

About Linari Engineering



Linari Engineering is an Italian SME founded in 2003 and named Best electrospinning Manufacturer of 2020 from famous Global Pharma & Health magazine thanks to 250+ Scientific Papers from more than 300 customers all over the world. 10 years' experience in international R&D projects and winner of n.6 EU Grants and n.4 Italian Grants for R&D in nanomaterials.

NANOFIX:

Miniature electrospinning system for aerial nanocoating application

The NanoFix system is designed to be used as standard drone payload to apply nanofibers on aerial structures (pipes, wires, cables...) to protect them from environmental effects like corrosion, ice adhesion and biofilm using specific material for each scope.

The system is able to take off and land on an aerial thin cylinder with diameter between 12 and 25 mm, other dimension can be done under customization. Thanks to an electric opening system of the lower part (the cargo area) done using four linear actuators controlled by a specific contact from drone. In Figure 1 the device with cargo door fully opened is shown. The V-shape guides are specifically designed for the selected diameter of the test wire but can be replaced to accommodate different ones for different diameters.





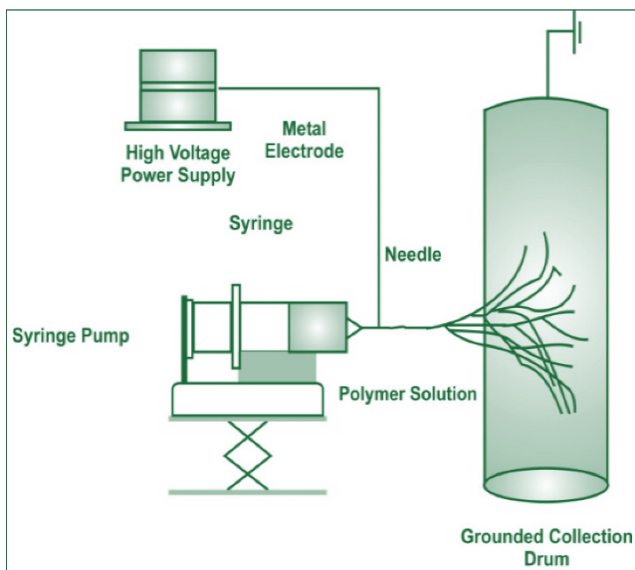
Figure 1: Nanofix during take-off / landing on electric line, lateral view

In Figure 2 a bottom view of the same operational phase shows the metallic brass wheels used to connect the ground of high voltage generator to the metallic conductor to close the electric circuit of electrospinning system.



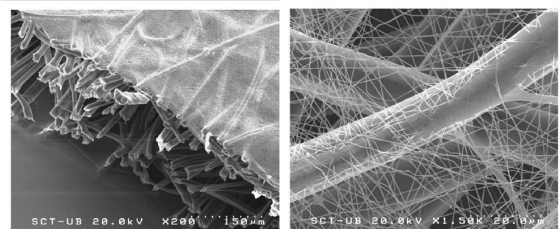
Figure 2: Nanofix during landing on electric line, bottom view

Electrospinning principle



High electric field drives nanofiber production from a liquid solution extruded from a needle at room temperature.

Solvent evaporates naturally during process to create a solid nanofiber of dissolved polymer in a *delicate equilibrium*.



Technical NanoFix specification

Total weight at take-off: 2,98 kg

Cargo opening/closing time: < 5 s

Material of the body: Nylon

Material of miniature pump: Delryn + Fiberglass rods

Batteries: Lithium type 18650 (3,7V @2,6 Ah) x 4 units

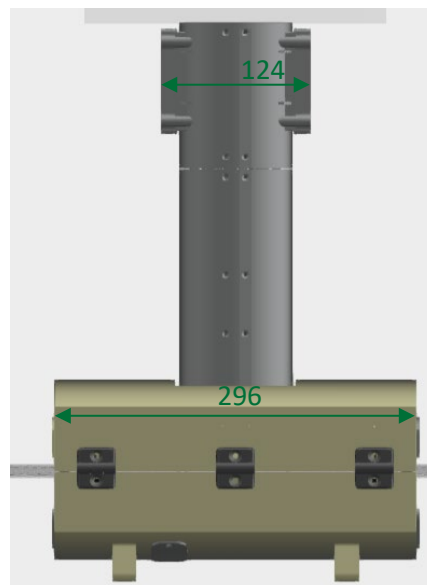
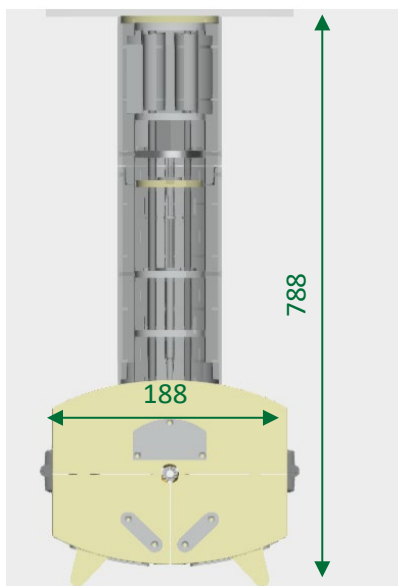
Autonomy: >25 min

Drone control signals: n°2 pnp type | Start/Stop pumps+HV | Open/Close cargo doors

Maximum electrospinning voltage: 0..10 kV

Maximum voltage of coated conductor: 60 kV

Dimensions



Media content

Video how it works

<https://youtu.be/hnx5KYhuLK0>

