PROJECT FACTSHEET

GA 315665

Thin film measurements on organic photovoltaic layers

THIME

www.thime.eu

01/11/2012 – 31/10/2014

PROJECT COORDINATOR:

Dr. **Mirta** Rodriguez Pinilla
IRIS SL
Innovació i Recerca Industrial i Sostenible
Spain
mpinilla@iris.cat

THIME PARTNERS:

Innovació i Recerca Industrial i Sostenible, Spain
VTT Research Centre of Finland, Finland
Vienna University of Technology, Austria
Accurion GmbH, Germany
Specim Spectra imaging Oy Ltd, Finland
Coatema Coating Machinery GmbH, Germany
Nanolayer Coating Technologies, Lda, Portugal
Solar Press Ltd, United Kingdom

ABSTRACT:

THIME is a 2 year R&D project which deals with the development of a novel optical instrument for the on-line measurement of thin film thickness during the roll-to-roll manufacturing of organic and large area electronics (OLAE), to help the European industry to enhance its competitiveness.

Printing and other large-area roll-to-roll (R2R)-compatible processes present exciting opportunities for cost-efficient mass manufacturing of electronics, among other functionalities, on large-area and flexible substrates such as plastic, paper and fabrics. In particular, thin film Organic Photovolactics (OPV) are generating a buzz in the industry. Printing the active components of a PV system onto flexible substrates means that solar cells could be incorporated onto a host of everyday objects, offing advantages in terms of weight, flexibility and low-cost production methods.
A major challenge for the manufacture of polymer and printed electronics is the ability to control the layer properties more precisely than with conventional colour printing. The performance of OPVs is strongly affected by the thickness and uniformity of the needed layers. Accurate information about the thickness of the thin films being deposited would prevent the production of large volumes of materials that do not perform to the standards that they should. Without online thin film thickness measurements the real thickness of the R2R deposited layer can be measured only after the deposition process.

The industry is in need of an online quality control method for thin film thickness on selected layers, which is vital for improved high quality, high volume, cost-effective production of such printed and large area electronics (OLAE) devices. The THIME project will develop a novel optical instrument for the on-line measurement of thin film thickness during the R2R manufacturing of these devices, which will be capable of measuring different OPV layers of differing characteristics values: thickness, refractive index, transparency and surface smoothness, and suited to a moving process (up to 10m/min) and is most likely not always in stable position in Z direction. No such detection method is available in the market and THIME will be a breakthrough for advancing the EU industry.

KEYWORDS: Hyperspectral & ellipsometric imaging techniques; non-scanning white light interferometry; OPV layers; large area electronics; roll-to-roll; online measurement; printing.

Powered by IRIS