n.jet EHD

NOTION SYSTEMS

powered by SCRONA

ADDITIVE DIGITAL PRINTING AT THE MICRON SCALE

Notion & Scrona Partnership

Both companies combine Notion's expertise in developing and manufacturing high-end printing systems for functional materials with Scrona's novel multi-nozzle EHD MEMS printheads. The partnership between Notion and Scrona will promote this new technology in various applications such as display, electronics or semiconductor manufacturing. Notion Systems will manufacture and service the n.jet EHD Lab printer, primarily for high-level research and development facilities.

Advantages of High Resolution EHD Printing

Electrohydrodynamic (EHD) printing is a new high resolution printing technology enabling maskless, direct-write, 3D, non-contact, conformal and additive patterning at the micron scale with a variety of ink systems and materials.

The printing resolution exceeds conventional ink-jetting by two to three orders of magnitude, paving the way of additive printing into applications dominated by photolithographic microfabrication and enabling completely new devices consisting of micron scale building blocks.

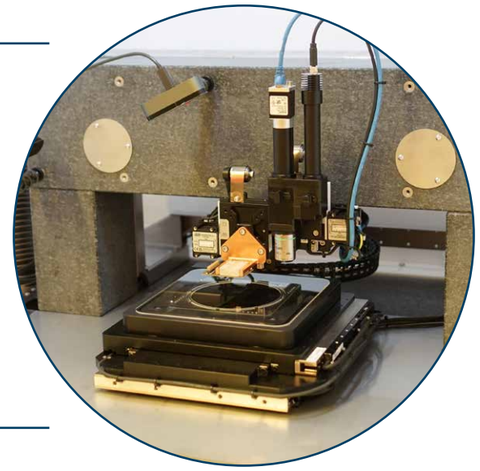
EHD printing is used to replace established subtractive process sequences and reduces waste and energy consumption, which makes electronics production more ecological and more economical at the same time.

The Scrona EHD Engine

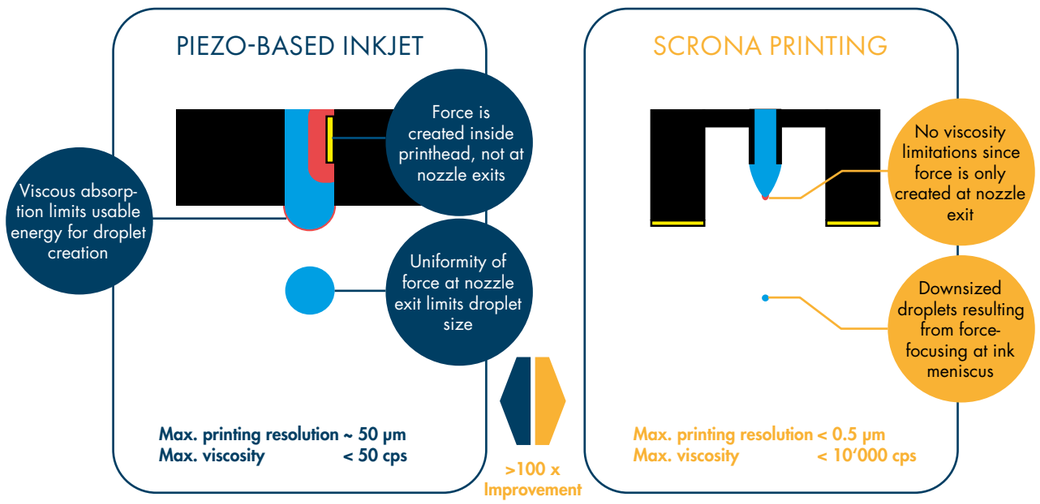
Scrona develops multi-nozzle MEMS printheads with ultra-high printing resolution capabilities better than 1 µm. This R&D tool is targeted to advanced development labs in various fields of micro-fabrication and digital additive manufacturing.

Scrona print engine advantages

- Additive technology that allows submicron resolution from multi nozzle MEMS printheads
- Multimaterial technology, works with ultra-high viscosities
- Delivered with GEN 3 Printheads, designed for future printhead generations
- Dedicated solutions for printing high viscosity materials



Comparison Between Inkjet & EHD Printing



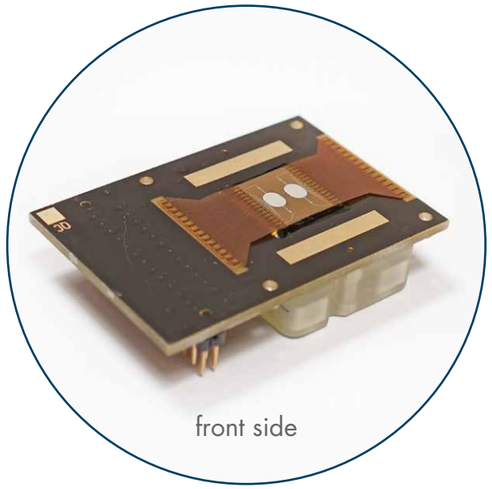
n.jet EHD System

Main features

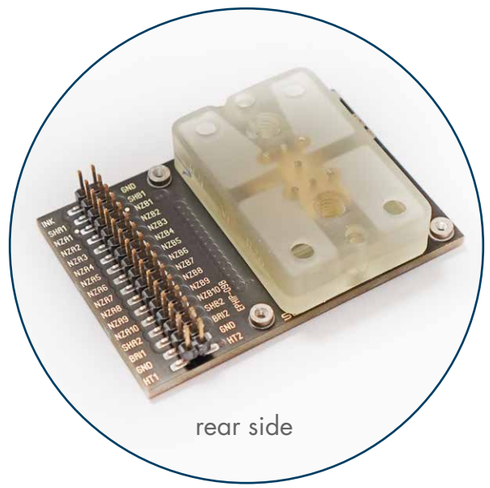
- Substrate size up to 150 mm
- Precision granite base on vibration isolation platform
- FFU with HEPA filter
- Precision better than 1 µm
- Motion system with 7 different motorized axes
- Encoder resolution 10 nm
- Ethercat based unified motion platform control with high resolution triggering and synchronization of motion and printhead actuation
- High resolution top and bottom video microscope units
- Highly integrated plug and play ITO and sapphire chucks available offering high voltage electrodes, sensing electronics, multi-zone vacuum supply and heating power supply

GEN 3 Print Head Starting From 8 Nozzles

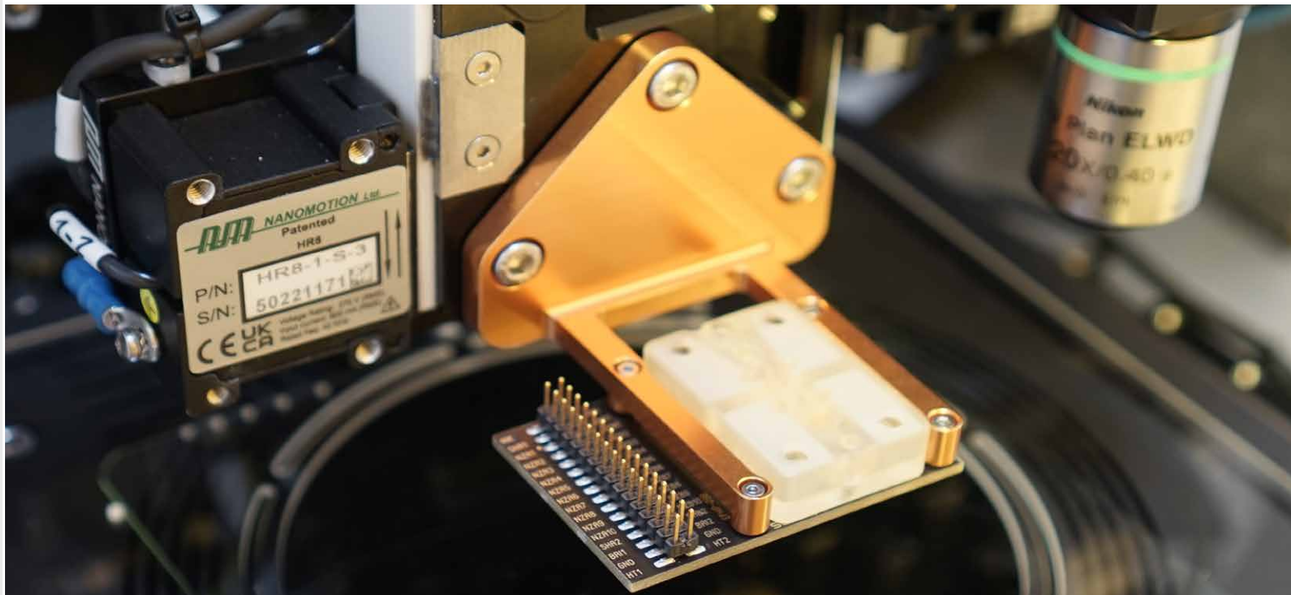
- Up to 256 nozzles possible
- Ink recirculation
- Environmental Control System ECS (Ventilation Drying System, Sheath Flow System)
- Resolution 2 µm with silver nano particle ink
- Print head heating up to 90 °C
- Typical print frequency 10 kHz
- Typical nozzle pitch 125 µm (adjustable in design)
- Typical drop volume 0,1 femto liter
- Dedicated high viscosity printheads available for printing up to 10 PaS



front side

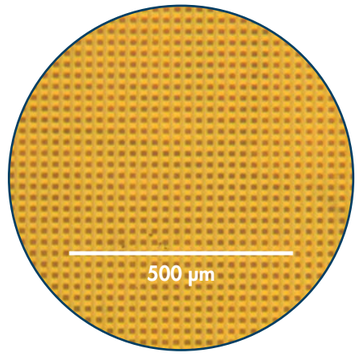


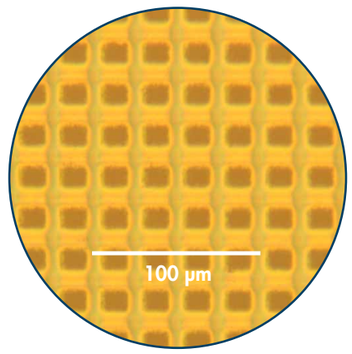
rear side



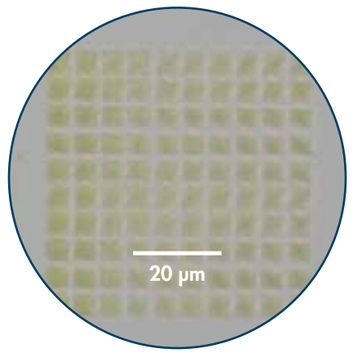
Application Results

Silver grid

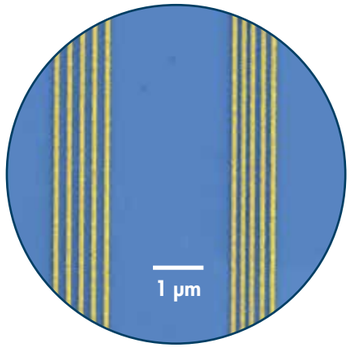




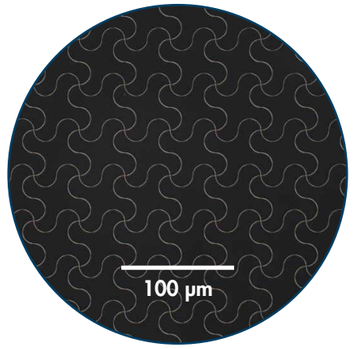
QD: 5 µm patches, 8µm pitch

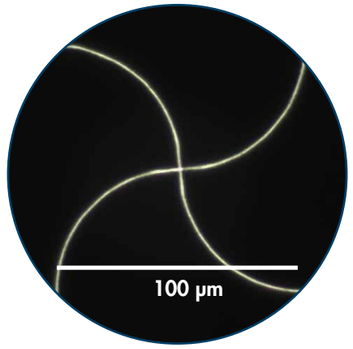


Gold line

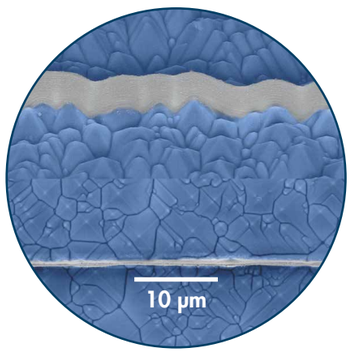


Silver line

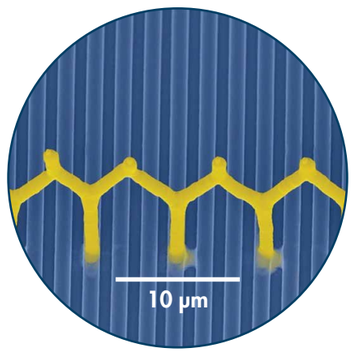




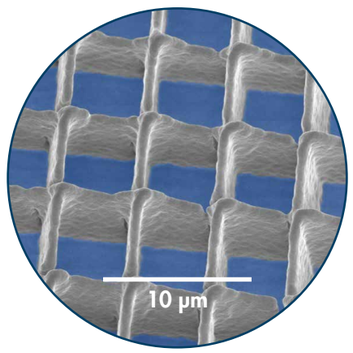
High AR silver line on solar cell



Gold 3D microarcs



Square array of high AR silver walls



Process Development

Process development helps optimize various parameters such as

- Ink formulation,
- Printhead selection,
- Substrate choice,
- Substrate preparation,
- Printing speed, and
- Image resolution.

By systematically adjusting these parameters, process development can enhance the **printing quality, efficiency, and reliability of inkjet printing**.

This is particularly important for industrial applications, where consistent and high-quality printing is required for mass production. Additionally, process development can help **minimize the environmental impact of inkjet printing** by reducing ink and energy consumption and waste generation.

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ECO FRIENDLY

THE FUTURE OF ADDITIVE MANUFACTURING

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