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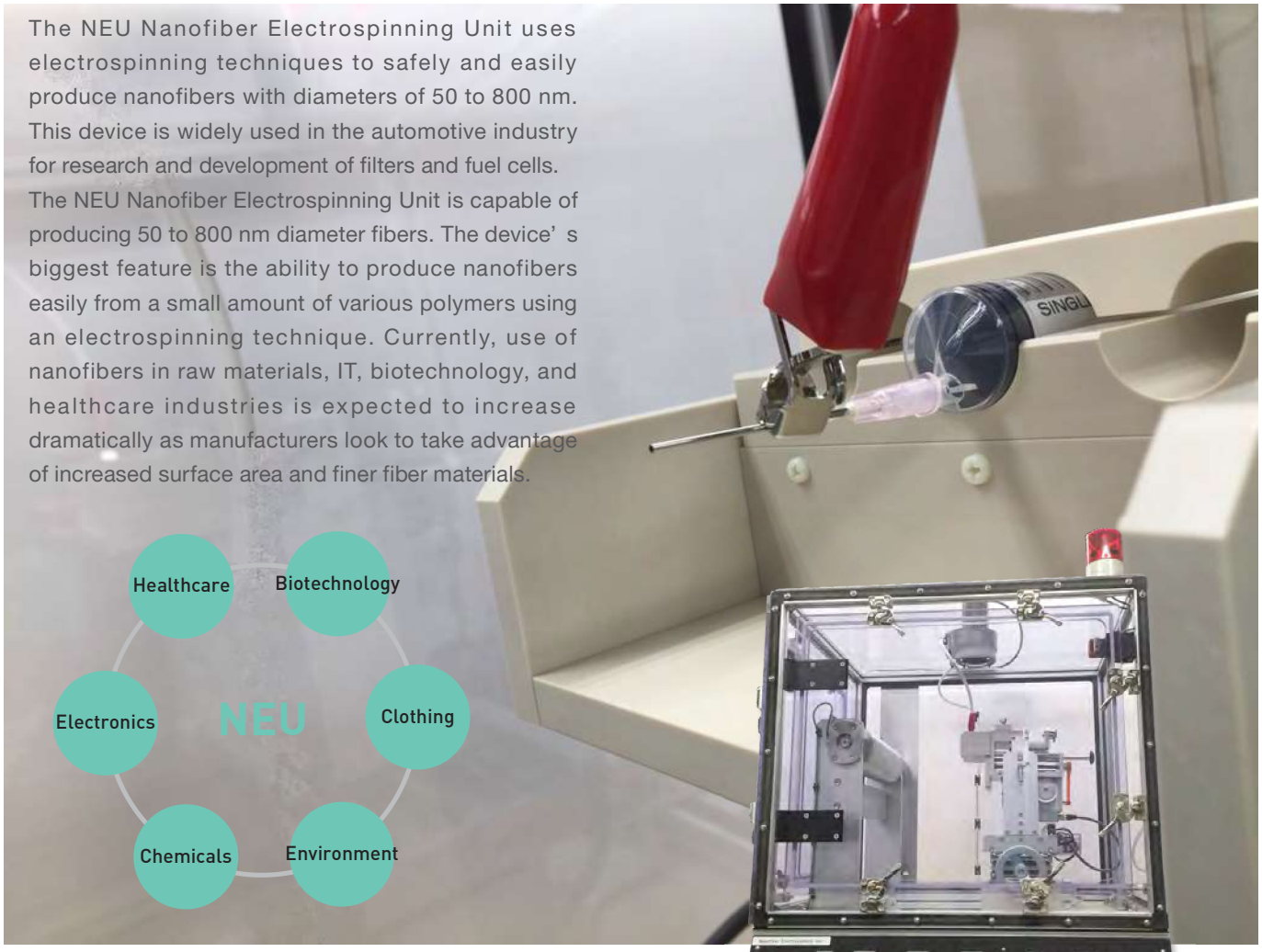
NEU

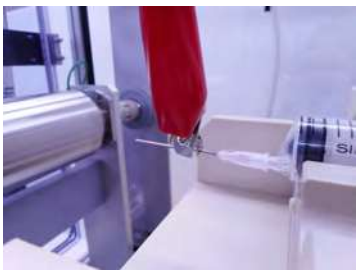
Nanofiber Electrospinning Unit

The NEU Nanofiber Electrospinning Unit uses electrospinning techniques to safely and easily produce nanofibers with diameters of 50 to 800 nm. This device is widely used in the automotive industry for research and development of filters and fuel cells.
The NEU Nanofiber Electrospinning Unit is capable of producing 50 to 800 nm diameter fibers. The device' s biggest feature is the ability to produce nanofibers easily from a small amount of various polymers using an electrospinning technique. Currently, use of nanofibers in raw materials, IT, biotechnology, and healthcare industries is expected to increase dramatically as manufacturers look to take advantage of increased surface area and finer fiber materials.



Industries Fabrics & Textiles, Paper & Non-Woven Fabric

Development history

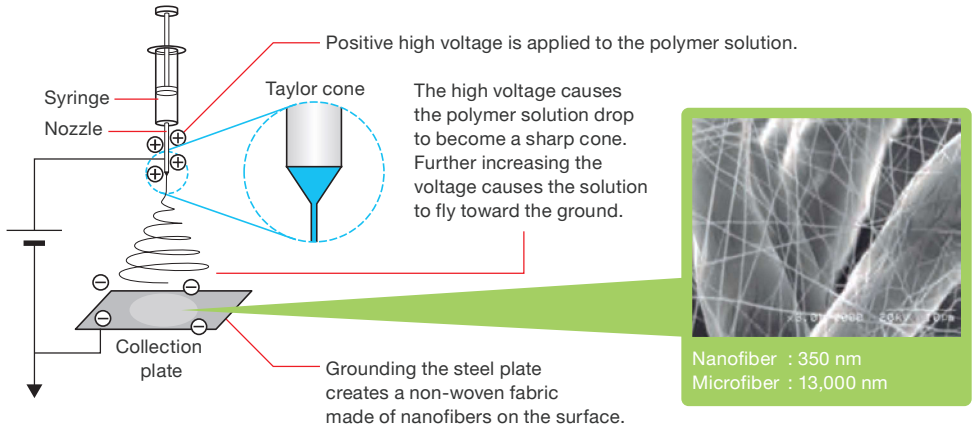


Despite active studies into electrospinning, only handmade devices were available. Although researchers at Drexel University attempted to manufacture a lab prototype, no company capable of producing a device with high accuracy could be found in the U.S. However, Kato Tech Co., Ltd. in Japan undertook the development of an electrospinning device for lab use and created a system that comprised a voltage generator and nozzle, rotating collector, a quantitative syringe pump, and a exhaust fan. This device largely featured the ideas of Drexel University' s Dr. Frank Ko, a leading authority on electrospinning, and made it possible to create nanofibers easily by electrospinning.

Yoshihiro Yamashita,
Associate Professor at Osaka Seikei College

Nano-fiber manufacturing principle

As shown in the diagram, the electrospinning device consists of a pointed positive electrode (capillary) and a flat negative (ground) electrode. High voltage is applied between the two electrodes, and the charged molten polymer or polymer solution coming from the capillary is attracted through the electric field toward the negative electrode. At this point, polymers with low molecular cohesion become a spray, and those with high molecular cohesion are further separated into fibers that are attracted to the negative electrode, where they form a thin layer of fibers.



Schematic of electrospinning technique using a nozzle (conventional nozzle method)

SEM image of nanofibers

NEU Nanofiber Electrospinning Unit

Dimensions/Weight (approx.)	W900 × D750 × H1080 (mm) / 120 kg *Including pilot lamp
Power source	100 VAC, power consumption: 80W Max. *Ensure grounding
Measurement environment temperature and humidity	10 to 40°C / 30 to 70% RH (No condensation.)
High-voltage DC power	Voltage: 0 to 39 kV (displayed on digital meter) Leakage current: Max. 500 µA (displayed on digital meter)
Exhaust fan	Sirocco fan

Syringe pump

Capacity	20 ml (standard)
Pieces	Up to 3 pcs.
Discharge speed	0.000 to 0.500 mm/min (Stable motor range: 0.030 mm to 0.250 mm/min) *When used with the 20 ml syringe
Traverse speed	0 to 300 mm/min
Distance between target and syringe	0 to 180 mm (with standard syringe and needle attached)
Unit adjustment angle	45° from the horizontal
Syringe height adjustment range	150 mm

Target

Drum type (standard)	Dimensions: 100 mm (diameter), 330 mm (width) Peripheral velocity: 0 to 9.00 m/min

Safety precautions

Standard	Spark limiter (stopping at 500 µA or higher) Door interlock

⚠ Precaution For safety use, please read the operation manual / the instruction carefully and throughly before using the tester.

Specification details recorded here are subject to change without notice.
We appreciate your understanding.

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