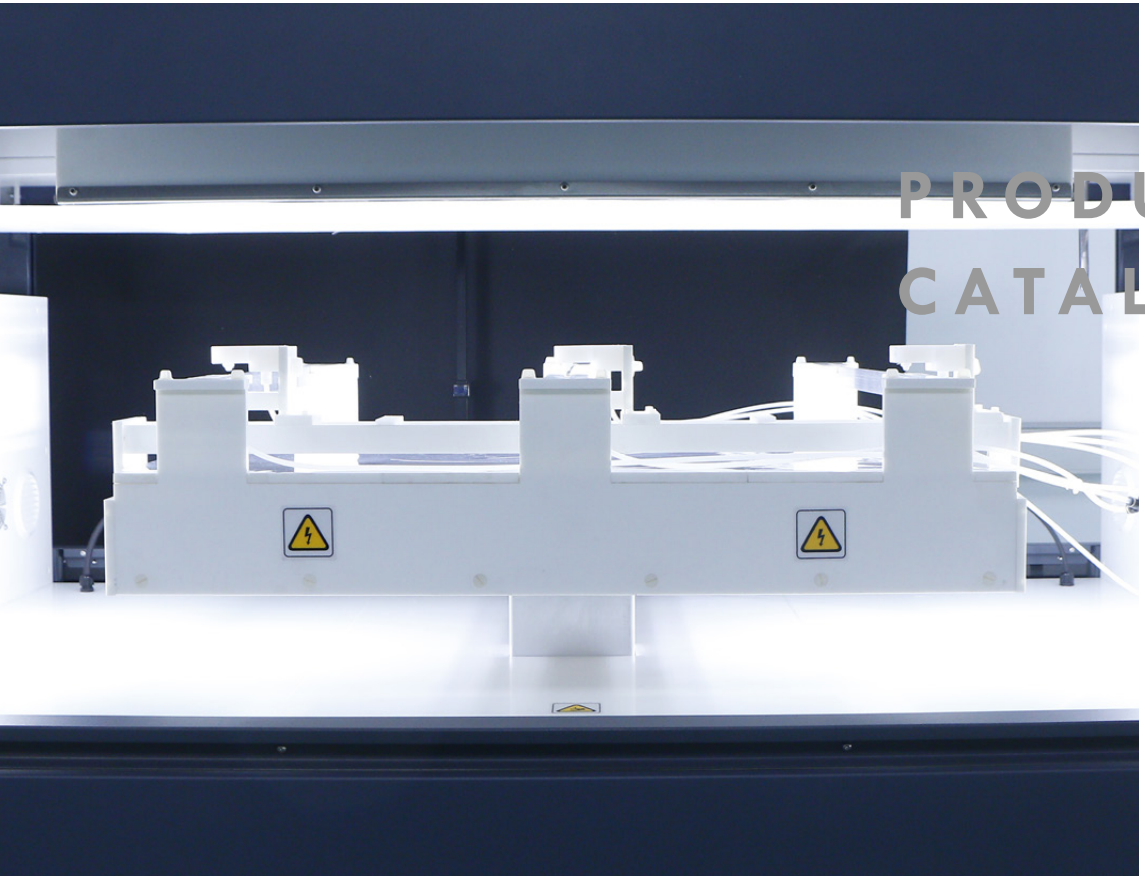
inovenso



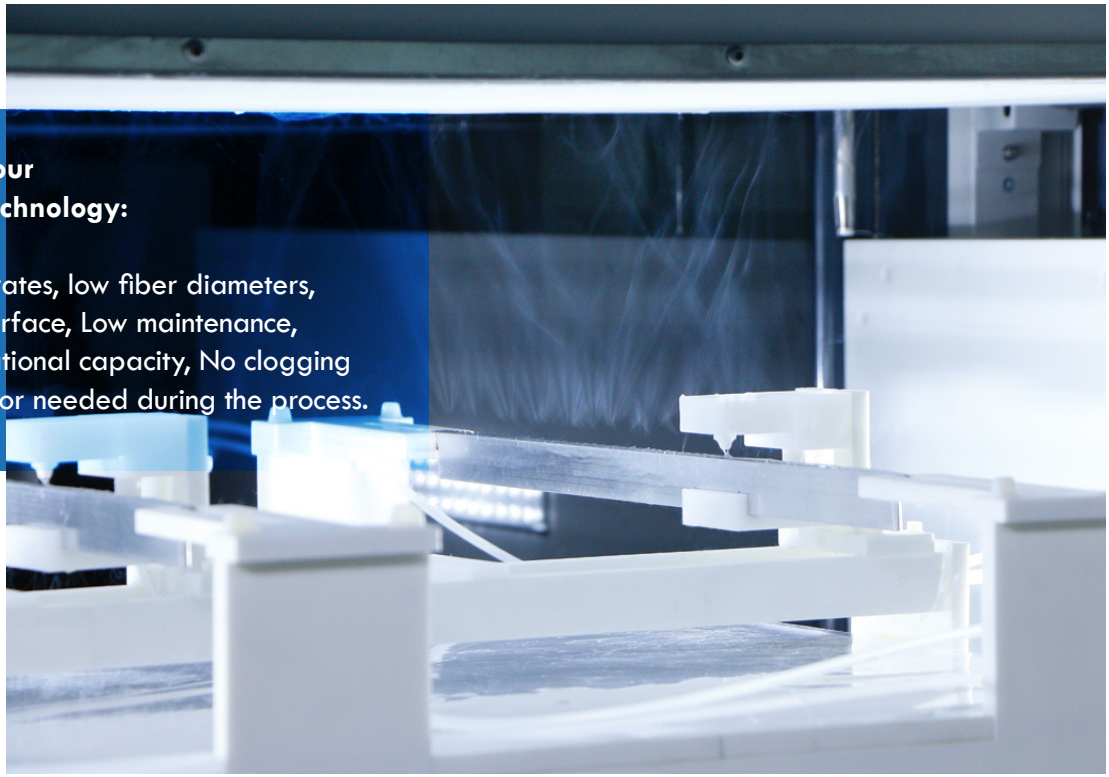
PRODUCT CATALOG

2024

ADVANCED NANOFIBER SOLUTIONS

The new Open Surface incorporated large-scale electrospinning machines, effectively titled the "**StreamSpinners**".

+ Open Surface Technology



Advantages of our Open Surface Technology:

High production rates, low fiber diameters, User friendly interface, Low maintenance, Continuous operational capacity, No clogging issues, No operator needed during the process.

As the apropos name suggests, the technology implements seamless streams of nanofiber jets. Resulting in not only the ability of increasing production output to an industrial level but also eliminating any clogging issues prevalent with a wide range of polymeric solutions. A copious amount of solution can be placed in a tank and consistently fed to a set of thin-slit spinneret rods with active high-voltage which gives rise to the electrospun jet streams. **All-in-all, the technology enables continuous manufacturing for upscaled nanofibrous media demand.**

Our industrial Open Surface electrospinning machines are designed for commercial usage as they possess the production capacity in accordance with factory level throughput. With these machines, **large fabric substrates rolls can be loaded and electrospun onto the machine for maximum synthesis of nanofiber media.**

The length of each roll can amount to thousands of linear meters. Our machines have a user-friendly interface and simplistic plug-and-play system that can run for **2-3 shifts per day.** With a peristaltic pump that can feed polymer solutions at a high rate based on your demand for several polymers.

About Inovenso

We started our academic activities in 2007 working on nanotechnologies under the Nano Fiber Membrane Group (NanoFMG). After focusing on improving nanofiber quality during the electrospinning process, we established our born global company Inovenso in 2010. Our name is acronym of Innovative Engineering Solutions. We aimed to develop very efficient electrospinning machines and accelerate the nanofiber science. We quickly became a bridge company between academia and industry and proudly contributed to hundreds of scientific projects using polymer nanofibers for wide variety of applications such as biomedical, tissue, engineering, pharmaceutical, energy, filtration, material

sciences, textile, agriculture, cosmetics. We brought new innovative approaches to overcome many common obstacles in the nanofiber production field such as scalability, flexibility, standardization and reproducibility.

Hybrid Electrospinning Technology

Hybrid Electrospinning Technology is a unique and patented technique that was developed by Inovenso's R&D team. It consists of optimized hybrid nozzles that enable a high throughput (5 to 10 times higher than a needle-based system).

This new technique combines the advantages of both needle-based and needle-less electrospinning technologies: High throughput, with an accurate control over the process. The final product is a uniform and homogeneous, bead-free and defectless nanofiber membrane.

+ Content

WHAT IS ELECTROSPINNING?

Electrospinning is an established method of producing nanofibers from a wide variety of natural and synthetic polymers. Interest in electrospinning has markedly increased over the past decade as new applications are constantly being investigated. While the applications of electrospinning have been extensively investigated, the full potential of the technology is yet to be discovered in industrial applications.

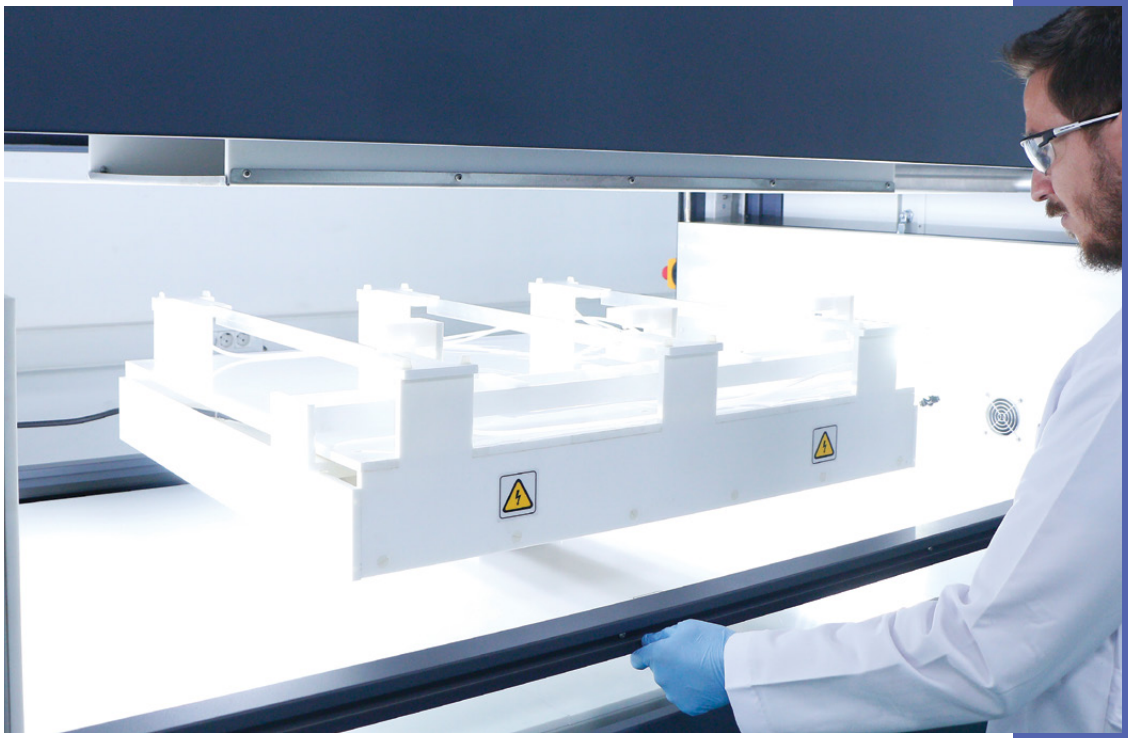
According to the latest report prepared by Technavio, titled “Global Nanofiber market 2015-2020”, Nanofiber market is predicted to grow from 455 million USD in 2015 to 1.245 billion US Dollars by 2020, with an annual growth rate of 33%. Inovenso is specialized in the production of state-of-the-art electrospinning equipment to help companies achieve their goals in realizing an economical approach to commercial scale production. In addition, Inovenso offers lab scale electrospinning equipment customized to satisfy the needs of researchers for scientific applications.

WHY CHOOSE NANOFIBERS?

1. Ability to produce structures with highly adjustable microstructure characteristics adaptable to the customized needs in a wide range of applications.
2. High surface area to volume ratio (high porosity).
3. Wide variety of physical and chemical properties.
4. Ability to incorporate soluble or insoluble additives.
5. Diverse applications.

+ Applications of Nanofibers

INDUSTRIAL LINES



INDUSTRIAL

OPEN SURFACE INDUSTRIAL

+ SS1600 + SS1000 + SS550

Open Surface Industrial Line

FEATURED

+ **High Production Rate:** 60% higher than SS1000

+ Up to **36 m2/min (PA6 0.1 GSM)** production of nanofibers.

+ **Compatibility to work** with a wide viscosity range of polymeric solutions.

+ **Patent Pending Technology.**

+ **Smart Dynamic Feeding System:** Provides an extremely homogeneous production, and precise adjustment of the flow rate.

+ **Smart Winding System:** The software sets the desired thickness by automatically adjusting the flow rate and winding speed.

SS1600 StreamSpinner

+ Industrial scale high-throughput electrospinning or electrospraying system

+ Open surface – needleless solution feeding mechanism

+ SS1600

+ CONSTRUCTION

Electrostatic painted sheet metal chassis
Exhaust fan system to remove solvent vapors
Air conditioning system for temperature and humidity control
Weight: 1000 - 1500 kgs
Dimensions: W: 4470 mm L: 2470 mm H: 1990 mm

+ HIGH VOLTAGE SYSTEM

Positive and negative high voltage power supply system
For the spinneret 0 - 80 kV positive high voltage module
For the collector 0 – 40 kV negative high voltage module
Voltage Adjustment Precision: 0.1 kV
Maximum Current: 1.87 mA

+ SOLUTION FEEDING SYSTEM

Three streamspinner open surface spinnerets,
Three peristaltic pumps set individually connected to the spinnerets, All the spinnerets can be fed with different solutions to obtain composite structures,
Spinneret Length: 1800 mm
Tubing: Silicone Tubing ID:5mm x OD:8mm and PE Tubing of ID:4mm x OD:6mm
Flow Rate of Peristaltic Pumps: 0.1- 40 ml/min
Flow Rate Precision: 0.1 ml/min

+ SPINNING DISTANCE

Distance between Rods and Collector: 150 - 350 mm
Distance Adjustment Precision: 1 mm

+ COLLECTOR

Roll-to-roll collector, Width of the collector: 1700 mm
Substrate Winding Speed: min 0.2 m/min - 30.0 m/min
Effective Coating Width: 1600 mm

+ PROCESSING

Throughput mainly depends on polymer type but also solution and process parameters,
Available for 24/7 operation,
Easily cleaning of spinnerets and production area surfaces of the machine,
15 minutes of starting up time required,
65 L tank capacity for batch mode operation for solution feeding,
Minimum maintenance requirement.

+ AUTOMATION

PLC Controlled, 12” Touch screen control panel,
Well-designed user-friendly interface,
Data saving and calling, Automatic winding speed adjustment depending on the process and solution parameters to achieve the desired coating thickness.

+ SAFETY AND REGULATIONS

Safety door feature, Emergency Button & Safety Relays, HV Warning Light,
Electrical Isolated & Grounded Cabinet,
Over Current Protection,
Meets regulatory standards under CE Certification,
Static discharge bar.

+ SITE REQUIREMENTS

Power: 110-120 VAC [3 ~ 208 V] @20A 4000W or 220-240 VAC @20A 4000 W Max.
External Grounding line is required
Pressurized air (3-4 bar) for winding-rewinding shafts
Ventilation: Hose channel and ventilating system to evacuate the evaporated solvents
Space requirement: 4 m x 6 m

Open Surface Industrial Line

FEATURED

+ **High Production Rate:** 5 to 15 times higher than conventional electrospinning systems.

+ Up to **24 m2/min (PA6 0.1 GSM)** production of nanofibers.

+ **Compatibility to work** with a wide viscosity range of polymeric solutions.

+ **Patent Pending Technology.**

+ **Smart Dynamic Feeding System:** Provides an extremely homogeneous production, and precise adjustment of the flow rate.

+ **Smart Winding System:** The software sets the desired thickness by automatically adjusting the flow rate and winding speed.

SS1000 StreamSpinner

+ Industrial scale high-throughput electrospinning or electrospraying system

+ Open surface – needleless solution feeding mechanism

+ SS1000

+ CONSTRUCTION

Electrostatic painted sheet metal chassis
Exhaust fan system to remove solvent vapors
Air conditioning system for temperature and humidity control
Weight: 1000 - 1500 kgs
Dimensions: W: 3700 mm L: 1910 mm H: 2215 mm

+ HIGH VOLTAGE SYSTEM

Positive and negative high voltage power supply system
For the spinneret 0 - 80 kV positive high voltage module
For the collector 0 – 40 kV negative high voltage module
Voltage Adjustment Precision: 0.1 kV
Maximum Current: 1.87 mA

+ SOLUTION FEEDING SYSTEM

Three streamspinner open surface spinnerets,
Three peristaltic pumps set individually connected to the spinnerets, All the spinnerets can be fed with different solutions to obtain composite structures,
Spinneret Length: 1105 mm
Tubing: Silicone Tubing ID:5mm x OD:8mm and PE Tubing of ID:4mm x OD:6mm
Flow Rate of Peristaltic Pumps: 0.1- 40 ml/min
Flow Rate Precision: 0.1 ml/min

+ SPINNING DISTANCE

Distance between Rods and Collector: 100 - 350 mm
Distance Adjustment Precision: 1 mm

+ COLLECTOR

Roll-to-roll collector, Width of the collector: 1100 mm
Substrate Winding Speed: min 0.2 m/min - 30.0 m/min
Effective Coating Width: 1000 mm

+ PROCESSING

Throughput mainly depends on polymer type but also solution and process parameters,
Available for 24/7 operation,
Easily cleaning of spinnerets and production area surfaces of the machine,
15 minutes of starting up time required,
10 L tank capacity for batch mode operation for solution feeding,
Minimum maintenance requirement.

+ AUTOMATION

PLC Controlled, 12” Touch screen control panel,
Well-designed user-friendly interface,
Data saving and calling, Automatic winding speed adjustment depending on the process and solution parameters to achieve the desired coating thickness.

+ SAFETY AND REGULATIONS

Safety door feature, Emergency Button & Safety Relays, HV Warning Light,
Electrical Isolated & Grounded Cabinet,
Over Current Protection,
Meets regulatory standards under CE Certification,
Static discharge bar.

+ SITE REQUIREMENTS

Power: 110-120 VAC [3 ~ 208 V] @20A 4000W or 220-240 VAC @20A 4000 W Max.
External Grounding line is required
Pressurized air (3-4 bar) for winding-rewinding shafts
Ventilation: Hose channel and ventilating system to evacuate the evaporated solvents
Space requirement: 3 m x 5 m

Open Surface Industrial Line

FEATURED

+ **High Production Rate:** 5 to 15 times higher than conventional electrospinning systems.

+ Up to **12 m2/min (PA6 0.1 GSM)** production of nanofibers.

+ **Compatibility to work** with a wide viscosity range of polymeric solutions.

+ **Patent Pending Technology.**

+ **Smart Dynamic Feeding System:** Provides an extremely homogeneous production, and precise adjustment of the flow rate.

+ **Smart Winding System:** The software sets the desired thickness by automatically adjusting the flow rate and winding speed.

+ SS550

SS550 StreamSpinner

+ Industrial scale high-throughput electrospinning or electrospraying system

+ Open surface – needleless solution feeding mechanism

+ CONSTRUCTION

Electrostatic painted sheet metal chassis
Exhaust fan system to remove solvent vapors
Air conditioning system for temperature and humidity control
Weight: 1080 kg
Dimensions: W: 2080 mm L: 2850 mm H: 2150 mm

+ HIGH VOLTAGE SYSTEM

Positive and negative high voltage power supply system
For the spinneret 0 - 60 kV positive high voltage module
For the collector 0 – 40 kV negative high voltage module
Voltage Adjustment Precision: 0.1 kV
Maximum Current: 2.5 mA

+ SOLUTION FEEDING SYSTEM

Three streamspinner open surface spinnerets,
Three peristaltic pumps set individually connected to the spinnerets, All the spinnerets can be fed with different solutions to obtain composite structures,
Spinneret Length: 550 mm
Tubing: Silicone tube of 5 mm ID, 8 mm OD
Flow Rate of Peristaltic Pumps: 0.1- 40 ml/min
Flow Rate Precision: 0.1 ml/min

+ SPINNING DISTANCE

Distance between Rods and Collector: 150 - 300 mm
Distance Adjustment Precision: 1 mm

+ COLLECTOR

Roll-to-roll collector, Width of the collector: 550 mm
Substrate Winding Speed: min 0.1 m/min - 20.0 m/min
Effective Coating Width: 500 mm

+ PROCESSING

Throughput mainly depends on polymer type but also solution and process parameters,
Available for 24/7 operation,
Easily cleaning of spinnerets and production area surfaces of the machine,
15 minutes of starting up time required,
10 L tank capacity for batch mode operation for solution feeding,
Minimum maintenance requirement.

+ AUTOMATION

PLC Controlled, 12” Touch screen control panel,
Well-designed user-friendly interface,
Data saving and calling, Automatic winding speed adjustment depending on the process and solution parameters to achieve the desired coating thickness.

+ SAFETY AND REGULATIONS

Safety door feature, Emergency Button & Safety Relays, HV Warning Light,
Electrically Isolated & Grounded Cabinet,
Over Current Protection,
Meets regulatory standards under CE Certification,
Static discharge bar.

+ SITE REQUIREMENTS

Power: 110-120 VAC [3 ~ 208 V] @20A 4000W or 220-240 VAC @20A 4000 W Max.
External Grounding line is required
Pressurized air (3-4 bar) for winding-rewinding shafts
Ventilation: Hose channel and ventilating system to evacuate the evaporated solvents
Space requirement: 4 m x 3 m

Open Surface Industrial Line

FEATURED

+ **High Production Rate:** 5 to 15 times higher than conventional electrospinning systems.

+ Up to **12 m2/min (PA6 0.1 GSM)** production of nanofibers.

+ **Compatibility to work** with a wide viscosity range of polymeric solutions.

+ **Patent Pending Technology.**

+ **Smart Dynamic Feeding System:** Provides an extremely homogeneous production, and precise adjustment of the flow rate.

+ **Smart Winding System:** The software sets the desired thickness by automatically adjusting the flow rate and winding speed.

SS300 StreamSpinner

+ Industrial scale high-throughput electrospinning or electrospraying system

+ Open surface – needleless solution feeding mechanism

+ SS300

+ CONSTRUCTION

Electrostatic painted sheet metal chassis
Exhaust fan system to remove solvent vapors
Air conditioning system for temperature and humidity control
Weight: 1080 kg
Dimensions: W: 2080 mm L: 2850 mm H: 2150 mm

+ HIGH VOLTAGE SYSTEM

Positive and negative high voltage power supply system
For the spinneret 0 - 60 kV positive high voltage module
For the collector 0 – 40 kV negative high voltage module
Voltage Adjustment Precision: 0.1 kV
Maximum Current: 2.5 mA

+ SOLUTION FEEDING SYSTEM

Three streamspinner open surface spinnerets,
Three peristaltic pumps set individually connected to the spinnerets, All the spinnerets can be fed with different solutions to obtain composite structures,
Spinneret Length: 300 mm
Tubing: Silicone tube of 5 mm ID, 8 mm OD
Flow Rate of Peristaltic Pumps: 0.1- 40 ml/min
Flow Rate Precision: 0.1 ml/min

+ SPINNING DISTANCE

Distance between Rods and Collector: 150 - 300 mm
Distance Adjustment Precision: 1 mm

+ COLLECTOR

Roll-to-roll collector, Width of the collector: 300 mm
Substrate Winding Speed: min 0.1 m/min - 20.0 m/min
Effective Coating Width: 300 mm

+ PROCESSING

Throughput mainly depends on polymer type but also solution and process parameters,
Available for 24/7 operation,
Easily cleaning of spinnerets and production area surfaces of the machine,
15 minutes of starting up time required,
10 L tank capacity for batch mode operation for solution feeding,
Minimum maintenance requirement.

+ AUTOMATION

PLC Controlled, 12” Touch screen control panel,
Well-designed user-friendly interface,
Data saving and calling, Automatic winding speed adjustment depending on the process and solution parameters to achieve the desired coating thickness.

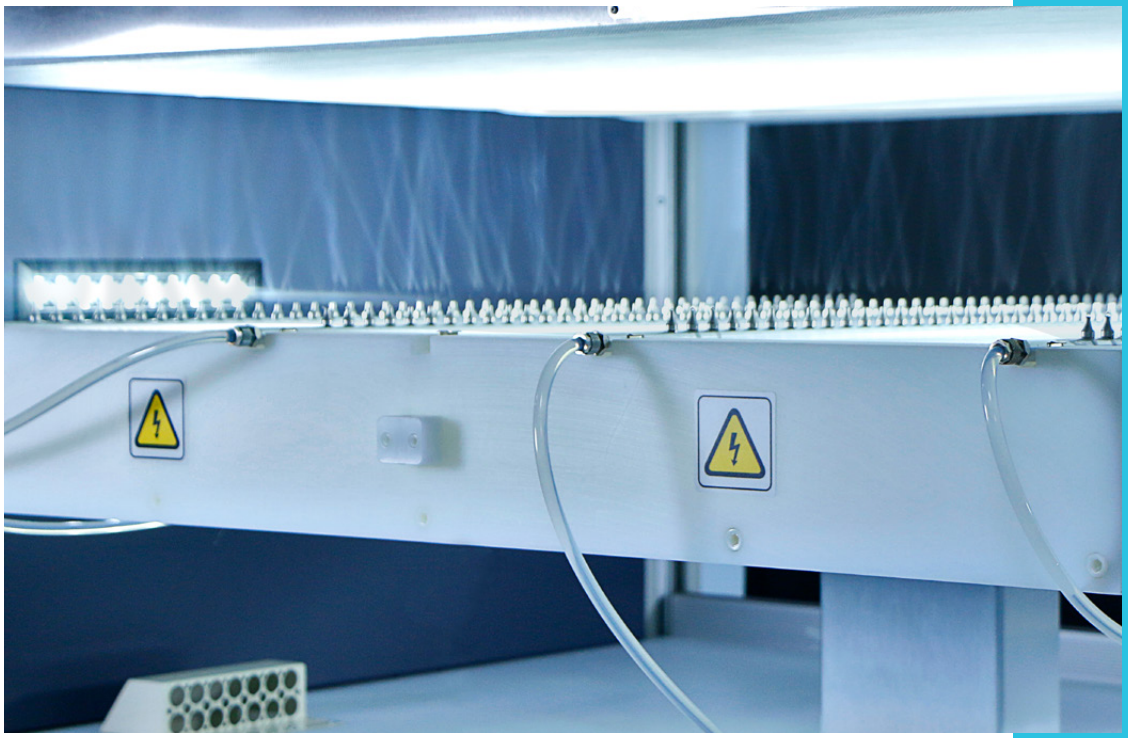
+ SAFETY AND REGULATIONS

Safety door feature, Emergency Button & Safety Relays, HV Warning Light,
Electrically Isolated & Grounded Cabinet,
Over Current Protection,
Meets regulatory standards under CE Certification,
Static discharge bar.

+ SITE REQUIREMENTS

Power: 110-120 VAC [3 ~ 208 V] @20A 4000W or 220-240 VAC @20A 4000 W Max.
External Grounding line is required
Pressurized air (3-4 bar) for winding-rewinding shafts
Ventilation: Hose channel and ventilating system to evacuate the evaporated solvents
Space requirement: 4 m x 3 m

SEMI
INDUSTRIAL LINES



SEMI INDUSTRIAL

NEEDLE BASED INDUSTRIAL LINE

+ NS416

NEEDLE BASED PILOT LINE

+ PE550 + PE300

Needle Based Industrial Line

FEATURED

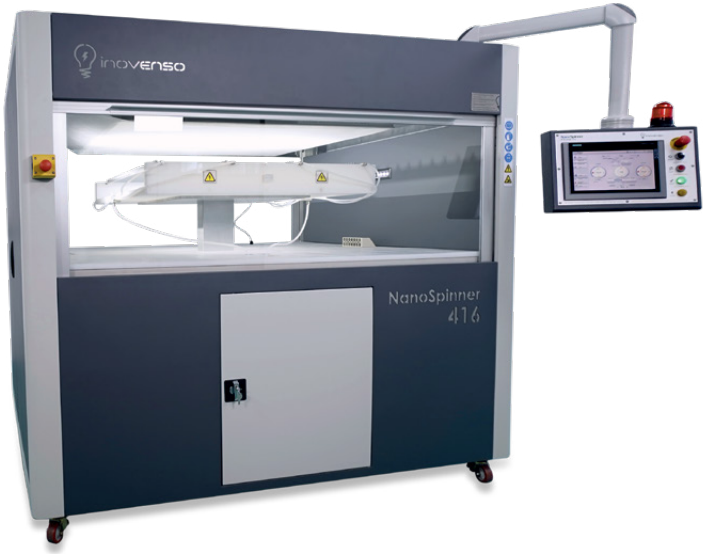
At the point of converting the nanofiber materials from R&D to the industrial production, the electrospinning systems have a great potential.

To this end, INOVENSO, one of the world's leading companies in the field of electrospinning has developed the "NS416 Industrial Scale Electrospinning Line".

The NS416 is equipped with 132 electrospinning needles and a homogenization system, allowing the surface to be uniformly and continuously at a width of 1 meter. Because of its advanced automation system and the air conditioning equipment, it enables continuous production at the highest set quality even under changing environmental conditions.

NS416 has a high production capacity. It also enables easy monitoring and management of all parameters that are effective in the production of nanofibers.

For the commercial production, repeatable production of materials in uniform and specific standards has the highest importance. NS416, designed and manufactured by INOVENSO's engineers, quality control passed tests successfully.



+ NS416

+ MODEL
Model Name: Nanospinner416 Industrial Line
Description: Industrial Scale Multi Nozzle Electrospinning Unit
Spinning-Type: Bottom-Up Spinning

+ CONSTRUCTION
Chassis: Electrostatic Painted Sheet Metal
Feeding Area Material: PE 1000
(High Density, Chemical Resistant)
Collector Material: Stainless Steel
LED Illumination
Exhaust Fan
Atmosphere Control (Optional)
Total Weight: Approx. 950 kgs
Dimensions: W:2400 mm L: 2670 mm H: 2025 mm

+ HIGH VOLTAGE POWER SUPPLY
Voltage Range: In the Spinneret 0-(+)60 kV
Voltage Precision: 0.1 kV
Maximum Current: 2.5 mA

+ PUMP SYSTEM
Flow Rate: ~0.01 - 5000 ml/h
Flow Rate Precision: 0.01 ml
Peristaltic Continuous Feeding Pump System

+ FEEDING AREA
Number of Nozzles on Each Feeding Pipe Set: 51 pcs
Number of Feeding Pipe Sets: 4 pcs
Number of Nozzles: 204 pcs
Single Nozzle Production: Available
Feeding Pipe Material: Aluminium
Nozzle Material: Electrically Conductive Stainless Steel
Nozzle Inner Diameter: Standard Nozzle: 0.8 mm
(Different diameters can be used)
Minimum Required Solution for Single Nozzle Feeding: 3 ml
Minimum Required Solution for Each Feeding Pipe Set: 150ml
Minimum Required Solution for Full Loading: 600 ml

+ SPINNING DISTANCE
Distance Between Nozzle and Collector:
50 mm - 350 mm
Distance Adjustment Precision: 1 mm

+ COLLECTOR
Roll to Roll Collector
Fiber Deposition Width: 1000 mm
Substrate Winding Speed:
max. 0.2 m/min - min. 20 m/min

+ UNIQUE USER INTERFACE
12” Touch screen control panel
with well designed user friendly interface
Fully able to control all parameters
Saving & recalling all parameters
via recipe & recall function

+ SAFETY FUNCTION
Safe Door,
Emergency Button & Safety Relay,
HV Warning Light,
Electrical Isolated & Grounded Cabinet,
Over Current Protection.

+ TECHNICAL REQUIREMENTS
Power: 110-120VAC or 220-240 VAC
@ Max 25A
Grounding: External Grounding Line
Area: min. 5 m. x 3 m.

Needle Based Pilot Line

FEATURED

The PE-550 is our best-selling electrospinning machine for the continuous production of nanofibers. Its major advantage is scalability, as it's suitable for both production line as well as R&D projects.

The NS Pilot Line functions with **108 nozzles** enabling high productivity for mass production of nanofibers, however it can also function with a single when working on R&D projects.

Its unique design enables production of nanofibers and composites, it accommodates four syringe pumps and four high voltage power suppliers, making it possible to work simultaneously with up to four different polymers, independently controlled.

PE550 uses a unique patented **Hybrid Electrospinning Technology.**

This new technique combines the advantages of both needle-based and needle-less electrospinning, which are including but not limited to: High throughput productivity (from the needle-less), with a very accurate control over the process and the final product (from needle-based electrospinning).

+ PE-550

+ MODEL
Model Name: PE-550
Description: Semi Industrial Scale Multi Nozzle Electrospinning Unit
Spinning-Type: Bottom-Up Spinning

+ CONSTRUCTION
Chassis: Electrostatic Painted Sheet Metal
Feeding Area Material: PE 1000
(High Density, Chemical Resistant)
Collector Material: Stainless Steel
LED Illumination, Exhaust Fan
Atmosphere Control (Optional)
Total Weight: Approx. 650 kgs
Dimensions: W: 1880 mm L: 2095 mm H: 2025 mm

+ HIGH VOLTAGE POWER SUPPLY
Number of HV Generators:
4 units (1 for each solution feeding rod)
Voltage Range: 0- 40 kV
Voltage Precision: 0.1 kV
Max Current: 0.125 mA

+ HIGH PRECISION MICRO PUMP
Number of Pumps: 4 units
Flow Rate: 0.35 - 7123 ml/h (BD 60 ml syringe)
Flow Rate Precision: 0.01 ml
Available Syringes: All types are available
Available Pump Systems: Syringe / Peristaltic (Optional)

+ FEEDING AREA
Number of Nozzles on Each Feeding Pipe Set: 14 pcs
Number of Feeding Pipe Sets: 4 pcs
Number of Nozzles: 108 pcs
Single Nozzle Production: Available
Feeding Pipe Material: Aluminum
Nozzle Material: Electrically Conductive Stainless Steel
Nozzle Inner Diameter: 0.8 mm
Minimum Required Solution for Single Nozzle Feeding: 3 ml
Minimum Required Solution for Each Feeding Pipe Set: 15 ml
Minimum Required Solution for Full Loading: 100 ml

+ SPINNING DISTANCE
Distance Between Nozzle and Collector:
30 mm- 280 mm
Distance Adjustment Precision: 1 mm

+ COLLECTOR
Roll to Roll Collector
Fiber Deposition Width: 550 mm
Substrate Winding Speed: 0.1 m/min - 10 m/min
Repetitive Winding Mode (Optional)
Coating Homogeneity System:
X-axis repetitive motion
Stroke of Coating Homogeneity System:
10 mm - 80 mm
Speed of Coating Homogeneity System:
2-20 mm/sec

+ UNIQUE USER INTERFACE
12" Touch screen control panel with well designed user friendly interface
Fully able to control all parameters
Saving & recalling all parameters via recipe & recall function

+ SAFETY FUNCTION
Safe Door,
Emergency Button & Safety Relay,
HV Warning Light,
Electrical Isolated & Grounded Cabinet,
Over Current Protection.

+ TECHNICAL REQUIREMENTS
Power: 110-120VAC or 220-240 VAC
@ Max 25A
Grounding: External Grounding Line
Area: Min. 3 m. x 3 m.

Needle Based Pilot Line

FEATURED

The PE-300 is a compact continuous nanofiber production machine. Its major advantage is scalability, as it's suitable for both production line as well as R&D projects.

The PE-300 functions with **18 nozzles** enabling high productivity for mass production of nanofibers, however it can also function with single nozzle therfore enables working on small-scale R&D projects

Its unique design enables production of nanofibers and composites, it accommodates two syringe pumps and two high voltage power suppliers, making it possible to work simultaneously with up to two different polymers, independently controllable.

+ PE-300

+ MODEL

Model Name: PE-300
Description: Semi Industrial Scale Multi Nozzle Electrospinning Unit
Spinning-Type: Bottom-Up Spinning

+ CONSTRUCTION

Chassis: Electrostatic Painted Sheet Metal
Feeding Area Material: PE 1000
(High Density, Chemical Resistant)
Collector Material: Stainless Steel
LED Illumination, Exhaust Fan
Atmosphere Control (Optional)
Total Weight: Approx. 350 kgs
Dimensions: W: 1700 mm L: 1670 mm H: 1910 mm

+ HIGH VOLTAGE POWER SUPPLY

Number of HV Generators:
2 units (1 for each solution feeding rod.)
Voltage Range: 0- 40 kV
Voltage Precision: 0.1 kV
Max Current: 0.125 mA

+ HIGH PRECISION MICRO PUMP

Number of Pumps: 2 units
Flow Rate: 0.35 - 7123 ml/h (BD 60 ml syringe)
Flow Rate Precision: 0.01 ml
Available Syringes: All types are available
Available Pump Systems: Syringe / Peristaltic (Optional)

+ FEEDING AREA

Number of Nozzle on Each Feeding Pipe Set: 9 pcs
Number of Feeding Pipe Sets: 2 pcs
Number of Nozzles: 18 pcs
Single Nozzle Production: Available
Feeding Pipe Material: Aluminum
Nozzle Material: Electrically Conductive Stainless Steel
Nozzle Inner Diameter: 0.8 mm
Minimum Required Solution for Single Nozzle Feeding: 2 ml
Minimum Required Solution for Each Feeding Pipe Set: 8 ml
Minimum Required Solution for Full Loading: 18 ml

+ SPINNING DISTANCE

Distance Between Nozzle and Collector:
30 mm- 280 mm
Distance Adjustment Precision: 1 mm

+ COLLECTOR

Roll to Roll Collector
Fiber Deposition Width: 300 mm
Substrate Winding Speed: 0.1 m/min - 10 m/min
Coating Homogeneity System:
X-axis repetitive motion
Stroke of Coating Homogeneity System:
10 mm - 80 mm
Speed of Coating Homogeneity System:
2-20 mm/sec

+ UNIQUE USER INTERFACE

9” Touch screen control panel with well designed user friendly interface
Fully able to control all parameters.
Saving & recalling all parameters via recipe & recall function

+ SAFETY FUNCTION

Safe Door,
Emergency Button & Safety Relay,
HV Warning Light,
Electrical Isolated & Grounded Cabinet,
Over Current Protection.

+ TECHNICAL REQUIREMENTS

Power: 110-120VAC or 220-240 VAC @ Max 15A
Grounding: External Grounding Line
Area: Min. 2 m. x 2 m.

LAB SCALE


Nanofiber Production Via Hybrid Electrospinning Technology
SIEMENS
SIMATIC HMI
NanoSpinner
Electrospinning Device
STOP
ON/OFF

LAB SCALE

ADVANCED LEVEL

+ NS24 + NE 300 + NE 200 + NE 100

ENTRY LEVEL

+ NS1 + NS PLUS + NS STARTER KIT

Lab Scale / Advanced

FEATURED

NS24 is a fully automated high-throughput electrospinning machine for laboratory scale applications.
The parameters can be controlled by the automation system via a 9” touch screen panel for precise research application.

In the standard configuration, there is a 120 mm diameter by 280 mm length rotating drum collector and a 130 mm by 370 mm flat collector. The drum collector can rotate up to 2000 rpm, making it possible to obtain well-aligned nanofibers.

This system is designed to be used with core-shell nozzles to obtain bicomponent products and rotating mill collector to obtain tubular nanofiber membranes. Additionally, temperature and humidity control could be added to the system according to the user preference.

DRUM COLLECTOR
(D x L) 120 mm x 280 mm

UP TO 12 NOZZLES

+ NS24

+ MODEL
Model Name: NS24
Description: Advanced Level Multi Nozzle Electrospinning Unit
Spinning-Type: Bottom-Up Spinning

+ CONSTRUCTION
Chassis: Electrostatically Painted Steel Feeding Area Material: PE 1000 (High Density, Chemical Resistant)
Collector Material: 7000 Series Aluminum Alloy, Stainless Steel, LED Illumination, Exhaust Fan, Atmosphere Control (Optional)
Total Weight: Approx.150 kgs
Dimensions: W: 760 mm L: 675 mm H: 1050 mm

+ HIGH VOLTAGE POWER SUPPLY
Voltage Range: 0- 40 kV
Voltage Precision: 0.1 kV
Max Current: 0.125 mA

+ HIGH PRECISION MICRO PUMP
Flow Rate: 0.35 - 7123 ml/h (BD 60 ml syringe)
Flow Rate Precision: 0.01 ml/h
Available Syringes Standard: All types are available

+ FEEDING AREA
Number of Nozzles on Each Feeding Pipe Set: 6 pcs
Number of Feeding Pipe Sets: Up to 2 Sets
Number of Nozzles: Up to 12 Nozzles
Single Nozzle Production: Available
Feeding Pipe Material: Aluminium
Nozzle Material: Electrically Conductive Stainless Steel
Nozzle Inner Diameter: 0.8 mm
Compatible with Standard Syringe Nozzles
Minimum Required Solution for Single Nozzle Feeding: 1 ml
Minimum Required Solution for Each Feeding Pipe Set: 8.5 ml
Minimum Required Solution for Full Loading: 16 ml

+ SPINNING DISTANCE
Distance Between Nozzle and Collector:
23.5 mm - 223.5 mm
Distance Adjustment Precision: 1 mm

+ ROTATING COLLECTOR
Drum Collector
Material: Aluminium
Dimensions of Drum: (D x L) 120 mm x 280 mm
Fiber Deposition Area: 376.8 mm x 280 mm
Drum Rotating Speed: 100 - 2000 RPM
(Able to produce aligned nanofibers.)
Surface Speed: 62.8 cm/s - 1256 cm/s
Coating Homogeneity System:
X-axis repetitive motion
Stroke of Coating Homogeneity System:
30 mm - 80 mm
Speed of Coating Homogeneity System:
2 - 20 mm/sec

+ STATIONARY PLATE COLLECTOR
Material: Stainless Steel
Dimensions of Stationary Plate:
(W x L) 370 mm x 130 mm

+ UNIQUE USER INTERFACE
9” Touch screen control panel with well designed user friendly interface, Fully able to control all parameters, Saving & recalling all parameters via recipe & recall function

+ SAFETY FUNCTION
Safe Door, Emergency Button & Safety Relay, HV Warning Light, Electrical Isolated & Grounded Cabinet, Over Current Protection, Fully Sealed Cabinet

+ TECHNICAL REQUIREMENTS
Power: 110-120VAC or 220-240 VAC @ Max 9A
Grounding: External Grounding Line
Area: min. 1 m. x 1 m. workbench able to carry min. 150 kgs.

Lab Scale / Advanced

FEATURED

Inovenso's NE300 fully automated electrospinning machine NE300 is designed to carry electrospinning research to a more advanced level.

NE300 is a Hybrid Electrospinning System of eight needles. It has a 314 x 220 mm nanofiber coating area via a rotating drum collector, also a flat collector of 130 x 370 mm comes with the standard configuration.

The NE 300 has an Electrically insulated cabinet with high density PE parts inert to chemical olutions, which enables working with many different solvents and polymers.

DRUM COLLECTOR
(D x L) 100 mm x 220 mm

UP TO 8 NOZZLES

+ NE300

+ MODEL
Model Name: NE300
Description: Advanced Level Multi Nozzle Electrospinning Unit
Spinning-Type: Bottom-Up Spinning

+ CONSTRUCTION
Chassis: Electrostatically Painted Steel Feeding Area Material: PE 1000 (High Density, Chemical Resistant)
Collector Material: 7000 Series Aluminum Alloy, Stainless Steel, LED Illumination, Exhaust Fan, Atmosphere Control (Optional)
Total Weight: Approx.150 kgs
Dimensions: W: 760 mm L: 675 mm H: 1050 mm

+ HIGH VOLTAGE POWER SUPPLY
Voltage Range: 0- 40 kV
Voltage Precision: 0.1 kV
Max Current: 0.125 mA

+ HIGH PRECISION MICRO PUMP
Flow Rate: 0.35 - 7123 ml/h (BD 60 ml syringe)
Flow Rate Precision: 0.01 ml/h
Available Syringes Standard: All types are available

+ FEEDING AREA
Number of Nozzles on Each Feeding Pipe Set: 4 pcs
Number of Feeding Pipe Sets: Up to 2 Sets
Number of Nozzles: Up to 8 Nozzles
Single Nozzle Production: Available
Feeding Pipe Material: Aluminium
Nozzle Material: Electrically Conductive Stainless Steel
Nozzle Inner Diameter: 0.8 mm
Compatible with Standard Syringe Nozzles
Minimum Required Solution for Single Nozzle Feeding: 1 ml
Minimum Required Solution for Each Feeding Pipe Set: 8.5 ml
Minimum Required Solution for Full Loading: 16 ml

+ SPINNING DISTANCE
Distance Between Nozzle and Collector:
23.5 mm - 223.5 mm
Distance Adjustment Precision: 1 mm

+ ROTATING COLLECTOR
Drum Collector
Material: Aluminium
Dimensions of Drum: (D x L) 100 mm x 220 mm
Fiber Deposition Area: 314 mm x 220 mm
Drum Rotating Speed: 100 - 500 RPM
(Able to produce aligned nanofibers.)
Surface Speed: 52.3 cm/s - 261.6 cm/s
Coating Homogeneity System:
X-axis repetitive motion
Stroke of Coating Homogeneity System:
30 mm - 80 mm
Speed of Coating Homogeneity System:
2 - 20 mm/sec

+ STATIONARY PLATE COLLECTOR
Material: Stainless Steel
Dimensions of Stationary Plate:
(W x L) 370 mm x 130 mm

+ UNIQUE USER INTERFACE
9” Touch screen control panel with well designed user friendly interface, Fully able to control all parameters, Saving & recalling all parameters via recipe & recall function

+ SAFETY FUNCTION
Safe Door, Emergency Button & Safety Relay, HV Warning Light, Electrical Isolated & Grounded Cabinet, Over Current Protection, Fully Sealed Cabinet

+ TECHNICAL REQUIREMENTS
Power: 110-120VAC or 220-240 VAC @ Max 9A
Grounding: External Grounding Line
Area: min. 1 m. x 1 m. workbench able to carry min. 150 kgs.

Lab Scale / Advanced

FEATURED

NE200 is a laboratory scale electrospinning unit with a single nozzle. The standard machines have a 500 rpm rotating drum collector and a flat collector. There are optional accessories upon request for functionality improvement.

Operation parameters like the needle-collector distance and high voltage value could be automatically adjusted from the user panel, with high precision. The system comes with an enclosed cabinet making it possible to add temperature and relative humidity control systems.

+ NE200

+ MODEL
Model Name: NE200
Description: Advanced Level Multi Nozzle Electrospinning Unit
Spinning-Type: Bottom-Up Spinning

+ CONSTRUCTION
Chassis: Electrostatically Painted Steel
Feeding Area Material: PE 1000
(High Density, Chemical Resistant)
Collector Material: 7000 Series Aluminum Alloy,
Stainless Steel
LED Illumination
Exhaust Fan
Atmosphere Control (Optional)
Total Weight: Approx.150 kgs
Dimensions: W: 760 mm L: 675 mm H: 1050 mm

+ HIGH VOLTAGE POWER SUPPLY
Voltage Range: 0- 40 kV
Voltage Precision: 0.1 kV
Max Current: 0.125 mA

+ HIGH PRECISION MICRO PUMP
Flow Rate: 0.35 - 7123 ml/h (BD 60 ml syringe)
Flow Rate Precision: 0.01 ml/h
Available Syringes Standard: All types are available

+ FEEDING AREA
Number of Nozzles: 1 Nozzle
Nozzle Material: Electrically Conductive Stainless Steel
Nozzle Inner Diameter: 0.8 mm
Compatible with Standard Syringe Nozzles
Minimum Required Solution for Single Nozzle Feeding: 2 ml

+ SPINNING DISTANCE
Distance Between Nozzle and Collector:
33.5 mm - 233.5 mm
Distance Adjustment Precision: 1 mm

+ ROTATING COLLECTOR
Drum Collector
Material: Aluminium
Dimensions of Drum: (D x L) 100 mm x 150 mm
Fiber Deposition Area: 314 mm x 150 mm
Drum Rotating Speed: 100 - 500 RPM
(Able to produce aligned nanofibers.)
Surface Speed: 52.3 cm/s - 261.6 cm/s

+ STATIONARY PLATE COLLECTOR
Material: Stainless Steel
Dimensions of Stationary Plate:
(W x L) 370 mm x 130 mm

+ UNIQUE USER INTERFACE
9” Touch screen control panel with well designed user friendly interface, Fully able to control all parameters, Saving & recalling all parameters via recipe & recall function

+ SAFETY FUNCTION
Safe Door,
Emergency Button & Safety Relay,
HV Warning Light,
Electrical Isolated & Grounded Cabinet,
Over Current Protection,
Fully Sealed Cabinet.

+ TECHNICAL REQUIREMENTS
Power: 110-120VAC or 220-240 VAC @ Max 9A
Grounding: External Grounding Line
Area: min. 1 m. x 1 m. workbench able to carry min. 150 kgs.

Lab Scale / Advanced

FEATURED

The NE100 Electrospinning Unit, a model in between basic and advanced Electrospinning systems, all process parameters can be adjusted from its programmable easy-to-use touch screen panel. It also has a special designed isolated chassis and an exhaust system that enables working with evaporative solvents.

Thanks to the advanced safety features, the door safety system and the isolated chassis, scientists can carry out their experiments in safe conditions, without worrying about any risk of users' health endangerment.

+ NE100

+ MODEL
Model Name: NE100
Description: Advanced Level Multi Nozzle Electrospinning Unit
Spinning-Type: Bottom-Up Spinning

+ CONSTRUCTION
Chassis: Electrostatically Painted Steel
Feeding Area Material: PE 1000
(High Density, Chemical Resistant)
Collector Material: 7000 Series Aluminum Alloy,
Stainless Steel
LED Illumination
Exhaust Fan
Atmosphere Control (Optional)
Total Weight: Approx.150 kgs
Dimensions: W: 760 mm L: 675 mm H: 1050 mm

+ HIGH VOLTAGE POWER SUPPLY
Voltage Range: 0- 40 kV
Voltage Precision: 0.1 kV
Max Current: 0.125 mA

+ HIGH PRECISION MICRO PUMP
Flow Rate: 0.35 - 7123 ml/h (BD 60 ml syringe)
Flow Rate Precision: 0.01 ml/h
Available Syringes Standard: All types are available

+ FEEDING AREA
Number of Nozzles: 1 Nozzle
Nozzle Inner Diameter: 0.8 mm
Compatible with Standard Syringe Nozzles
Minimum Required Solution for Single Nozzle Feeding: 2ml

+ SPINNING DISTANCE
Distance Between Nozzle and Collector: 30 mm - 205 mm
Distance Adjustment Precision: 1mm

+ STATIONARY PLATE COLLECTOR
Material: Stainless Steel
Dimensions of Stationary Plate:
(W x L) 370 mm x 130 mm

+ UNIQUE USER INTERFACE
9” Touch screen control panel with well
designed user friendly interface,
Fully able to control all parameters,
Saving & recalling all
parameters via recipe & recall function

+ SAFETY FUNCTION
Safe Door,
Emergency Button & Safety Relay,
HV Warning Light,
Electrical Isolated & Grounded Cabinet,
Over Current Protection,
Fully Sealed Cabinet.

+ TECHNICAL REQUIREMENTS
Power: 110-120VAC or 220-240 VAC @ Max 9A
Grounding: External Grounding Line
Area: min. 1 m. x 1 m. workbench able to carry
min. 150 kgs.

Lab Scale / Entry

FEATURED

The NS Plus is the most recent model of Inovenso, designed to accommodate the maximum components required for an optimized and versatile Electrospinning Process. It's an ideal solution for lower-budget projects working on small-scale nanofibers research.

It has 3 Hybrid Nozzles, spinning on a rotating drum collector or plate collector, therefore enabling the production of both well-aligned and randomly collected nanofibers.
The homogeneity system allows the user to produce a uniform and homogeneous nanofibers membranes.

+ NS PLUS

+ MODEL
Model Name: NS Plus
Description: Entry Level Multi Nozzle Electrospinning Unit
Spinning-Type: Side By Side Spinning

+ CONSTRUCTION
Chassis: Enclosed Chassis For Spinning Area
Feeding Area Material: PE 1000
(High Density, Chemical Resistant)
Collector Material: 7000 Series Aluminum Alloy,
Stainless Steel
LED Illumination
Exhaust Fan
Total Weight: Approx. 60 kgs
Dimensions: W: 760 mm L: 645 mm H: 780 mm

+ HIGH VOLTAGE POWER SUPPLY
Voltage Range: 0- 30 kV
Voltage Precision: 0.1 kV
Max Current: 0.170 mA

+ HIGH PRECISION MICRO PUMP
Flow Rate: 0.35 - 7123 ml/h (BD 60 ml syringe)
Flow Rate Precision: 0.01 ml/h
Available Syringes Standard: All types are available

+ FEEDING AREA
Number of Nozzles: 3 Nozzle
Nozzle Material: Electrically Conductive Stainless Steel
Nozzle Inner Diameter: 0.8 mm
Compatible with Standard Syringe Nozzles
Minimum Required Solution for Single Nozzle Feeding: 2 ml

+ SPINNING DISTANCE
Distance Between Nozzle and Collector: 30 mm - 300 mm
Distance Adjustment: Manual Control

+ ROTATING COLLECTOR
Material Aluminium
Dimensions of the drum (D x L) 100 mm x 220 mm
Fiber Deposition Area 314 mm x 220 mm
Drum Rotating Speed 100-500RPM
Surface Speed (cm/s) 52.3 cm/s - 261.6 cm/s
Stroke of Coating Homogeneity System:
30 mm - 80 mm
Speed of Coating Homogeneity System:
2 - 20 mm/sec

+ STATIONARY PLATE COLLECTOR
Material: Stainless Steel
Dimensions of Stationary Plate:
(W x L) 275 mm x 150 mm

+ UNIQUE USER INTERFACE
4.3” Touch screen control panel with well designed user friendly interface
Fully able to control all parameters.

+ SAFETY FUNCTION
Emergency Button,
HV Warning Light,
Electrical Isolated & Grounded Cabinet,
Over Current Protection.

+ TECHNICAL REQUIREMENTS
Power: 110-120VAC or 220-240 VAC @ Max 2A
Grounding: External Grounding Line
Area: min. 1 m. x 1 m. workbench able to carry min. 70 kgs.

Lab Scale / Entry

FEATURED

It is possible to apply high voltage with precision as well as adjust the flow rate and the distance between the needle and collector.

The spinning area is not enclosed in a cabinet, but the small size of the system allows it to fit inside a fume hood.

+ NS1

+ MODEL
Model Name: NS1
Description: Entry Level Single Nozzle Electrospinning Unit
Spinning-Type: Side By Side Spinning

+ CONSTRUCTION
Chassis: No Enclosed Chassis (Included in NS Plus)
Feeding Area Material: PE 1000
(High Density, Chemical Resistant)
Collector Material: 7000 Series Aluminum Alloy,
Stainless Steel
LED Illumination
Total Weight: Approx. 40 kgs
Dimensions: W: 760 mm L: 645 mm H: 440 mm

+ HIGH VOLTAGE POWER SUPPLY
Voltage Range: 0- 30 kV
Voltage Precision: 0.1 kV
Max Current: 0.170 mA

+ HIGH PRECISION MICRO PUMP
Flow Rate: 0.35 - 7123 ml/h (BD 60 ml syringe)
Flow Rate Precision: 0.01 ml/h
Available Syringes Standard: All types are available

+ FEEDING AREA
Number of Nozzles: 1 Nozzle
Nozzle Material: Electrically Conductive Stainless Steel
Nozzle Inner Diameter: 0.8 mm
Compatible with Standard Syringe Nozzles
Minimum Required Solution for Single Nozzle Feeding: 2 ml

+ SPINNING DISTANCE
Distance Between Nozzle and Collector: 30 mm - 300 mm
Distance Adjustment: Manual Control

+ STATIONARY PLATE COLLECTOR
Material: Stainless Steel
Dimensions of Stationary Plate:
(W x L) 300 mm x 238.5 mm

+ UNIQUE USER INTERFACE
4.3” Tocuh screen control panel with well designed user friendly interface
Fully able to control all parameters.

+ SAFETY FUNCTION
Emergency Button,
Over Current Protection.

+ TECHNICAL REQUIREMENTS
Power: 110-120VAC or 220-240 VAC @ Max 2A
Grounding: External Grounding Line
Area: min. 1 m. x 1 m. workbench able to carry min. 70 kgs.

Lab Scale / Entry

FEATURED

The NS Starter Kit electrospinning system is designed for low-cost, small-scale nanofiber research, producing results from a single-nozzle configuration in a compact unit.

Spinning distance, flow rate and applied voltage are easily adjustable in side-by-side spinning system.

+ NS STARTER KIT

+ MODEL
Model Name: NS Starter Kit
Description: Entry Level Single Nozzle Electrospinning Unit
Spinning-Type: Side By Side Spinning

+ CONSTRUCTION
Chassis: No Closed Chassis For Spinning Area
Collector Material: Stainless Steel
Total Weight: Approx. 2.2 kgs
Dimensions: W: 210 mm L: 170 mm H: 137 mm

+ HIGH VOLTAGE POWER SUPPLY
Voltage Range: 0- 30 kV
Voltage Precision: 0.1 kV
Max Current: 0.170 mA

+ HIGH PRECISION MICRO PUMP
Flow Rate:
Max. 120 ml/min (140 ml Monoject Syringe)
Min. 10 nl/min (Hamilton 0.5 µl)
Flow Rate Precision: 0.01 ml/h
Step Resulation: 357 nm/µstep (Travel/Microstep)
Linear Speed Rate: (Pusher Travel Rate)
Max. 107 mm/min
Max. 2,14 µm/min
Available Syringes Standard: All types are available

+ FEEDING AREA
Directly Feed Into Nozzle
Number of Nozzles: 1 Nozzle
Nozzle Material: Stainless steel
Compatible with All Standard Syringe Nozzles

+ SPINNING DISTANCE
Distance Between Nozzle and Collector: 0 - ∞
Distance Adjustment Method: Manual Distance Control

+ STATIONARY PLATE COLLECTOR
Material: Stainless Steel
Dimensions of Stationary Plate:
(W x H) 180mm x 210mm

+ UNIQUE USER INTERFACE
4.3” Resistive Touch TFT LCD screen,
Microcontroller software,
User friendly interface.

+ TECHNICAL REQUIREMENTS
Power: 12 VDC 1A (110-240 VAC adapter included)
Grounding: External Grounding Line
Area: min. 0.5 m. x 1 m. workbench able to carry min. 8 kgs.

Additional Modules

Co-axial System

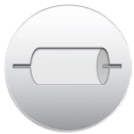
Two special designed coaxial nozzles: Shell Nozzle
(ID : 0.337 mm, OD: 3.3 mm)
Core nozzle (ID: 0.6414 mm, OD: 1 mm) and an extra syringe pump to obtain core-shell, hollow and bicomponent nanofibers.
*Available for all models.

Negative High Voltage Power Supply (For Collector)

Applied to the collector: negative (-10) – 0 KV. Negative voltage can increase the attraction of nanofibers.
*Available for NE Series and Pilot & Industrial Machines.

Interchangeable Rotating Rod Collectors

Interchangeable rotating shaft collectors to produce tubular structure nanofibers.
Dimensions and speed varies on each model.
*Available for NE Series.



Rotating Drum Collector

Rotating drum for the production of well-aligned nanofibers.
Dimensions and speed varies on each model.
*Available for NS Starter Kit, NS1 & NE100.

Plexiglass/ Metal Chamber

Provides more safety for the user, and prevents from any sparking.
*Available for NS Starter Kit & NS1.

Drum Collector with Homogeneity System

X-Axis motion applied to the collector, to produce homogeneous nanofibers membrane.
*Available for NE & NS Series.

Chamber Heating

Heating of spinning area up to 40°C. Some polymers behave better under higher temperature levels.
*Available for NE Series and Pilot & Industrial Machines.

Dehumidifier Attached Chamber

Ambient humidity adjustment between 25% and room condition.
Some polymers behave better under low humidity.
*Available for NE Series and Pilot & Industrial Machines.

Vacuum Holder Plate Collector

Vacuum fixing of solid substrates (metal, glass, thin plate, lamella) on stationary plate collector.
*Available for NE Series.

Camera Integration

Camera option with Laptop to visualize and record the process.
*Available for all models.

Gas-Jacket Module

Gas shield is a way to solve clogging of polymer on the top of needle by solvent saturated N2 gas. This option may increase productivity of many polymer solutions. Also enables flooding the chamber with inert gas.
*Available for NE Series and Pilot & Industrial Machines.

Different Diameter Needles

Electrospinning needles with the following diameters:
(23G, 21G, 19G, 17G, 15G) X10 pieces
*Available for all models.

Recipe Recall Function

Enables saving and recalling previous parameters.
*Available for NE Series and Pilot & Industrial Machines.

Additional Warranty

One extra year warranty / Two extra years warranty / Three extra years warranty

Services

PROOF OF CONCEPT

Concept plans: Turning an idea into a target product profile including technical feasibility, regulatory and IP considerations, with unbeatable pricing and minimized risks. Feasibility studies: Evaluating whether we can create a scalable, reproducible process from a concept or lab scale process.

Pre-design control studies: Research studies to achieve the desired target profile and optimize the process including packaging and sterilization regimes. Make samples for in vitro and other testing.

Design control modules: Verification and validation studies to establish the tolerances of the optimized process. Regulatory studies: Manage ISO bio-compatibility studies with accredited third-party suppliers and coordinate documentation. Generation of documents for design history file.

PRODUCT DEVELOPMENT

With product development, we offer R&D services based on electrospinning technology. Our services range from design to development and analytical services that convert great ideas to scalable prototypes and final commercial products. We urge companies to partner with us for advanced product development that will meet their application needs. With intellectual property and technical expertise, we will develop a custom product that meets the requirements through a structured approach following specified milestones. We work with our customers right from the initial R&D stage up to the manufacturing stage. We have life time commitment to our partners sustainable success.

CONTRACT MANUFACTURING

Through contract manufacturing, we offer clients a bespoke manufacturing service that meets research grade and commercial grade material. The contract will be based on the client's customized product specification and product supply terms and conditions. We offer the possibility of producing customizable commercial nanofiber-based products under OEM business agreements with private labeling. Examples of the application areas that we actively work on: Bio-medical (Tissue engineering and regenerative medicine, artificial organs, wound dressing), pharmaceutical (drug delivery systems), filtration (air filters, oil/ liquid filters), cosmetics (Anti-ageing facial masks) and energy (battery separators, energy storage devices, solar cells).
Certain categories of textile applications can also be covered. Contact us to learn more about our services.

References


3M
Argonne NATIONAL LABORATORY
Honeywell
HUAWEI
Johnson & Johnson
MAYO CLINIC
cellcentric
A Daimler Truck & Volvo Group Company
Stanford University
JOHNS HOPKINS UNIVERSITY
Massachusetts Institute of Technology
Northeastern
THE UNIVERSITY OF ALABAMA
Jefferson
UMASS University of Massachusetts Lowell
MIDWESTERN UNIVERSITY
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SENOPLAST
UNIVERSITY OF MANITOBA
Manchester Metropolitan University
CIATEC
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SENAI
UNIVERSIDAD DEL BÍO-BÍO
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The Papua New Guinea UNIVERSITY OF TECHNOLOGY
NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE
SUTD SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN
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UNIVERSITY OF THE WITWATERSRAND JOHANNESBURG
UCRIVERSIDE
NTNU Norwegian University of Science and Technology
secant group
CNRNANOTEC INSTITUTE OF NANOTECHNOLOGY
PRIFYSGOL BANGOR UNIVERSITY
Graphwear
NORTH CAROLINA AGRICULTURAL AND TECHNICAL STATE UNIVERSITY
POLARIS SCIENCE
Mizzou University of Missouri
UNIVERSITY OF LIMERICK OLLSCOIL LUIMNIGH
πErSiCa
NanoTechnology
THE UNIVERSITY OF BRITISH COLUMBIA
KITECH
NREL Transforming ENERGY
Amongst 400+ references...

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