

TECHNOLOGY	INNOVATOR
Inorganic and organic nanofibrous materials	Company European Union

## TECHNOLOGY

## OVERVIEW

Novel nanofibrous materials have been developed such as ceramic nanofibers and organic nanofibers that have a plurality of applications.

## MAIN CHARACTERISTICS

### Description:

The company focuses on two categories of nanofiber materials that are the following:

- **Inorganic (ceramic) nanofibers** are a powder like materials with high surface area, high porosity and represent great material properties in a nanofibrous structures. Applications for those materials are being tested and developed by many institutions all around the world. The main focus is on new materials for energy storage (batteries and fuel cells), sensors, catalysts, composite materials, thin films and coatings.....
- **Organic (polymer) nanofibers** are produced as membranes deposited on different substrates (different materials, nonwoven/woven textiles, filtration paper etc.) or can be used as self supported membranes. The main application for organic nanofibrous membranes are filtration (air, water purification), separation membranes for outdoor cloths etc.....

For production of these materials, they use Electrospinning and Force-spinning technologies which they have bought from producers of the equipment. They produce new nanofibrous materials using those novel technologies. They can spin fibers into mats and deposit them on different substrates.

The company can develop and produce new products for its customers and if customers are willing to produce the developed products by themselves, they could buy their own technology and start their own production.

The company offers the following services:

- **Industrial production of inorganic nanofibers** ( $\text{TiO}_2$ ,  $\text{SiO}_2$ ,  $\text{ZrO}_2$ ,  $\text{Al}_2\text{O}_3$ ,  $\text{Li}_4\text{Ti}_5\text{O}_{12}$ );
- **Industrial production of organic nanofibers** (PA6, PVA, PUR .....);
- **Development and Laboratory production** of new nanofibrous materials for Universities and R&D teams;
- **Production of nanofibrous products** such as membranes, pellets, sheets, dispersions, etc.;
- **R&D development** - development of final applications based on inorganic and organic nanofibers.

The company is also extending its product portfolio and currently is capable to provide its customers with prototypes of  $\text{SiO}_2$  and  $\text{ZrO}_2$  sheets with different thickness and shapes, which can be used as catalyst, support material, separator for batteries or as nano-filtration. Also  $\text{Al}_2\text{O}_3$  pellets for catalytic reactions are available for our partners.

**Polymer membranes:** new polymer based nanofibrous membranes made of Nylon 6, PUR, PAN and other polymers can be produced in various weights with very high homogeneity. Those products can be used for water and air filtration with high mechanical and chemical resistance.

### Possible Applications:

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	<p>Polymer nanofibrous membranes for water and air filtration, SiO<sub>2</sub> nanofibrous material in microelectronics, Lithium titanate (LTO) nanofibrous material for Li-ion batteries.</p> <p><b>Competitive Advantage:</b></p> <p>Nanoparticles are materials, which have been produced for many years on big volumes. Nanofiber materials are a novel kind of materials which production is currently being upscale to industrial level. The price of nanofiber materials is obviously higher as the technology is young and unique. However a nanofiber material poses unique properties, which nanoparticles cannot have. Mainly it is the structure and physical form of nanofibers, which enable the usage of those materials in many different and new applications. • Large specific surface area • High porosity • Good permeability even at small pore sizes • Possibility to incorporate different additives • Large choice of materials These properties bring opportunities to new unique materials in many application fields...</p> <p><b>Development Stage:</b></p> <p>In user / Testing result available</p> <p><b>Intellectual Property:</b></p> <p>Not provided.</p>
<b>INNOVATOR</b>	The company is specialized in the development and production of novel nanofibers materials, and is open to any kind of cooperation with potential partners/ customers.