



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



Nanospider™ Lab Products NS LAB 200, NS LAB 500

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

Recommended dustiness class: ISO Class 8 (FED Class 100 000)

Connections

Voltage supply: adapted for grids in all countries

Exhaust ventilation: 130 m³/hour / 150 m³/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