Fraunhofer
POLO

FRAUNHOFER POLYMER SURFACES ALLIANCE POLO


© Dirk Mahler/Fraunhofer

TRANSPARENT HIGH BARRIER FILM FOR ORGANIC ELECTRONICS

ROLL-TO-ROLL PILOT PRODUCTION

Fraunhofer Polymer Surfaces Alliance POLO

Please adress inquiries to the following contact persons:

Pilot production:
Dr. John Fahlteich
john.fahlteich@fep.fraunhofer.de
Phone +49 351 2586-136

ORMOCER® development:
Dr. Patrick Wenderoth
Phone +49 931 4100-221
patrick.wenderoth@isc.fraunhofer.de

Roll-to-roll ORMOCER® coating:
Dr. Klaus Noller
Phone +49 8161 491-500
klaus.noller@ivv.fraunhofer.de

www.polo.fraunhofer.de

Flexible organic electronic devices have to be protected from water vapor and oxygen in order to guarantee an adequately long lifetime.

The Fraunhofer Polymer Surfaces Alliance POLO has developed a technology for modifying polymer films with a layer system that is almost impermeable to water vapor and oxygen, without significantly impairing the flexibility and optical transparency of the film.
The technology is based on oxide layers deposited by reactive sputtering which are separated by an intermediate polymer layer.

The intermediate polymer layer consists of a novel inorganic-organic hybrid polymer, a so-called ORMOCER® (registered trademark of Fraunhofer-Gesellschaft), which is applied in a roll-to-roll process. ORMOCER®s are lacquers and can be processed under atmospheric conditions.

Their properties can be adapted to specific customer requirements by altering their chemical composition and process parameters. The intermediate layer interrupts defect growth in the oxide barrier layer and provides ideal conditions for deposition of the second oxide barrier layer.

A commercially available standard PET film was used as substrate. At 38°C and 90% relative humidity the coated film has a water vapor transmission rate of 2×10^{-4} g/(m²d).

The barrier layer system can be adapted to other substrates or according to specific customer requirements. For example, the film can be provided with a further protective layer or transparent conductive layer in order to use it as a substrate for (organic) electronic components such as organic light emitting diodes.