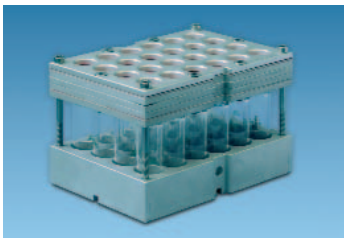
ZINSSER ANALYTIC

Formula X®

Automated System for Formulation Design & Development

Formula X® has been developed as an automation platform for the design and development of formulations for a variety of industries – pharmaceutical, chemical, petrochemical, personal hygiene and cosmetic. The system can handle highly viscous media using a variety of newly developed, patented hardware with both precision and accuracy. Formula X® can also dispense solid materials and, when used in conjunction with an integrated balance, both liquids and solids can be gravimetrically dispensed to a set target under full software control. The instrument is controlled by sophisticated but user friendly Windows based software "WinFormula", allowing experimental design, running of methods and full documentation in an integral database, providing full automation of formulation design and development.

- Precise gravimetrically controlled distribution of all components
- Liquid handling of solvent arrays
- Variable volume precision powder dispensing pipette
- Viscous media dispenser
- Temperature control
- Mixing and stirring
- Capping and De-capping
- Integrated viscosity meter for viscosity measurement & adjustment

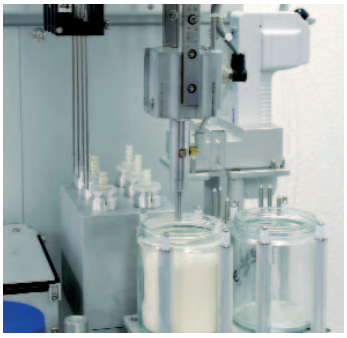


Parallel Processing

Formulations are prepared either in Zinsser Analytic's DESYRE reactor blocks which are manufactured from aluminium for efficient heat transfer. The modular blocks contain 96 (1ml), 48 (4 or 6ml), 24 (4,8 or 10ml) or 8 (20, 25 or 40ml) glass or PTFE reactors for smaller volumes or for higher volumens volumes in standard disposable glass jars (60, 150, 200, 300ml).
To prevent evaporation each individual reactor can be capped and uncapped individually with the integrated capper and de-capper unit, or sealed within the reactor block with piercable septa.

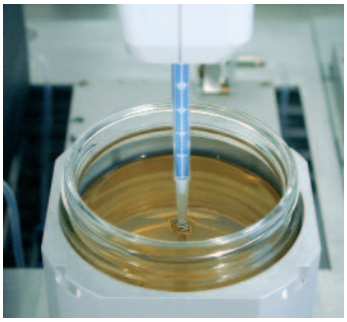
Gravimetric Dispensing

Formula X® is equipped with 4 standard stainless steel probes for standard liquid handling, a variable volume powder dispenser and a viscous media dispenser.
All dispensing steps are controlled gravimetrically - samples are dispensed to an exact weight, based on direct feedback from an integrated weighing cell.
The combination of volumetric and gravimetric dispensing enables outstanding performance, with precision and accuracy being > 99%.



Solid Dispenser

The well-proven solid dispenser REDI distributes as little as 1mg of the solid compounds. Unknown solids can be distributed accurately to a target weight using WeighWizard software in combination with the integrated balance. Thorough cleaning and dedicated tips for each powder prevent cross contamination when several solids are dispensed.
Highly reactive powders can be stored in screw-capped vials or can be kept in an inert environment.
For higher volumes, the powder feeder REDI Super can be integrated. REDI Super is ideal for a dispensing range from 100mg to 100g.



Viscous Media Dispenser

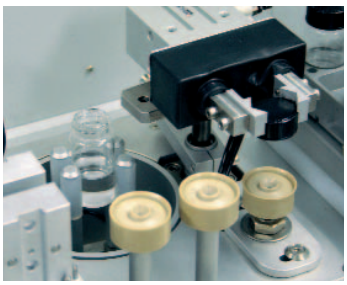
Highly viscous media (up to 15,000 cps) is dispensed using individual positive displacement tips which can also be heated. The software selects the appropriate tip size and the gripper brings it to a heating position, if required. There the viscous media dispenser picks it up, aspirates, moves to the reactor located on the balance and dispenses the sample gravimetrically.

Temperature Control

The entire process can be temperature controlled. The samples are stored on special vial racks with high temperature conductivity, on software-controlled heating positions.
Stirring and/or vortexing can also be performed under temperature control.

Mixing and Stirring

For efficient mixing, strong magnetic stirrers, vortexers and overhead stirring are available which are integrated into the platform.
All mixing devices can also be heated, with temperature being controlled by the WinFormula software directly.



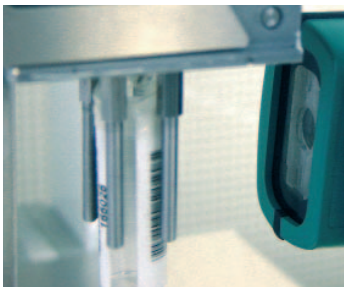
Capping and De-capping

A capper/de-capper unit can open and close screw capped sample vials to minimise their exposure to air.
It can also close the reactors to prevent evaporation.

Options

2D Barcode Reader

High resolution CCD barcode reading including 2D barcode reading of plates and tubes, allows you to track and store information relating to your samples.

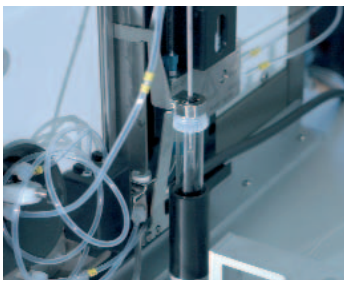


HPLC & LC/MS Sampling

Samples can be taken at any given time. There are several ways of preparing the samples. With filtration probes, the samples can be filtered from the top and transferred directly into the auto sampler vials. Alternatively, the samples can be purified on an integrated filtration station, processing the samples with controlled positive pressure through a filtration plate before they are transferred into HPLC vials. Additionally, the samples can be transferred into pre-crimped HPLC vials or open top vials, which can be automatically capped with either screw caps or aluminium caps.
The samples can be stored on cooling plates to avoid evaporation and degradation.

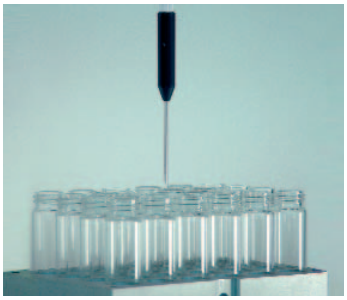
Viscosity Management & Adjustment

To measure the kinetic or dynamic viscosity of a sample during a run, a viscosity meter can be integrated. Based on the data the viscosity can be adjusted to a given target value.



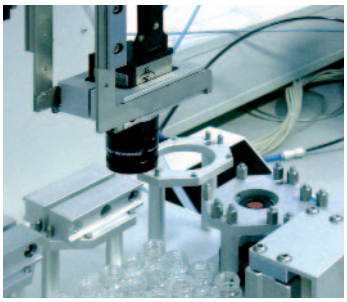
Filtration

Samples can be filtered using filter plates on an integrated vacuum manifold. The instrument transfers the samples to the filtration plate and the filtration can be achieved using vacuum or controlled positive pressure. The process is totally automated as the system can place the elution plate into the manifold and remove the lid for sampling after completion of the filtration step.



pH-Monitoring & Adjustment

An integrated pH probe can measure the pH value of the samples. The data is stored in a database and can be exported if required.
The pH can also be adjusted, if necessary, with the addition of acid or base to reach a pre-defined value. The gripper transports the probe and places it in the sample for monitoring. If acid or base is required they are pumped into the vessel through separate channels on the probe. The probe is thoroughly washed between samples.



Camera tool

A pick up camera tool can be used to document the status of the samples online. The camera can take pictures, either of each cavity individually or also of the entire block. The pictures are stored in a database so that you can keep them for documentation of your experiments. Special blocks are available which allow back lighting from a light box that the block sits on to ensure a clear picture.

Customised options

At Zinsser Analytic we supply systems tailor made to both your process and your preferred working practices. If there is anything you require on your system, which is not mentioned here, we will be happy to accommodate your needs.date your needs.

System Configuration of Formula-X®

Platform Liquid Handling

with robotic arm for transportation of vials or plates
4 stainless steel 1-channel pipetting probes 158mm; variable spacing between probes (8 to 38 mm) for every type of probe
Liquid level detection at each probe
4 precision syringe pumps (for 500 µl, 1 ml, 2.5 ml, 5 ml syringes)
Wash and vacuum drying station for pipetting probes
Capper/decapper for vials

Precision Powder Dispensing REDI-VARIX

1 powder distribution pick-up tool REDI-VARIX, software controlled variable volume powder pipette 30-245 µl
1 REDI cleaning station
6 powder reservoirs 60ml with stirrers
2 powder reservoirs 250ml with stirrers

Viscous Media Handling

Visc Dispensing Pick-Up Tool for Viscous Media
1 heated rack for Visc tips (heating optional)

Weighing and Mixing Modules

4-digit weighing cell, integrated into workbench
magnetic stirrer "super" for complete reactor blocks, temperature controlled, to be connected to recycling thermostat, 80-800 rpm

Carriers and Racks on the Platform

1 heated position for viscous media
3 heated positions for racks or blocks

Software

WinFormula software package for Windows
User friendly, “drag and drop” software
Experimental design of formulations with Zinsser Designer or Excel®
Creation of methods with Zinsser Designer or importing of parameters from Excel® from other sources
Complete audit trail for all samples
Data export in either ASCII or in Excel format to other compatible databases
Simulator function for “dry runs” of methods
Complete with PC, keyboard and TFT monitor

Dimensions

workbench 1200 x 710 mm - workarea 1000 x 290 mm

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