

## BARRIER PAPER FOR PRINTED ELECTRONICS

In day to day products, including labels and packaging, there is a rising consumer demand for smart products, that is to say objects able to be part of a digital ecosystem. Embedding sensors and communications technologies while minimizing the environmental impact of these smart products is a key challenge for the future. The major way of achieving this is to work on the base materials of the electronics components to be embedded in, by providing organic materials instead of rare and toxic inorganic ones when applicable. For organic electronic applications it is elementary to protect these components against the impact of oxygen and water vapour.

Recycling of paper is a well-established process and is performed under economic favorable conditions. But it is not trivial to bring these requirements to the basis material together in the same product.

Barrier properties against water vapour in the range of  $\text{mg/m}^2\cdot\text{d}$  even in polymer films is only reachable with a combination of wet chemically applied organic layers and vacuum deposited inorganic layers. To bring this together with a recyclable paper (and even biodegradability) is an extremely high requirement. For paper this has not been possible currently. So this combination is a novelty and to reach comparable barrier values as with polymer films. The reasons for this will be explained in the presentation and which measures have been taken.

In a European project called „SuperSmart“ based on these findings we just succeeded to achieve the barriers that are necessary for the encapsulation of printable electronic layers.

### Structure of the presentation:

- Requirements to packaging
- Current packaging concepts
- Design for recycling