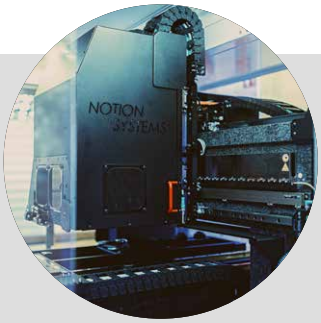
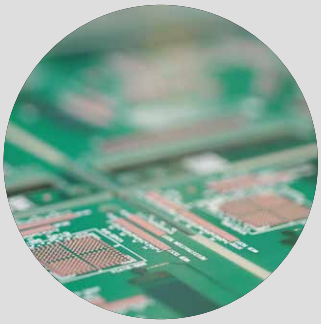
COMPANY BROCHURE

NOTION SYSTEMS



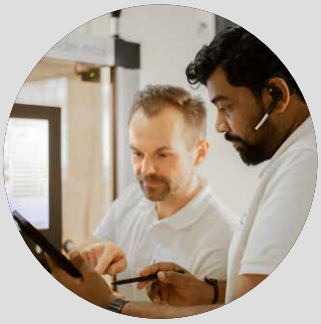










THE FUTURE OF ADDITIVE MANUFACTURING

INDUSTRIAL INKJET SYSTEMS FOR FUNCTIONAL MATERIALS

Notion Systems is a leading supplier of industrial inkjet printing systems for functional materials. Our n.jet inkjet platform is used to produce electronic displays, printed circuit boards, semiconductor components, as well as high precision optical 3D parts, covering the full range of solutions from lab to fab. We rely on decades of expertise, bringing precise inkjet systems to clients and scaling up digital printing processes from laboratory to industrial production.

Notion Systems is based in Schwetzingen close to Heidelberg in Germany and works together with leading sales and service organizations worldwide with a focus on Asia, Europe, and North America.

2024 Move into the new company building

2023 First shipment of EHD printer with Scrona's patented electrostatic printing technology

2021 RSBG Advanced Manufacturing Technologies GmbH (RSBG AMT) has acquired 75.1 % of Notion Systems GmbH as of January 1, 2021

LAB 14

2020 Introduction of Gen 4.5 inkjet printer for glass applications. Development of 400 dpi mura free display printing.

2019 PCB flag ship project completed: Manufacturing conversion of PCB producer to inkjet technology with multiple units.

2018 First shipments of high laydown 3D printers. First shipment of printers for fuel cell production. Market access to North America.

2017 Kick-off of PCB project: First shipment of inkjet for solder mask application.

2016 First shipments of RGB display printers. First shipment to Asia.

2015 Cooperation with major printed circuit board manufacturer for solder mask application development, first shipment of mass production sensor printer.

2014 First shipment of 3D printers for laboratory and production.

2012 **Notion Systems GmbH was founded**

KEY DRIVERS FOR OUR BUSINESS

Inkjet is a non-contact, digital printing technology which creates fine structures of down to 20 µm and processing without screens of mask. The fully digital non-contact printing enables wet-on-wet processing without the need for masks or screens.

Inkjet is used to replace established subtractive process sequences and reduces waste and energy consumption, which makes electronics production more economical and ecological.

ECONOMICAL DRIVERS

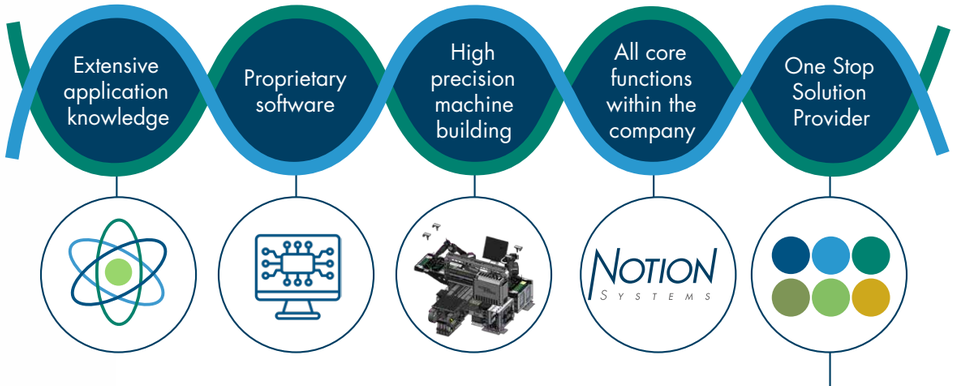
- REDUCED PROCESS STEPS
- HIGHER YIELD
- REDUCED ENERGY CONSUMPTION
- FASTER TURNAROUND
- REDUCED MATERIAL WASTE

TECHNICAL DRIVERS

- CONTACTLESS DIGITAL PRINT
- PRINT ONLY WHERE REQUIRED
- PRINT MULTIPLE MATERIALS
- PRINT MULTIPLE LAYERS
- WET-ON-WET PROCESSING

OUR DNA IS INKJET

Developing high-quality inkjet systems, custom software and stable inkjet processes is a complex assignment that requires advanced expertise in a range of technical areas.
Inkjet printing is our passion, and we brought together a range of experts in the field of process development, software and engineering to develop tailor-made inkjet systems for functional materials with the highest standards.



With decades of expertise in inkjet printing of functional materials, we cover all steps for scaling processes from lab to industrial production.

LAB EQUIPMENT | INDUSTRIAL SOLUTIONS | PLATFORM ENGINEERING | SERVICE | PROCESS | INKS

LABORATORY EQUIPMENT

Notion Systems offers various types of laboratory equipment for testing new functional printing inks, substrates and printing strategies to develop new applications. We are the right partner no matter the application, development goal or budget. We have every system in use ourselves, which allows us to give accurate field support and real world training.

DMP 2850

n.jet lab

n.jet EHD

Fujifilm DMP 2850

The Fujifilm Dimatix Materials Printer (DMP) is a benchtop materials deposition system designed for micro-precision jetting a variety of functional fluids onto virtually any surface, including plastic, glass, ceramics and silicon, as well as flexible substrates from membranes, gels and thin films to paper products.

n.jet lab

The modular design of the n.jet lab allows adapting the platform to your exact specification with industrial grade components including full automation and environmental control.
Compatible with all major printheads manufacturers, that n.jet lab allows the simultaneous use of multiple inks with fully automated printhead cleaning solutions available.
A dropwatch system can be fully integrated into the platform making the visualization and analysis of the drop formation process possible.
These factors make the n.jet lab the primary option for scaling your process from lab to fab.

Advantages

- Open platform that provides access to all process parameters
- Smooth scale-up from R&D to 24/7 industrial production
- Versatile applications with printheads from all major manufacturers
- Multiple configurations with heads and inks from different suppliers possible
- Up to four active printhead configurations, each with their own ink
- High precision mechanical design with self-calibration including nozzle calibration
- and nozzle substitution strategies
- Clearly structured graphical user interface

n.jet EHD powered by Scrona

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

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

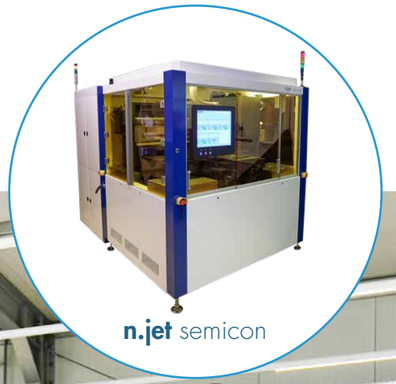
INDUSTRIAL SOLUTIONS

Our innovative inkjet production solutions for functional materials have contributed to important success in the high-tech industry - from innovative new OLED displays to perovskite-based solar cells.

Depending on the application and customer requirements, we are able to offer the right production solution and various options such as automation or different types of pre- & post-treatment options.

n.jet soldermask

n.jet display



n.jet semicon

n.jet display

DISPLAY

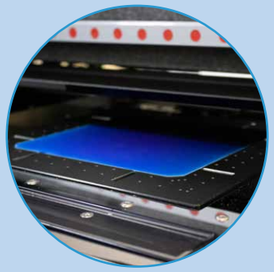
Applications
- Pixel printing
- Encapsulation
- Light blocking, switching & guiding layers

ELECTRONICS

Applications
- Conductives
- Dielectrics (e.g. soldermask)
- Etch resists

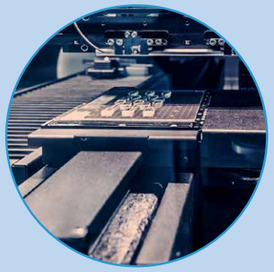
SEMICON

Applications
- Resists
- Deposition of sensor active inks
- Chip packaging



SOLAR

Applications
- Conductives
- Persovskites
- Resists for crystalline and thin films



3D PRINTING

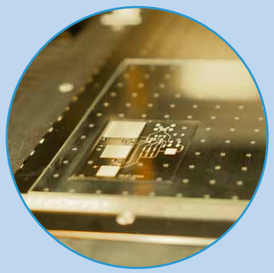
Applications
- Advanced optics
- Precision parts
- Hybrid manufacturing

SPECIAL SOLUTIONS

Applications
- Tailormade systems depending on customer request

GLASS

Applications
- Adhesives
- Conductives
- Blackmask



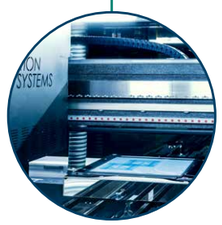
AUTOMOTIVE

Applications
- Sensors
- Antennas
- Adhesives

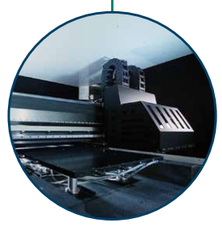
PLATFORM ENGINEERING

Notion Systems has developed a modular and open inkjet platform, which can be adapted to end user requirements in almost any respect. Our inkjet solution portfolio sets international standards in terms of efficiency increase while reducing production costs.

Stage platform



Gantry platform



Roll2Roll platform

Automation

Pre & Post Treatment

Our modular n.jet platform can be adapted to any production layout

MODULAR ENGINEERING OPTIONS

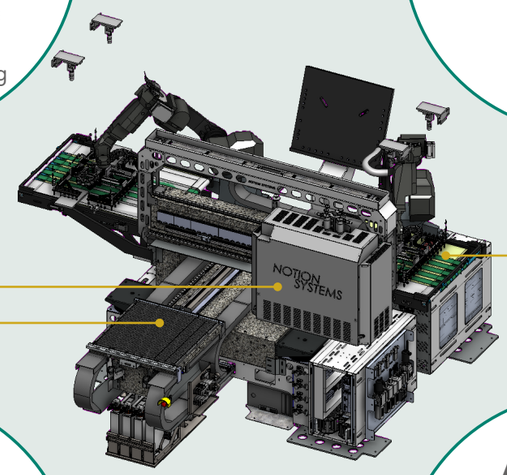
Without compromising process stability or precision, our n.jet platform can be adapted to suit your needs including printhead assemblies in any configuration for almost any industrial print-head, stage sizes up to Gen 6, stage temperature control, hardware & software modules for drop formation analysis, optical alignment, automatic platform calibration, AOI modules as well as various stages of process environment control.

PROCESS UNIT

- **Printheads**
  - From all mayor suppliers
- **Ink supplies**
  - Variable volumes
  - Heatable
  - Non/recirculating

PROCESS ENVIRONMENT

- **Top down flow**
- **Laminar flow**
- **T & RH control**
- **N2 glovebox**



STAGE

- **Chuck rotation**
- **Temp. control**
- **Lift units**
- **Vacuum zones**
- **Chuck design**

AUTOMATION

- **Sheet to sheet**
- **Roll-to-Roll**
- **Different kind of substrates, as:**
  - **Glass panels**
  - **PCBs**
  - **Wafers**

Notion is ISO 9001:2015 certified

WHAT CAN INKJET DO?

SUBSTRATE SHAPE
2-2.5 D

SUBSTRATE SIZE
up to Gen 6

SPEED
up to 2000 mm/s

VISCOSITY
2-15 cPs

DROP SIZE
30-200 µm

LAYER THICKNESS
50 nm-20 µm

APPLICATIONS
- Structure
- Coat
- Dispense

PROCESS DEVELOPMENT

Process development helps optimize various parameters such as

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

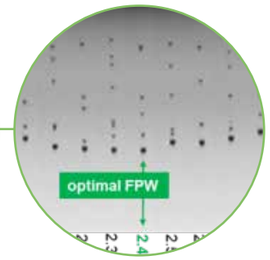
By systematically adjusting these parameters, process development can enhance the **printing quality, efficiency, and reliability of inkjet printing.**

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.

1 Printhead selection

2 Ink selection & material compatibility

3 Waveform development



4 Print process implementation

5 System development

6 On-site process support

PROJECT MANAGEMENT

Project management encompasses the entirety of management tasks, organization and techniques for the successful completion of any inkjet machine project. The aim of project management is to limit the risks and achieve the project goals qualitatively, within the planned time and budget, and to offer the customer a single point of contact from the start of the project to the final acceptance and the acceptance test on site.

AFTER SALES SERVICE

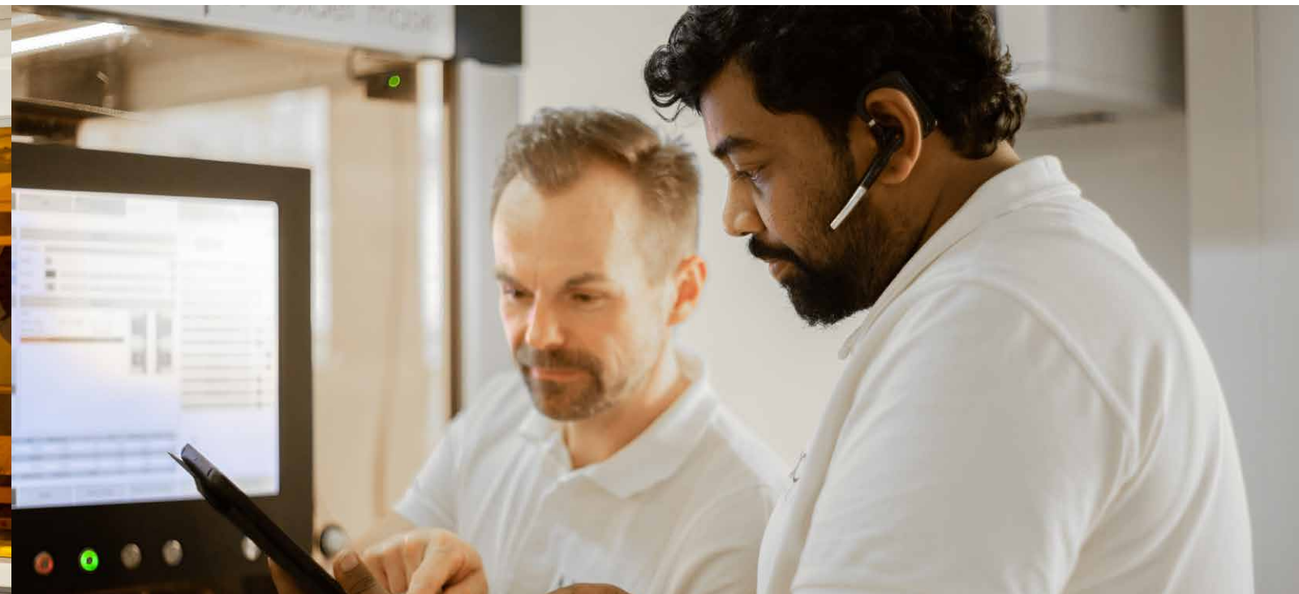
Solution provider for the entire service life of your inkjet printing system

To round off our global offering of high performance inkjet printing systems and having world leading inkjet expertise, Notion Systems offers professional, reliable and a comprehensive service program.

Service makes the difference

An inkjet printing system is not just about the device, the ink and the printing process. In addition to the outstanding technical features of the printing systems, Notion's after sales service ensures maximum availability, the highest performance and the best print quality of your system and there-fore the satisfaction of your customers. It is our mission to have a genuine partnership with our customers and to support achieving our customers goal for every step along the way.

Discover the diverse possibilities of our service product portfolio on the following pages and create your own individual service package.



NOTION SYSTEMS

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ECO FRIENDLY

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LAB EQUIPMENT

INDUSTRIAL SOLUTIONS

PLATFORM ENGINEERING

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PROCESS

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