



Centre for Nanotechnology
and Smart Materials

Nanotech & Textiles



ENCONTRO
COM A CIÊNCIA
E TECNOLOGIA
EM PORTUGAL

Centro de Congressos de Lisboa

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#ciencia2017PT

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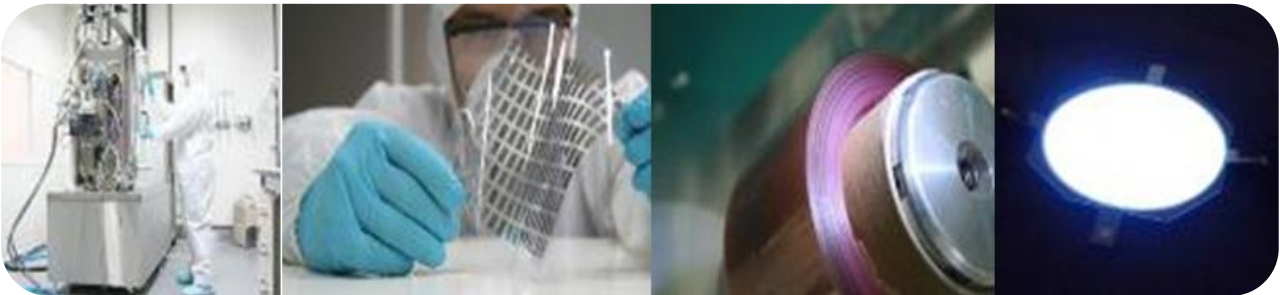


About CeNTI

Three Main Competence Pillars



① Functional Materials & Solutions



② Smart Materials & Systems



③ Modelling Design & Engineering





Three main sectoral targets

Automotive & Aeronautics



Architecture & Construction



Sports, Health, Protection & Well-being





'Three steps' philosophy



R&D

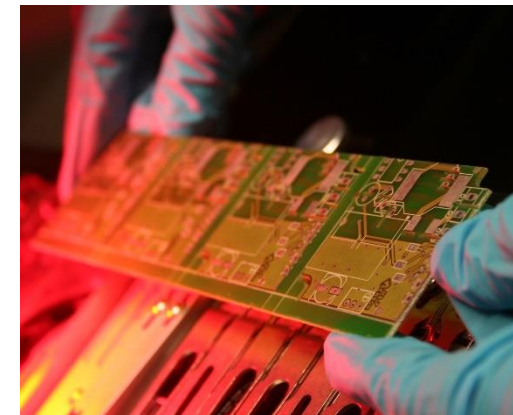
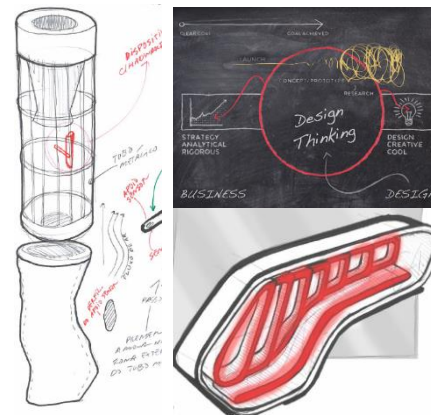
Proof-of-concept
1st Process approach
1st Cost Assessment

Prototyping

Product Design
Process Refining
Cost Assessment

Pre-series co-production

Market Proof





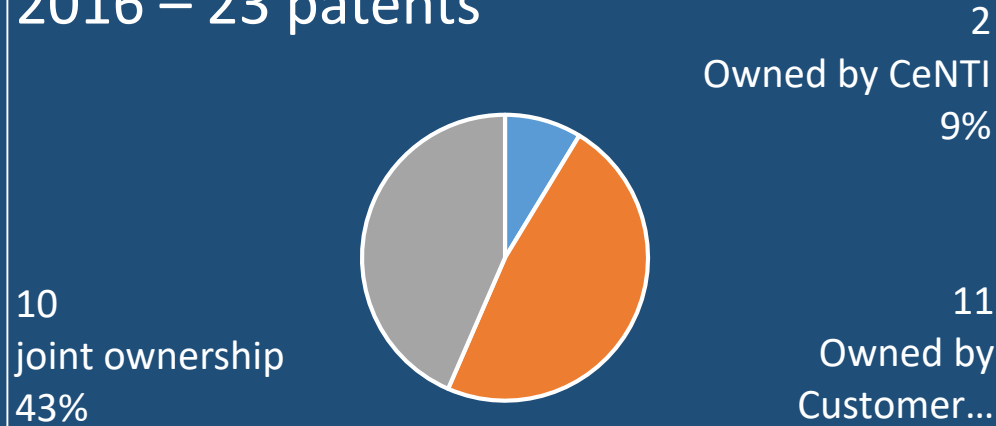
Many base materials



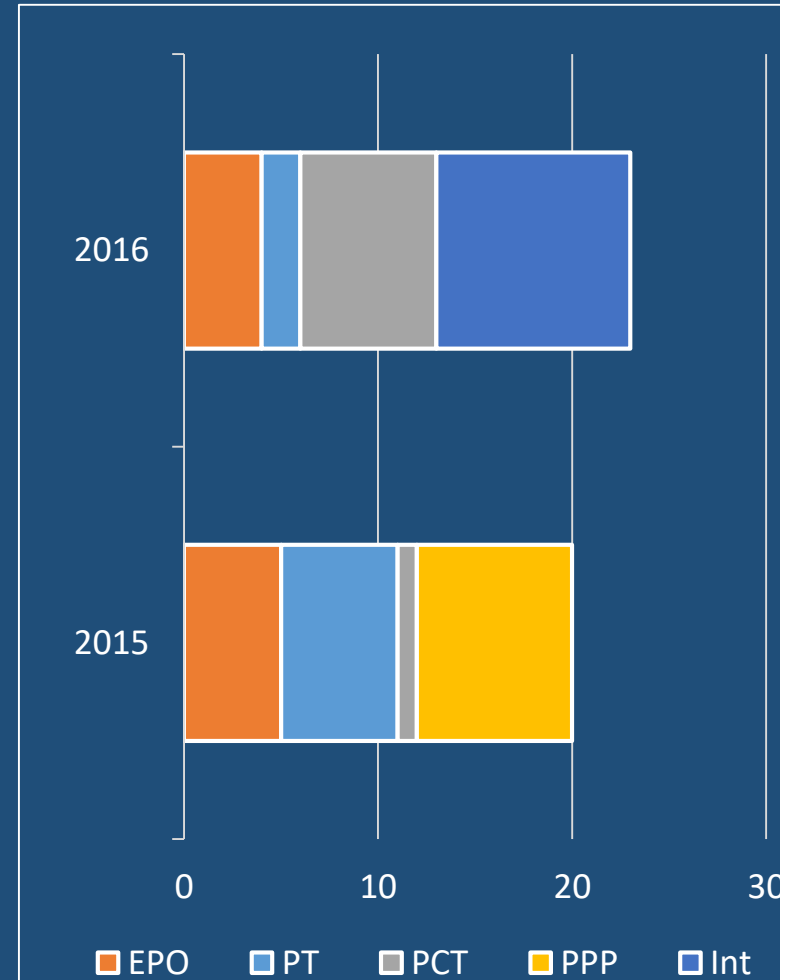
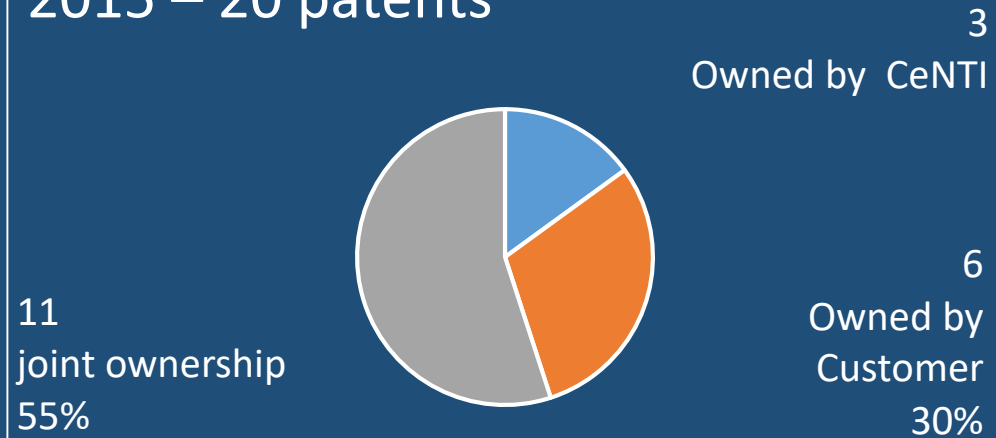


67
APPLICATIONS
47
FAMILIES

2016 – 23 patents



2015 – 20 patents





Nano in Textiles

Look at your
surroundings



Textiles are
everywhere

Everything is going
to be textile

Nano in Textiles, sure?

- High technicity garments
- Textiles as advanced base materials for other industries

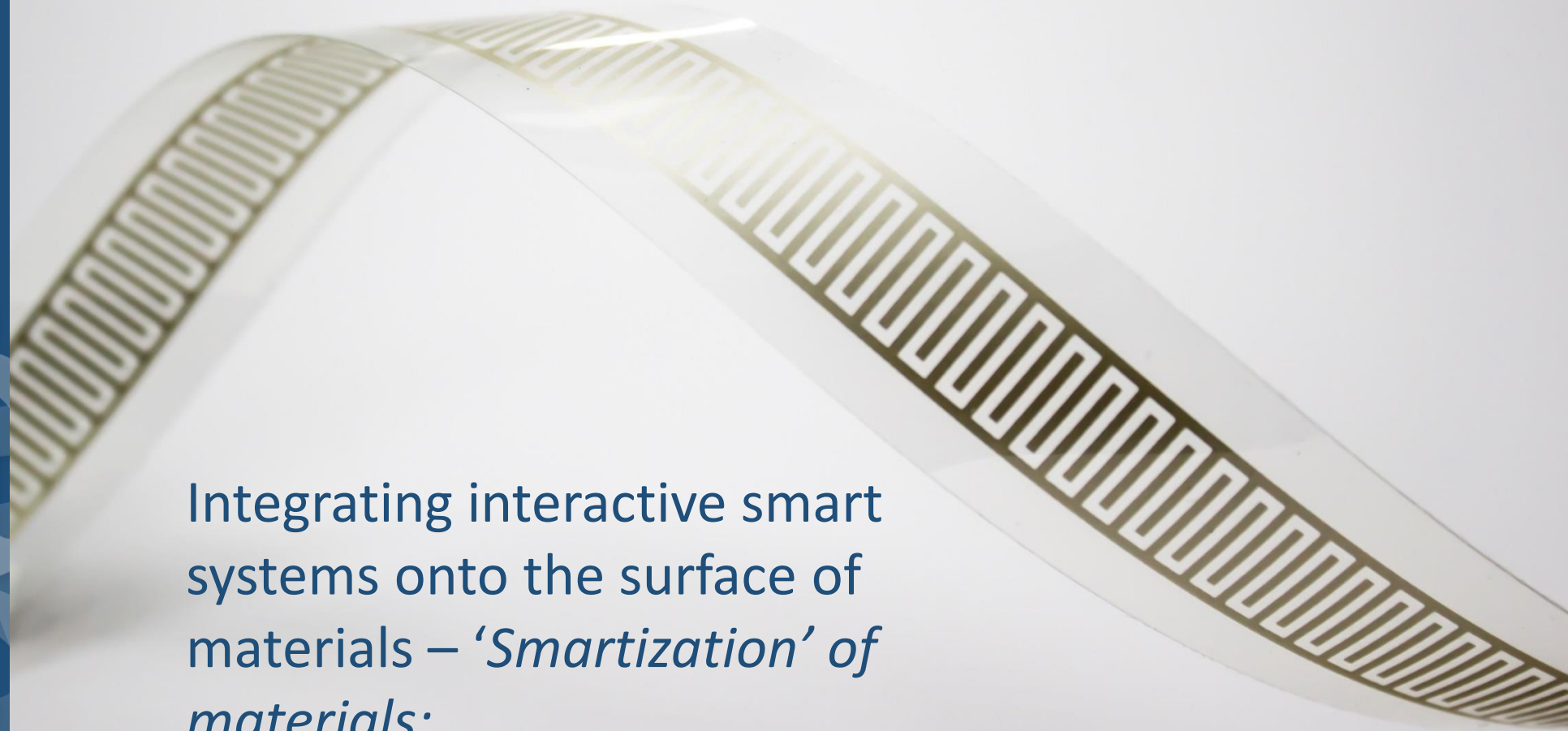


Smart and Functional Textiles



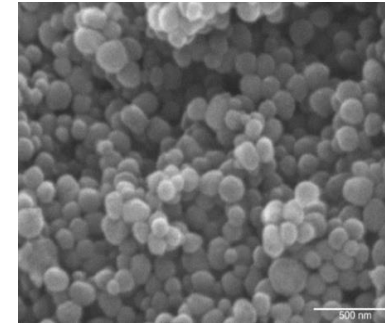
Integrating functionalities directly into material structure and surface;

Integrating interactive smart systems onto the surface of materials – *'Smartization' of materials;*



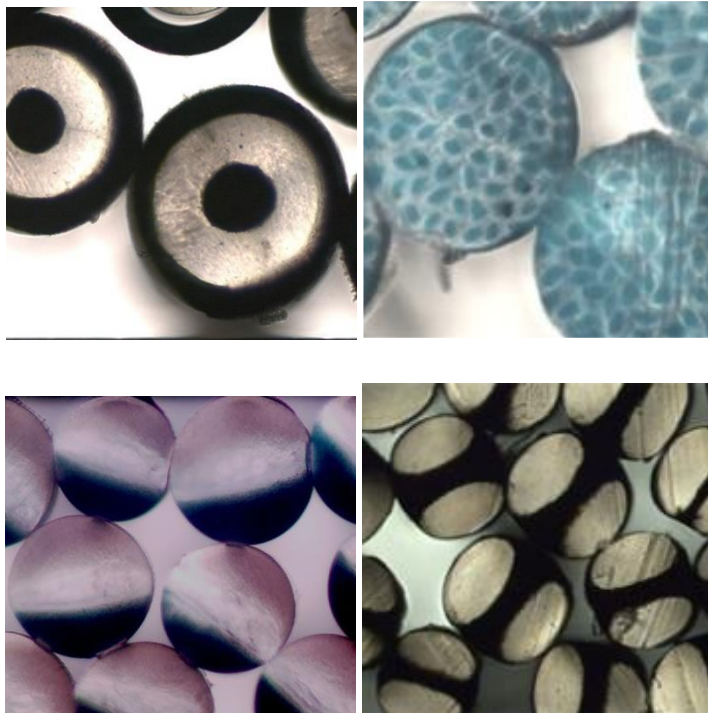


- **Nano particles and nanocapsules development and synthesis**
- **Applications**
 - Antibacterial
 - Super hydrophobic / oleophobic / hydrophobic
 - Self cleaning
 - Anti counterfeit
 - Drugs and cosmetics release
 - Fire retardance
 - Electrical behaviour
 - ...

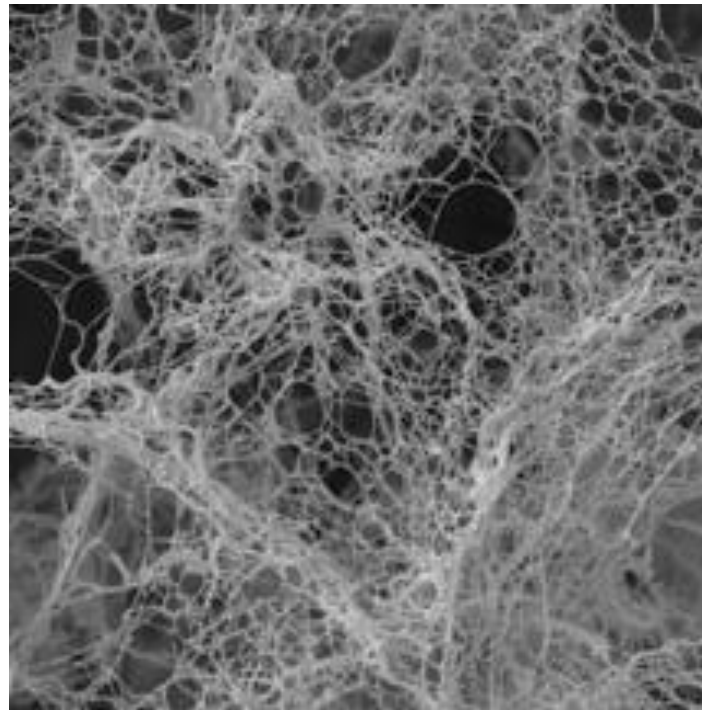




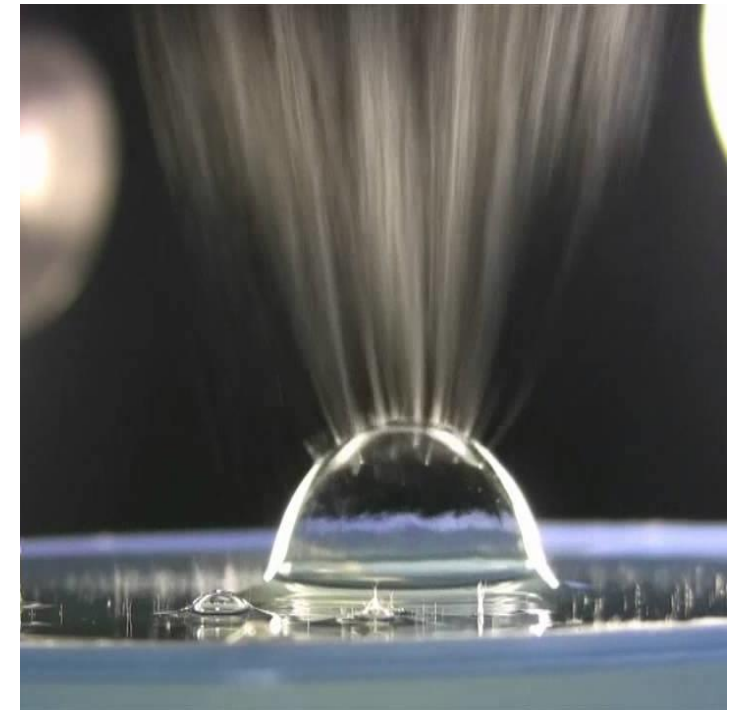
Bi / tri component fibers doped
with nanomaterials



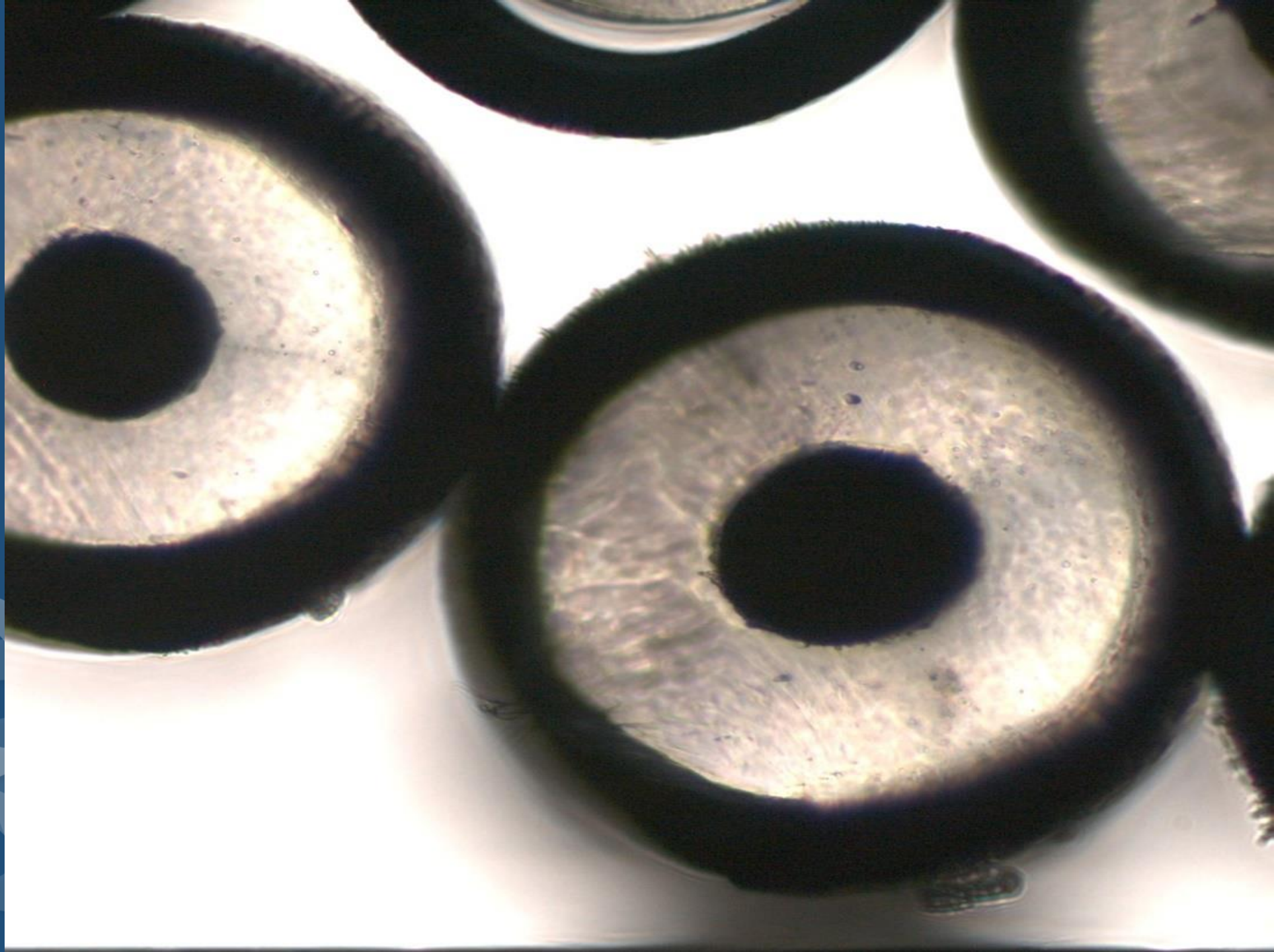
Nano Cellulose



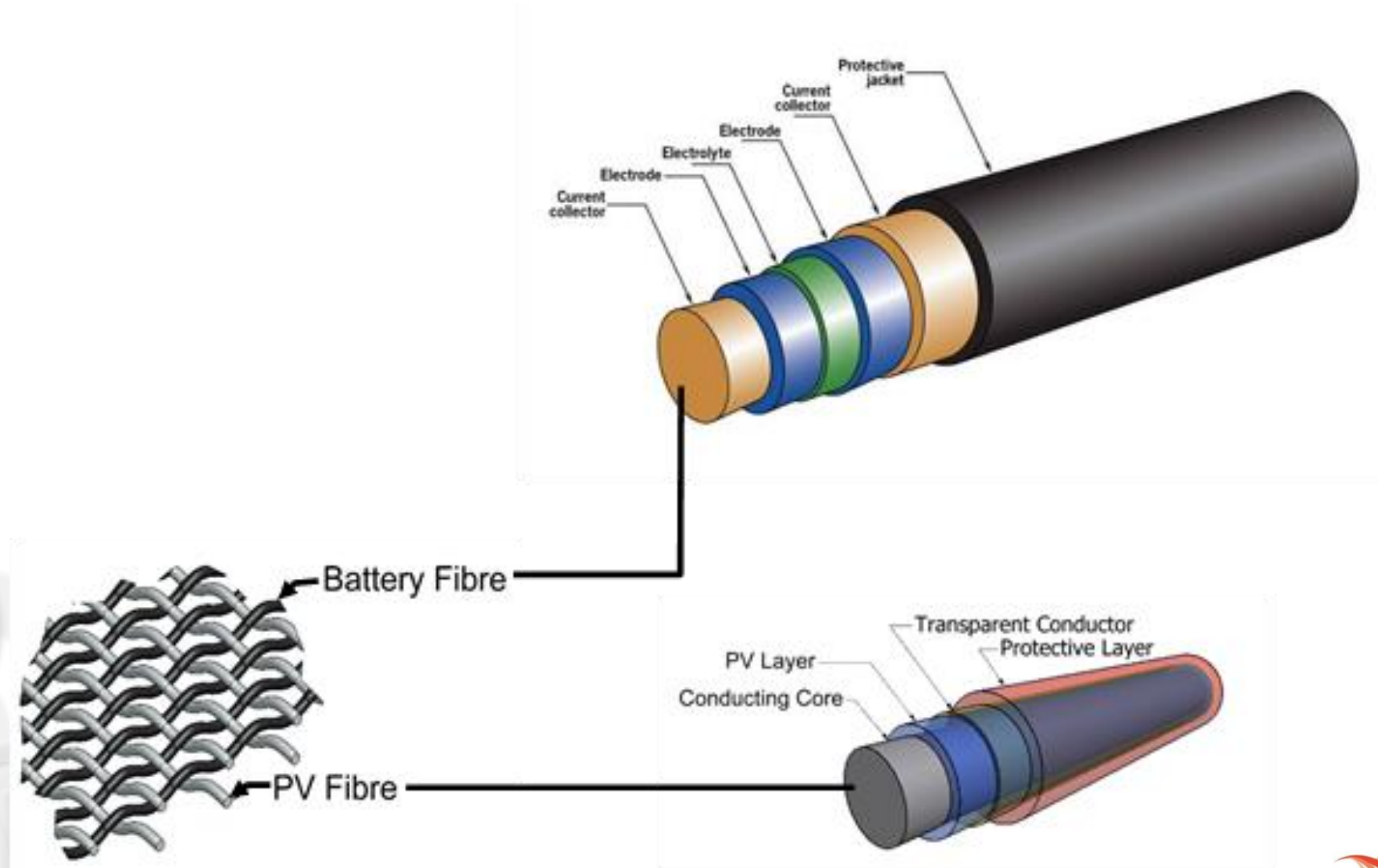
Nano fibers / electrospinning



Piezoelectric
TriComponent Fibres



Energy harvest and storage fibres and filaments





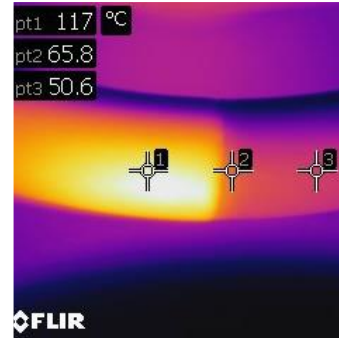
Easy/Self Cleaning



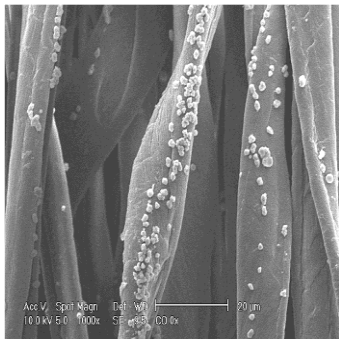
Drug Release



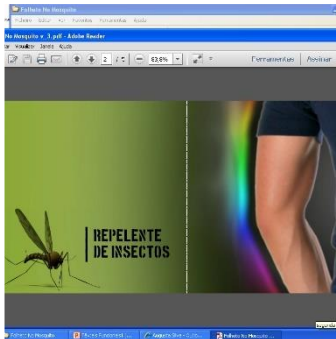
Thermal Management



Anti Microbial



Cosmetotextiles

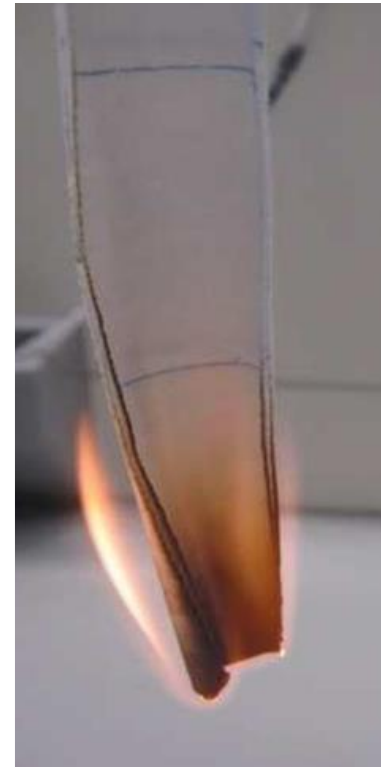


Fire Retardance



- ① R2R UV Surface Modification
- ① Ozone Surface treatment
- ① Wet Coating / Nanoparticle Dispersion
- ① Plasma Surface Modification;
- ① Polymeric Composite nano-coatings
- ① Metal vapour deposition

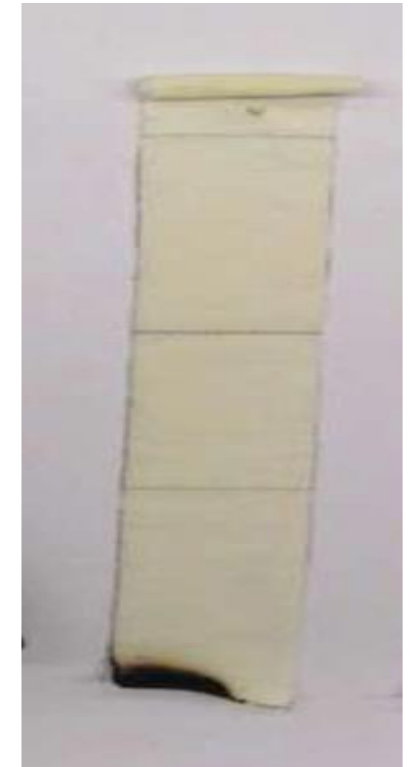
Fire Retardant Materials



Untreated
Cotton



Impregnated
Cotton



Nanocoated
Cotton





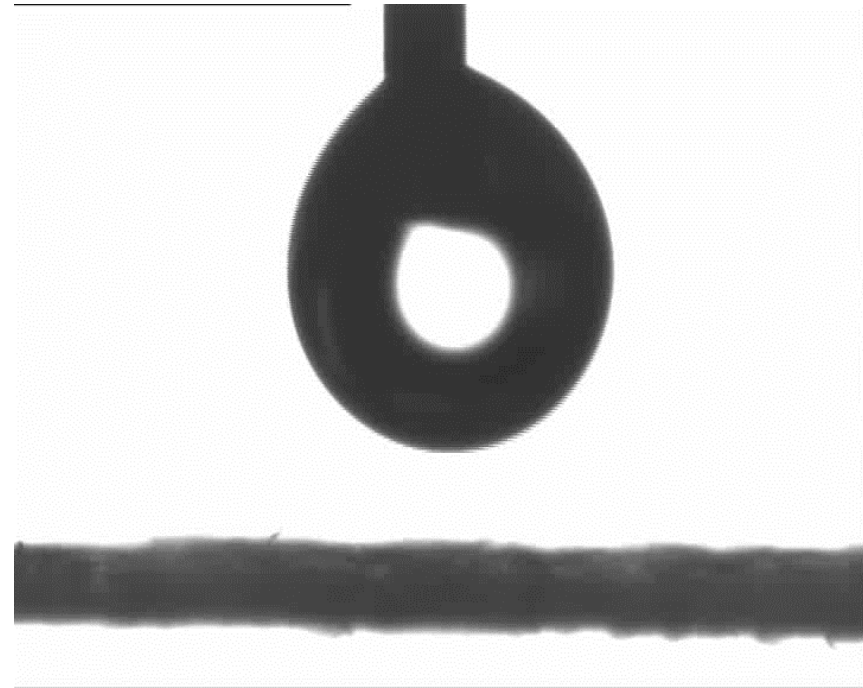
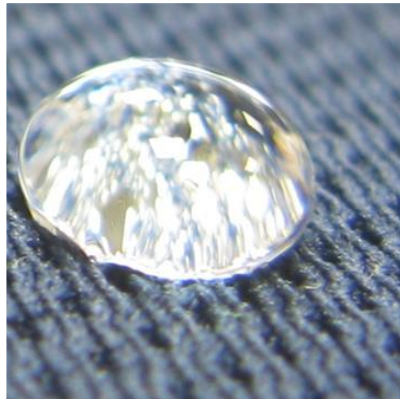
Blood



water



Oil



Functional Solutions
Water repellent
Oil repellent



Functional Solutions
**Self-cleaning
surfaces**

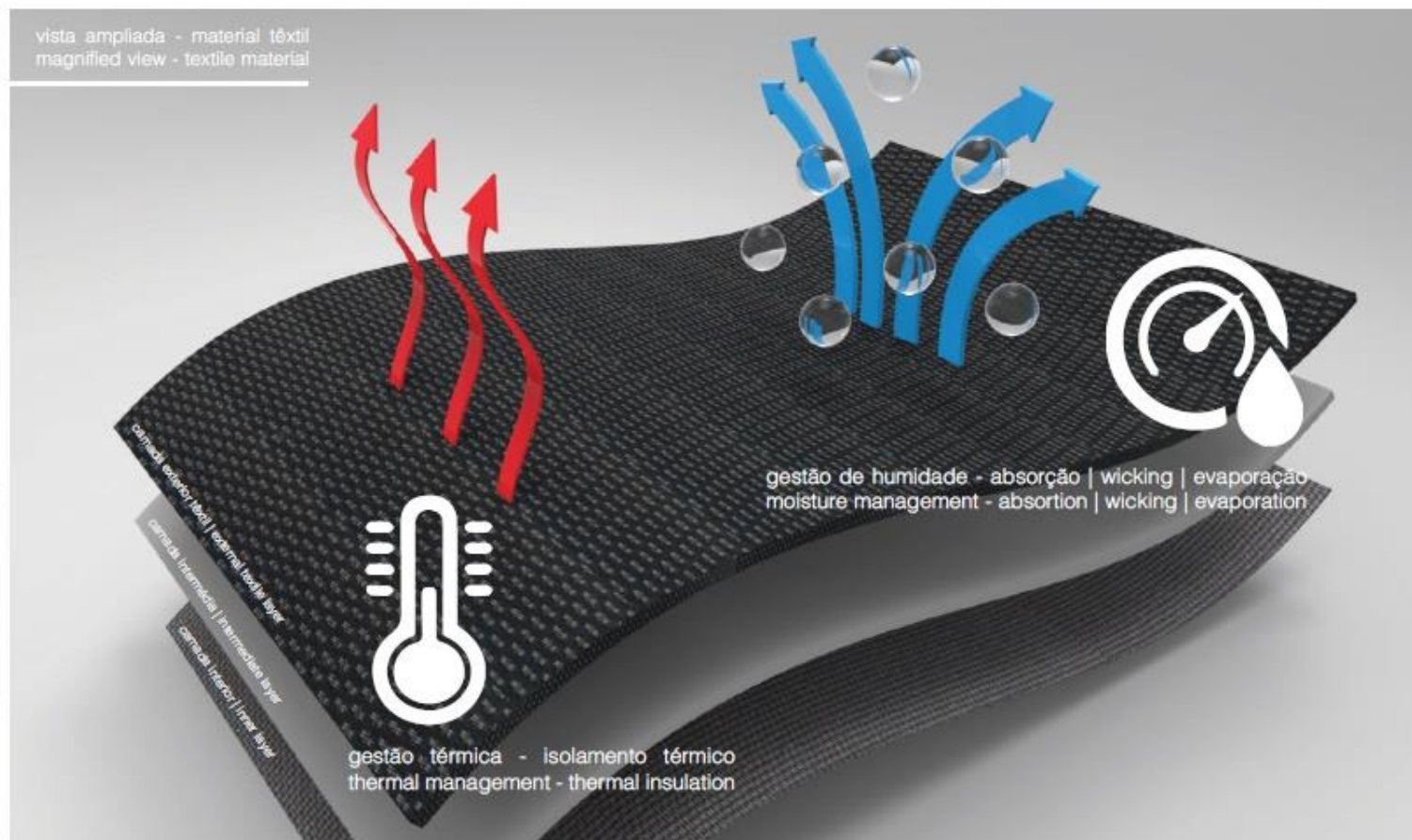


Functional Solutions

Thermal management

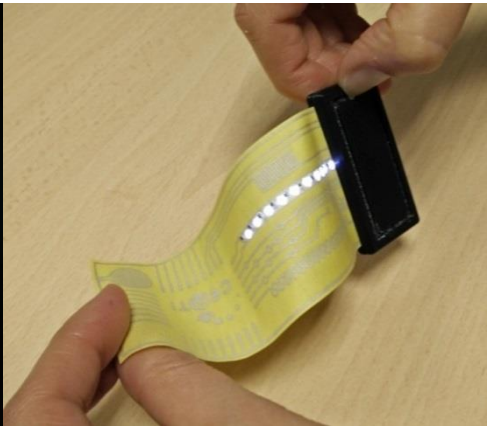


vista ampliada - material têxtil
magnified view - textile material



Functional Solutions
Antimicrobial surfaces
Odour neutralization





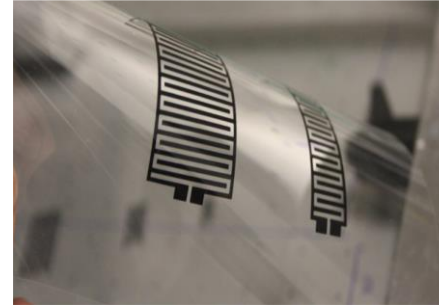
Circuitry and sensors

Direct printed or laminated on textiles

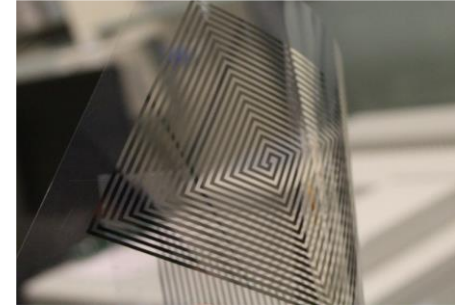
Printed and laminated touchpads



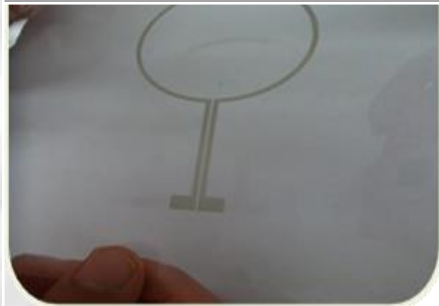
Printed and laminated Biosensors



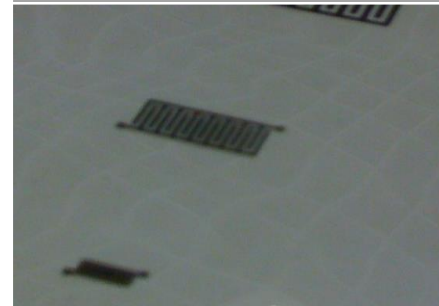
Stretchable sensors



Printed capacitive sensors



Printed Biosensors

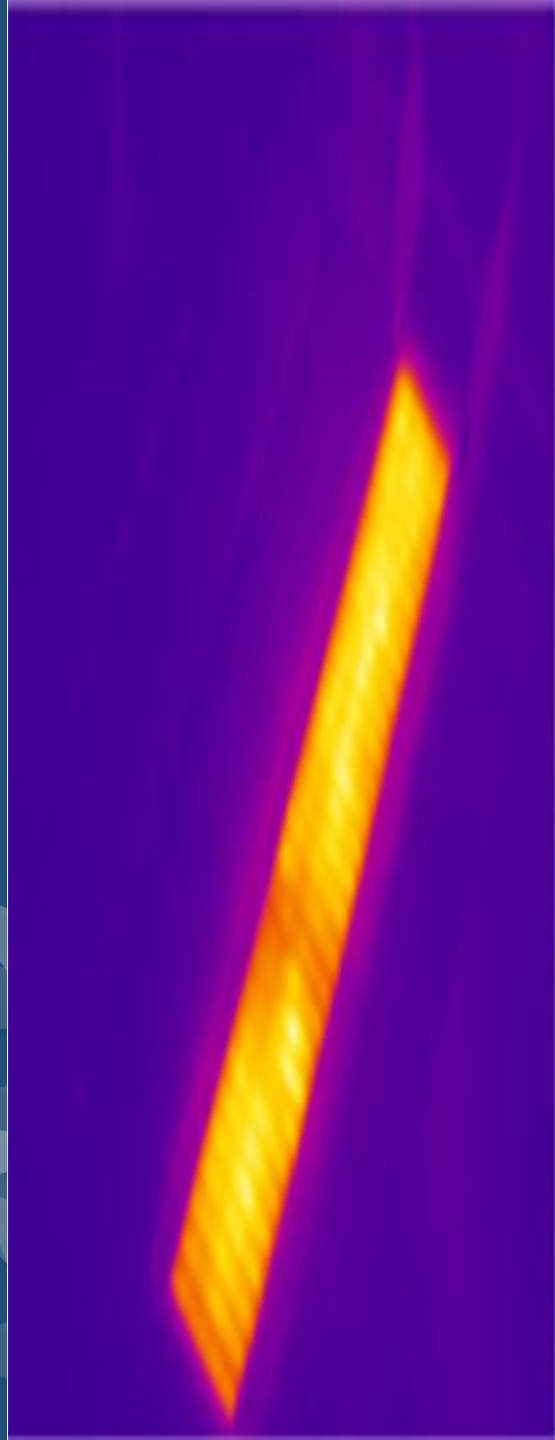


Printed capacitive sensors

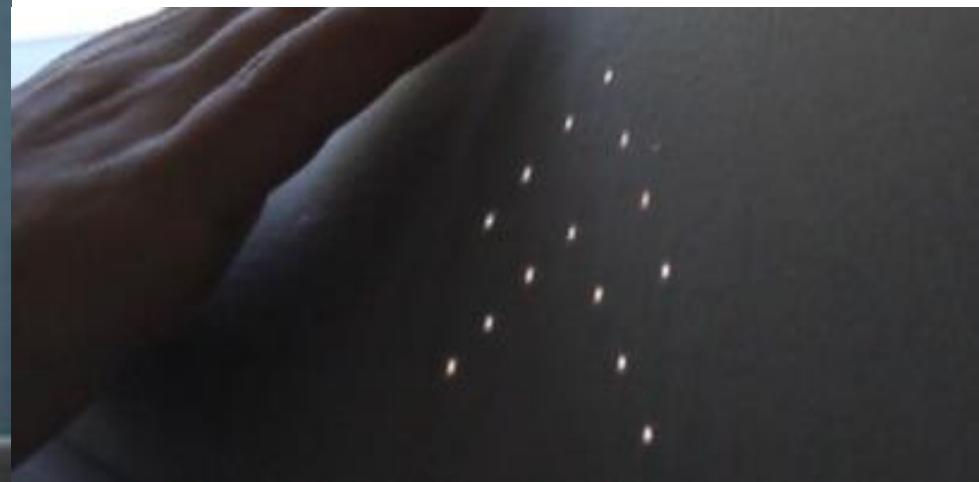
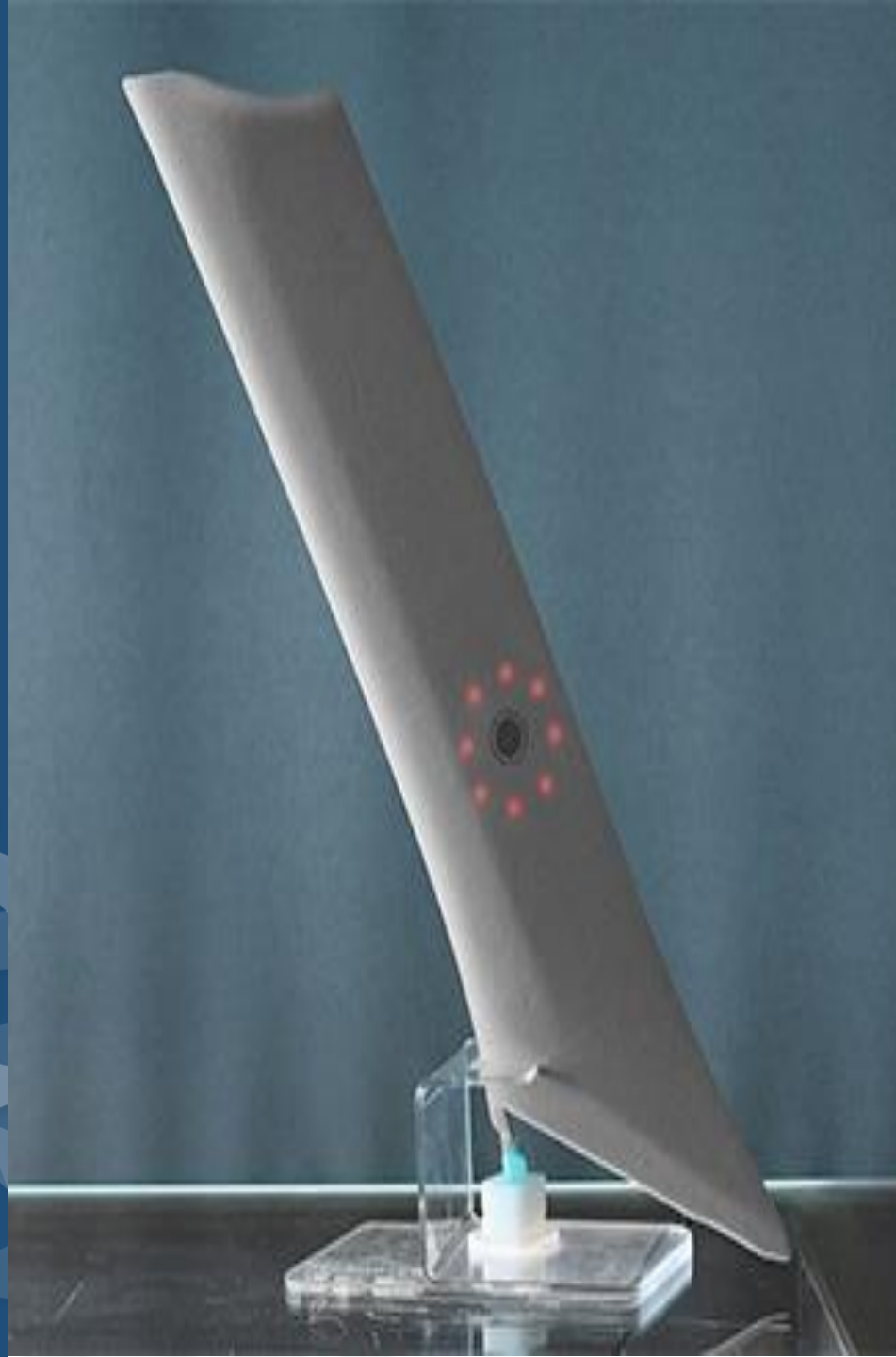


Smart Solutions

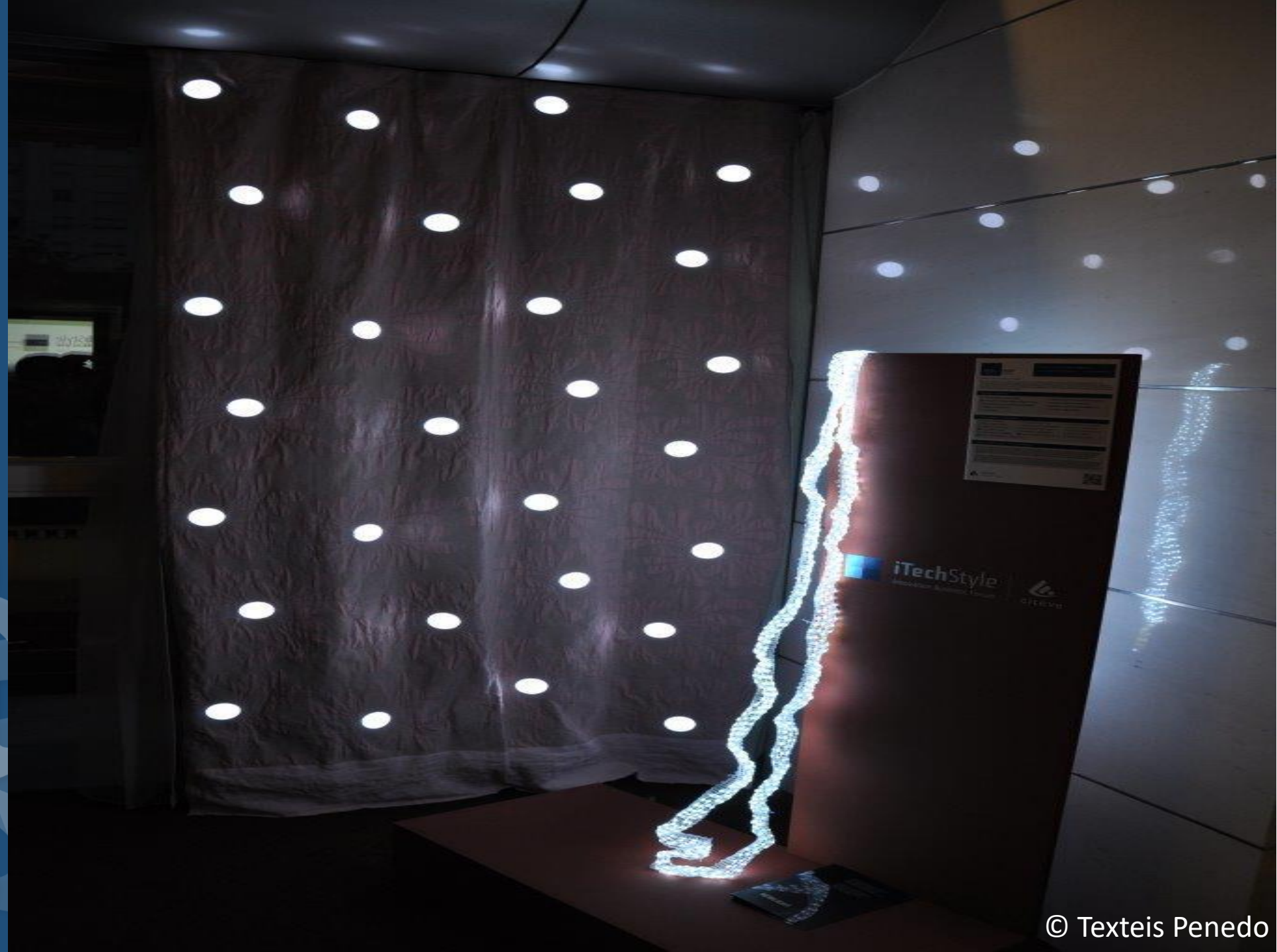
Full printed heating elements



Printed electronics on textiles



Printed
electroluminescent on
textiles



Printed OLED devices for
functional Lighting

Integration of flexible
EL lighting for functional
and decorative lighting





Thank you for you attention

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