filter. We wanted to achieve that with a suitable inline measuring technology to run a precise phase separation at the filter outlet. It was important for us that the measurement is precise and requires no bypass”, explains the brew master, Birgit Diesing. To meet these needs, the brewery installed a sensor with a Varivent connection of LiquiSonic® Plato into a DN50 pipeline after the filter.



LiquiSonic® Plato measuring point at the beer filter outlet of the Colbitzer Heidebrauerei

The accuracy of the original gravity measurement is ± 0.05 wt%. The controller has been installed with a wall-mounted stainless steel housing. “The system has been running failure-free for many years. We are very satisfied with its easy handling and cost savings. All of our LiquiSonic® measuring points have easily paid off”, emphasizes Birgit Diesing.

SensoTech:

For almost 20 years SensoTech GmbH has been engaged in the development, manufacturing and sales of inline analysis systems for process liquids. With worldwide installed, highly precise and innovative measuring systems for monitoring of concentrations, compositions and changes of chemicals as well as properties directly in the process, SensoTech has significantly contributed to the enhancement of the state of the art. In addition to the measurement of concentration and density, the phase inter-face detection as well as the monitoring of chemical reactions like polymerization and crystallization are typical applications. SensoTech inline analyzers set standards in the technological and qualitative valence, user friendliness and reproducibility of process values. Special calculation methods and sophisticated sensor technologies enable reliable and precise measuring results even under the most difficult process conditions.

The knowledge and the experiences of the highly motivated and committed SensoTech staff are the result of many different applications supported by well-known customers from the chemical and pharmaceutical industry, food technology, semiconductor technology, automobile and steel industry as well as many other industries. In addition, these experiences also open up unimagined solution possibilities for new measuring challenges.

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FIELD REPORT