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ZINSSER ANALYTIC
by Gardner Denver

Zinsser Analytic Works with Bayer AG to Automate their NMR and LCMS Sample Preparation

Speed up your analysis with our automated NMR and LCMS sample preparation solution.

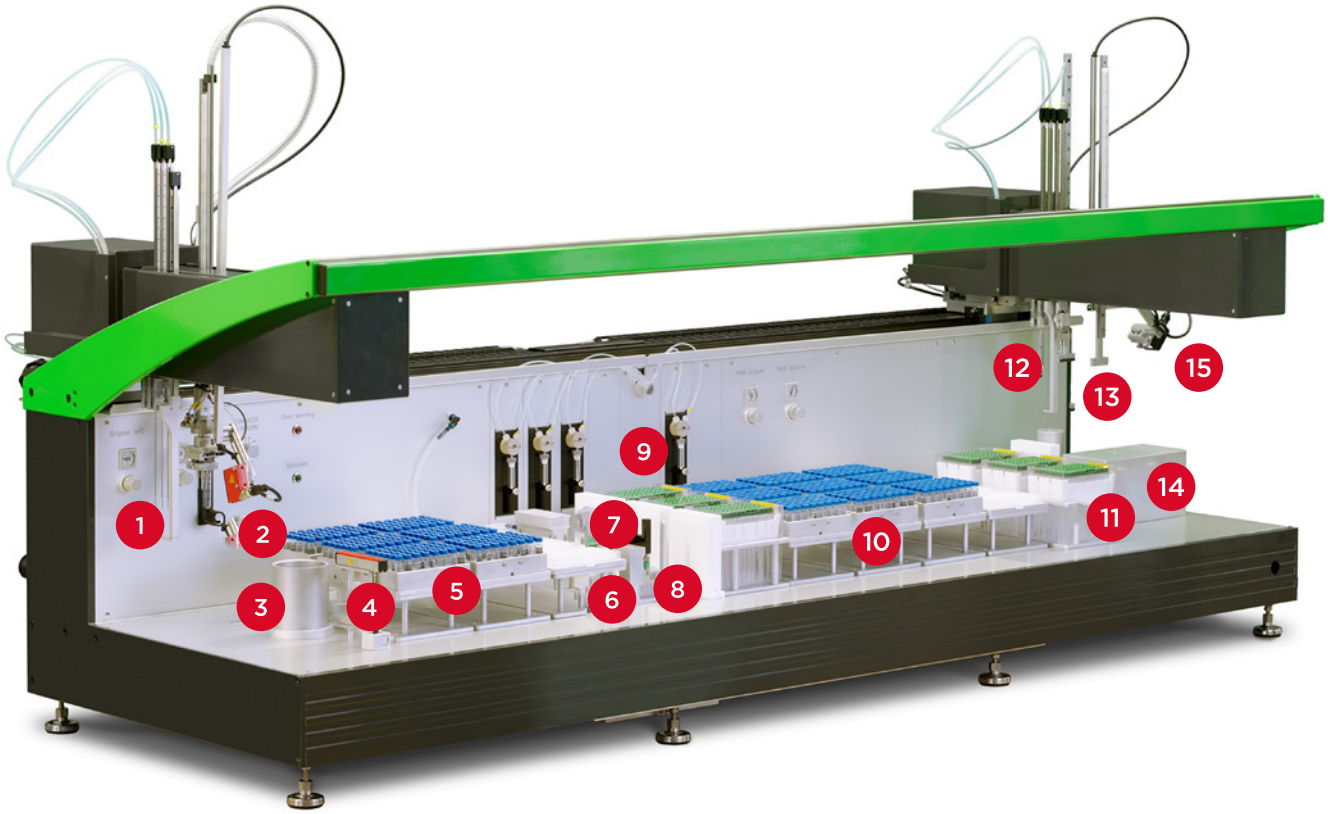
BAYER

Increase sample preparation throughput

The Crop Science Division of Bayer AG required an automated solution to improve the LCMS (Liquid Chromatography Mass Spectrometry) and NMR (Nuclear Magnetic Resonance) sample preparation process.

The high throughput, combined with extremely precise dosage requirements, meant that the Bayer AG needed an automated solution that provided the highest levels of accuracy and efficiency. Having seen the custom solution developed for a peer organization, the Crop Science Division of Bayer AG reached out to Zinsser Analytic to provide a tailored and automated solution.

- ✔ High Throughput of Preparation of Samples
- ✔ High Dosage Precision
- ✔ Reliable Results
- ✔ Customized Software Interface
- ✔ Improve Reproducibility
- ✔ Reduce Processing Cost



HARDWARE DESIGN

1	Customized tips with holding down clamp for NMR tubes.
2	2D Barcode reader for vials with 270° rotation.
3	Balance with housing.
4	Ionizer.
5	Source racks: Either 2 mL input vials and screw caps with septum OR deepwell plates.
6	Microtiter plates for LCMS analysis.
7	Evaporation manifold.
8	Adjustment station for positioning check of tips.
9	Precision syringe pumps.
10	NMR tube racks, 2 mL HPLC vial racks with caps and septum and microtiter plates for recovery of desired samples after analysis.
11	NMR tube racks with caps and POM balls for recovery or disposal after analysis.
12	POM ball adapter for setting of POM balls and customized tip with holding down clamp for NMR tubes.
13	Gripper for racks.
14	NMR cap with POM ball removal station.
15	2D Barcode reader for racks.

INCREASED OUTPUT AND REDUCED PROCESSING COST

The provided solution has improved the traceability of samples, accuracy and reproducibility of results; both desirable characteristics that allow the Bayer AG to bolster research and findings, and helping the division comply with a range of international quality standards.

The 24/7 operation has allowed the Bayer AG to increase the processed amount of samples to 40,000 per year; providing the division with a greater opportunity to discover new molecules.

The system also allowed the division to optimize a range of processes, such as the cleaning process, allowing them to reduce the amount of deuterated solvent by two thirds and thus reducing the cost per sample.

Following processes were customized:

Process A

- 2 mL sample vials with septum and 2 – 10 mg sample are provided.
- Read barcode and obtain tare information from database OR corresponding file.
- Add 500 – 1000 µL solvent after calculating correct volume (from database information).
- Shaking for dissolution.

Process B

- MTPs or DWPs are provided with samples.
- For DWP either dissolve in 700 µL solvent OR a volume regarding the corresponding initial weight.
- Aspirate and dispense multiple times for dissolution.

- Transfer 200 µL in NMR tube (4’ or 7’ tubes possible).
- Optional: press POM ball in cap of NMR tube.
- Pipette 10 – 50 µL in MTP and evaporate solvent with N_2 stream.
- Add 0 – 250 µL DMSO to MTP for LCMS.
- Aspirate and dispense multiple times for dissolution.

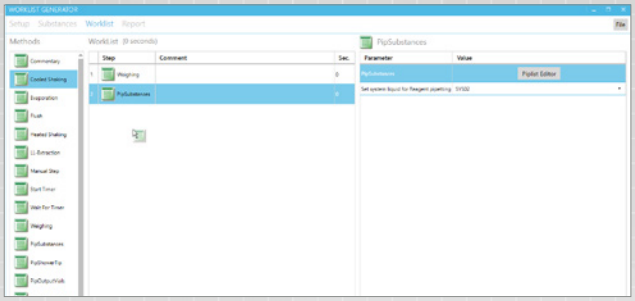
A throughput of **250 to 300 samples a day** is achievable with a preparation time of maximum **180 seconds per sample**.

RECOVERY

- Rack with NMR tubes and rack with 2 mL vials.
- Use recovery method: read from database which NMR tubes should be recovered.
- Remove cap and POM ball.
- Pipette sample through septum in new vial.
- Rest of NMR tubes is pipetted into waste.
- Partly used racks should be reused (saving free positions within database).

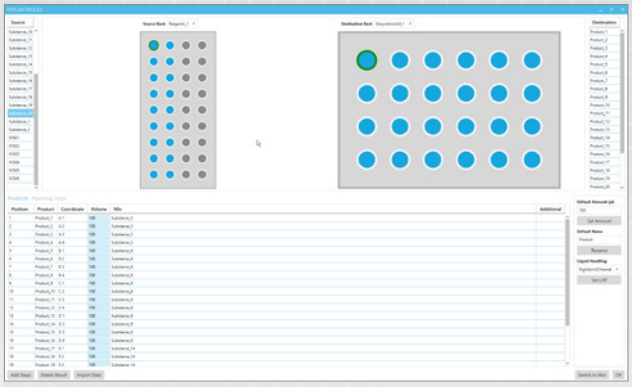
SOFTWARE SOLUTION FOR YOUR SPECIFIC PROCESS

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 system according to your requirements and processes.



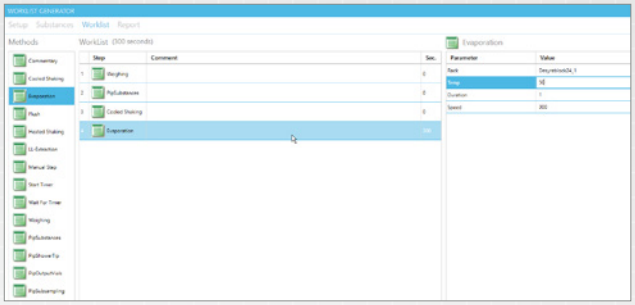
Worklist Generator

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



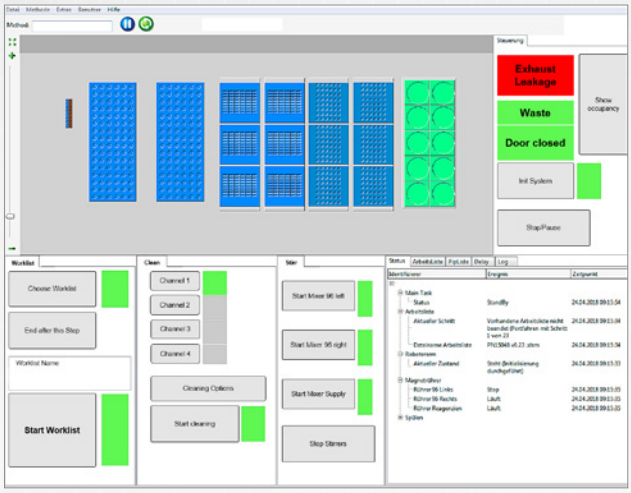
Pipetting Editor

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.



Method Definition

Input the desired time or anything the method requires, while you are defining the process.



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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