

Ultra-high barrier films for r2r-encapsulation in OLED and OPD-demonstrators @ SIEMENS Corporate Technology

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The main activities at SIEMENS Corporate Technology in the EU-funded Flexonics-Project will be presented. The main focus of our activities has been on Water Vapour Permeations Rates (WVTR) of barrier foils newly developed by our project partners.

The design of barrier foils and potential substrate foils will be as well discussed as the two WVTR-measurement systems used in our lab. For high performance barrier layers the in-house developed Ca mirror test has been used. Setup and limitations of this testing method are presented.

The results of the barrier foil characterization and the foil selection are discussed particularly with regard to the time dependence of the WVTR.

Design, functionality and the results of first life time tests of Organic Photodetectors incl. the applied packaging concepts are shown. The Siemens Flexonics demonstrator, which contains an Organic Photodetector combined with an OLED-Lighting, is described.

Water Vapour Transmission Rate in the 10^{-4} range is reached (initial values), this value should be ok for mean term applications of OPDs, but it is still insufficient for long term stable OLED devices. An additional problem could be disclosed in the demonstrator setup: the insufficient curing yield of the glue in the demonstrator assembly. So our further activities will include the barrier properties of epoxy glues too.

An ITO coated barrier foil developed and produced within Flexonics has been successfully applied to an EC-display at SIEMENS (in EU-funded Olatronics project): The life span of the EC-displays has been distinctly improved.