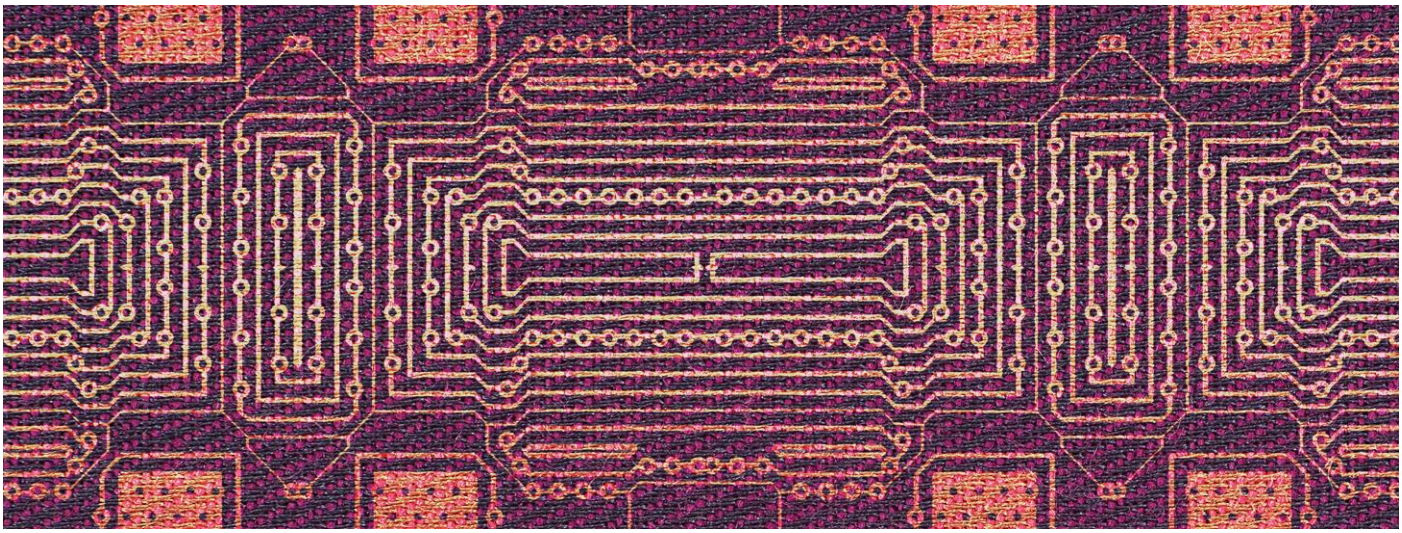
TRANSPARENT, FLEXIBLE, ANTIMICROBIAL AND CONDUCTIVE GRAPHENE TEXTILE SUBSTRATES



TECHNOLOGY SUMMARY

Processing graphene coating technology of textile fibres and fabrics, turning them highly electrically conductive keeping the textile properties. It is a simple method, with solution deposition at room temperature, in which the coating can also add antimicrobial properties.

APPLICATIONS

TECHNICAL TEXTILES
BIOMEDICINE
SMART WEARABLES
PORTABLE ENERGY

BENEFITS

ELECTRIC SENSOR

HIGH CONDUCTIVITY: ≈1kΩ/sq

FLEXIBILITY: stable performance up to at least tensile strength of 2%.

TRANSPARENCY: transmittance reduction of 2.3%.

LOW COST PROCESS

COMPATIBLE WITH COMMON TEXTILE FIBRES

APPLICABLE TO OTHER SUBSTRATES

ANTIMICROBIAL

CONTEXT

Textile electronics offers the prospect of providing new functions to our clothes, such as wearable sensors for monitoring vital signs, sustainable energy systems or smart home interiors. The electrodes currently used do not have compatible features with textile fibres, being opaque, inflexible, fragile and not compatible with the manufacture of textiles. The present invention is intended to replace conventional electrodes facilitating the incorporation of electronic devices in textiles, by combining the conductivity of graphene to a common textile fibre.

The present graphene coating method can be used in common textile substrates, fibres or fabrics of polyethylene, polyamide and nylon or others. The transfer process, in water and at room temperature, incorporates highly conductive and antimicrobial properties, with the mechanical and elastic properties of textile substrates unchanged, and without altering the colour and transparency. The process allows the creation of conductive and antimicrobial textile substrates that can be integrated in traditional textile applications as well as in biomedical applications.

Potential applications for this technology include technical textiles and textile substrates with electronic devices, such as sensors for medical surveillance, camouflaged security devices, luminescent devices, thermoelectric devices, textile batteries, among other applications.

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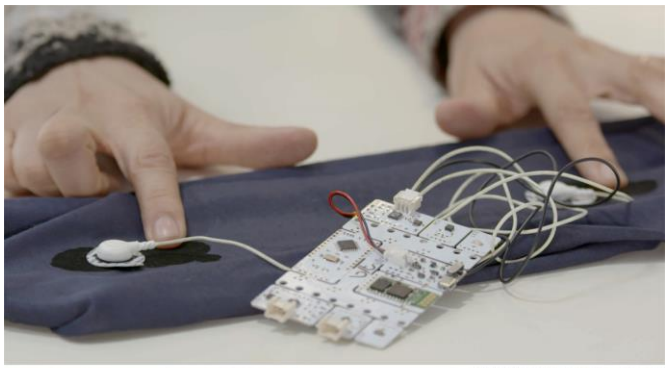
IP RIGHTS

European patent filed (WO2018007880 (A1)).

DEVELOPMENT STAGE

TRL 4: Laboratory tests in samples with centimetres of fibres, monofilament, multifilament, fabrics and textiles.

Preliminary experiments as electric sensor for some biomedical parameters and as conductive element in an electric circuit. The process can be scaled up and in compatible with existing textile technology. The process can also be applied to other substrates.



KEYWORDS

ELECTRONIC TEXTILES

GRAPHENE

FUNCTIONALIZED TEXTILES

ANTIBACTERIAL TEXTILES

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Technology #CI15029

DEVELOPED BY

Researchers from Aveiro Institute of Materials (CICECO), from Universidade de Aveiro, and from INESC-MN.

BUSINESS OPPORTUNITY

Licensing agreement.

Technology joint further development.

Testing of new applications.

Adaptation to specific needs.

PARTNERSHIP

Universidade de Aveiro seeks partners within textile industry, internet of things (IoT) or energy, interested in licensing the technology and/or collaborate with the university to develop new technologies within this area.

TRL: Technology Readiness Level – more information in https://ec.europa.eu/research/participants/portal/desktop/en/support/faqs/faq-2890.html