





The University of Catania to work with Bandera, leader in polymer-biopolymer extrusion lines, on innovative smart green compounds enabled by graphene, for packing, food, and agriculture applications

kw: polymer, biopolymer, graphene, 2D materials, extrusion, packaging, smart packaging, IoT, IoP Internet of Packaging, RD, innovation, circular economy, sustainability, recycle, biodegradable, recycling

Graphene and related materials are ideally suited for applications in functional polymer composites.

A formal collaboration between the Department of Physics and Astronomy of the University of Catania, and the Costruzioni Meccaniche Luigi Bandera, European leader in extrusion machinery, has been announced under the PON - Ricerca e Innovazione 2014-2020 programme funded by the Italian Ministero dell'Università e della Ricerca.

Bandera will work with the researchers in Catania and at the Imperial College London on a specific programme which aims to exploit graphene and related two dimensional materials in functional polymers suitable for extrusion processes.

Bandera, founded in 1947, develops and manufactures complete extrusion lines for plastic/bioplastic.

The Department of Physics and Astronomy at the University of Catania is home to the newly established Nanomaterials and two-dimensional materials and devices (NANO2D²) laboratory, which performs cutting-edge research in the field of graphene and two-dimensional (2D) materials for applications spanning from electronics and photonics to polymer composites. Graphene is a one atom-thick layer of graphite with remarkable potential to enable significant technological advances. One of the research streams of the NANO2D² lab aims at finding ways of manufacturing and optimising graphene and related materials for real industrial applications.

The research programme itself will investigate the development of graphene as a functional additive within polymer matrix, which promises to significantly improve the performances of extrudable thermoplastic polymers for applications such as anti-fog or gas barriers.

Prof. Felice Torrisi, principal investigator of the programme said:"We are proud recipients of the PON Ricerca e Innovazione and thrilled to be working with a leader in extrusion lines like Bandera on the key task of translating the benefits of graphene and 2D materials from the laboratory to industry. The electrical, optical and mechanical properties of graphene make it a key material for greener smart packaging and more environmentally-friendly agricultural applications"

"We welcome Bandera as one of our strategic partners. Graphene and related materials are ideally suited for applications in polymer composites and this strong synergy with a world-leading Italian-based company can accelerate exploitation." adds Dr Antonio Alessio Leonardi, the researcher hired on the project.



Diego Castiglioni, Technical Director Blown Film from Bandera, salutes the collaboration with University of Catania and the Imperial College London as important for the manufacturing industry to remain on the edge of R&D so to innovate via the creation of new lines, advanced polymer composites, and smart sustainable products adequately to market demands.



Figure 1: left, a blow film extrusion machinery by Bandera. Right, a transparent graphene-coated PET film.

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