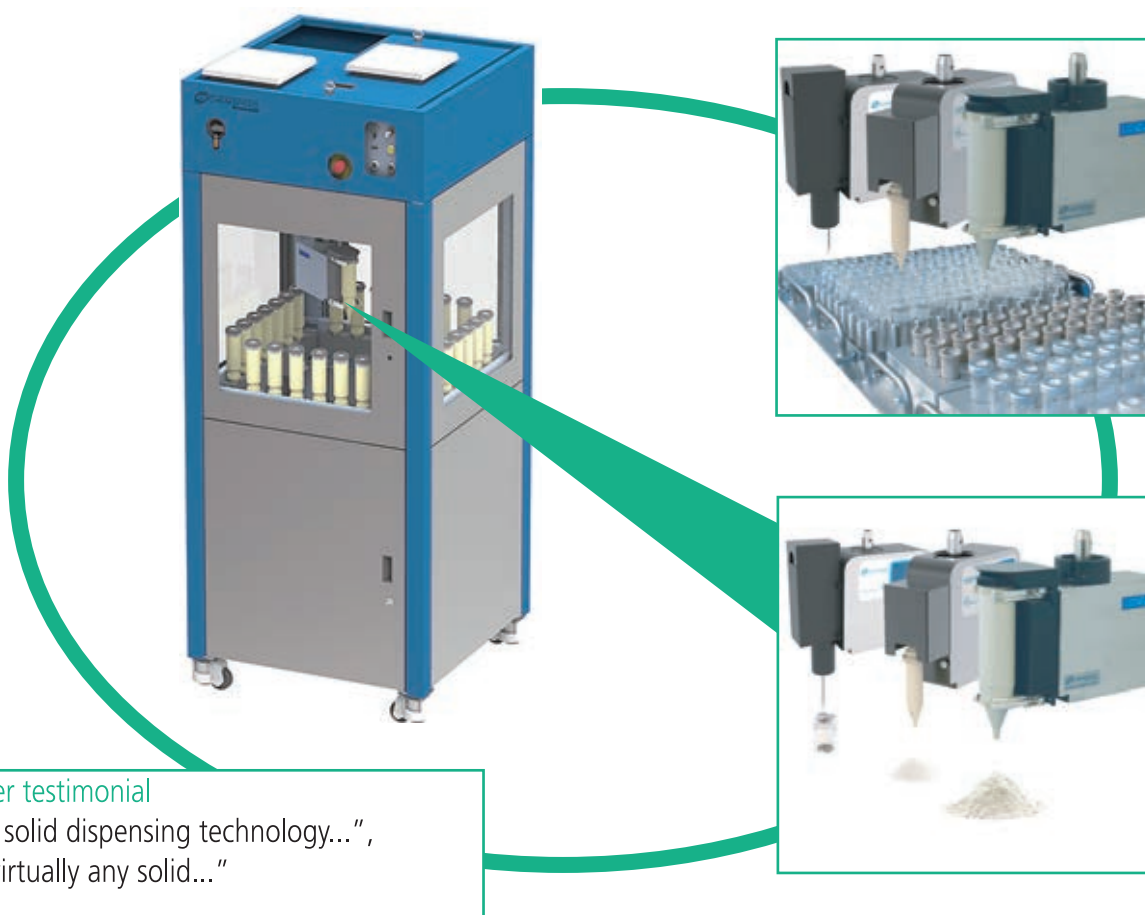


FLEX POWDERDOSE

Automated Gravimetric Solid Dispensing / Dosing

Precision, Accuracy, Speed, Traceability (For applications in a GMP environment)



Customer testimonial

"... best solid dispensing technology..." ,
"... for virtually any solid..."

Related brochures:

- *SWILE*
- *SWING POWDERDOSE*
- *SWING XDOSE*

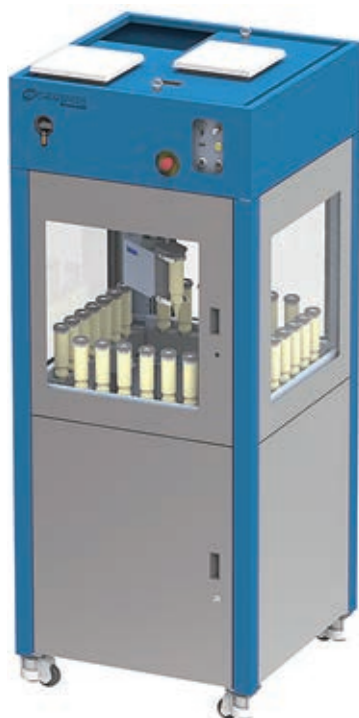
Robustness and Ease-of-Use by Design

Solid dispensing / dosing technology combined with our overhead gravimetric (patented) capability and our user-friendly software allow you to automatically dispense virtually any powder and extrudate into any type of container.

Precision – Speed – Accuracy
Performance – Versatility
R&D Cost Savings – High-Throughput

Key Advantages:

- Decrease in cost per sample up to 90+ %.
- Increase in productivity by a factor of 10+.
- The balance moves to the destination, increasing speed and efficiency.
- Gravimetric solid dispensing (low density, sticky, any particle size, spherical or granulates shapes, beads and tablets) into an unlimited choice of vial / plate / reactor formats.
- A large dispensing range, from sub mg up to several grams.
- Powder dispensing / dosing robotic tool can be combined with other tools to accommodate multiple workflows (e.g. 4-Needle Head for volumetric liquid handling and sampling).
- Dispensed amount and other data are stored in a read only log file.
- Easy access to data with a convenient interface to pull results into Excel or virtually any other software.



FLEX POWDERDOSE workstation



FLEX POWDERDOSE workstation with storage extension module

Enhance your Efficiency and Productivity with our Workflow Solutions!



Pick the appropriate solid



Gravimetric dispensing unit moves to destination

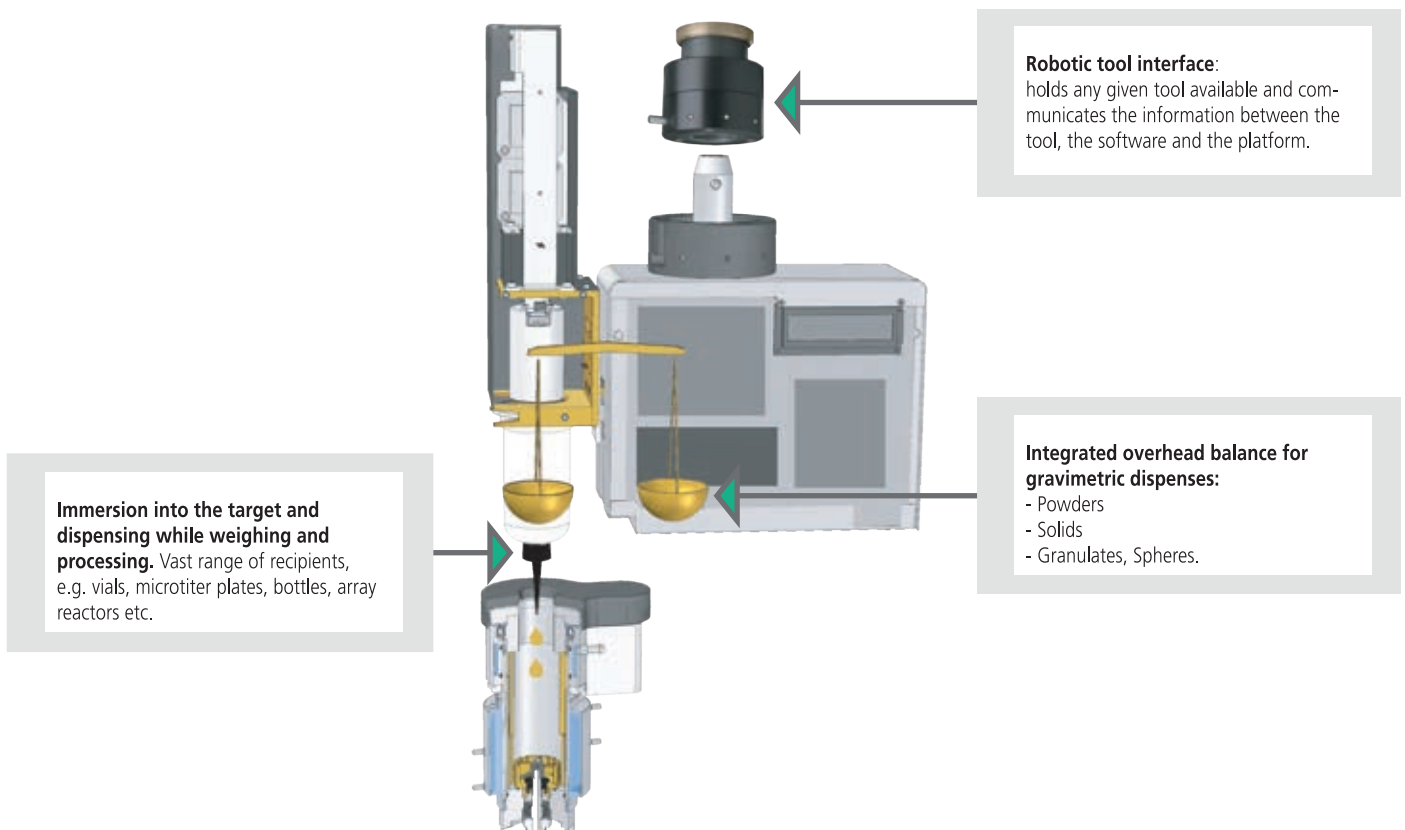


Gravimetric dispensing unit dispenses into destination while weighing

Unrivalled possibilities of extensions:

Expand your workflow with e.g. barcode reading, (screw) capping and crimping, shaking, mixing, and even with dissolution or further features.

Breakthrough Dispensing Technology: Overhead Gravimetric Dispensing WHILE Weighing and Processing



Technical Details

Chemspeed's **FLEX POWDERDOSE** deck modularity allows the user to execute and perform a variety of workflows in a fully automated fashion.

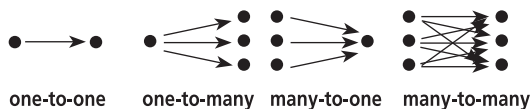
FLEX POWDERDOSE dimensions:
900 x 900 x 2'150 mm

FLEX POWDERDOSE with storage module:
1'800 x 900 x 2'150 mm

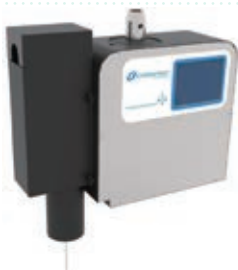


The **Gravimetric Dispensing Units** (SWILE and GDU-P models) are used to perform automated, gravimetrically controlled dispenses of a wide range of solids and powders from sub milligram to multigram scale. The modules pick the appropriate solid, dispense the solid / powder, and then place the solid back to its station before picking the next one. Both dispensing units include an overhead balance and allow dispensing and simultaneous weighing of solids and powders into various vials, well-plates or reactor formats.

Multiple dispensing configurations:



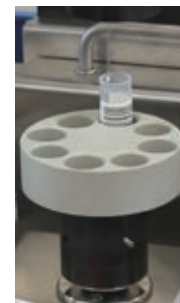
	Compound Type	Balance Resolution	Dispensing Range	Dispensing Container Volume
SWILE	Solids and Powders	0.1 mg (optionally down to 0.01 mg)	< 0.1 mg to 30 mg	Various types of positive displacement tips (SWIN)
GDU-P (Fine Dispensing)	Solids and Powders	0.1 mg (optionally down to 0.01 mg)	0.1 mg to 10 g	30 mL (smaller volumes upon request)
GDU-P	Solids and Powders	1 mg (optionally down to 0.01 mg)	1 mg to 100 g	200 mL



SWILE: Patented overhead gravimetric pick & dispense (0.01 mg resolution)

SWILE: First true one-to-one gravimetric pick & dispense of solid compounds

- Picking & dispensing directly from almost any source into any destination.
- Dispensing of a vast range of solid compounds from < 0.1 mg to 30 mg.
- Disposable positive displacement tips.
- No cross-contamination.
- No dead volume.
- A recovery rate equal or higher than in manual procedures.
- Unattended operation (with optional inert atmosphere).
- Picked & dispensed amounts and other data are stored in a read only log file.
- Easy access to data with a convenient interface to pull results into Excel or virtually any other software.



0.01 mg balance for the result



GDU-P: The Gravimetric Fine Dispensing Unit for solids and powders

GDU-P models:

- Typical dispensing time: 1 g in 20 sec (depending on powder flow properties).
- Reduced dispensing time: the balance moves from one target to the next, continuously dispensing and weighing without having to move the target to the balance.
- AutoTeaching tool to cover all your solids. Indeed, the software automatically finds the best parameters to dispense your powder.
- Automatic exchange of a dispensing cartridge if one is empty or clogged (container spanning).
- Optional, work under inert gas.
- Dispensed amount and other data are stored in a read only log file.
- Easy access to data with a convenient interface to pull results into Excel or virtually any other software.

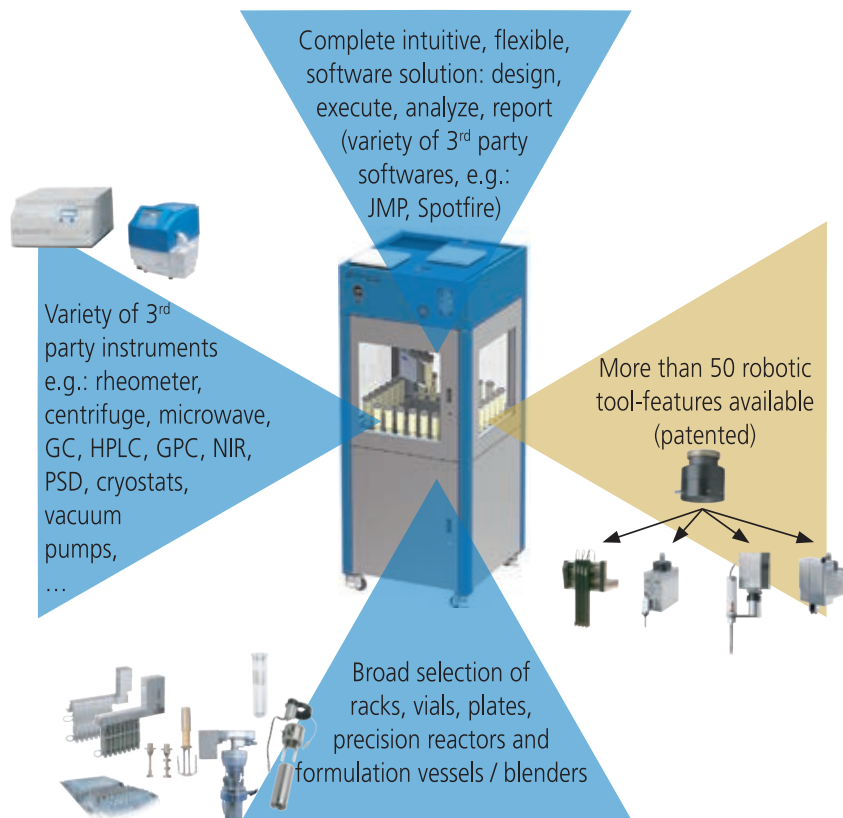
Available upgrade options:

- Powder dispensing / dosing robotic tool can be combined with other tools to accommodate multiple workflows (e.g. 4-Needle Head for volumetric liquid handling, e.g. sampling, dissolution).
- Storage extension module for solid / powder dispensing containers.



GDU-P: The Gravimetric Dispensing Unit for solids and powders

4 Dimensions of Modularity and Flexibility

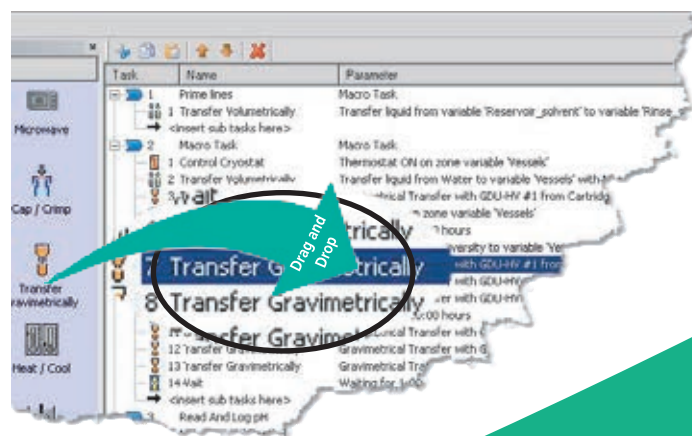


Complete Software Solution: Design, Execute, Analyze, Report

Chemspeed's AutoSuite User Interface & Executor software packages execute and control all modules of the entire product development cycle. They control all Chemspeed robotic platforms and any other integrated 3rd party software and hardware.

AutoSuite **FLEX** is a software with a user friendly interface which allows easy workflow oriented programming. Many features such as gravimetric dispensing are automatically calibrated, eliminating tedious optimization steps.

- The AutoTeaching tool simplifies dispensing applications without manual trials and is applicable to e.g. solids eliminating the need for manual optimization before the dispenses are done.
- **Easy programming: drag-and-drop workflow steps or just execute standard workflow protocols.**
- Barcode tracking.
- Easy integration with virtually any LIMS or ELN software.
- AutoSuite Application Programming Interface (API) for 3rd party software and hardware integration.
- Optional, Chemspeed VLab for DoE and Data Analysis / Reporting. It includes a full document management system (electronic lab-journal) and is 21 CFR Part 11 compliant. The software scales from a single PC to large network installations with multiple hardware and clients.



Easy Programming – Intuitive interface

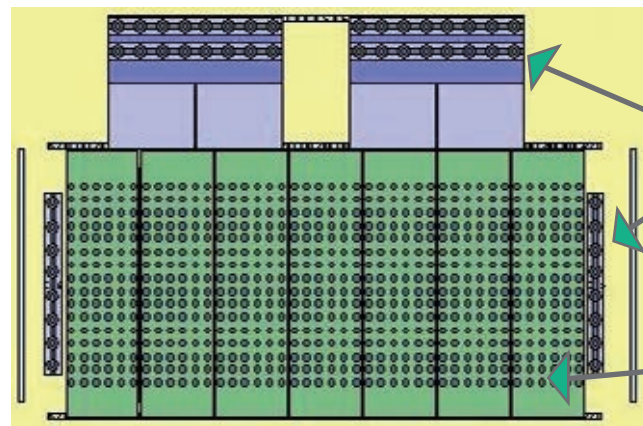


Platform Configuration Example

Exemplary **FLEX POWDERDOSE** deck with reagent / sample racks, solid / powder dispensing container and the following tools:
 Gravimetric Dispensing Unit (GDU-P models)
 for solid dispensing, or SWILE.



SWILE: Patented overhead gravimetric pick & dispense (0.01 mg resolution)

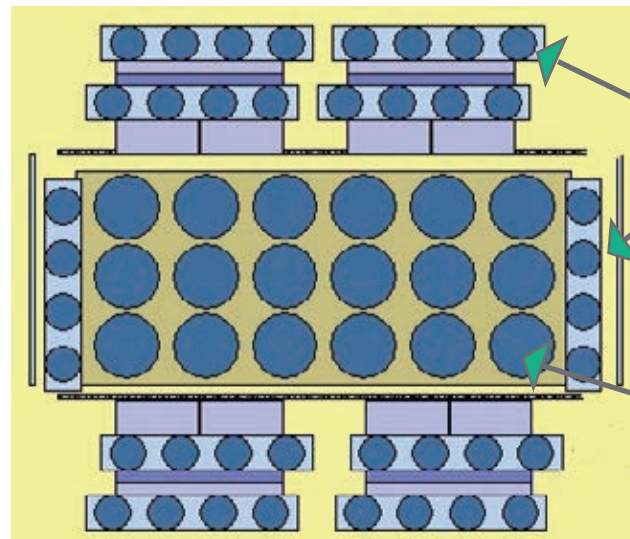


48 x GDU-P fine dispensing containers 30 mL for solid / powder storage

7 racks with 96 x 2 mL vials = total of 672 vials



GDU-P: The Gravimetric Fine Dispensing Unit for solids and powders

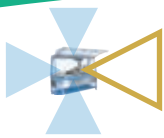


40 x GDU-P containers 200 mL for solid / powder storage

Rack with 18 x beakers 100 mm diameter



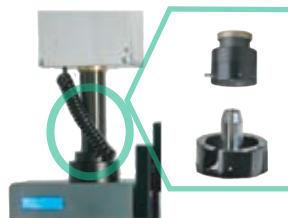
GDU-P: The Gravimetric Dispensing Unit for solids and powders



















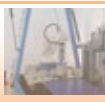
Robotic Tool-Features


More than 50 robotic tool-features can be integrated including unrivaled overhead gravimetric dispensing, which can operate while mixing, heating and cooling. Virtually any combination of these robotic tools is possible.

Highlighted are the most common and recommended robotic tool-features for the **FLEX POWDERDOSE** robotic platform.

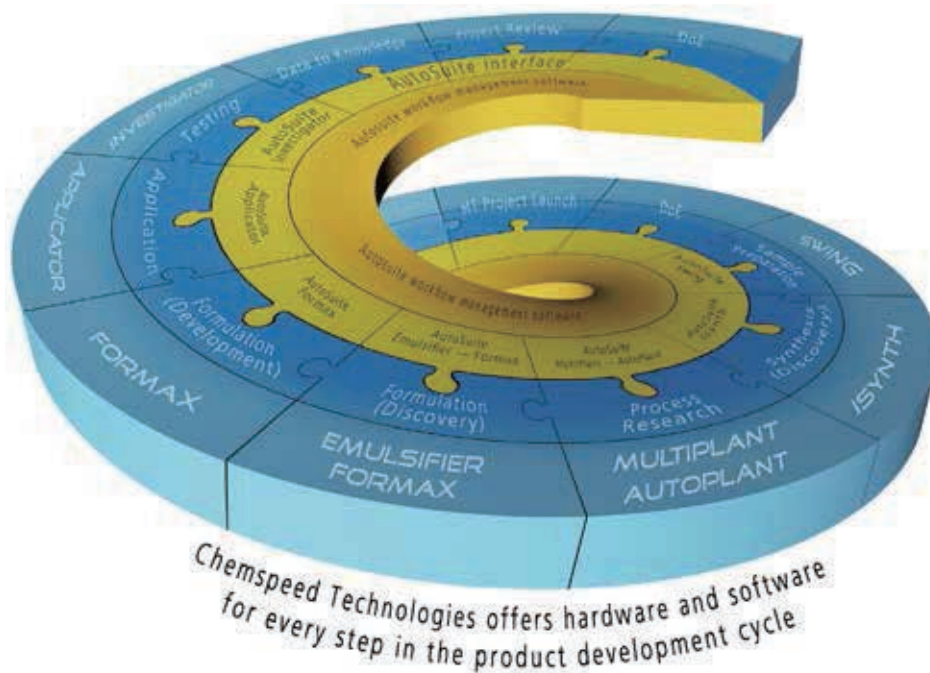


Robotic tool exchange interface (proprietary)

Precision balance Overhead gravimetric dispensing robotic tools (proprietary)	Volumetric dispensing robotic tools	Action robotic tools	Analytic robotic tools
<p>NEW</p> <ul style="list-style-type: none"> Overhead gravimetric 1:1 pick & place / dispense of solids & powders DIRECTLY from virtually any source to any destination (<0.1 mg to about 30 mg) Disposable pick & dispense tips (no dead volume) resolution: 0.1 mg (or 0.01 mg with a second balance) 	<ul style="list-style-type: none"> Liquid handling powered by 4 syringe pumps (syringe volumes: 1, 10, or 25 mL) for viscosities from 1 mPa-s to 100 mPa-s Special options: <ul style="list-style-type: none"> Disposable tips (1'200 µL) Disposable syringes Heated needles (up to 100°C) Spray needles pH and temperature measurement and control Coated needles, PEEK needles... 	<ul style="list-style-type: none"> Multigripper for vial and MTP transport and much more Automated barcode scanner 	<ul style="list-style-type: none"> Online density measurement (aspiration technology), on the fly resolution: 1 mg (or 0.01 mg with second balance) 
<p>NEW</p> <ul style="list-style-type: none"> Overhead gravimetric fine dispensing of solids & powders (0.1 mg to 10 g) Dispensing container volume: 30 mL resolution: 0.1 mg (or 0.01 mg with a second balance) 	<ul style="list-style-type: none"> Liquid gas dispensing with gravimetric control resolution: down to 0.1 mg 	<ul style="list-style-type: none"> Screw capper Vial diameter range: from 10 mm to 50 mm Larger ranges available Torque range: from 0.1 Nm to 1 Nm 	<ul style="list-style-type: none"> Brookfield Viscosimeter (RVDV-II+ Pro BK) 
<ul style="list-style-type: none"> Overhead gravimetric dispensing of solids & powders (1 mg to 100 g, larger volumes are available) Dispensing container volume: 200 mL resolution: 1 mg (or 0.01 mg with a second balance) 		<ul style="list-style-type: none"> Capping, crimping (N8 / N11 / N13 / N20) Decapping (N8 / N11 / N13 / N20) 	<ul style="list-style-type: none"> Tri gloss measurement Thickness measurement Color measurement Precision tack-cure 
<ul style="list-style-type: none"> Overhead gravimetric dispensing of highly viscous liquids, pastes and creams (1 mg to 100 g) with viscosities from 1 mPa-s to 500'000 mPa-s (based on Newtonian substances) resolution 1 mg (or 0.01 mg with a second balance) Optional aspiration feature Optional transfer of hot (up to 90 °C) substrates via heatable cartridges (e.g. for waxes) 		<ul style="list-style-type: none"> High shear homogenization (11'000 to 30'000 rpm) 	<ul style="list-style-type: none"> Camera Observation of dissolution Particle size distribution and dynamic light scattering
<ul style="list-style-type: none"> Overhead gravimetric aspiration and dispensing of viscous liquids (1 mg to 100 g) with viscosities from 1 mPa-s to 15'000 mPa-s via disposable positive displacement syringes, resolution: 1 mg (or 0.01 mg with a second balance) 	<ul style="list-style-type: none"> Overhead gravimetric / volumetric aspiration and dispensing of viscous liquids (0.1 µL to 12.5 mL) with viscosities from 1 mPa-s to 15'000 mPa-s via disposable positive displacement syringes, resolution: down to 1 µL 	<ul style="list-style-type: none"> Overhead stirrer (20 to 200 rpm) Different stirrer types available 	
		<ul style="list-style-type: none"> Ultrasonic dispersion (100 W) 	
		<ul style="list-style-type: none"> Vacuum / Degassing Reflux condenser Evaporation Filtration 	
		<ul style="list-style-type: none"> High speed injection molding Foam formation 	
		<ul style="list-style-type: none"> Draw-down with disposable or reusable precision spiral and / or gap bars Free film generation Dip coating Spray coating Wet-on-wet coating 	
		<ul style="list-style-type: none"> Robotic transfer arm to serve 3rd party instruments e.g. centrifuge 	

15+ Years of Experience in Automated Experimentation.
 Customized Workflow Solutions.
 Swiss Quality Products.
 An International Team of Highly Experienced Chemists.

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