

WORLD-CLASS SMART MATERIAL - BORN IN BOLTON



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FibrLec Limited was established in 2013 to develop and commercialise flexible smart materials. These are based on applications in energy regeneration and renewable energy. They have spun out of recent breakthroughs at the University of Bolton. This has led to hybrid energy conversion systems driven by piezoelectric and photovoltaic materials and arranged in fibre, film and 3-D structures.

The multi-award winning team is led by Professor Elias Soares BSc, MSc, Dip Ed, MBA, PhD, CEng. FibrLec Limited has world exclusive licences of all related international patents.

FROM TYRES TO TREES, YACHTS TO TRAINS

The technology has reached exploitable commercial standing with huge potential applications. This stretches from energy parks to marine vessels, automotive parts, aerospace, military, construction and city-regeneration, wearable textiles, sports and outdoor lifestyle and biomedical devices. These materials exhibit flexibility, durability and recyclability, at a very low production cost.

FibrLec material can be layered within the wall of a tyre. Four such tyres will produce enough energy to power vehicle batteries, improving MPG and power output charge. Synthetic trees made with FibrLec will allow the capture of wind, rain and sun. Trees could be placed in areas where solar panels are unacceptable. The material can be deposited into building facades to harvest energy which can then be transferred to the building's electrical infrastructure. It can be woven to any size or shape, allowing it to combine with existing materials. FibrLec could be used in the sails of a yacht to harvest energy from the wind, rain and sun. Transferring this energy to the yacht's power sources allows the removal of heavy conventional batteries. FibrLec can be integrated into composite railway sleepers to recover large amounts of energy. The energy generated by people

walking can be captured by integrating the materials into carpets. It has significant additional attributes. Once the material is placed onto an object or over an area, it reflects radar, making the material radar passive.

INDIVIDUAL ENERGY

You may soon be buying and wearing clothes containing FibrLec. There has been much coverage in recent years about the potential for apparel to incorporate smart technologies. FibrLec has some exciting applications here; the material can line the woven structure of clothing to allow 'wearable chargeables'. A jogger using the materials in shoes can recharge an iPhone in 60 paces.



MEDICAL AND BIOMEDICAL APPLICATIONS

Medical applications are another significant growth area. The reflection of radar and harmful rays means the material can be used to cover healthy areas of the body not subject to treatments. Its use in a pacemaker can allow constant charging, so that the patient does not require further surgery for battery replacement.

UK SUCCESS STORY

Our headquarters is on the University of Bolton campus. We are establishing manufacturing

plants overseas and investing in international R&D collaborations to ensure that the technology remains competitive, and in the vanguard of UK materials innovation.

THE UNIVERSITY OF BOLTON

The University of Bolton has an illustrious background in engineering and smart materials. The Institute for Materials Research and Innovation is internationally renowned for its applied materials science and engineering applications. It has developed novel, smart and multifunctional materials (fibres, fabrics, films, foams and particles) at nano and micro levels. It also excels in the associated processing technologies.

This year is a celebration for the University as it looks back at its origins as the Bolton Mechanics' Institute 190 years ago. Research into the next generation of piezoelectric and organic photovoltaic fibres is already under way at the University. This includes designer materials modelling and experimentation, targeting improved energy conversion properties and enhanced power outputs. The success of FibrLec and the commercialisation of the University's research will support scholarships and bursaries for a number of students studying science, technology, engineering or mathematics (STEM) subjects. This will enable the next generation of innovators to make their mark.