

Introducing the World's First Commercialized Carbon Nano Conductive Thread "Electro-Yarn"

What is "Electro-Yarn"?

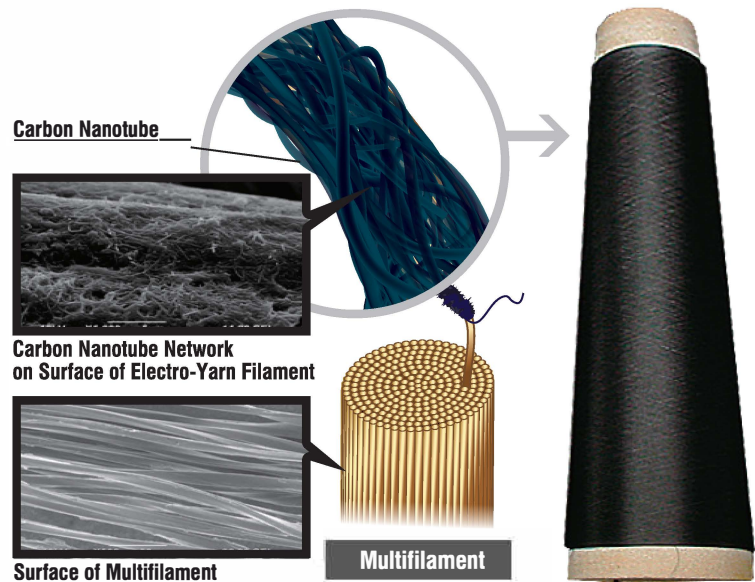
Material
Composition

Polyester Multifilament, Multi-Walled Carbon Nanotube (MWCNT)

Electro-Yarn is an innovative new material utilizing advanced carbon nano technology that allows power, data or heat to be conducted through simple fabric.

The technology involves a special patented process of coating multi-walled carbon nano-tubes to thread. This opens up the possibility for creating amazing new products, using smart fabric with technology to be woven in.

Electro-Yarn received the Grand Prize for the Japanese Government Economy, Trade and Industry Minister's Innovative Manufacturing Award and Fabriclink's 2017 Top 10 Textile Innovation Award.



Six (6) Characteristics of Electro-Yarn

■ Fully Conductive

Each filament of the multifilament has been thoroughly coated with carbon nanotube. Robust network of circuits allowing for high conductivity which is maintained even after extreme expansions and contractions of the yarn.

■ Electrical Resistance can be Custom Designed

The electrical resistance of the yarn can be custom made within the range of $10^0 \sim 10^{10} \Omega/\text{cm}$. (Specification will change depending on the thread type, shape, construction, thickness, etc)

■ Even Electrical Resistance

The electrical resistance is even throughout the whole length of the yarn.

■ High Durability & High Resistance to Bend Fatigue

Even after bending, stretching and contracting there is very little change in electrical resistance and durability is not compromised. The base material of polyester multifilament has much higher resistance to bend fatigue than metallic cable.

■ Light Weight

Much lighter in weight than metallic cable.

■ Quick Surface Heating

For heating applications, the speed of surface heating is exponentially faster than metal wire heaters.

Electro-Yarn Application and Product Lineup

Surface Heater

Electro-Yarn-T

- Fabric surface heater with Electro-Yarn (Horizontal) and Polyester Thread (Vertical)
- The vertical Electro-Yarn threads heat up when electrical power is applied.
- Extremely fast and even heat = Conserve Electricity
- Light and Soft

■ Conductive Fabric

Carbon Nanotube is highly conductive. When fabric is coated with carbon nanotube and electrical power is applied, the fabric heats up. Light and soft polyester heater is an excellent surface fabric heater.



X-ray Shielding Fabric

Electro-Yarn-B

- After special treatment is applied to Electro-Yarn Fabric, the fabric is capable of shielding X-ray.
- Significantly lighter, flexible and lower cost than traditional X-ray shielding material.

■ X-ray (Electromagnetic Wave) Shielding

In order to increase the X-ray shielding performance of the carbon nanotube, barium sulfate composite is coated on the thread. By utilizing this coated thread as both horizontal and vertical threads, we were able to achieve light weight X-ray shielding fabric.



Signal Cable/Wire Yarn

Electro-Yarn-S

- Twisting Electro-Yarn allows it to be used as signal cable/wire.
- Making Electro-Yarn into a fabric, allows it to be used as tape wire.
- Even with just one stand of Electro-Yarn, it is possible to be used as a sensor.

■ Polyester Cable/Wire

By adding a small quantity of metallic agent into the carbon nanotube formula, we are able to manufacture highly conductive, low electrical resistance fabric material. So far we have been able to achieve Electro-Yarn with electrical resistance of $10^{-1}\Omega/\text{cm}$. This is an excellent substitute for metallic signal/power cable requiring light weight and high resistance to bend fatigue.



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