



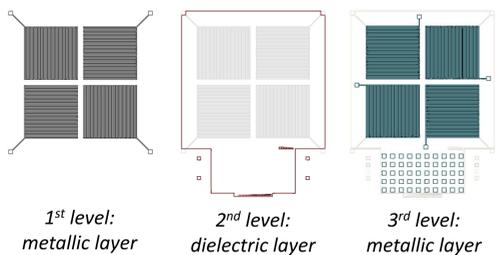
EURIPIDES² PRAGUE FORUM | 2014

SPrinTronics

INDUSTRIAL SINGLE PASS INKJET PRINTING TECHNOLOGY FOR HIGH ADDED VALUE PRINTED ELECTRONICS

The purpose of the project is to bring an established additive, tool-less, fully digital and contactless inkjet technology, demonstrated as scientifically leading and fully proven with ceramic and organo-metallics, to a much higher TRL, and all the way to a production-ready stage, of high throughput enabled rupture capability geared towards large area **printed electronics applications**. Based on a bottom-up approach, with an over 1000%-level productivity merit, the **SINGLE PASS INKJET PRINTING** enables, costs-wise, to address the newer markets of ceramic electronics components, IC card, RFID and IC interconnect and 3rd G organic photovoltaic. It is well beyond state-of-the-art. Focused on the ink - print-head - shaping triptych, dedicated to single pass multi-material printing equipment the project partners want to integrate the pre- and post-printing processes for the highest performance achievement and to propose a full in line process ready to start manufacturing at 2015.

Thick Films Application



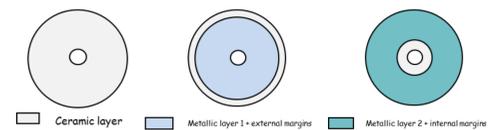
Advantages of IJP for thick films application:

- ✓ Multimaterial components made in one step
- ✓ Flexible design which can be easily modified
- ✓ No tools required (≠ screen printing)

Goal in SPrinTronics project:

- Print both materials (conductive and dielectric) thanks to IJP technology
- Reduce costs and manufacturing delay for high added value components

Multi-Layer Ceramic Capacitors (MLCC) Application



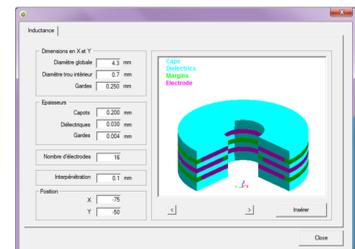
Advantages of IJP for MLCC application:

- ✓ Multimaterial components made in one step
- ✓ 3D components thanks to layers stacking
- ✓ No tools required
- ✓ Possibility to produce irregular shapes

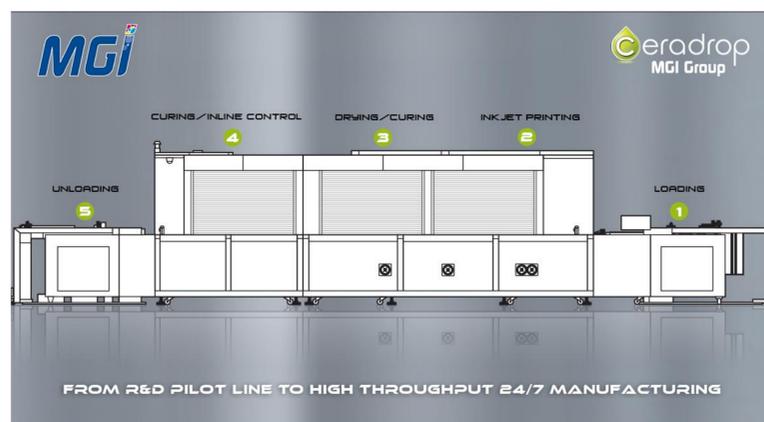
Goal in SPrinTronics project:

- Adapt ceramic material to low firing temperature ($\approx 950^{\circ}\text{C}$)
- Print one whole layer (dielectric or metallic) in one passage to avoid cracks at the interfaces

➔ Completely well modelised thanks to CeraSlice software



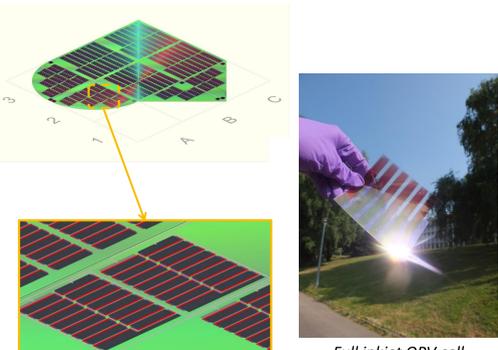
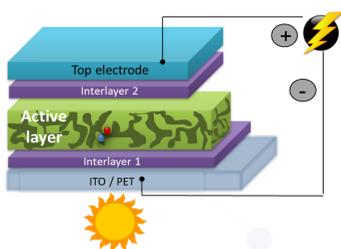
Inkjet printers for pilot or production scale



Goal in SPrinTronics project: to enable single pass Inkjet Technology for Printed Electronics

- ✓ Printing width > 0,5 m,
- ✓ Proprietary electronics driving Konica-Minolta, Kyocera and Dimatix printheads,
- ✓ Multi-material capabilities
- ✓ Multi drying/curing technologies (UV LED, UV Lamp, NIR...etc.)
- ✓ In-line control
- ✓ CAD/CAM software adapted to large area Printed Electronics components

Organic Photo-Voltaic (OPV) Application



Full inkjet OPV cell

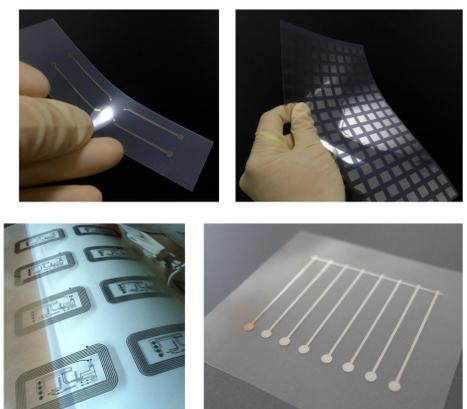
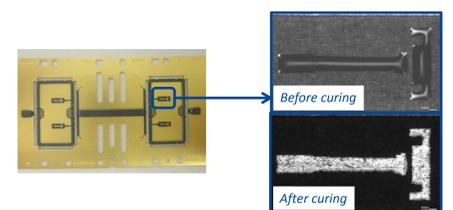
Advantages of IJP for OPV application:

- ✓ Multimaterial components made in one step
- ✓ 3D components thanks to layers stacking
- ✓ Possibility to produce specific shapes and sizes according to the customer's needs

Goal in SPrinTronics project:

- Maximize the production throughput
- Find an alternative in ITO use, compatible with IJP process
- Study of ecological organic solutions

Interconnexion Application



Advantages of IJP for interconnexion application:

- ✓ Adapt to each specific configuration to connect with conductive ink the pads on a card and the external contacts
- ✓ Huge reduction of number of required materials and production steps
- ✓ Non contact technology : print in a cavity with a high resolution

Goal in SPrinTronics project:

- Maximize the production throughput

Project Coordinator



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