



- 1 Scheme of ESJET printing.
- 2 Comparison ESJET (left) and Inkjet (right) printed dots on glass at a dot distance of 50 μm.
- 3 10 μm dots of an OLED.

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ESJET PRINTING A NEW TOOL TOWARDS HIGH RESOLUTION PPRINTING

Experimental Principle

In ESJET printing drops are generated between a high constant potential V_1 , yielding a Taylor-cone deformation of the liquid meniscus. An additional pulsed potential V_2 to a conductive plate below the isolated sample induces single drop or jet formation at the apex of the Taylor-cone. The printing process is controlled by a set of two cameras; a side-view camera as drop-watcher and a top-view camera for the substrate alignment. Typical drop volumes are below one pl and therewith smaller than with inkjet printing allowing smaller structures than achievable by inkjet printing.

Application: Printing High Resolution OLED Displays

ESJET printing is an interesting approach towards printing of high resolution OLED displays. Whereas inkjet printing is limited to the deposition of pixel sizes down to 10 μm,

smaller sizes can be realized by ESJET.

Fig. 2 shows as comparison an ESJET and Inkjet printed array of 50 μm spaced drops of an active OLED material. Drop volumes of ~0.5 pl versus 4 pl lead to significant smaller structures by ESJET printing. In contrast to Inkjet, a larger variety of ink formulations are accessible, most important is the use of higher viscosities enabling higher layer thicknesses in one printing step.

Application: Printing Fine Metal Lines

This method is also well suited for printing fine line structures such as they are needed for metal grids as replacement of commonly used transparent sputtered ITO. These applications are interesting in a broad field of organic electronic applications such as OLEDs, OPVs or touch screens.