



# 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: 40 - 100 min
  - Volume of solution per batch: 50 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: 350 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

Spinning carriage: 50 ml
Small volume spinning carriage: 10 ml
Foundation stand
Cleaning container for carriages

#### Optional peripherals

Humidity and temperature control (NS AC 150)
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#### Consumption

Power: up to 300 W (without peripherals)
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#### Safety/regulation

Meets all CE requirements
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#### Dimensions

Height: 2053 mm	Length: 1045 mm
Width: 1295 mm	Weight: 240 kg

### 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 required
Appropriate treatment of waste air required
Inlet air connection for optional AC unit
Extinguishing system connection required
External grounding required

### 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: 50 ml
Mini batch volume: 10 ml

#### Cycle times

Start-up time: up to 30 min
Time to refill the polymer solution: up to 5 min
Run time per batch: 40 - 100 min (depends on polymer / solvent solution)

#### Process example for PA6 polymer

Solution viscosity:	150 mPa*s
Mean fiber diameter:	100 nm +/- 20%
Nanofiber layer basis weight:	2,8 g/m <sup>2</sup>
Nanofiber layer effective width:	300 mm
Air permeability (@ 200 Pa):	11,5 l/m <sup>2</sup> /s +/- 7%
Total run time per 50 ml batch:	100 min
Polymeric solution consumption:	0,5 g/min

Conditions: PP antistatic spunbond substrate, 31% RH @ 22 °C, substrate speed 25 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
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#### 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