Nanospider™ Production Line
NS 4S1000U

elmarco

Elmarco's Nanospider™ ("NS") Production Line is the ideal piece of electrospinning equipment for those ready to scale up their process from a lab concept to high volume industrial production. Elmarco makes safe and reliable equipment that delivers cost effective, uniform nanofiber webs. With minimized usage of solvents, the NS 4S1000U is based on Elmarco's proprietary needle-free electrospinning process, to deliver the performance that your products need.

→ 2 spinning modules

→ 4 spinning electrodes

→ 0,3 - 1,0 m effective width of nanofiber layer

RECOMMENDED USES

- **New product introduction**
  - Delivers high quality materials in a compact and affordable form factor
  - Four spinning electrode system allows for high throughput

- **Early stage manufacturing**
  - Designed for 24 hours / 7 days operation
  - Automated production control system

FEATURES

- **High throughput**
  - NS 4S1000U throughput example: 0,45 g/min for PA6 on PA spunbond, 150 nm fiber diameter, 1,0 m width
  - High nanofiber web uniformity

- **Low solvent consumption**
  - Low volume polymer system
  - Minimized solvent usage
  - Low solvent evaporation

- **Polymer and solvent flexibility**
  - Better able to handle volatile solutions
  - Two separate solution reservoirs
  - Nanospider™ needle-free technology allows easy process optimization

- **Small footprint, simplicity**
  - Easy to fit into your facility
  - Standard connections for easier plant integration

Nanospider™ Production Line NS 4S1000U

TECHNICAL DATA

EQUIPMENT

Production line

Number of spinning units: 1
Number of spinning modules: 2
Modules can be operated independently, also with different polymers
Total number of spinning electrodes: 4 (2 per module)
Spinning electrode width: 1,0 m (configurable between 0,3 - 1,0 m)

Equipment variables

Spinning voltage: 0 - 140 kV
Substrate speed: 0,2 - 12,0 m/min (depends on unwind / rewind system)
Spinning distance: 150 - 250 mm (spinning electrode to substrate)

Peripherals

Polymer mix station	Unwind / rewind
Air dryer	Adhesion pre-treatment
Filling and cleaning station	Air permeability tester
Humidity control (AC unit)	Waste air treatment

Consumption

Power: up to 6 kW (without peripherals)

Safety/regulation

Meets all CE requirements

Dimensions

Height: 2200 mm	Length: 2100 mm
Width: 2300 mm	Weight: 1500 kg

Note: All dimensions without peripherals

WEB

Substrate

Max width: 1100 mm
Potential substrates: cellulose, synthetics, fiberglass, foils
Sufficient tensile strength, thickness and conductivity necessary

Polymers

Versatile equipment for soluble polymers
Commonly used polymers: Polyamides, PVDF, PU, PAN, PES and others

Fiber metrics

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

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

PROCESS

Process

Throughput: depends on polymer, substrate, process and fiber diameter
Example: 0,45 g/min for PA6 Ultramid B24 on PA spunbond, nanofiber layer width: 1,0 m, fiber diameter: 150 nm +/- 25%, spinning voltage: 100 kV, temperature: 22 °C, relative humidity: 30%
Effective width of nanofiber layer: 0,3 - 1,0 m
Working temperature: 20 - 30 °C
Working humidity: 20 - 40% RH (influence on throughput)

Cycle times	Polymer filling
Operation: 24 hours / 7 days	Operating mode: batch
Start-up time: up to 20 min	Volume of solution per batch: 20 l
Polymer refilling: 10 min	

Maintenance

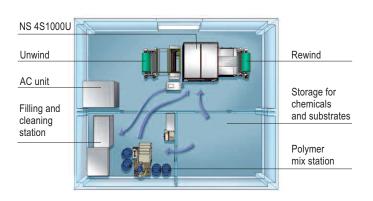| |
|---|
| Regular maintenance time: total of 15 hours/month (depends on process) |
| Cleaning of spinning components: inside or outside of the unit |

SITE

Site

Operating staff required: 1 person/shift
Production premises: 10 m x 10 m space required
Low dust environment required

Connections

Voltage supply: adapted for grids in all countries
Exhaust ventilation: 2000 m^3/hour
Appropriate treatment of ventilation waste
Compressed air required
Inert gas required

Note: Site requirements cover NS 4S1000U and peripherals

NS 4S1000U

Unwind

AC unit

Filling and cleaning station

Rewind

Storage for chemicals and substrates

Polymer mix station