NOTION SYSTEMS

n.jet lab NIL

NANO IMPRINT LITOGRAPHY (NIL) PROCESSES WITH INKJET

New Opportunities for NIL with Inkjet

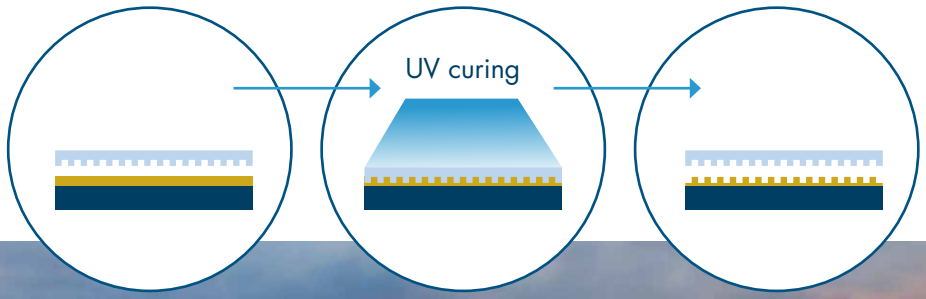
Notion Systems and EV Group (EVG) announced an agreement in April 2023 to develop the first fully integrated and automated nanoimprint lithography (NIL) with inkjet coating capabilities. Under the joint agreement, the two companies will develop a custom inkjet module that will be integrated into EVG's industry-leading HERCULES® NIL platform and based on EVG's SmartNIL® technology.

The new inkjet module from Notion Systems will complement EVG's existing spin-coating modules and will be offered as an alternative option for applying NIL photoresists to substrates for high-volume manufacturing (HVM) applications for NIL that have special requirements for layer deposition and uniformity. To help customers get started with their R&D activities, Notion System has developed an n.jet lab NIL system that allows potential customers to use the system as a stand-alone system. The prerequisite is that potential customers already use NIL systems from EVG and use the processes and inks developed by EVG.

In addtion to the fully integrated inkjet module, Notion Systems offers a stand-alone system called n.jet lab nil for customers interested in process development or small-scale production.

UV - NIL

SmartNIL® / Lens Molding

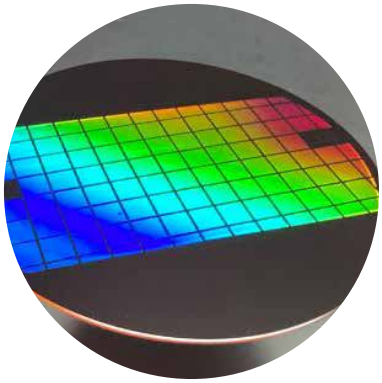


Nanostructured surfaces with highest resolution into UV-curing resins

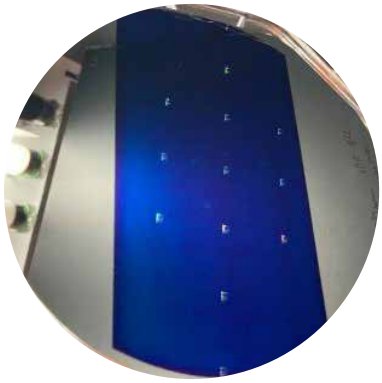
Advantages of Inkjet Printing for NIL

- SELECTIVE AREA PRINTING
- LAYER THICKNESS FINE TUNING FOR UNIFORM RLT
- MULTI PASS PRINTING
- FILL FACTOR ADJUSTED VOLUME DISPENSING
- REDUCED MATERIAL CONSUMPTION COMPARED TO SPIN COATING
- PANEL COATING

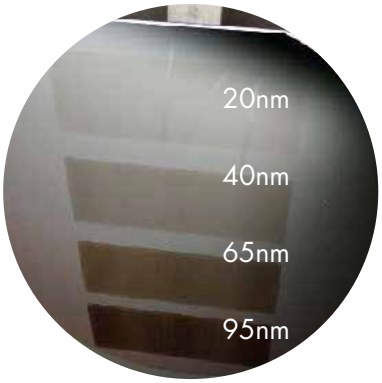
Process Results



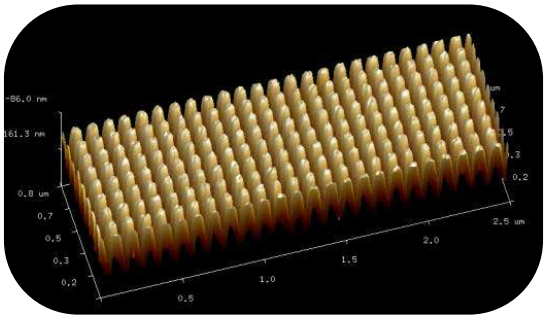
Resolved 400 nm lines



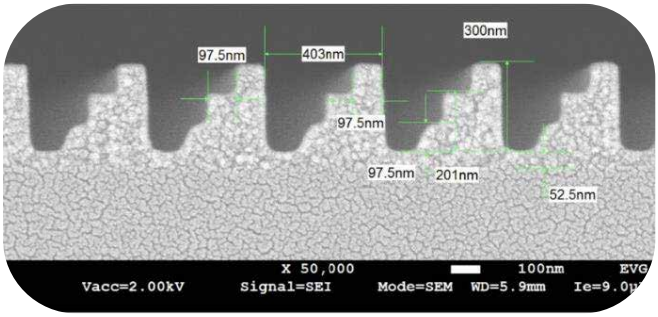
Very uniform layers



Layer thickness fine tuning
→ down to 20 nm



Resolution down to 50 nm,
no missing pillars



Layout adjusted coating

System Configuration

Alignment

Alignment types:	2-4 fiducial marks
Alignment light source:	Selectable ring light source, coax light

Drop watcher

Drop watcher:	Visualisation of drop formation process
Drop formation analysis:	Measurement of drop volume, speed, angle, number of satellites, …

Printheads

Number of heads:	Up to 6 printheads
Head types:	According to EVG recommandation
Calibration:	All nozzle positions calibrated better than 1 µm
Print resolution:	Up to 5080 x 5080 dpi
Drop placement:	±5 µm
Print repeatability:	±1 µm
Jetting parameters:	Full access to waveform and all other jetting parameters

Ink System

Ink types:	According to EVG recommandation
Tank volume:	50 - 200 ml
Recirculating tank system:	Optional

The n.jet drop watch

The n.jet drop watch is a very compact and highly integrated measurement system under real production environment. The measurements of droplets under different process conditions helps to optimize the inkjet process, the fluid formulation, and the overall system performance.

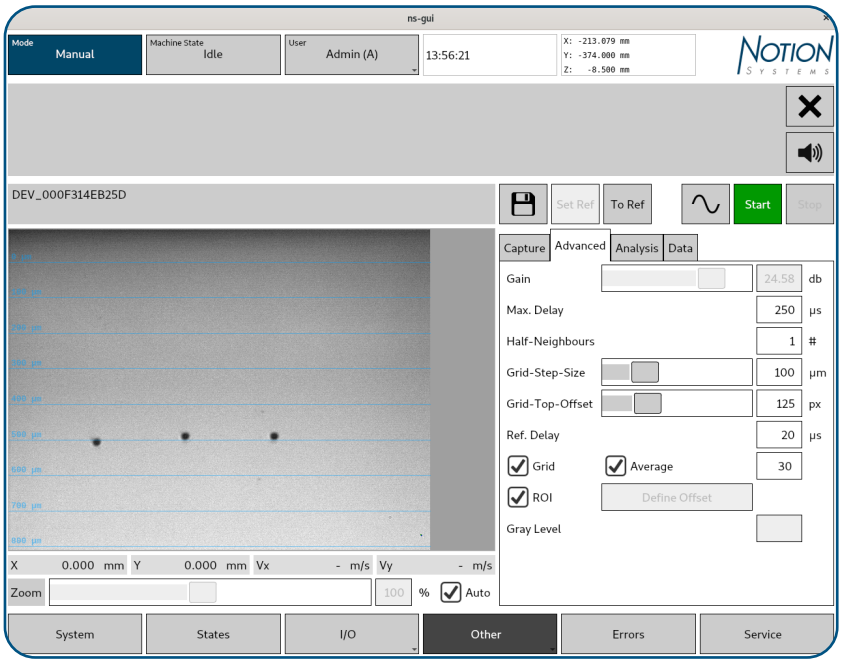
The n.jet dropwatch serves the two main purposes of visualization and analysis of the drop formation process.

Visualization is used to optimize fundamental quality parameters, like

- Drop appearance
- Drop formation repeatability
- No satellites
- No misting
- No wetting of nozzle plate
- Jetting performance at different frequencies

Analysis can be used to optimize advanced parameters, e.g.

- Drop volume
- Drop velocity
- Drop travel angle



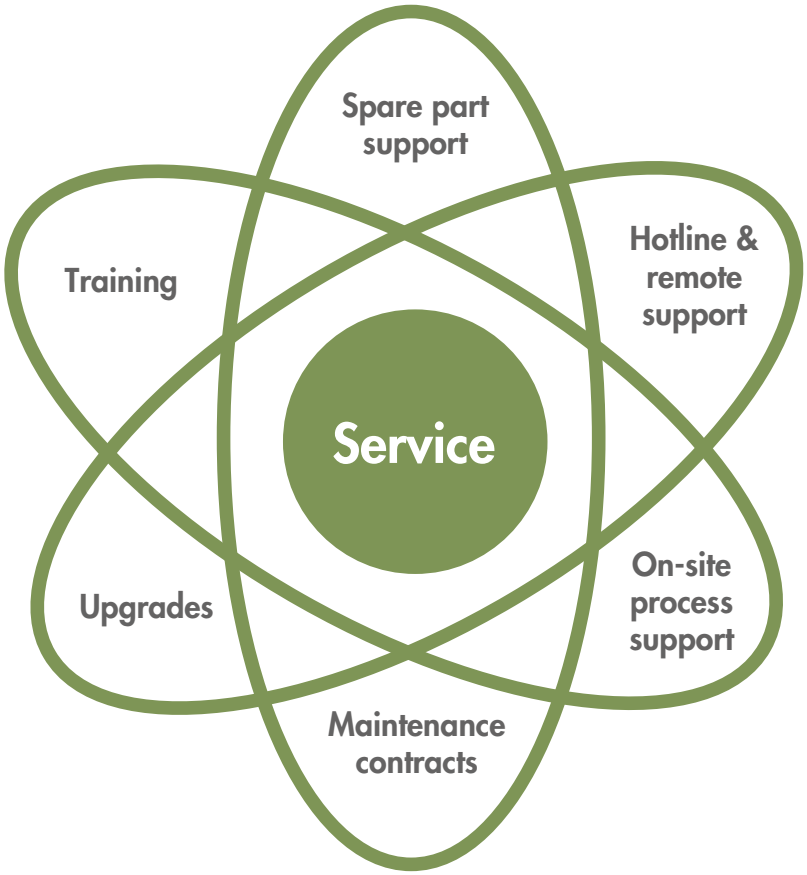
Dimensions & Specifications

Stage size:	156 x 156 mm, 305 x 305 mm
Substrate height:	Up to 80 mm
Substrate fixture:	Vacuum hold down
Print speed:	Up to 500 mm/s
Self calibration:	Automated self calibration
x & y axis type:	Ironless linear motor
x & y repeatability:	±1 µm
z axis type:	Servo motor spindle drive
Dimensions (LxWxH):	1800 x 1600 x 1900 mm
Electrical interface:	400 V / 16 A, 3 phases
Transformer:	Supplied by Notion Systems
Power consumption:	< 2 kW
CDA:	6.5 bar - 8.5 bar
CDA consumption:	< 1 liter per minute

After Sales Service

We support our clients in achieving their goals

We offer worldwide service and spare parts support to ensure our customers the highest possible operational uptime of our inkjet systems.



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