

NanoSpinner416: Industrial Nanofiber Production System

NanoSpinner416 is electrospinning oriented industrial nanofiber production machine that can coat 1 meter width fabrics with 50-400 nm (0.05-0.4 μm) diameter nanofibers. In accordance with the customized product properties and nanofiber coating level (g/m^2), the output of NanoSpinner416 can vary 500 m^2/day to 10.000 m^2/day nanofiber membrane coating. Net nanofiber production capacity of NanoSpinner416 is approximately 5.000 g nanofiber daily. Various products can be obtained after customization such as;

Target Product	Air Filter	Antimicrobial Mask	Performance Fabric	Microfiltration Membrane	HEPA Air Filter	Ultrafiltration Membrane
Coating Level	0.5 g/m^2	0.4 g/m^2	10 g/m^2	8 g/m^2	10 g/m^2	14 g/m^2
Production Capacity	10.000 m^2/day	12.500 m^2/day	500 m^2/day	625 m^2/day	500 m^2/day	360 m^2/day

Polyurethane (TPU), Polyvinilalcohol (PVA), Polyamide 6 (PA6), Polyacrylonitrile (PAN), Alginate and Polyvinilchloride (PVC) solutions are mainly processed in NanoSpinner416. Other polymer solutions need to be optimized in NanoSpinner416 in customization. According to application, substrate material can be such as; spunbond, meltblown, cellulose, woven fabric, paper or any other textile form.

Hardware: 1 item 100 kV DC negative high voltage power supply, 1 item 60 kV DC positive high voltage power supply, 6 item micro controlled peristaltic pumps, 3 item high reduction AC motors, Fabric transfer and wind up units, 2 item solvent transfer mechanisms, 256 spinning nozzles, 275x125 cm aluminum plate, aluminum sigma profile chassis, control panel, other mechanisms and equipments.

Capacity: 0.5-5 ml/h solution processing capacity per needle, 128-1280 ml/h solution feeding for total system, 125 cm substrate and nanofiber coating width, TPU, PU, PAN, PA, PA6, PVA etc. can be processed.

NanoSpinner, thanks to its unique needle design, can provide a more stable process and higher production capacity compared to cylinder or block needled electrospinning systems. When considering electrospinning in 1 needle of 256 needled NanoSpinner416 system, polymer solution is ejected from the needle by electrical forces. While electrospinning process occurs, solvent in the solution evaporates and with 1000 to 10.000 drawing ratios fiber diameter drops into nano levels. Nanofiber coating effect is also reinforced by lamination units in NanoSpinner416 so that a strong cohesion between substrate and the nanofiber web is constituted. Adjusting the gram square meter level of nanofiber coating by means of automation determines the final product of the system.

