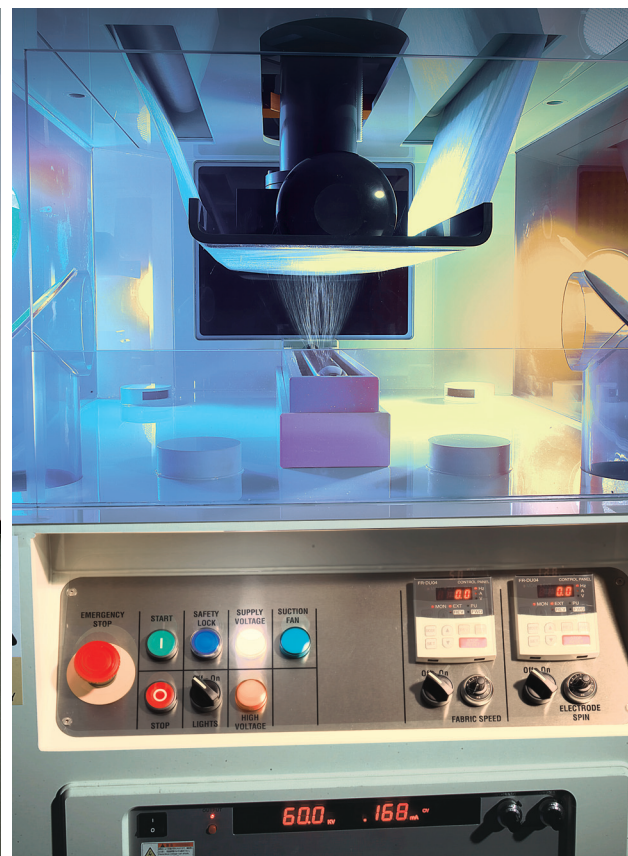




# Nanospider™ Lab Products

## NS LAB 200, NS LAB 500

Elmarco's Nanospider™ ("NS") Lab products provide a robust platform for creating a uniform nanofiber web for materials science and technical textiles experimental work. Adapted for a wide range of polymers and substrates, NS Lab products provide samples with repeatable parameters in sufficient amount for final application development. The NS LAB 200 and NS LAB 500 use Elmarco's proprietary Nanospider™ needle-free electrospinning process that brings the features of the first mass-production technology into the laboratory for your experimental work.



- ➔ Integrated unwind / rewind of substrate
- ➔ Interchangeable spinning electrodes
- ➔ 200 or 500 mm effective width of nanofiber layer

### RECOMMENDED USES

- **Basic research and development**
  - Designed for experimental work
  - Spinning voltage, spinning distance and substrate speed can be controlled
  - Easy set up and operation
- **Small sample production for applied research**
  - Wide range of sample size choices
  - Better nanofiber web and fiber uniformity in comparison to needle-based systems
  - Short path from the laboratory to the product
  - Easy to scale up to industrial NS technology

### FEATURES

- **Designed for the laboratory**
  - Scalable volume polymer system
  - Short set up time as low as 2 min
  - Interchangeable spinning electrodes for use with many polymer / substrate sets
  - Pike spinning electrode for quick cycle time and small volumes
  - Time saving experimental work
- **High throughput**
  - Elmarco's proprietary free-surface Nanospider™ electrospinning process
  - Built in roll-to-roll capabilities for substrates
  - Run time per batch up to 20 min
- **Polymer and substrate flexibility**
  - Designed for both water and non water soluble polymers
  - Capable of spinning variety of polymers
  - Coat numerous substrates, including cellulose, synthetics and fiberglass
  - Work with Elmarco to use existing recipes or develop new ones
- **Simple and safe**
  - Minimal maintenance
  - Integrated unwind / rewind
  - Meets all CE requirements



Orange coded values are valid for NS LAB 500 exclusively. Others are valid for NS LAB 200 and NS LAB 500.

### TECHNICAL DATA

#### EQUIPMENT

##### Spinning unit

Total number of spinning electrodes: 1  
 Spinning electrode width: 200 mm / 500 mm  
 Interchangeable spinning electrodes  
 Integrated unwind / rewind

##### Equipment variables

Spinning voltage: 0 - 80 kV  
 Substrate speed: 0,13 – 1,57 m/min  
 Spinning distance: 70 - 190 mm / 70 – 210 mm

##### Accessories

Cylinder spinning electrodes  
 Wire spinning electrodes  
 Pike spinning electrodes  
 Two types of collecting electrode  
 Two tubs for different batch volumes

##### Peripherals

Humidity and temperature control (dehumidifier, AC unit)

##### Consumption

Power: up to 0,45 kW / 0,45 kW (without peripherals)

##### Safety/regulation

Meets all CE requirements

##### Dimensions

Height: 2200 mm	Length: 800 mm
Width: 800 mm / 1100 mm	Weight: 300 kg / 400 kg

Note: All dimensions without peripherals

#### SITE

##### Site

Operating staff required: 1 person  
 Production premises: 3 m x 3 m space required  
 Dustiness class: ISO Class 6 (FED Class 1000)

##### Connections

Voltage supply: adapted for grids in all countries  
 Exhaust ventilation: 130 m<sup>3</sup>/hour / 150 m<sup>3</sup>/hour  
 Appropriate treatment of ventilation waste

Note: Site requirements without peripherals

#### PROCESS

##### Process

Effective width of nanofiber layer: 200 mm / 500 mm  
 Working temperature: 20 - 30 °C  
 Working humidity: 20 - 40% RH (influence on throughput)

##### Polymer filling

Operating mode: batch  
 Standard batch volume: 200 ml / 400 ml  
 Low batch volume: 20 ml / 20 ml  
 Pike electrode volume: 0,1 ml / 0,1 ml

##### Cycle times

Run time per batch: up to 20 min (depends on polymer / solvent solution)  
 Start-up time: up to 2 min  
 Time to change spinning electrode: 2 min

##### Maintenance

Regular maintenance: not necessary  
 Cleaning of electrodes, tubs and spinning chamber after each batch

#### WEB

##### Substrate

Max width: 400 mm / 600 mm  
 Potential substrates: cellulose, synthetics, fiberglass, foils  
 Sufficient tensile strength, thickness and conductivity necessary

##### Fiber metrics

Controlled fiber diameters: approx. 80 - 700 nm  
 Fiber diameter deviation: +/- 30%

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

##### Polymers

Capable for water and non water soluble polymers

Commonly used polymers on the NS LAB 200 and NS LAB 500

PA 6	PVDF	PCL	Acetylcellulose
PVA	PUR	PLA	Collagen
PAN	PAI	PSU	Gelatin
PES	PAA	PS	Chitosan