# High Accuracy printed electronics down to µm size, for Organic Large Area Electronics (OLAE) Thin Film Transistor (TFT) and Display Applications

**H2020- DT-NMBP-18-2019**

**EC Grant Agreement Number: 862410**

# PUBLIC SUMMARY OF Deliverable Report: D1.1 Report outlining nanomaterials, substrates, surface and ink requirements including public summary

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**Type: Public (PU)**

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| Dissemination level | | |
|---|---|---|
| **PU** | Public | **X** |
| **CO** | Confidential, only for members of the consortium (including the Commission Services) | |

# 1 PUBLIC SUMMARY

In the project Hi-Accuracy granted under no. 862410 in EC's H2020 program, a first report outlining nanomaterials, substrates, surface and ink requirements has been issued after 3 months in the course of the 3 years project.

The specification task has been carried out in a cooperative way of all 11 partners making each of them aware of the manifold challenging requirements brought about by the targeted fabrication of an active matrix quantum dot (AM-QD) LED display (300 dpi full colour) using printing processes nearly exclusively. Resolutions of 5 µm and far below will be achieved by electrostatic inkjet printing (ESJET), through pre-patterning by nanoimprint lithography (NIL) and strong control of surface properties. Also reverse offset printing promises to break the 5 µm resolution limit by roll-to-sheet printing.

Free-standing or foil-on-carrier processing, starts on a polymer substrate covered by a barrier layer fulfilling electro-emissive QD-LED-requirements, which is covered in turn by a planarizing adhesion layer eliminating surface defects.

The low roughness requirements for surfaces such as the transistor channel (<1 nm) and the QD-LED (<10 nm) are reached by the above-described basis and nano-inks with particle sizes below 50 to 100 nm and viscosities optimised for the various printing processes. Surface-energies (adhesion) and solvent compatibility have also been taken into account and specified to enable the printed AM-QD-LED in Hi-Accuracy.