

High throughput malt sample preparation solution for Carlsberg

Carlsberg
innovated their malt
analysis preparation
with Zinsser Analytic's
automation



Designed for your processes

Zinsser Analytic developed a liquid handling system which is used for malt analysis in the beer production to test certain criteria of the harvested barley. This way breweries make sure the beer doesn't change its taste and always keeps the same level of alcohol.

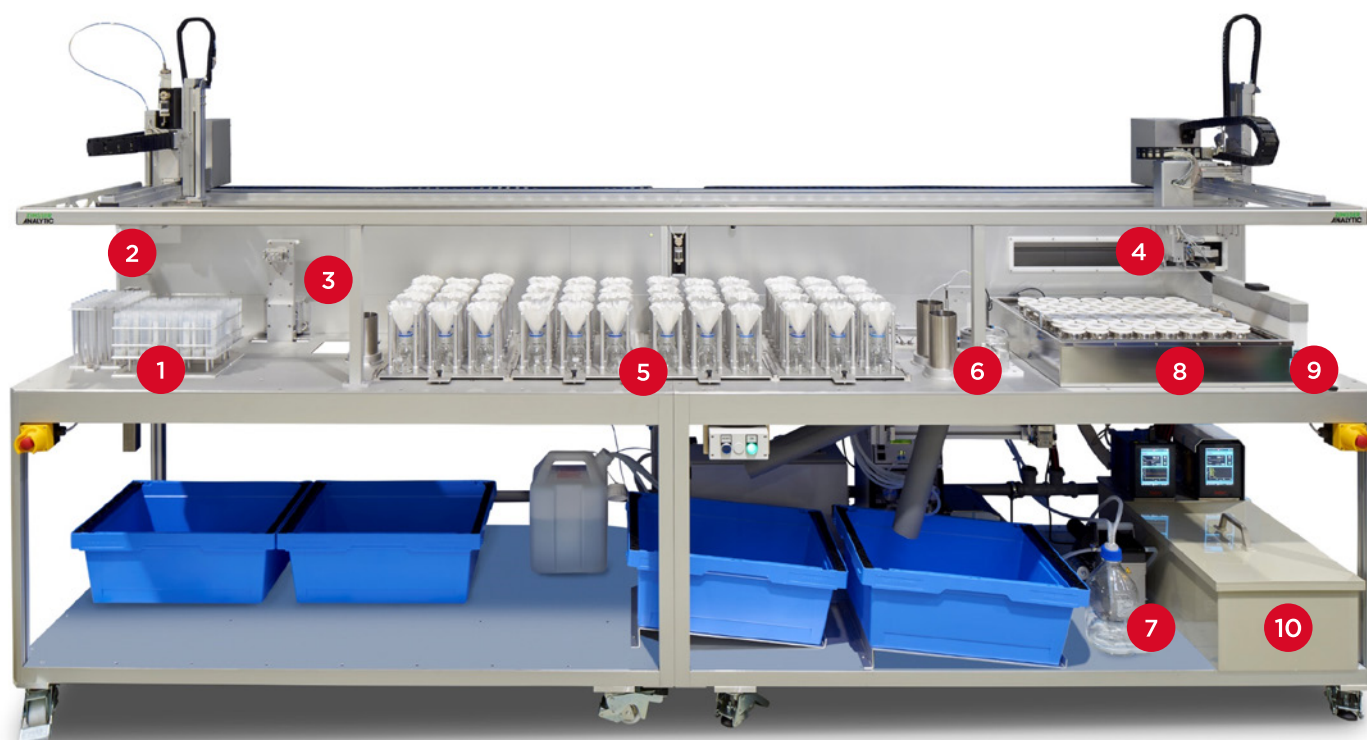
This analysis process is an essential part of brewing, however is very time and labor consuming when done manually. For this reason Carlsberg was looking for a solution that could automate the entire workflow and hence save time and cost.

- ✓ Precise Dispensing of Water to Malt Samples
- ✓ Various Heating Programs with Flexible Intervals
- ✓ Reproducible and Reliable Results
- ✓ Temperate Water is filled into the Water Bath with Submerged Magnetic Stirrers
- ✓ Stirring and Retaining of Magnetic Stirring Bar During Transportation of Beakers
- ✓ Customized Software Interface



HARDWARE DESIGN

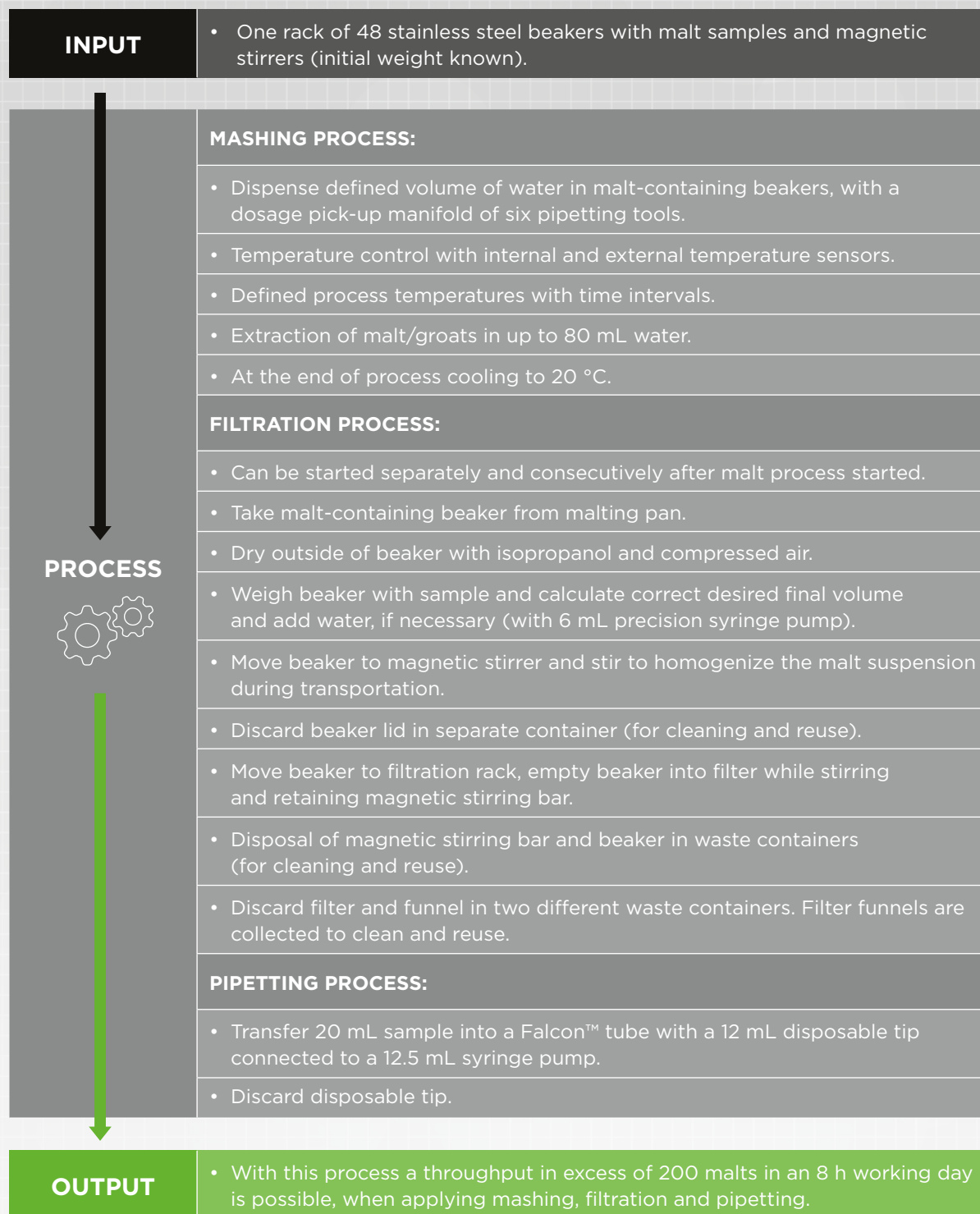
The hardware was designed for handling 48 samples in one run, including heating intervals, the filtration step and sample taking.



- | | |
|----|---|
| 1 | Target rack for further analysis (with Falcon™ tubes). |
| 2 | 12 mL disposable tip rack. |
| 3 | Filter and funnel drop station on separate arm. |
| 4 | Magnetic gripper for stainless steel beakers and retention of stirring bar. |
| 5 | Filtration racks with filters; four can be placed on the platform. |
| 6 | Magnetic stirrer, drying station and balance for volume correction due to evaporation, in addition to beaker and lid drop stations. |
| 7 | Bottle for liquid waste. |
| 8 | Temperature controlled basin for stainless steel beaker with submerged magnetic stirrers. |
| 9 | Priming and park station for dosage pick-up manifold. |
| 10 | Temperature controlled water reservoir. |

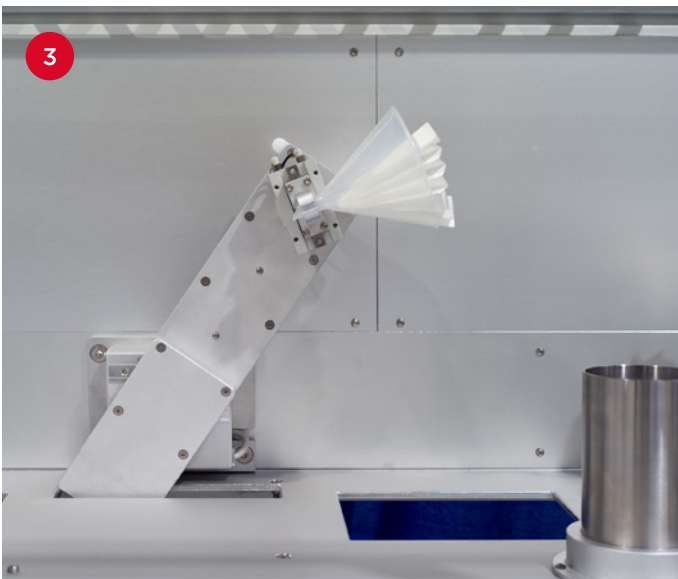
PROCESSES OF MALT ANALYSIS

Zinsser Analytic's system automated the whole process from extraction and filtration to pipetting and further analysis preparation. As an outcome the automated solutions did not only release the laboratory staff from tedious work but also increased the analysis output with 200 prepared samples within 8 h.



PRECISION IN EVERY DETAIL

With the broad variety of devices included in the modules we are able to automate almost every process.



2 3 4 Special Gripper and Arm Tools:

- Special gripper integrated in the workbench for disposal of filters and funnels into separated bins below the workbench.
- Herein we provided a gripping solution to overcome difficulty in automatically gripping versatile plastic funnels that are compressible when external pressure is applied.
- An extra-large adapter for 12 mL disposable pipetting tips including the connected precision syringe pump is applied.
- A second gripper with integrated magnetic stirrer to allow stirring during transportation of beaker. Additionally, the gripper tilts to fill the liquid into the funnel equipped with a filter, while retaining the magnetic stirring bar in the beaker.

6 8 Superior Labware:

- A water-submergible 48 position rack with 48 magnetic stirrers including temperature control was designed.
- Drying process of the beakers' outside with isopropanol and vacuum drying afterwards was installed.
- The refilling of evaporated water after the temperature profile through an integrated pipette with balance control has been included.

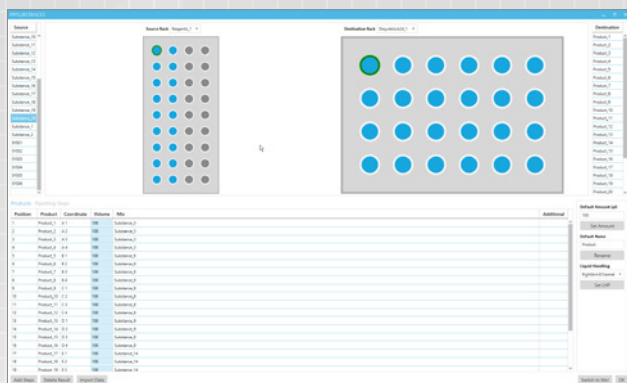


SOFTWARE SOLUTION FOR YOUR SPECIFIC PROCESS

Our software solution has a simple to use interface making it easy for your staff to configurate or change process steps by themselves. Every process step is designed modularly to help to set up a variety of individual processes depending on different powders, chemicals and solvents. This way you can easily set up the sample preparation process according to your requirements. Detailed Information about Zinsser Analytic's software solution are available in a separate note.

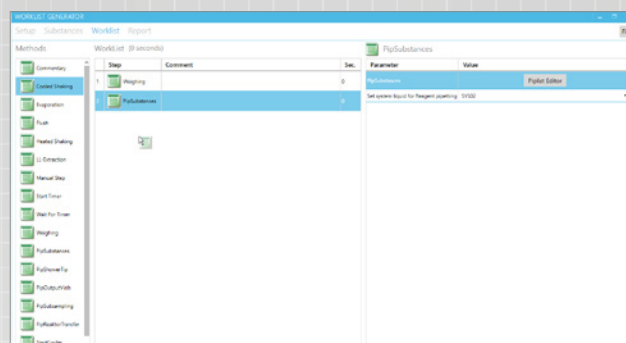
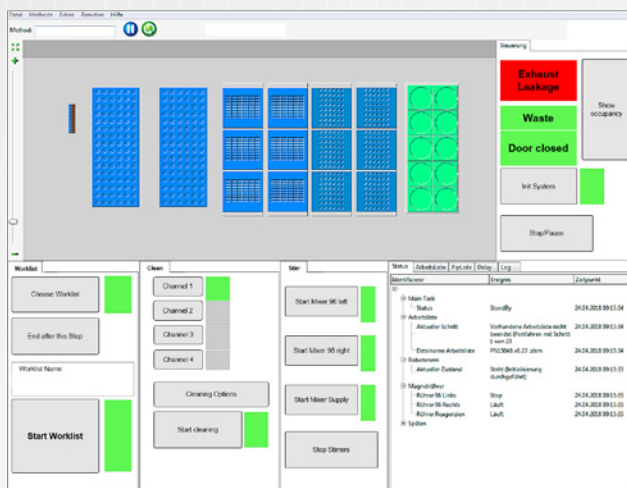
Worklist Generator

Drag and drop the needed methods to the desired positions of the worklist.



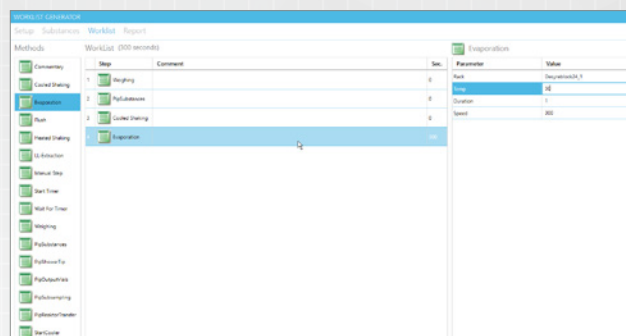
Method Definition

Input the desired time or anything the method requires, while you are defining the process. Each sample is tracked throughout the whole process, which enables easy and efficient workflow adaptations.



Pipetting Editor

For pipetting steps, the Pipetting-Editor is opened for the definition of racks and number of pipetting steps. Every filled position is indicated blue and the selected positions are highlighted green.



WinLissy®-Software

With our WinLissy®-software every prepared worklist of the Worklist-Generator is executable. Communication with customer specific databases or LIMS is easily conceivable.

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