

E-Fiber

Modular electrospinning/electrospraying platform



EF300 - Advanced electrospinning/electrospraying system

EF300 is the high-end product of our lab electrospinning line. It provides a larger environment for electrospinning and is designed for processes at a larger scale. Despite its outstanding performances the system still remains user-friendly with a plug & play installation of optional secondary modules.

EF300 is a fully-customisable electrospinning/electrospraying platform consisting of injection stages and application-specific collectors (static or movable), for the lab- or pilot- scale manufacturing of polymeric-nanofibrous matrices. This device creates a powerful and highly versatile technique for the creation of various fibrous architectures with controlled fiber diameter and orientation. Its technology minimizes influence on the electrospinning process. E-fiber offers various technological solutions to accurately control each process guaranteeing batch-to-batch reproducibility and precise control of fiber parameters such as diameter, orientation and texture. The equipment is user-friendly and safe thanks to the automatic safety devices that protect the operator.

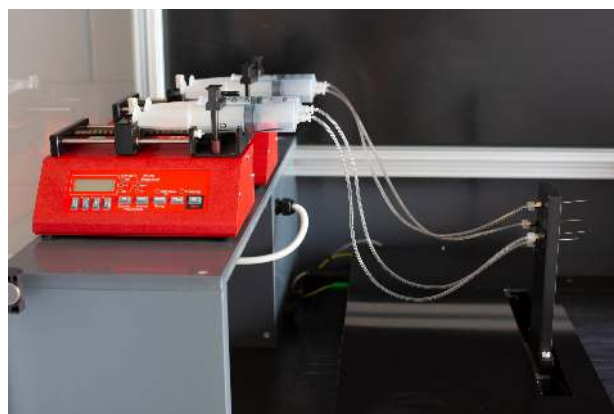
EF300 is a scale-up of the EF100 version, capable of manufacturing small batches of medium format nanomatrix (up to 30 cm x 60 cm), including single or dual high voltage power supply up to 100 kV, control system with touch screen console, single or double multi-channel syringe pump, rotating collector, spinneret linear motion for homogeneity deposition on wide format, distance adjusting, coaxial and triaxial spinneret setup.

The EF300 includes all the necessary instrumentation for a complete and ready to use setup, to rapidly begin your electrospinning sessions, and allows you to create both flat sheet (2D) and tubular structures (3D).

Disposable kit includes 2 stainless steel nozzles of 5 different diameters, 100 syringes, tygon/ptfe tubing (7.5m), polypropylene male and female luer connectors (15+15).

EF300 can be equipped with a variety of add-on modules and accessories to extend and best fit user requirements and applications, such as complex movement, multi spinneret systems, needleless solutions, full environmental control, custom-shaped targets etc.

System is installed in a cabinet equipped with an extraction fan. Optionally it can be provided with a TUV certified ceiling fume cupboard (customizable for specific solvent and chemical agents), ready to be used on every lab or clean room without any arrangement or connection.



EF300 - Accessories

EF300 can be equipped and upgraded with a variety of accessories to extend and best fit user requirements and applications.

High speed rotating collector

A motor-driven cylindrical collector, used for electrospinning cylindrical or big planar structures with oriented and non-oriented fibers: this model can reach very high rotation speed.

Entirely made with insulating materials, in order to avoid interferences with the electrical field and electrospinning process. Electronic feedback for a precise control over speed rotation, in order to grant highly reproducible batch-to-batch conditions.

Standard Parameters : adjustable speed between 50-4000 rpm, collector 250mm length and 160mm diameter.



Multi Channel Syringe pump

Replaces the standard supplied syringe pump, useful for electrospinning of high quantity of solution through multiple syringes, big target collectors, or coaxial and triaxial spinneret.

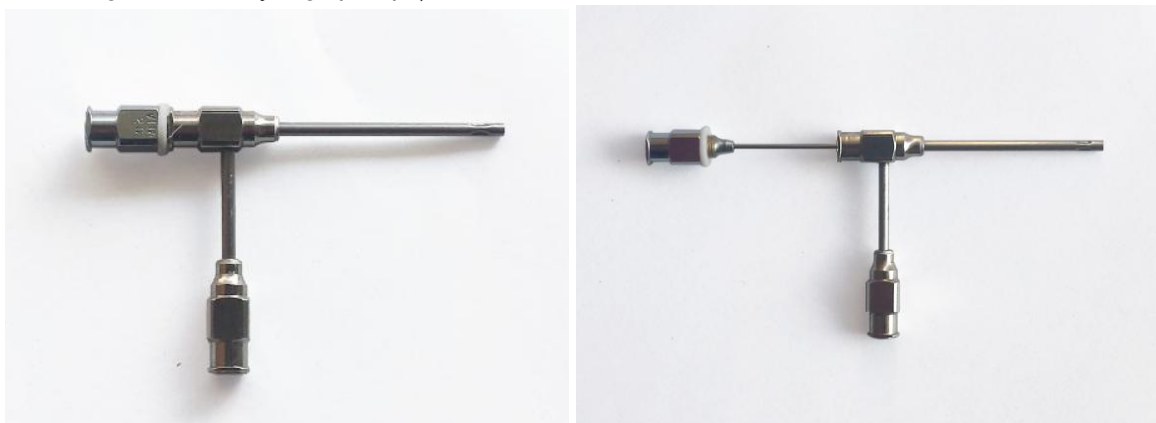
Available with 2, 6 and 12 channels



Coaxial spinneret needle

Coaxial spinneret needle made of two coaxial needles, used to simultaneously electrospin up to two different polymers. This is generally used to create fibers whose core and shell are made of different materials. Ideal for research purposes. Detachable options for easy cleaning operations. Minimum dead volume.

Fully customizable and made according to customer specifications (need at least a dual channel syringe pump or 2 single channel syringe pumps).



Triaxial spinneret needle

Triaxial spinneret needle, made of three coaxial needles, used to simultaneously electrospin up to three different polymers. Generally used to create fibers with cores and shells made of different materials. Ideal for research purposes. Detachable options for easy cleaning operations. Minimum dead volume.

Fully customizable and made according to customer specifications. (need at least a six channel syringe pump).



Quadriaxial spinneret needle

Quadriaxial spinneret needle, made of four coaxial needles, used to simultaneously electrospin up to four different polymers. Generally used to create fibers with cores and shells made of different materials. Ideal for research purposes. Detachable options for easy cleaning operations. Minimum dead volume.

Fully customizable and made according to customer specifications. (need at least a six channel syringe pump).



Climate control unit - Full environmental control

E-Fiber EF100 system can be equipped with an external full control module, in order to control environmental parameters on your working area, with a real time monitoring. This module controls temperature and humidity of the air of the working area, and keeps it constant during your electrospinning session. You can directly manage your setpoint of °C and RH% on the control user interface.

Parameters :

Setting Range: Tenv/+35°C – 20/60 % RH,

Working range: +18/+25°C – 40/80% RH,

Heating power: 3 kW, Dehumidification power: 2kW,

Air volume effective: 180 m3/h



Climate control unit - Humidity reduction

E-Fiber EF100 system can be equipped with an external humidity reduction module, in order to control environmental parameters on your working area, with a real time monitoring. This module dehumidifies the air of the working area, and keeps it constant during your electrospinning session. Humidity is directly visualized on the control user interface. It is equipped with its own control panel, and eventually can be integrated in your E-Fiber also at a later time.

Parameters : humidity reduction up to 20% RH, working range: 0 – 100% RH, Dehumidification performance 1.6 kg/h @ 60% RH.



Climate control unit - Heater

E-Fiber EF100 system can be equipped with an external heater module, in order to control environmental parameters on your working area, with a real time monitoring. This module can heat the air of the working area, and keeps it constant during your electrospinning session. Temperature is directly visualized on the control user interface. It is equipped with its own control panel, and eventually can be integrated in your E-Fiber also at a later time.

Parameters : heating of electrospinning area up to 40 °C.



Ceiling fume cupboard

This accessory avoids connection to an extraction fume system, and the electrospinning can be used inside every lab or clean room without any arrangement or connection. All the process air is filtered through a TUV-certified active carbon filtering system. It adds to the overall height 60 cm.



Disposable kit

The disposable kit includes:

- 2 stainless steel spinneret of different diameters
- 100 syringes
- tygon/ptfe tubing (7.5m)
- polypropylene male and female luer connectors (15+15).



TECHNICAL DATA

General Information

Control Panel	Touch Panel Interface
Temperature & Humidity Sensor	-40 to 80°C $\pm 0.5^\circ\text{C}$ accuracy & 0-100% RH 2-5% accuracy
Power supply	220V-110V AC 50-60 Hz
Dimensions	1300 mm x 750 mm x 2000 mm
Chassis	Aluminium and plastic (PVC)
Approximate Weight	100-150 kg (depending on accessories)
Safety Interlock	Yes

High-voltage power supply (CE and UL mark)

Voltage *	Single supply 0÷40 kV or 0÷50kV Dual supply ± 40 kV or ± 50 kV
Power *	Single supply: 60 W Dual supply: 120 W (60 W x 2)
Arc and Short-circuit protection	Yes
Safety Interlock	Yes
Voltage Stability	0,02% per 8 h

Syringe pump

Fully Programmable (RS-232 and TTL logic interfaces)

Channels	2
Syringe	up to 60 ml / 140 ml filled up to 120 ml
Flow rates	from 1.459 $\mu\text{L/hr}$ (1 mL syringe) to 7635 ml/hr (60 ml syringe)
Accuracy	± 1.00 %

Channels	6
Syringe	up to 60 ml / 140 ml in 4 channel
Flow rates	from 0.454 µl/hr (1 ml syringe) to 1451 ml/hr (60 ml syringe)
Accuracy	± 1.00 %

Channels	12
Syringe	up to 3 ml
Flow rates	from 0.454 µl/hr (1 ml syringe) to 153.2 ml/hr (3 ml syringe)
Accuracy	± 1.00 %

Collector

Rotating collector speed*	0÷1200 rpm
Standard collector size range*	1÷10 mm
Customized collector size*	up to 200 mm diameter at maximum length
Collectors maximum length*	up to 300 mm

Spinneret linear motion

Maximum linear movement*	250 mm, adjustable with sensors
Linear speed*	0-50 mm/s
Maximum # of spinneret*	12 (depending on pump version)

Spinneret

Spinneret type	Single, coaxial or triaxial needles
Spinneret range size	30G up to 10G
Material	Stainless Steel

Safety

Interlock system	On door opening, Safe/Normal mode
Emergency button switch	Mushroom push button
Fume extraction	Enclosure with extraction fan extracted volume 200 m ³ /h
Filtering Option	Enclosure with active carbon filtering system (optional) filtered volume 600 m ³ /h
External fume extraction connection	150 mm
Short circuit and arc protection	On board
In Force legislations	LVD 2014/35/UE 2006/42/CE

* Fully customizable features

ORDERING DETAILS

S-EF-300*

E-Fiber EF300

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