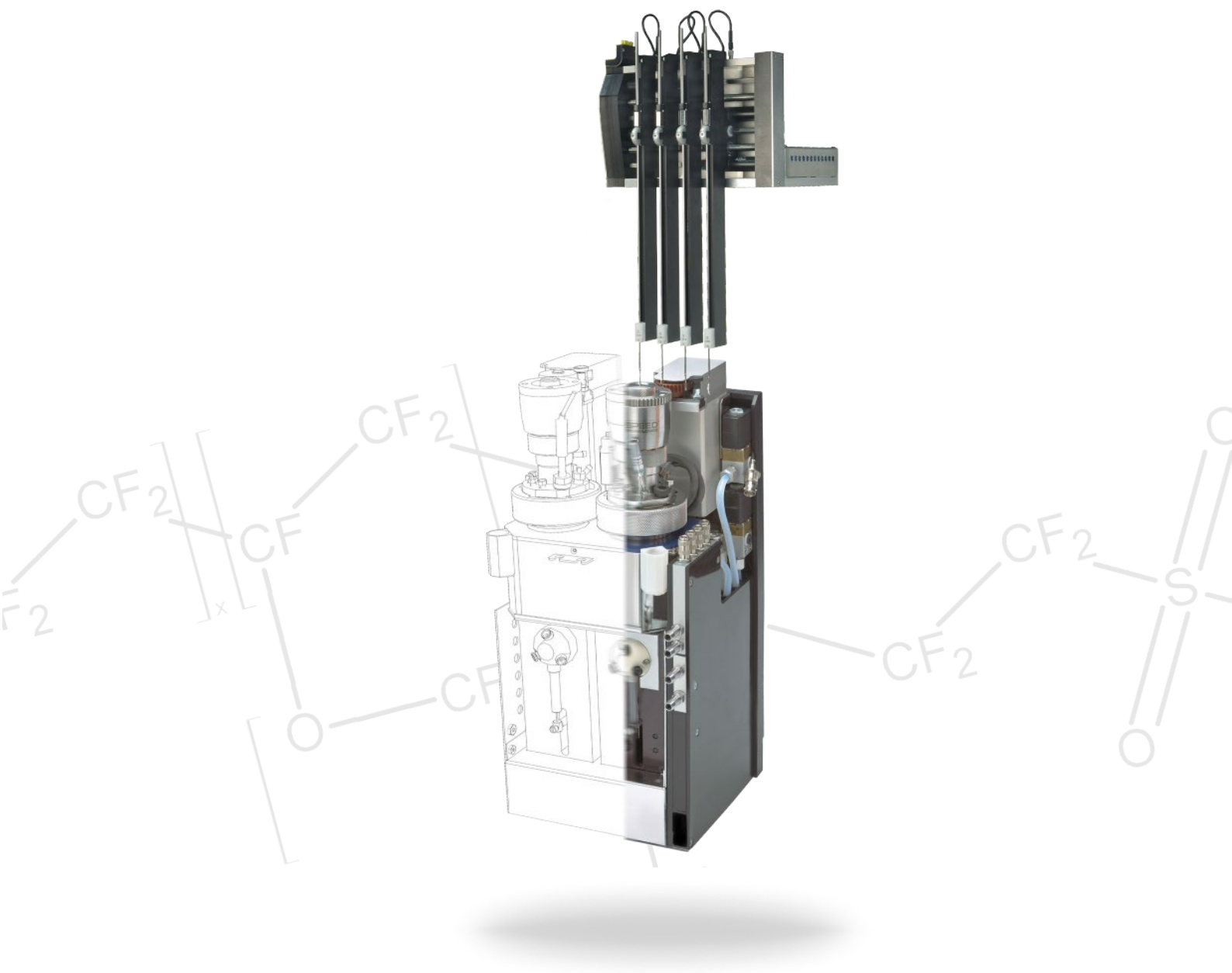


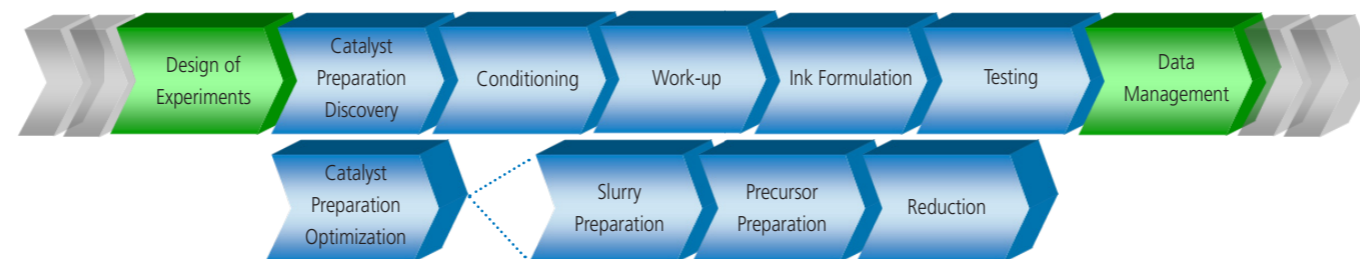
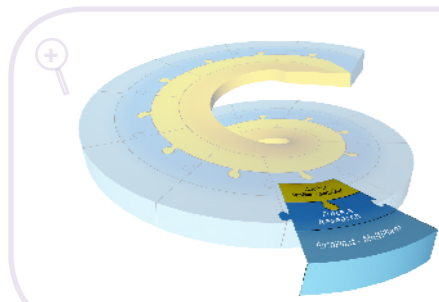
AUTOPLANT/ MULTIPLANT FC

from concepts to success

- Faster & better fuel cell catalyst discovery & optimization -



from concepts to success



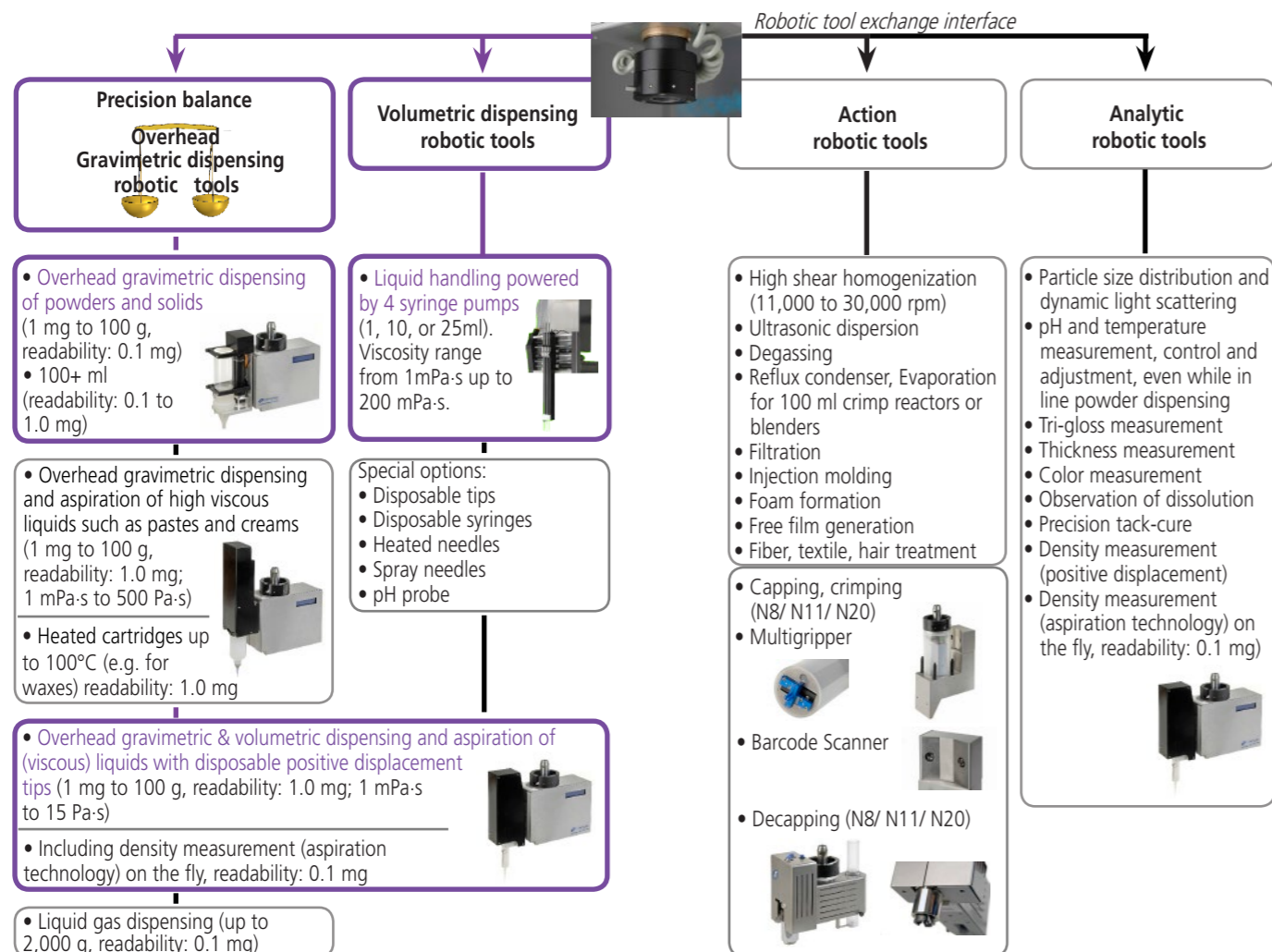
AUTOPLANT FC, a robotic platform for fuel cell catalyst discovery & optimization

AUTOPLANT FC is Chemspeed's software-driven robotic platform designed to automate fuel cell catalyst development. The reproducibility is increased, you gain from enhanced throughput, and reach better results faster!

- AUTOPLANT FC brings paradigm shifting modularity enabling an easy to use workflow task driven software
- Exchangeable robotic tools
- Unrivaled gravimetric dispensing technology
- High quality, flexible and modular reactors
- A large choice of hardware and software tools allow fine tuned adaptation to your workflow

Unrivaled gravimetric dispensing technology & exchangeable robotic tools

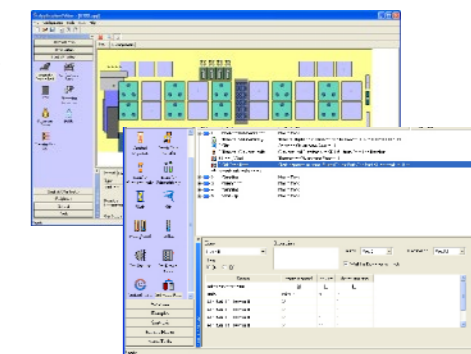
More than 30 features can be delivered with Chemspeed's unique robotic tool exchange technology, including unrivaled overhead gravimetric dispensing tools.



Powered by AutoSuite AUTOPLANT FC user interface

AutoSuite AUTOPLANT FC is an intuitive user interface software which allows easy workflow orientated programming. Many features such as the gravimetric dispensing steps are automatically calibrated, eliminating tedious optimisation steps.

- The AutoTeaching tool allows to dispense solids, liquids, viscous liquids, and waxes without manual optimizing steps, and with high precision, accuracy and speed
- Easy programming: drag-and-drop workflow steps
- Barcode tracking
- Smooth integration into Chemspeed's workflow management software (see reverse)
- AutoSuite Application Programming Interface (API) for 3rd party software and hardware integration (standard integration of Spotfire, JMP, VirtualLab etc. as well as many instruments listed on the reverse page)



High-performance preparation reactors and flexible configuration

Chemspeed is able to dispense any type of compound into any type of container (vial, microtiter plates, bottles, reactors, formulation vessels etc.) (Please refer to other Workflow Brochures)

Reaction preparation:

- Preparation of metal salt solutions and combinatorial mixtures thereof
- Preparation of homogeneous suspensions of carbon powder and aqueous reducing agent in parallel reactors

Catalyst preparation optimization in tank reactor:

- Variation of feeding rates/ratios
- Stirrer speed/geometry
- Temperature profiles
- Refluxing
- Hydrogen pressure (optional)
- Up to 36 fuel cell catalysts per run

Conditioning:

- Defined particle sizes by applying a dip-in sonifier probe
- Dip in titanium sonifier probe
- 100W total power output
- Dynamic rinse station

Work-up:

- Filtration and washing
- Evaporation to dryness
- Mixing with Nafion solution and electrolyte to prepare catalyst ink
- Reforming into output vials or microtiter-plates

Testing:

- Option for integrated galvanostat/ potentiostat



Material of choice: glass, stainless steel (available inserts), others on request



Easily exchangeable stirrer design (anchor, twisted blade...). Powerful mixing for viscosities up to 80 Pa-s at 300rpm and 30 Pa-s at 900rpm



Sonification



MiniPlant: highly flexible



Accessories

All tools and accessories of Chemspeed's Swing, Sweigher, Swave, Synthesizer SLT II, Formax, Applicator and Investigator are fully compatible with the **AUTOPLANT FC** robotic platform and vice versa (see the high output product development spiral below). Please refer to Chemspeed's other workflow brochures for modularity examples.

- Testing module, galvanostat / potentiostat
- Large choice of sample, reagent, and customized racks
- Cleaning module
- Tailor-made customer care package



High output product development spiral

Chemspeed's AutoSuite workflow management software integrates with:

1. All of Chemspeed's robotic platforms for

- Sample preparation workflows
- Parallel array synthesis workflows
- Parallel process research workflows
- High output formulation workflows
- High output application workflows
- High output testing workflows

2. Third party instruments

Chemspeed integrates a vast number of 3rd party components (e.g. in robotic tools). Please refer to Chemspeed's Workflow Portfolio brochure and/ or contact your Chemspeed's representative.

3. Third party software such as

- SpotFire (premium data visualization and selection)
- JMP (design of experiments - DoE)
- VirtualLab (lab journal, workflow management, instrument control)
- and many other laboratory software through industry standard languages (SQL, .net, C#, etc)

