

MULTICOATER

Easy, Modular, Versatile



ROBOTIC PLATFORM FOR THIN FILM PREPARATIONS



- Ultrasonic Spray Coating
- Electrospinning
- Inkjet Nozzle
- Dip coating
- Process Automation

Introduction

In R&D institutions, universities and startup companies engaged in material science, the question of how to apply a formulation to a substrate often arises. Manual application has proven to be inaccurate and unreliable, thus the need for a coating device. Although such machines already exist, their inflexibility means that many such machines must be purchased to support even a subset of the most common coating techniques.

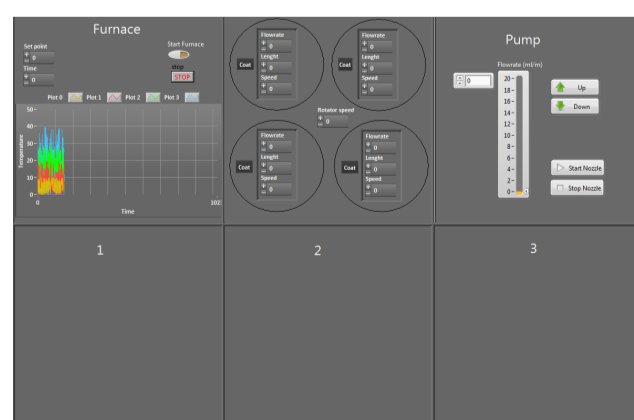
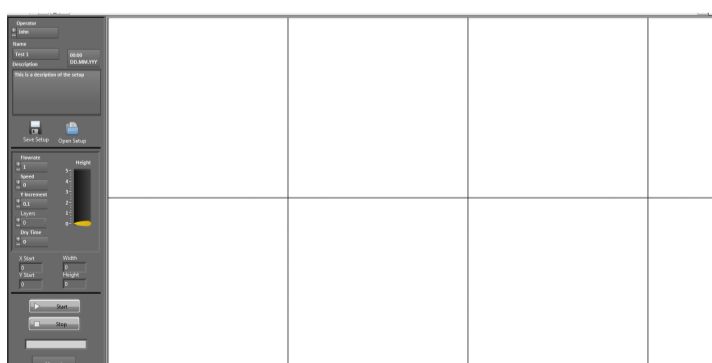
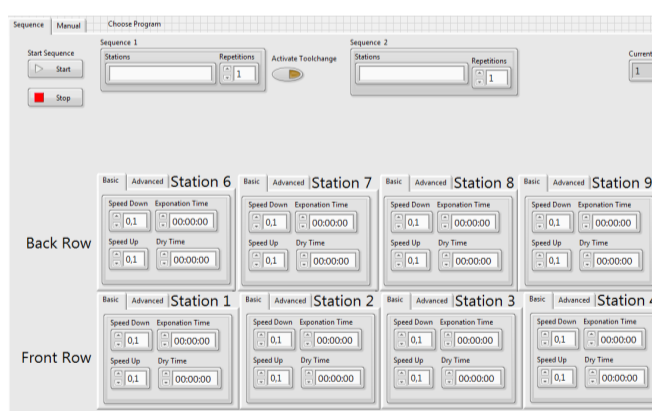
The modular approach



The Multicoater instead offers a wide range of modules that facilitate different coating techniques. This modular approach allows a single machine to support many common coating techniques used today. In addition to different coating modules, various pre- and post-coating modules are offered, such as furnaces, UV irradiators, driers, ultrasonic baths and beaker racks. This allows the MultiCoater to perform fully automated inline thin film fabrication.

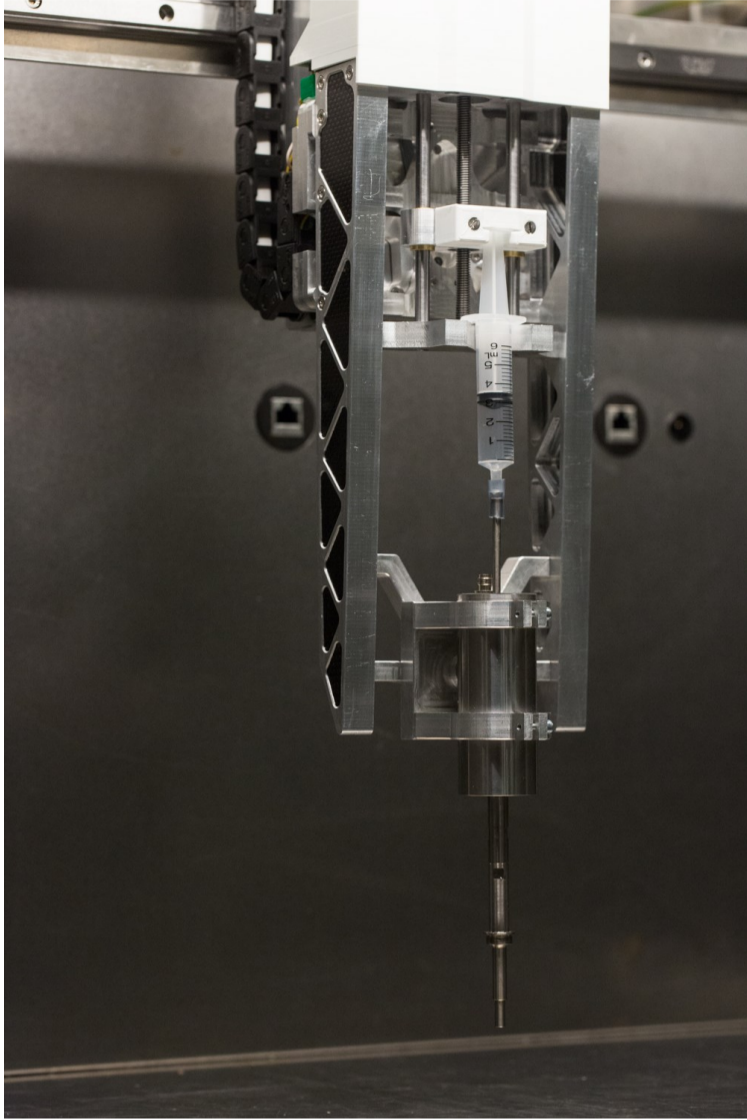
Software and user interface

The software is just as modular as the hardware. Each setup and module has its own user interface which makes it effortless to learn and use on daily basis. Just configure your desired parameters and hit play. No programming needed. Everyone can learn to use a Multicoater module in just minutes



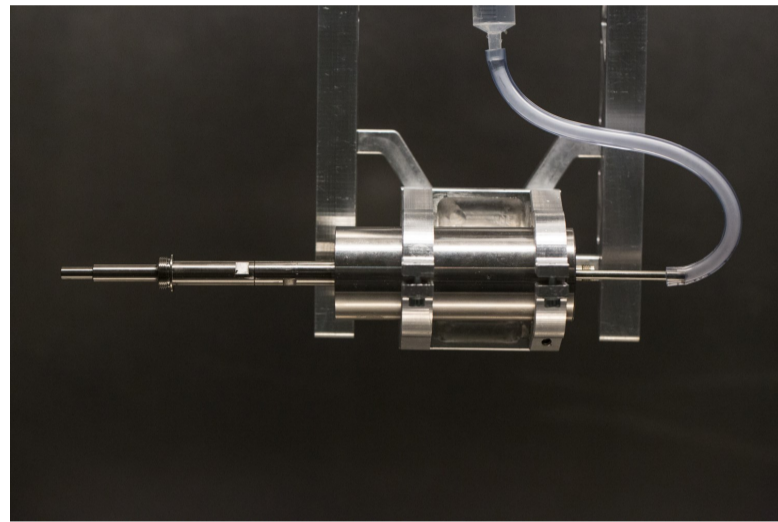


Ultrasonic spray coating



The ultrasonic nozzle provides small uniform drops that results in thin homogenous layers. The module is fully equipped with a pump and changeable syringes of different sizes. The short distance from the syringe to the nozzle reduces material waste.

LRC provides several accessories with graphical user interface, making it easy to setup and use.



The module lets you adjust the nozzle 90 degrees for both vertical and horizontal coating.

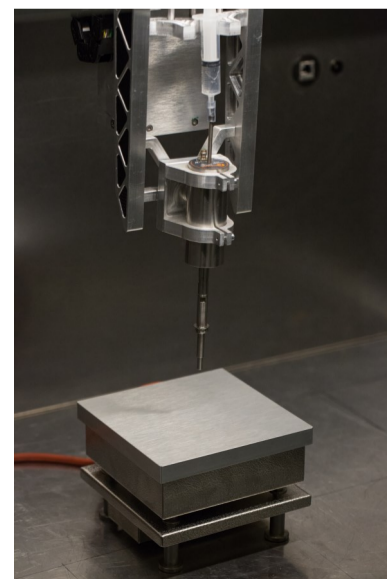
Application

- Fuel Cells
- Transparent Conductive Films
- Carbon Nanotubes
- Solar Cells
- Spray Pyrolysis
- Gas separation

Accessories



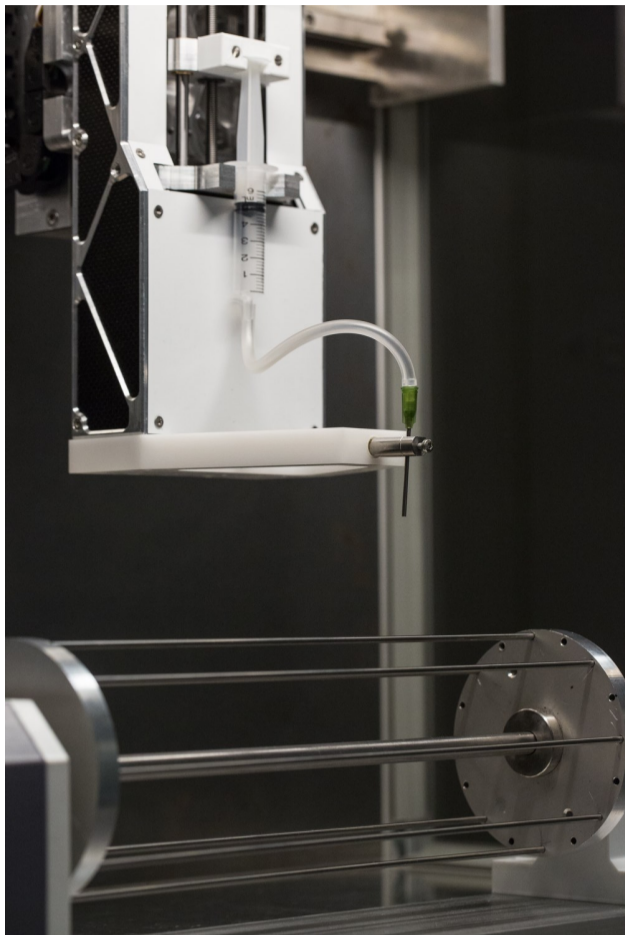
Rotating device for tubular substrate.



Heating plate



Electrospinning

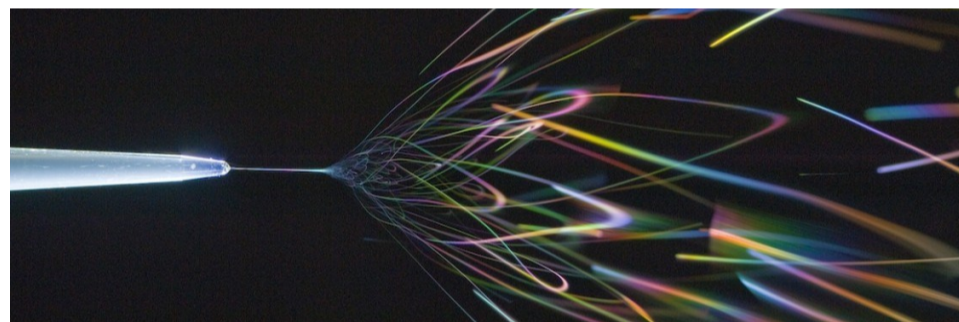


With the emergence of nanotechnology, researchers are increasingly studying the unique properties of nanoscale materials. Electrospinning, an electrostatic fiber fabrication technique, has elicited more interest and attention in recent years due to its versatility and potential for applications in diverse fields.

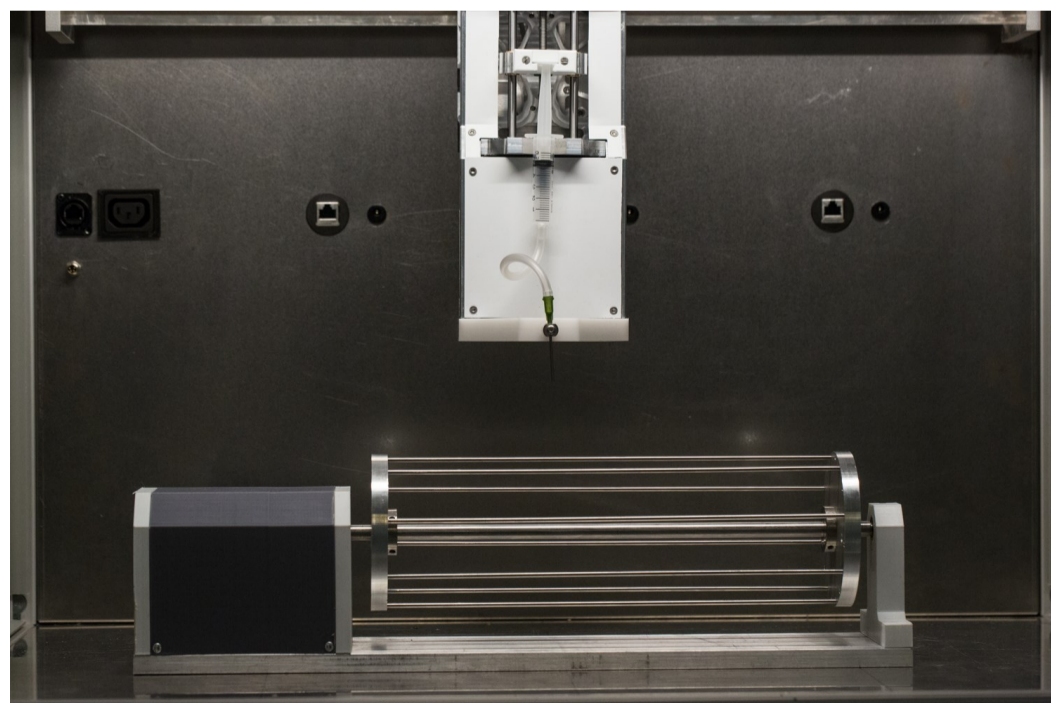
The nanoscale fibers are generated by the application of strong electric field on polymer solution. The sub-micron fibers produced by this process offer various advantages like high surface area to volume ratio, tunable porosity and the ability to manipulate nanofiber composition in order to get desired properties and function.

Applications

- Sensors
- Energy Storage
- Catalysis
- Biomedicine
- Cell Adhesion
- Tissue Engineering
- Filtration



Electrospinning is a fiber production method which uses electric force to draw charged threads of polymer solutions or polymer melts up to fiber diameters in the order of some ten nanometers



Dip Coating



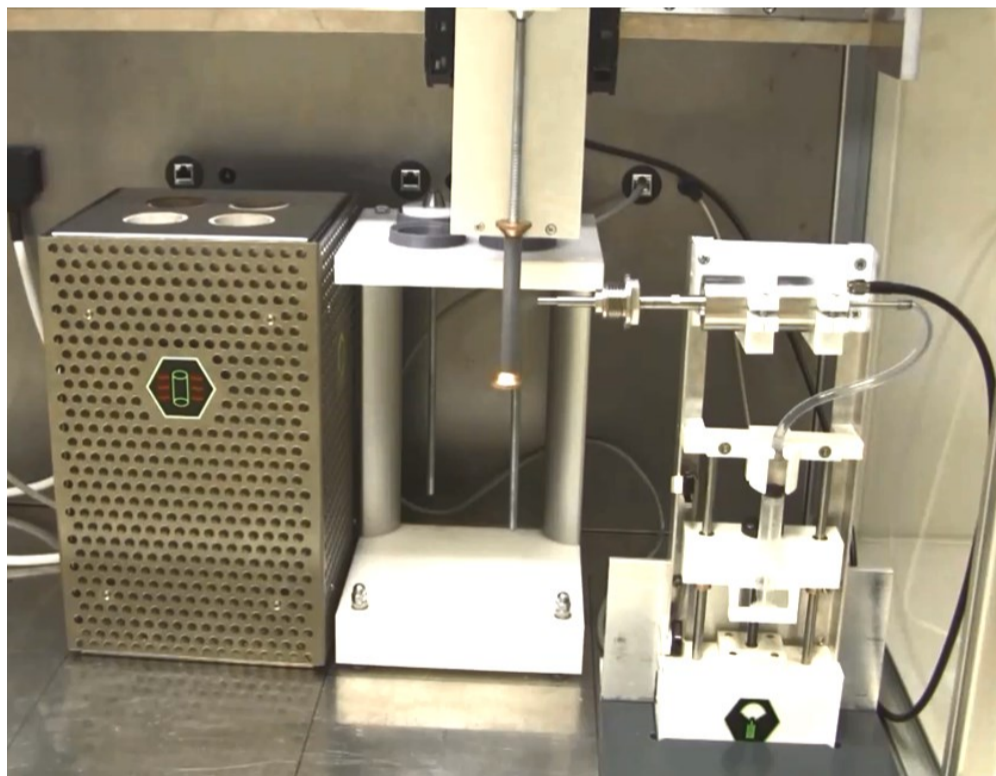
Make thin films on both simple and complex shaped substrates with good control over film thickness and porosity, by playing around with immersion speed, withdrawal speed, immersion duration and drying times. This method is especially good for layer by layer deposition to create hybrid and micro/nanoporous coatings. A simple, fast and cheap way to transform sol gel solutions into functional thin films.

Applications

- Layer by layer deposition
- Organic-inorganic Hybrid materials
- Conformal Coatings
- Protective and decorative coatings

Accessories

LRC offers a wide range of accessories for process automation for the MultiCoater, allowing for pre and post processing of samples.

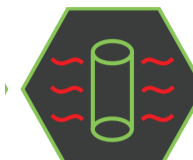


Pick & Place

The Pick And Place module allows for handling several samples and treating them in the pre and post processing modules. This makes high throughput experiments and small scale production possible. The Pick & Place also has a rotating function that allows double sided coating and tubular substrates.



Furnace



The standard furnace is built to handle four, 25 cm long tubes. Each chamber has an inner diameter of 38 mm. The furnace is controlled by the dip coat software module which features temperature ramps and PID control. LRC offers custom furnaces, while we continually work to expand our range of off-the-shelf solutions.



Air blade drier



Compressed air blows the excess liquid off the substrate. Suitable for layer-by layer coatings to prevent contamination. The module has a changable top for fitting to different types of Substrates



UV module



UV module lets you cure the coating and cleaning the substrate without the use of high temperature.



Stands

As with substrate holders, LRC offers a wide range of stands and racks for different beakers. Custom solutions are also offered.





Inkjet Module

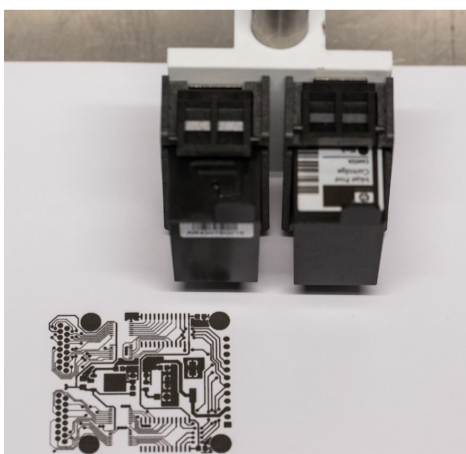
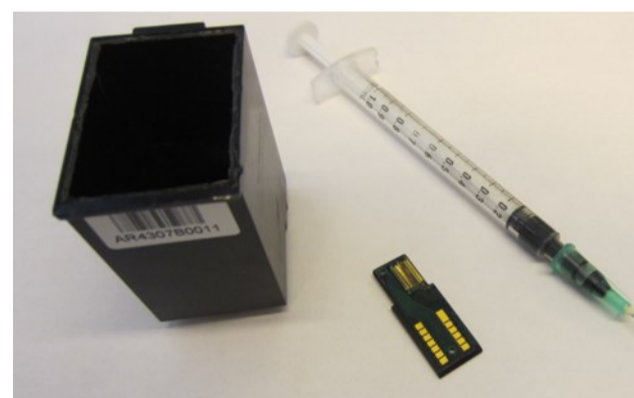


Explore the unique properties of the inkjet technology, found in a desktop printers. With a plug and play functionality, it's easy to coat flat and tubular substrates. Small and dimensionally accurate coatings can be made without the need for masking

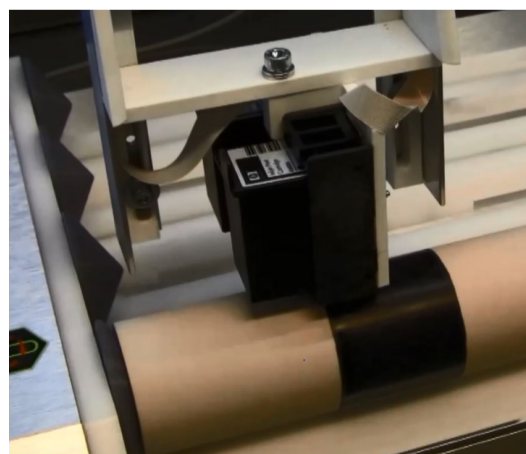
- Empty cartridges available
- Low cost nozzles
- Work with microlitre volumes
- No Masking
- No need for hacking printers, just plug and play
- Coat flat, raised and tubular substrates
- High throughput capabilities
- Possibilities for layer by layer deposition

Applications

- Lab on a chip
- Printed electronics
- Fuel Cells
- Sensors

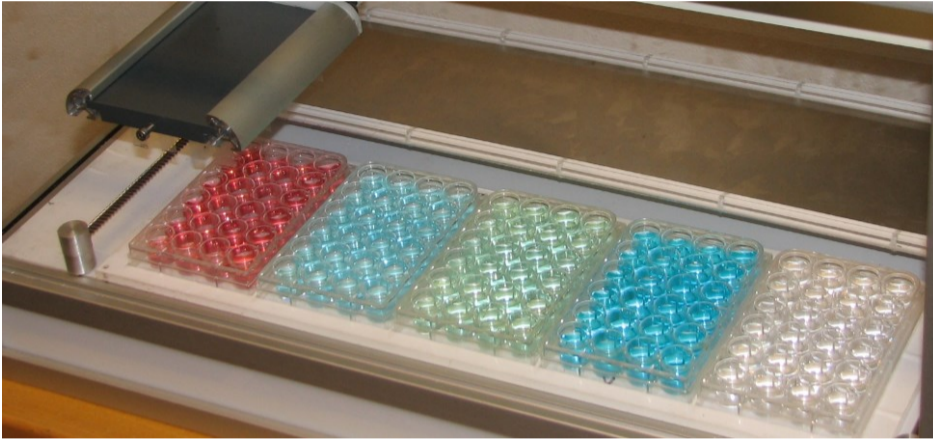


Alpha testing of printed circuit boards from inkjet



The Inkjet module can be used to print on tubular substrates

CONFIGURATION FOR PARALLEL DIP COATING



Custom Multicoater delivered to Abalonyx AS

CUSTOM SOLUTIONS



Custom Multicoater delivered to SINTEF

LRC AS

LRC is a technology company providing automation solutions, test instruments, prototyping and concept development within the field of mechatronics. Mechatronics is the integration of electronics, programming and mechanics with the use of modern design software. LRC also develops its own products for the laboratory industry. Our MultiCoater is a product for depositing thin films of functional materials to a substrate with different coating techniques.

LRC has facilities with equipment for rapid prototyping such as 3D printer, CNC router, laser cutter, lathe and mill. This allows for quick manufacturing and iterations of prototypes, product development and turnkey solutions for our customers.



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