

RD Clevios™ P Jet X N printing example (Elephantech Inc.)

Digital Printing: Clevios™ for Inkjet

PEDOT:PSS / AgNW – Design Flexibility – Low Cost Processing

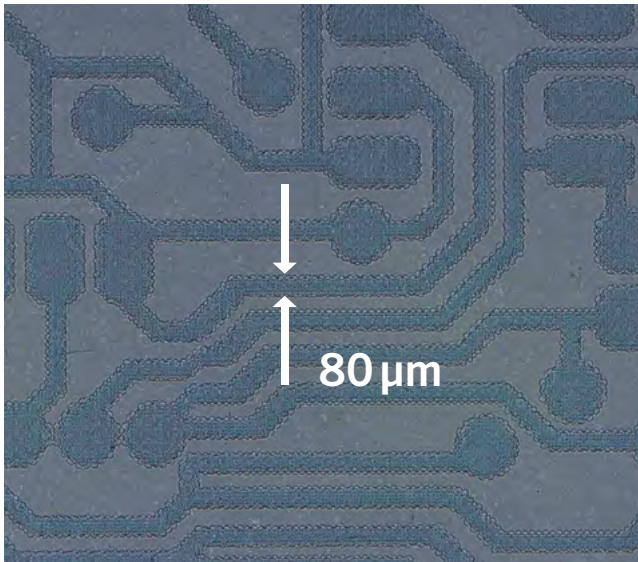
Digital printing, particularly inkjet, has become popular in the printed electronics community and grown mature for industrial manufacturing. Heraeus Epurio offers a range of Clevios™ conductive polymer inks optimized for inkjet. Small and defined PEDOT:PSS gel particles ensure stable jetting, and transparent hole-injection layers or electrodes with high optical quality can be printed.

The pH-neutral, aqueous PEDOT:PSS based ink **RD Clevios™ P Jet X N** offers sheet resistances of about **200 – 750 Ohm/sq** at high transmission. Printing of small features at **<100 µm** line/space has been successfully demonstrated.

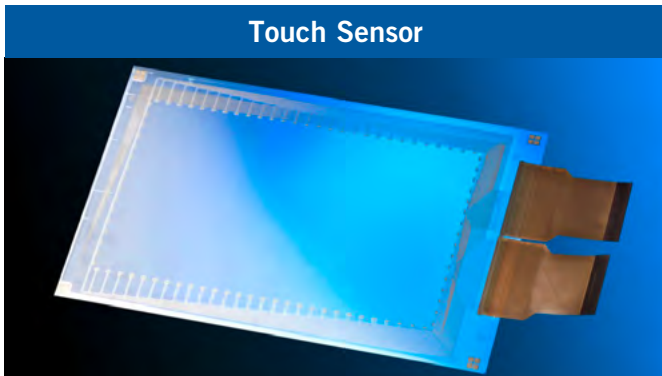
For lower sheet resistances, Heraeus Epurio developed **RD Clevios™ HY Jet 3**, a silver nanowire/PEDOT:PSS hybrid ink, that extends the sheet resistance to a range of **10 – 100 Ohm/sq**.

Special inks for **OLED and self-emissive QLED applications** with excellent **hole-injection layer (HIL)** properties are also available. Besides the aqueous, pH adjusted Clevios™ P Jet OLED, a new waterless, solvent-based ink **RD Clevios™ HIL Jet 8** is now available based on high boiling non-toxic solvents.

Product	Type	Function	Typical Properties
RD Clevios™ P Jet X N	PEDOT:PSS	Transparent electrodes	200 – 750 Ohm/sq, pH neutral
RD Clevios™ HY Jet 3	AgNW/PEDOT:PSS	Transparent electrodes	10 – 100 Ohm/sq, aqueous, pH neutral, 5 µm filtration
Clevios™ P Jet OLED	PEDOT:PSS	Hole injection layer (HIL)	1.000 – 15.000 Ohm-cm, aqueous, pH neutral
RD Clevios™ HIL Jet 8	PEDOT dispersion	Hole injection layer (HIL)	100 – 10.000 Ohm-cm, solvent based, waterless

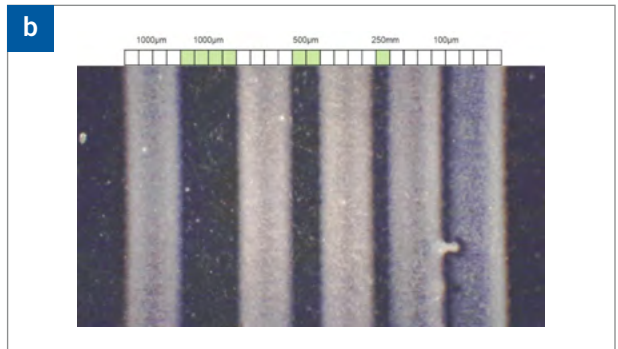
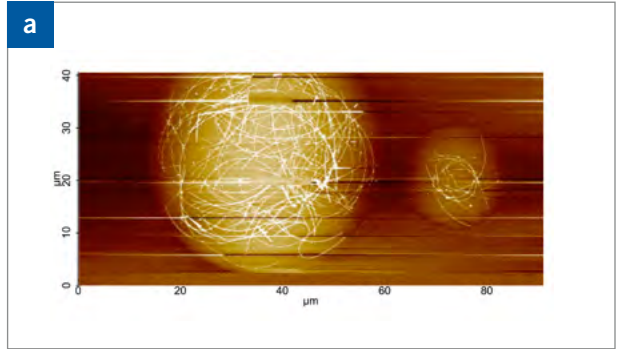


RD Clevios™ P Jet X N: line pattern printing
(Seiko Epson Corporation/Aicello Corporation)



Touch Sensor

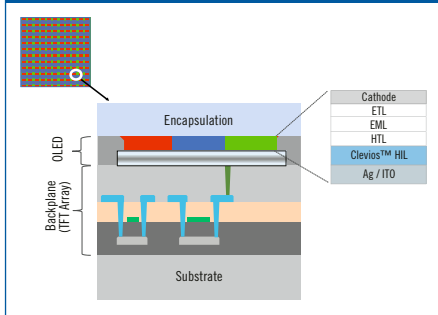
RD Clevios™ HY Jet 3



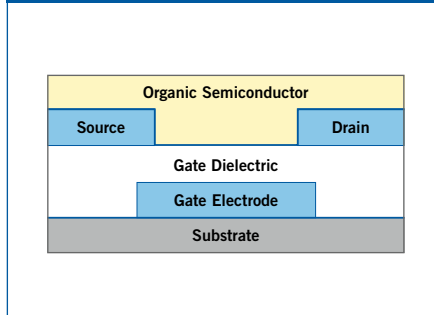
- Stable printing with Pixdro LP50 / KM 1024i LHE
- Sheet resistance of 10 – 100 Ohm/sq

- (a) AFM image of inkjet printed dried droplets
- (b) OM of inkjet printed line pattern

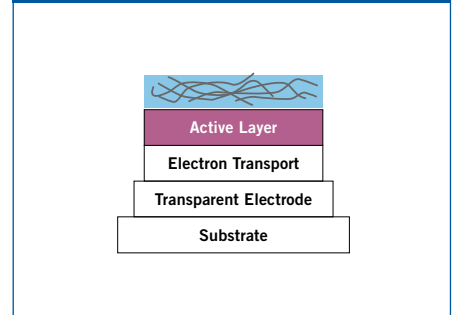
OLEDs (HIL)



OTFT



ORGANIC SOLAR CELLS



Clevios™ inks were developed and optimized with a Dimatix 2850 printer with Samba piezoelectric print head.

The conditions of your use and application of our products, technical assistance and information (whether verbal, written or by way of production evaluations), including any suggested formulations and recommendations, are beyond our control. Therefore, it is imperative that you test our products, technical assistance and information to determine to your own satisfaction whether they are suitable for your intended uses and applications. This application-specific analysis at least must include testing to determine suitability from a technical as well as health, safety, and environmental standpoint. Such testing has not necessarily been done by Heraeus. All information is given without warranty or guarantee. It is expressly understood and agreed that the customer assumes and hereby expressly releases

Heraeus from all liability, in tort, contract or otherwise, incurred in connection with the use of our products, technical assistance and information. Any statement or recommendation not contained herein is unauthorized and shall not bind Heraeus. Nothing herein shall be construed as a recommendation to use any product in conflict with patents covering any material or its use. No license is implied or in fact granted under the claims of any patent. Properties of the products referred to herein shall as general rule not be classed as information on the properties of the item for sale. In case of order please refer to issue number of the respective product data sheet. All deliveries are based on the latest issue of the product data sheet and the latest version of our General Conditions of Sale and Delivery.

Heraeus Epurio GmbH

Heraeusstrasse 12-14

63450 Hanau, Germany

clevios@heraeus.com

www.clevios.com | www.heraeus-epurio.com



Clevios™