Skalar

your partner in chemistry automation

Brewing industry

Range of analyzers for the **Brewing Industry**


Ethanol

Range of analyzers

SP2000
beer & wort analyzer

SAN++®
beer & malt analyzer

PRIMACS™ SNC-100
Total nitrogen/protein analyzer

Malt, wort and beer analyses are essential to control brewing and end product quality during beer production. Skalar offers full automation for many key parameters in this analysis for beer quality control.

QUALITY ASSURED: The Skalar beer, malt & wort analyzers offer completely automated standards according to EBC, ASBC and MEBAK and have been successfully installed and implemented at many beer and malt laboratories worldwide. The automated analysis achieves better response times, less operator intervention and an increased accuracy in the results.

TIME EFFICIENT: An important factor for efficient laboratories is time. Automation of the analyses with the SAN++®, PRIMACS™ and SP2000 series reduces the analysis times and increases sample throughput. The response times to the detection of changes in production quality are more immediate which ensures a better control of the production process and waste reduction.

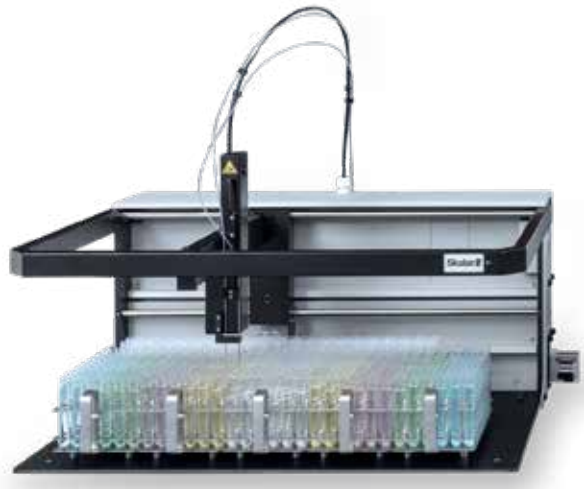
ACCURATE RESULTS: The ability of Skalar's instrumentation to give accurate results time after time is what most of our customers regard as the deciding factor before purchasing a system. Over a period of years, Skalar's application laboratory has worked with brewing and malting laboratories to achieve rapid, accurate and reliable results across numerous sample matrices.

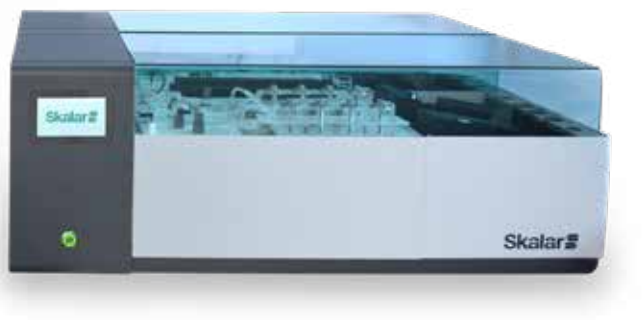
COST EFFECTIVE: Our analyzers have proven to be robust workhorses for brewing and malting laboratories. Low operational costs simplify the choice to automate applications, bearing in mind the increase in speed and reliability. In addition, less waste per sample analysis is produced compared to traditional manual methods.

SKALAR'S BEER / MALT / WORT ANALYZERS INCLUDE:

- **The SAN++® beer / malt analyzer** offering full automation for various parameters in the analysis of beer and malt
- **The SP2000 beer/ wort analyzer** automates the analysis of bitterness, FAN, SO_2, pH, color, polyphenolen, anthocyanogen, TBZ, iron, beta (β) glucan in beer & malt
- **The PRIMACS™ SNC-100 beer/malt analyzer** measures total nitrogen / protein in beer & malt by using Dumas combustion technology

The SAN++® automatic beer & malt analyzer





The SAN++® is ideal for analyzing large series of beer & malt/ wort samples in one batch for multiple parameters with complex analysis methods such as diacetyl, polyphenols and anthocyanogen fully automated.

The analyzer has a modular set up. Each chemistry module is configured for a specific parameter.

A typical five-channel Beer analyzer is configured with modules for bitterness, Total SO_2, free amino nitrogen (FAN), polyphenols and diacetyl while a malt analyzer is usually configured for diastatic power, α-amylase, FAN, ß-glucan and color analyses.

All analyses comply with (inter)national guidelines such as EBC, ASBC, Mebak and others as well as to individual laboratory requirements.
Skalar offers autosamplers ranging in capacity to accommodate sample batches of all sizes and with the possibility of an integrated auto-diluter for overrange sample dilution. Multiple sample needles are available for simultaneous analyis of different sample matrices. A total of up to 16 parameters can be analyzed simultaneously.

A range of specific detectors are available induding a U.V. detector, fluorimeter and others. Automatic start-up, shutdown and stand-by are just some of the features that can be easily integrated for automatic running outside working hours.

Skalar has become a world leader in chemistry automation due to its dedication to working according to customer requirements and the versatility of its range of instrumentation. In addition, the ease of operation, the decrease in operator time and its robust design has made the Skalar SAN++® beer and malt analyzer the standard for many international breweries and malting plants.

FEATURES

- Methods according to EBC, ASBC, Mebak & others
- Integration of various detectors for Beer and Malt analysis, such as a fluorimeter and UV / VIS detector
- Skalar FlowAccess software with real time graphics, data calculation and data export to Excel / LIMS
- Simultaneously analysis of up to 16 parameters
- Unattended automatic start-up and shutdown
- Autosamplers ranging in capacity to accommodate sample batches of all sizes

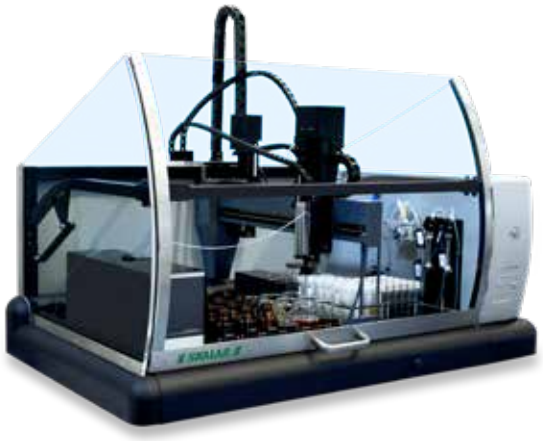
The SP2000 beer & malt analyzer

Beer and wort analysis are essential to control brewing quality during beer production.

Typically, every 2-3 hours, beer & wort samples need to be tested for multiple parameters and the results need to be provided instantly to the operators controlling the brewing process. Besides this, breweries nowadays produce smaller batches of different beers instead of only large quantities of one beer. Therefore, Skalar has developed the SP2000 beer & wort analyzer, which is flexible, easy to use and capable of directly analyzing small batches of samples for single or multiple parameters.

A critical analysis in beer brewing process is bitterness. Bitterness in beer comes from the hops added during the brewing process. In order to maintain consistency of bitterness in beer, it needs to be tightly monitored and controlled. Skalar has automated the analysis of bitterness compounds such as α & iso-α-acids in beer and wort according to EBC, ASBC, Mebak and other international methods.

The automated procedure includes automatic degassing of the samples, dilution of samples, de-capping and capping of an extraction tube, addition of hydrochloric acid and iso-octane, extraction of the sample and its measurement at 275 nm.
The analyzer configuration shown above can be loaded with 15 samples for a combined analysis of bitterness, pH and color or 9 samples for a multi-parameter analysis in 150 ml beakers. The robot includes two shakers to obtain complete extraction of bitterness compounds. The analysis platform is enclosed by a protective cover for operator safety.



The analyzer is controlled by our own RoboticAccess software, a user-friendly data handling software package, including a pre-set application procedure for bitterness, user definable sample table set up and extensive QC features.

Additionally, more parameters can be added to this bitterness robotic analyzer such as color, pH, SO^2, polyphenol, anthocyanogen, thiobarbituric acid value (TBZ), iron, beta (β) glucan & Free Amino Nitrogen (FAN).

FEATURES

- Complete automation incl. degassing of the samples, (de)-capping the sample tube, sample dilution, addition of reagents, mixing and measurement of the absorbance
- Iso-octane reagent consumption of the automatic bitterness method is reduced by a factor of 5 compared to the manual method
- Flexibility to process small or large batches and run single or multiparameter analysis
- Possibility to combine the bitterness application with the measurement of pH, color, FAN, SO_2, TBZ, beta (β) glucan, anthocyanogen, polyphenolen, iron etc.
- RoboticAccess software for instrument control, data handling, result calculation and quality control
- Methods according EBC, ASBC, Mebak and others

Procedure

Typical fully automated Bitterness, pH, Color analysis sequence consists of the following steps:

Samples are poured into beakers. The beakers with sample, extraction tubes, dilution tubes and necessary reagents are all loaded on the analyzer by the operator. The sample table is set up and the analyzer is started.

- The samples are automatically degassed by magnetic stirrers
- The extraction tube is de-capped
- An aliquot of the sample is picked up and dispensed in the extraction tube; when required this sample can be automatically pre-diluted
- An amount of HCl and iso-octane is also added into this test tube
- The extraction tube is capped and placed in the shaker
- The sample test tube is capped and placed in the shaker
- Sample is shaken for a pre-defined time
- After the sample has been shaken the extraction tube is placed back into its original position, where the phase separation takes place
- The extraction tube is de-capped
- An aliquot of the organic phase, the upper iso-octane phase, is picked up and transported through the flow through cell, where the absorbance is measured at 275 nm
- Bitterness as IBU is automatically calculated by the software

Analyzer configurations with higher sample capacities or other beer applications are also possible, please contact Skalar for more information.

Automatic sample degassing

Automatic extraction tube pick up

Automatic extraction tube de-capping

Extraction of the sample

The PRIMACS™ SNC-100 TN / Protein analyzer

Routine monitoring of total nitrogen/ protein content during the brewing process is important to ensure the quality & stability of subsequent beer products.

Protein present in malt and wort are important nutrients for yeast to ferment wort into beer. By measuring nitrogen, we can indicate the protein content in malt and wort.

Classical nitrogen measurement is done via the Kjeldahl method. The Kjeldahl method is not easy to automate, additionally the analysis time takes several hours and toxic or harmful reagents are used. Therefore, Skalar has developed an analyzer which fits better into the brewing industry.

The PRIMACS™ SNC-100 provides fast, efficient and accurate analysis results for total nitrogen (TN) / protein in malt and wort by using high temperature combustion according to Dumas methodology.

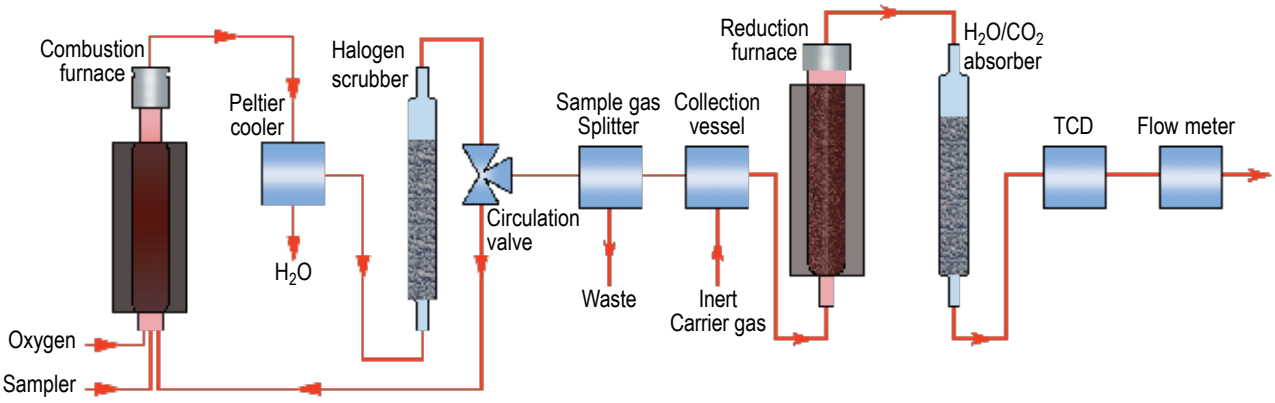
The analyzer contains an integrated autosampler with 100 positions. The sample rack is removable and re-usable ceramic crucibles are used for sample weights of up to 3 g of solids and up to 1 g of liquid material allowing simultaneous analysis of malt & wort in a representable sample volume.

Samples are automatically introduced in the high temperature combustion furnace through a unique vertical sample introduction system. Sample ash remain in the crucible after the analysis and are taken out of the instrument with removal of the crucible. This avoids sample ash build-up in the combustion zone and therefore significantly reduces maintenance and downtime.

In the combustion furnace, nitrogen is converted into NxOy in presence of oxygen. In the reduction furnace all nitrogen is reduced to N_2. The N_2 gas is measured by Thermal Conductivity Detection (TCD).

FEATURES

- Analyses of TN / Protein
- Re-usable ceramic crucibles
- Sample weights up to 3 g of solids and up to 1 g of liquid material
- 100-position autosampler
- Unique vertical sample introduction system
- Better alternative for Kjeldahl analysis, results in minutes and environmental friendly, less waste



Current Skalar Wort, Malt and Beer applications

ANALYSES PARAMETERS	SAN++ ® CONTINUOUS FLOW ANALYZER	PRIMACS™ SNC-100 ANALYZER	SP2000 SERIES ROBOTIC ANALYZERS
Acetaldehyde	x		
α-Amylase	x		
Anthocyanogen	x		x
Bitterness	x		x
Carbohydrates	x		
Carbon dioxide	x		
Color	x		x
Diacetyl	x		
Diastatic Power	x		
Ethanol	x		
ß-Glucan	x		x
FAN	x		x
Iron			x
pH	x		x
Nitrate + Nitrite	x		
(Soluble) Protein	x	x	
Polyphenols	x		x
Sulphur dioxide	x		x
Thiobarbituric acid value	x		x
Total Nitrogen		x	
Total Reducing Sugars	x		

Skalar has over 300 off-the-shelf methods in operation at brewing laboratories as well as other industries, such as water, soil - plant and fertilizer, detergent, food and beverage, wine and environmental analyses.

*For more information about the above or other applications, please contact Skalar.

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