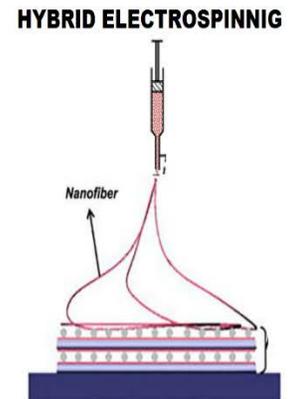
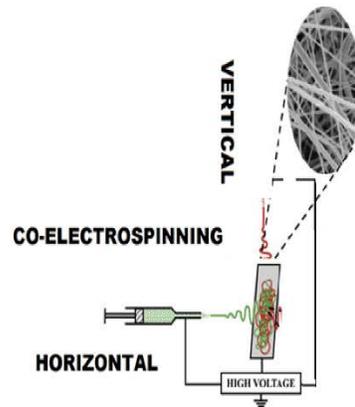
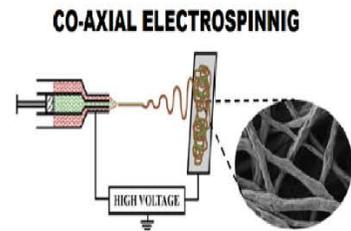
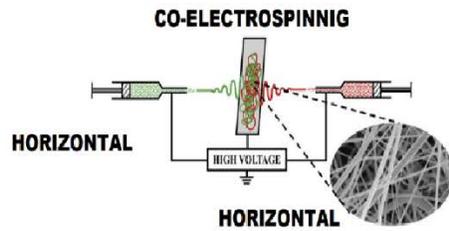




FYTRONIX ES-9000 ELECTROSPINNING SYSTEM



FYTRONIX ELECTROSPINNING SYSTEM includes

The electrospinning process uses high voltage to create an electric field between a droplet of polymer solution at the tip of a needle and a collector plate).

The ES-9000 is a complete electrospinning production system.

You can prepare the following materials

1. Nanofiber (semiconductor, superconductor, insulator)
2. Nano thin film
3. Thin film applications
4. Thin films for diode, photosensor, solar cells, transistor

SPECIFICATIONS

Electrospinning Machine

1. Substrate-Nanofiber-Substrate composite,
2. Fibre-substrate composite
3. Substrate-Fibre composite
4. Vertical and horizontal arrangement for co-spinning

All these provisions should be available to make the composite structure nanofibers of the size of 15 -15 cm².

a)Adjustable High Voltage

1. Input voltage range: 210-240 VAC+/-
2. Output voltage range: 0 to 30 KV
3. Output current: 0-400 μ A preferable
4. Digital: Digital voltage and current monitoring outside of device chamber
5. Voltage Regulation: 0.01 kV must needed
6. Overload trip- unit shut down if current exceeds 20% of the maximum output current

b) Microcontroller Syringe Pump

1. Single syringe attachment with separate stepper drive unit
2. Infusion and withdrawal function optional
3. Volume, time and flow control preferable
4. Acceptable sample syringe: 5 μ l-60 ml
5. Adjusting resolution: 0.1 μ l/min or higher side
6. Flow rate: 1nl/min-3 ml/min or higher side with μ L/sec, μ L/min, μ L/h units
- 7.Touch Screen controller and monitor
- 8.Spray volume and flow rate controller unit
9. ES-9000 includes standard 2 syringe pumps controlled independently, optional up to 6 syringe pumps
10. Humidity and temperature control and monitor
- 11.Designed for vertical or horizontal production

c) Collector

1. Plate: 200 mm x 200 mm is preferable
2. Dum Collector: D=100 mm, L=200 mm
3. Disk: D=10 mm, L=200 mm
4. RPM: 200-5000 or more preferable
5. Controlled by touch screen controller
6. Adjustable vertical and horizontal speed controller

d) Spinneret /Nozzles

Co-axial nozzle (Stainless steel arrangement with fixed needle geometry)

Multi-nozzle (Quadruple nozzle with single output tip)

Hybrid Nozzle

Linear stage

Both side X-Axis: Distance adjustment manual. Computer controlled preferred Y-Axis:

Programmable transverse motion

Specification:

Oscillation speed: 1 mm/sec to 5 mm/sec adjustable preferable

Stroke distance: 300 mm preferable

Speed: Three speed adjustment (Slow, Medium and Fast) Z-Axis manual control optional

Spinning arrangement

Vertical spinning Horizontal spinning

Both side spinning is must

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g) Spinning conditions

1. Solvent spinning (Compatible for water, Acetone, Methanol and other solvents)

h) Spinning Cabinet

Temperature control and display (up to 60 degree Celsius)

Humidity display and controller
Ventilation for fumes
Illuminating Light:20 Wx2 LED tubes
Computer control interface,
Dischargable connection provided.
Transparent view port on the front side

i) Panel control

Touch Screen Controller and Monitor System to for current and voltage parameters
Emergency stop
Arc Protection Unit Circuit
Electricity Protection feature mode
Main stop
UV light arrangement
Exhaust Operation
Auto cut high voltage while door is opened.

j) Accessories

Foot pad: 1 number
Insulation pad: 1 number
Standard spinning samples
Chemical resistance tubing
Tube connectors

k) Additional Accessories

Syringes with needles: 3ml and5ml
PAN Powder
Silicon Tube
Aluminum Foils
Blower
Humidifier

l) Precession syringe pump for micro-fluidic applications

The pump should have independent controller with software based applications
Laptop/ Computer/HMI should be provided along with the machine
Warranty 01 year

Annual Maintenance Charges: AMC will be charged after completion of Warranty period for 5
years Demonstration of the setup is necessary after installation

NEEDLES

The needles can be changed easily, many choices for diameter and length as follows,

Inner diameter

27G=0.184mm

26G=25G=0.232mm

25G=0.232mm

24G=0.28mm

23G=0.317mm

22G=0.39mm

21G=0.49mm

20G=0.56mm

18G=0.79mm

16G=1.10mm

14G=1.60mm

REAL-TIME VISUALIZATION / IMAGING SYSTEM

THE CAMERA is at the heart of Electro-Hydrodynamics atomization. In order to get a steady coaxial/simple electrospinning/electrospraying process, Taylor cone steadiness is required. CAMERA visualization is key for checking time-real he performance of the process. Includes: Analog CCD Camera, Lens & Extensor, Camera Support, LED Illumination and VGA output to connect to most of commercial screens.

CHAMBER ILLUMINATION

LED Illumination is equipped with all the security measures, ensuring a safe operation for the user.

ROTATING COLLECTOR

Rotating collector of electrospinning is used for collecting aligned nanofiber sheet. This is the simplest and effective method to make aligned nanofibers. By using different length/ diameter ratio, with different rotating speed, an even fiber sheet or aligned fibers can be made.

High aligned nanofiber collector: normally, linear speed is bigger, the fiber alignment will be better. Even though disk collector can make best aligned nanofibers, its collecting area is too limited. In order to get larger fiber sheet with good alignment, FYTRONIX designs the following collector with short length and big diameter.

SYRINGE HEATER (optional)

Some polymers can't be dissolved at room temp., or has high viscosity, which is not suitable for electrospinning. FYTRONIX designed syringe heater for heating the polymer solution up to 80 degree C, it is a simple way to heat the solution. Only syringe can be heated, while the tubing connected with the syringe can't be heated, so it should be used with Tubeless spinneret together.

XY MOVING STAGE

X-Y moving stage is quite useful for making even fiber film on inflexible materials. It can be used as a holder for glass or ceramic, and other inflexible materials, to make even nanofiber film or nanoparticle film on the surface of the collector.

PTFE TUBING

Many solvents used by electrospinning process can dissolve many plastic tubing and connectors. FYTRONIX designed and made special PTFE tubing for electrospinning which can be used for almost all solvents used for electrospinning process.

Humidity & Temperature Monitor

RH monitor is a cost effective solution to monitor the temperature and relative humidity of glove box inside. It can set up an alarm based on requirement, and show instant humidity and temperature.

ENVIRONMENT HEATER

Halogen lamp heater with thermal couple and digital temperature controller are integrated into the fume hood for environmental heating up to 40 °C

ENCLOSURE

The unit has been designed to work in a laboratory and research environment, having an excellent flexibility, ease of use and minimum setup time and maintenance. The working area is 650mmx400mmx645mm. The transparent enclosure allows the visualization of the process and an easy access to the cabinet

SOME DETAILS ABOUT NEEDLE TIPS

Syringe Needle Tips

Stainless steel





14 GAUGE

COLOR: OLIVE

OUTER DIAMETER: .072IN (1.83MM)



15 GAUGE

COLOR: AMBER

OUTER DIAMETER: .065IN (1.65MM)



16 GAUGE

COLOR: GRAY

OUTER DIAMETER: .064IN (1.63MM)



18 GAUGE

COLOR: GREEN

OUTER DIAMETER: .050IN (1.27MM)



20 GAUGE

COLOR: PINK

OUTER DIAMETER: .036IN (.91MM)



21 GAUGE

COLOR: PURPLE

OUTER DIAMETER: .033IN (.83MM)



22 GAUGE

COLOR: BLUE

OUTER DIAMETER: .027IN (.70MM)



23 GAUGE

COLOR: ORANGE

OUTER DIAMETER: .025IN (.63MM)



25 GAUGE

COLOR: RED

OUTER DIAMETER: .020IN (.53MM)



27 GAUGE

COLOR: WHITE

OUTER DIAMETER: .016IN (.42MM)

🖱 Mouse over to zoom in