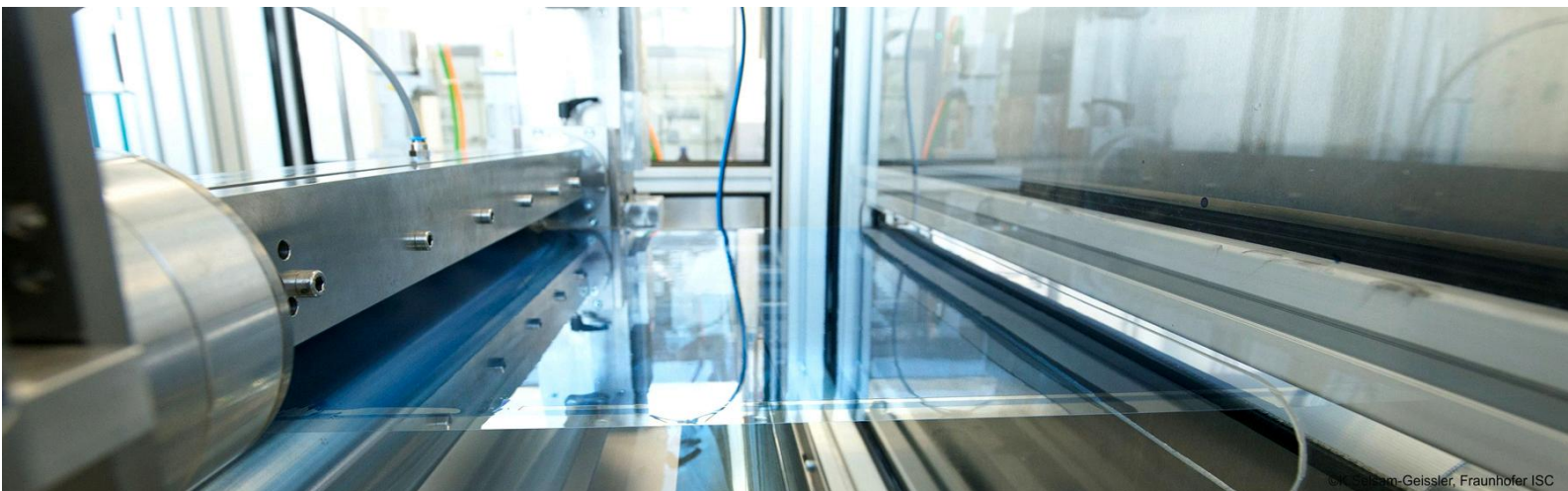




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SUPERSMART Technologies

Paper-Based Printed Circuit Board Approaches with Integrated Electrochromic Layers and Impedance Matching Electronics

Electrochromic devices can be used for Signage application and anti-counterfeits amongst others. PEDOT:PSS based electrochromic materials will be up-scaled, and the performance of the up-scaled material is demonstrated using Sheet2Sheet processing. In order to get rid of plastic substrates the electrochromic devices are manufactured on paper based substrates which can be used as paper-based printed circuit board. The combination with impedance matching electronics based on metal oxides is envisaged. Technologies to manufacture improved paper substrates at large scale appropriate for electronic devices are envisaged as well.

Electronics Based on Printable Metal Oxide Semiconductors

Low-temperature processable metal-oxides are key materials for competitive electronic applications, such as backplane technology, logics or further electronic circuits. **SUPERSMART** is dedicated to up-scale the Metal-oxide synthesis which results in cost reduction and sufficient availability for industrial application. Simple circuits are processed by R2R technology to prove the material performance.

Pressure Sensor Arrays

Conventional Pressure sensors based on PZT (lead zirconium titanate) are limited in sensor design and imply challenges for recycling. Objective of **SUPERSMART** is the industrialization of PVDF based sensors by scaling up synthesis procedure and by overcoming difficulties, i.e. pyroelectric behavior. Processing of materials in an R2R scheme and automatization of poling procedures are developed in order to make the material and the sensors available for commercialization.

Near-Field Communication Devices

Near-field communication devices might play a major role for signal transfer. Taking the step to paper-based NFC using printed antenna structures will prepare a more ubiquitous distribution in everyday life products and commodities. The manufacturing of electronic grade paper substrates and processing of antenna structures will be up-scaled.

Paper-Based Barrier Films

Although encapsulation is in issue for conventional electronics as well, lots of alternative materials are sensitive against ambient conditions (humidity, oxygen). As a cross-section technology for applications mentioned above, barrier substrate approaches are up-scaled and transferred to paper substrates in order to get rid of plastics.

Recycling and Life-Cycle-Analysis

All materials and multilayers up-scaled will be assessed with regard to recyclability and life-cycle analysis using common recycling procedures and standardized approaches for life-cycle-analysis emphasizing the end-of-life aspects.

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