Product profile

Nanospider™ Production Line

NS 8S1600U

Elmarco's Nanospider™ NS 8S1600U is the base spinning unit for the industrial production of nanofibers in our scalable electrospinning line. Combining of up to four spinning units, NS Production Lines deliver high volume throughput for cost effective production. With minimized usage of solvents, the NS 8S1600U is based on Elmarco's proprietary needle-free electrospinning process, to deliver the performance that your products and customers need.

Single unit of NS 8S1600U in line

RECOMMENDED USES

- **Full scale manufacturing**
  - Optimized for mass production
  - Designed for 24 hours / 7 days operation
  - Automated production control system

FEATURES

- **High throughput**
  - NS 8S1600U (single unit) example: 20 000 000 m^2 of coated material annually for PA6, 150 nm fiber diameter, 0,03 g/m^2 basis weight, 85% uptime
  - High nanofiber web uniformity
- **Scalable production volume**
  - Scalable concept to increase production volume by addition of spinning units
  - Combine 1, 2, 3 or 4 spinning units of the NS 8S1600U in line
- **Cost effective production**
  - Process optimization for particular polymer, substrate material and parameters of the product
  - Low volume polymer system
  - Low solvent evaporation
- **Ready for plant integration**
  - Configure for in-line processing
  - Easy to fit into your facility
  - Standard connections for easier plant integration

Nanospider™ Production Line NS 8S1600U

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: 8 (4 per module)
- Spinning electrode width: 1,6 m (configurable between 0,8 – 1,6 m)

Equipment variables

- Spinning voltage: 0 - 140 kV
- Substrate speed: 0,2 - 40,0 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 5 kW (without peripherals)

Safety/regulation

- Meets all CE requirements

Dimensions

Height: 2800 mm	Length: 2600 mm
Width: 2800 mm	Weight: 2500 kg

Note: All dimensions without peripherals

Scalability

NS 8S1600U x 1	1 spinning units	8 spinning electrodes
NS 8S1600U x 2	2 spinning units	16 spinning electrodes
NS 8S1600U x 3	3 spinning units	24 spinning electrodes
NS 8S1600U x 4	4 spinning units	32 spinning electrodes

WEB

Substrate

- Max width: 1700 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: 20 000 000 m^2/year for PA6 on cellulose, nanofiber layer width: 1,6 m, basis weight: 0,03 g/m^2, fiber diameter: 150 nm +/- 30%, 85% uptime
- Effective width of nanofiber layer: 1,6 m
- Working temperature: 20 - 30 °C
- Working humidity: 20 - 40% RH (influence on throughput)

Cycle times	Polymer filling
Operational: 24 hours / 7 days	Operating mode: batch
Start-up time: up to 20 min	Volume of solution per batch: 60 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

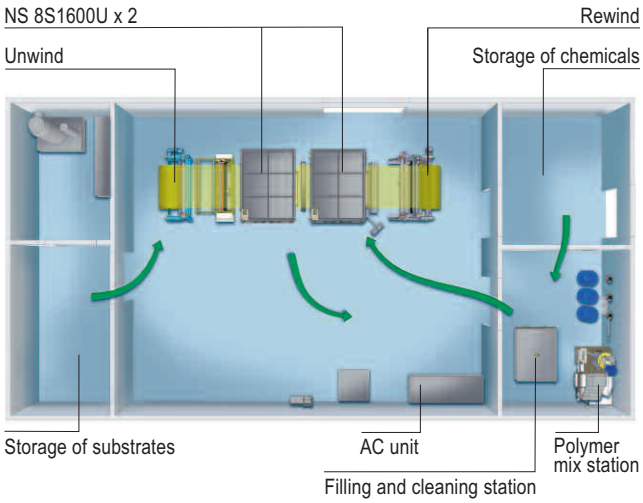
Site

- Operating staff required: 1,5 person/shift
- Production premises: 10 m x 20 m space required
- Low dust environment required

Connections

- Voltage supply: adapted for grids in all countries
- Exhaust ventilation: 2500 m^3/hour
- Appropriate treatment of ventilation waste
- Compressed air required
- Inert gas required

Note: Site requirements cover NS 8S1600U and peripherals



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CONTACT US: **Europe:** sales@elmarco.com, **Americas:** sales-us@elmarco.com, **Asia:** sales-asia@elmarco.com, www.elmarco.com