



Nanospider™ Lab Products

NS LAB

Elmarco's NS LAB provides a robust platform for creating a uniform nanofiber membrane for materials science, technical textile, and membrane research, and for experimental work. This compact, affordable research tool uses the same stationary wire electrode system as found in industrial Nanospider™ production lines – the established world leader. More compact and affordable than the NS 1S500U, the NS LAB is the second iteration of Elmarco's pioneering series of lab equipment and incorporates years of customer feedback.



- Needle-free technology
- High throughput
- Long run time per batch
- Spinning voltage 0 - 80 kV

RECOMMENDED USES

- **Basic research and development**
 - High throughput compared to needle based systems
 - Designed for experimentation and product development in academic, research and industrial spheres
 - All process parameters can be controlled
 - Low substrate speed capabilities for thick membrane materials preparation
- **Basic application exploration**
 - Ideal for exploratory research in membrane, air filtration, liquid filtration, medical, and many other areas
 - Designed to enable basic materials science exploration such as process parameters and new material development

FEATURES

- **Technical data**
 - Needle-free electrospinning system
 - Effective width of nanofiber layer: 250 - 300 mm
 - Run time per batch: 30 - 80 min
 - Volume of solution per batch: 40 ml
 - Substrate speed: 0 - 5000 mm/min
 - Spinning voltage: 0 - 80 kV
- **Simple and safe**
 - Meets all CE requirements
 - Safety door locks
 - Safety shut off switches
 - Integrated substrate unwind / rewind
 - Standalone equipment



Nanospider™ Lab Products - NS LAB

TECHNICAL DATA

EQUIPMENT

Spinning unit

Total number of spinning electrodes: 1
 Spinning electrode width: 300 mm
 Stationary wire electrode system
 Integrated unidirectional substrate unwind / rewind

Equipment variables

Spinning voltage: 0 - 80 kV
 Substrate speed: 0 - 5000 mm/min
 Spinning distance: 120 - 240 mm

Accessories

Standard spinning carriage: 40 ml
 Optional small volume spinning carriage: 10 ml
 Optional large volume spinning carriage: 80 ml
 Optional foundation stand: 700 mm height
 Optional cleaning container for carriage

Optional Peripherals

Humidity and temperature control (AC unit)

Consumption

Power: up to 300 W (without peripherals)

Safety/regulation

Meets all CE requirements

Dimensions

Width: 1193 mm	Length: 820 mm	Weight: 195 kg
Height: 1276 mm (1976 mm with optional foundation stand)		

SITE

Site requirements

Operating staff required: 1 person
 Production premises: 3 m x 3 m space required
 Low dust environment required

Connections

Voltage supply: adapted for grids in all countries
 Exhaust ventilation connection
 Appropriate treatment of waste air
 Inlet air connection for optional AC unit
 Extinguishing system connection
 External grounding

PROCESS

Process

Throughput: depends on polymer, substrate, process and fiber diameter
 Effective width of nanofiber layer: 250 - 300 mm (depends on process)
 Working temperature: 20 - 30 °C
 Working humidity: 20 - 40% RH

Polymer filling

Operating mode: batch
 Standard batch volume: 40 ml

Cycle times

Start-up time: up to 30 min
 Time to refill the polymer solution: up to 5 min
 Run time per batch: 30 - 80 min (depends on polymer / solvent solution)

Process example for PA6 polymer

Solution viscosity	170 mPa*s	300 mPa*s
Mean fiber diameter	100 nm +/- 20%	150 nm +/- 13%
Nanofiber layer basis weight	1,1 g/m ²	2,4 g/m ²
Nanofiber layer effective width	300 mm	300 mm
Pressure drop (@ 5 m/min)	620 Pa +/- 7%	650 Pa +/- 7%
Total run time per 40 ml batch	75 min	60 min

Conditions: PP antistatic spunbond substrate, 30% RH @ 22 °C, substrate speed 50 mm/min

Maintenance

Regular maintenance time: up to 2 hours/month
 Cleaning of spinning chamber after each batch recommended

WEB

Substrate

Max width: 500 mm
 Potential substrates: cellulose, synthetics, fiberglass, foils

Polymers

Versatile equipment for soluble polymers

Fiber metrics

Controlled fiber diameters: approx. 80 - 700 nm
 Fiber diameter deviation: typically +/- 30%
 Cross profile and winding direction homogeneity: typically +/- 5%

Note: All fiber metrics depend on polymer, substrate and process