

XTPL[®]

shaping global nanofuture



XTPL[®] Delta Printing System

First truly additive method
for printing conductive single micron lines

Award Winning Technology



BENEFITS

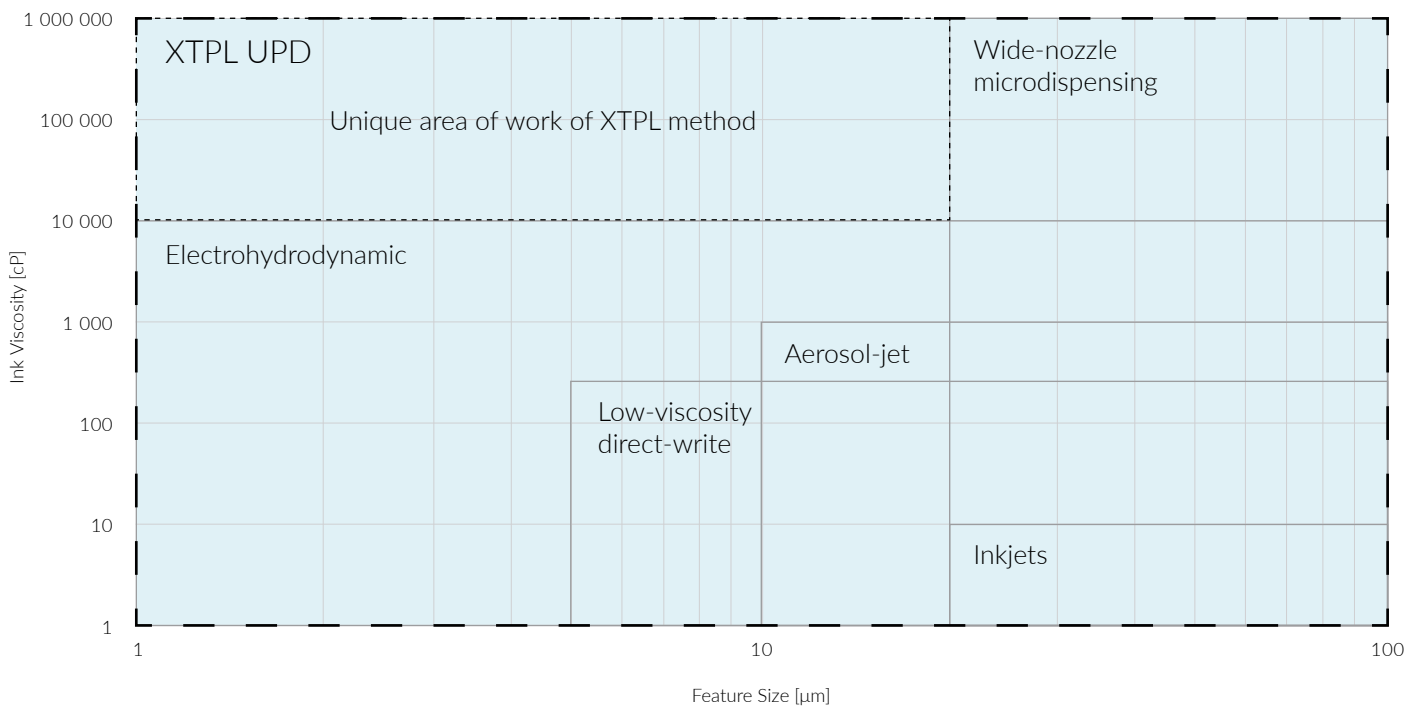
- Features down to 1 μm , conductive after single pass
- Up to 500 nm single pass layer thickness at 5 μm
- Up to 45% of bulk Silver conductivity after sintering
- Conductive and not conductive material support
- Printing on heterogeneous materials and 3D topographies
- Uniform & clean features geometries: no overflow or spills
- 8 hours continuous printing stability
- Up to 60 days of on/off printing

DEVICE DETAILS

- Fast & easy exchange of cartridges & nozzles
- Only 0.5 mL of ink required to start printing
- Minimum deposited volume: 40 fL
- Minimum ink volume required: 0.5 ml
- Up to a 100% ink utilization

UNIQUENESS OF XTPL ULTRA-PRECISE DEPOSITION TECHNOLOGY

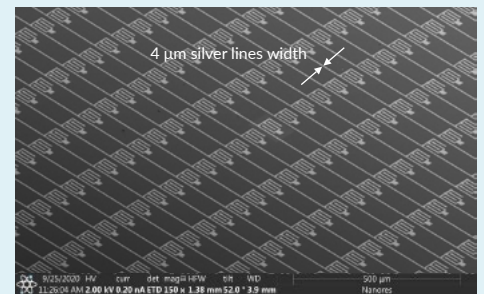
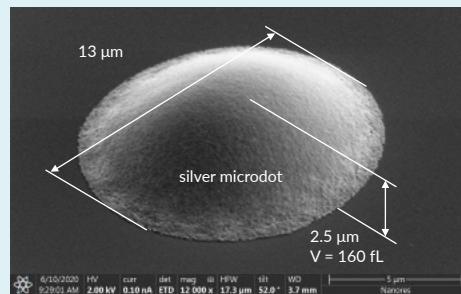
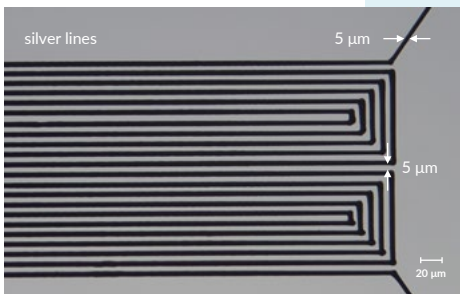
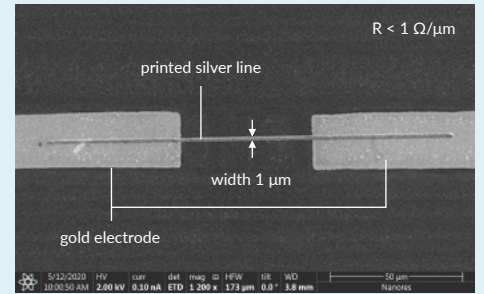
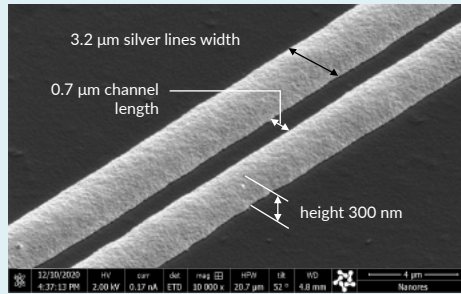
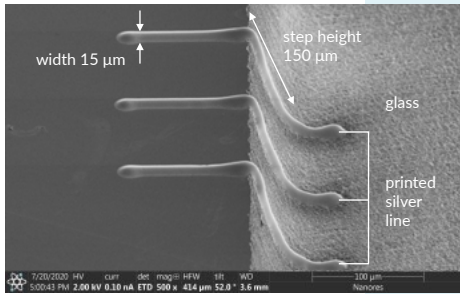
- Ability to print high viscous materials along with small feature sizes
- High aspect ratios just after a single pass
- Matchless variety of printing different materials
- Uninterrupted interconnections on highly complex topographies
- Ultra-high-resolution printing on practically any kind of substrate



LEGEND:

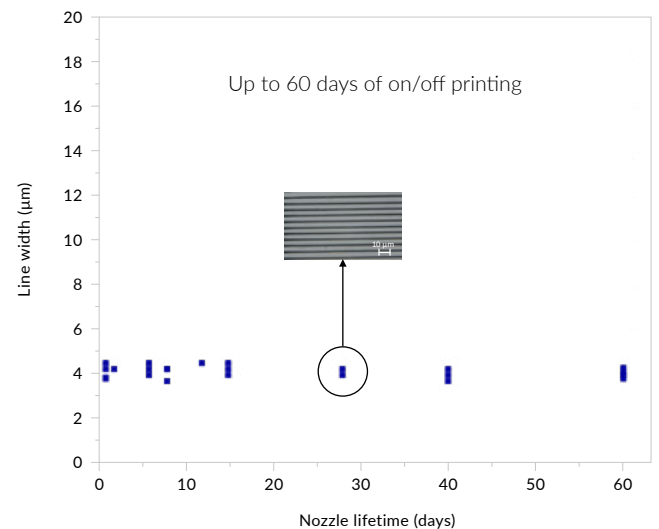
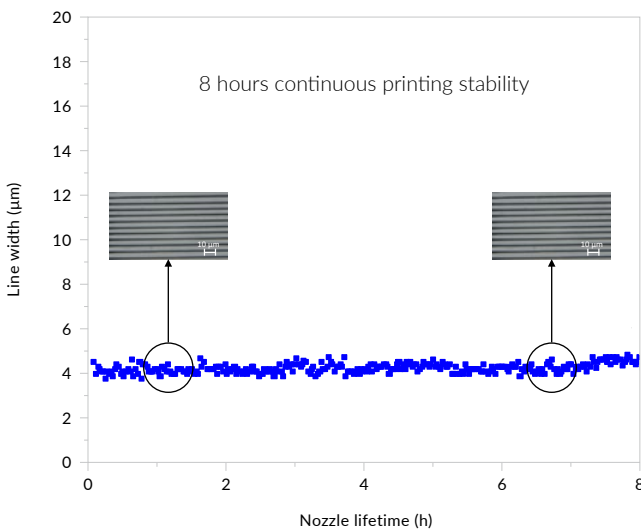
- unique area of work where there are no competitive methods exists
- — general area of work of XTPL

High-precision microdispensing system for rapid prototyping of microelectronics, advanced IC packaging, MEMS, microwave, RF components, FPD etc.



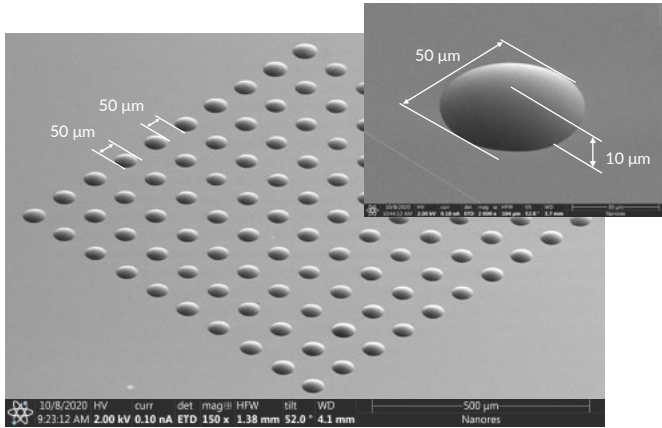
SUPERIOR PRINTING PROCESS STABILITY

The users of XTPL Printing System benefit from a demonstrated best-in-class printing stability: sustained 1 day of continuous printing, and up to 60 days of on and off printing with XTPL CL85 conductive Silver nanopaste.

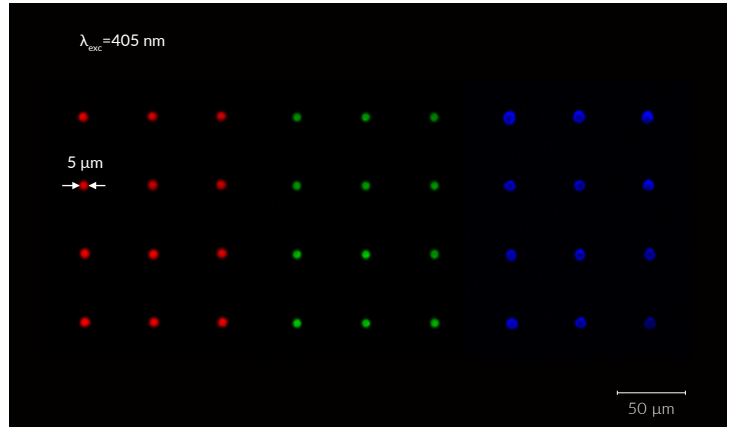


BROAD VARIETY OF MATERIALS

XTPL Delta Printing System has a demonstrated capability of working with a broad variety of 3rd party materials: quantum dot inks, photoresists, polymers. Inks and pastes with viscosities from several to a million cP and particle sizes below 50 nm (if applicable) have been demonstrated in applications that require features of down to 2 μm .



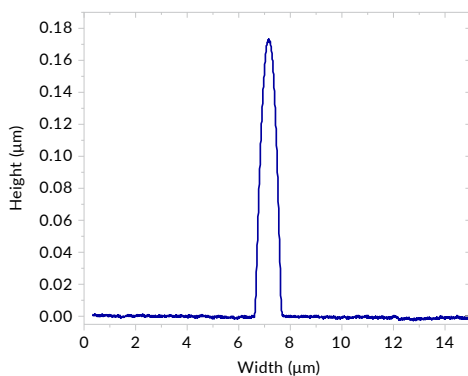
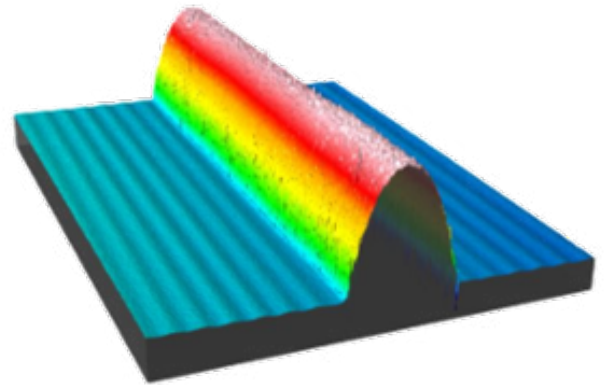
Printed material: Photoresist AR-P 3110
Viscosity = 12 cP



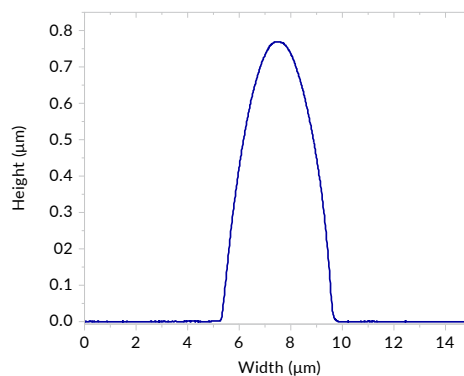
Printed material: QNA.dots from QNA Technology
Viscosity \approx 20 cP

EXCELLENT HEIGHT TO WIDTH ASPECT RATIO

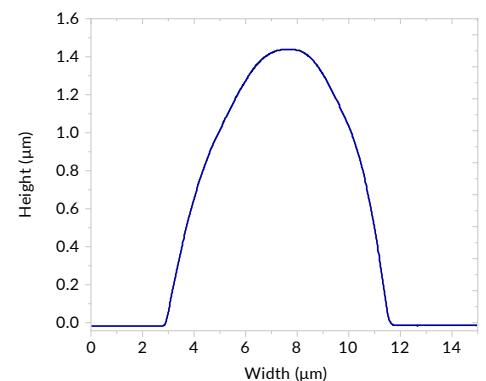
XTPL UPD technology is the first system capable of delivering conductive 1 μm structures from the very first pass. Single-pass height to width aspect ratios of up to 1:4 have been demonstrated. Multi-pass printing does not require an interim sintering step and delivers the capability of reaching and exceeding the aspect ratio of 1:1.



Height: 0.17 μm
Width: 1.0 μm



Height: 0.75 μm
Width: 5 μm



Height: 1.4 μm
Width: 9 μm

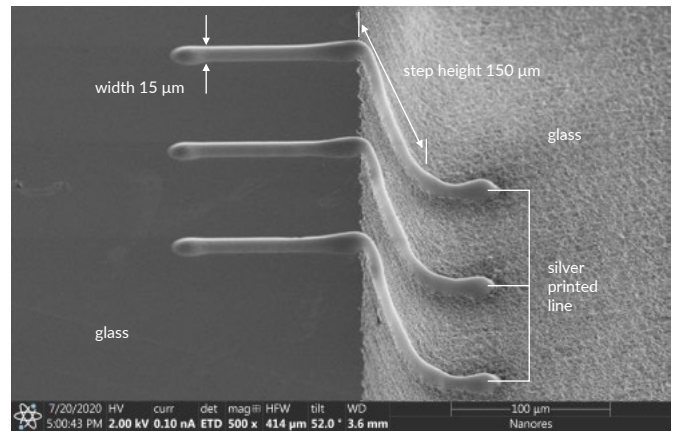
HIGH STEP COVERAGE

ABILITY TO:

cover complex substrate topographies with steps of up to a few hundred μm with continuous silver printed lines

APPLICATIONS:

flexible hybrid microelectronics, micro-LED displays, 2.5/3D interconnections in advanced IC packaging, 3D printed (micro) electronics



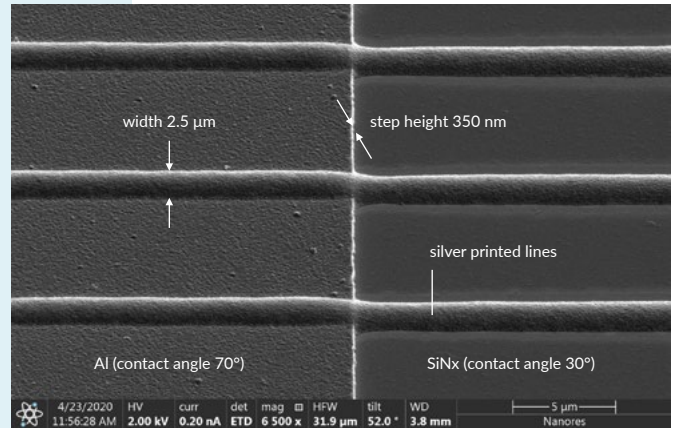
HETEROGENEOUS SUBSTRATES

ABILITY TO:

print lines with homogeneous width on materials with different wettability, e.g. Al and SiN_x

APPLICATIONS:

large area microelectronics, displays (LCD, OLED, micro-LED), MEMS and semiconductors



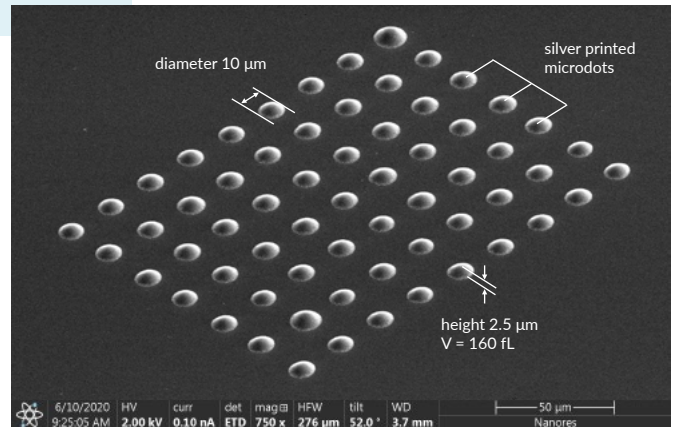
PRINTED CONDUCTIVE MICRODOTS

ABILITY TO:

print regular silver microdots with diameter in the range of single to several μm , with the height of up to 3 μm

APPLICATIONS:

flip-chip conductive die attach, MEMS, repair in micro-LED display



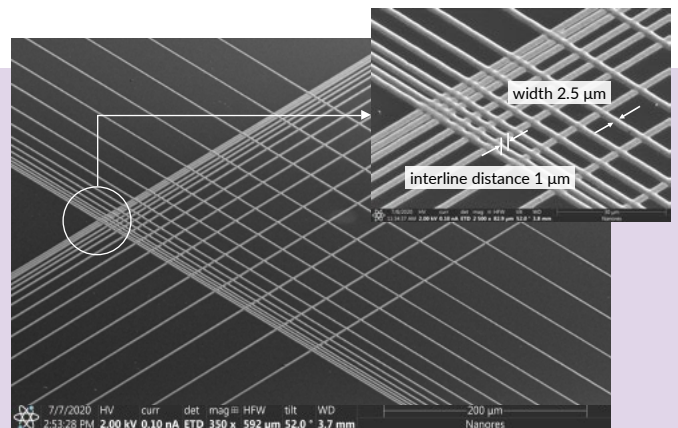
FINE PRINTED LINES AND MESHES

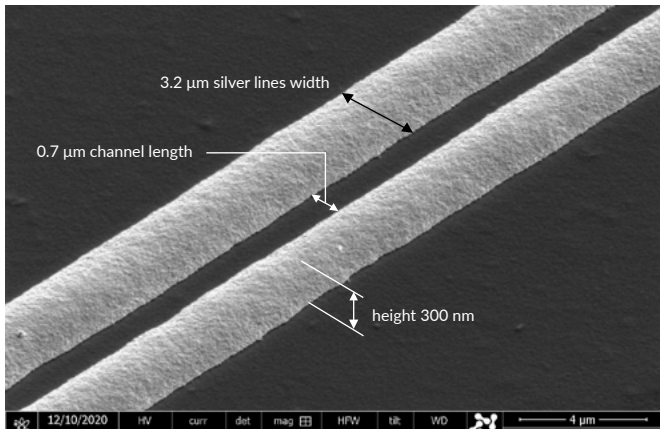
ABILITY TO:

print regular and repeatable conductive meshes with high resolution and precision

APPLICATIONS:

large area microelectronics, displays (TE-OLED), transparent antennas





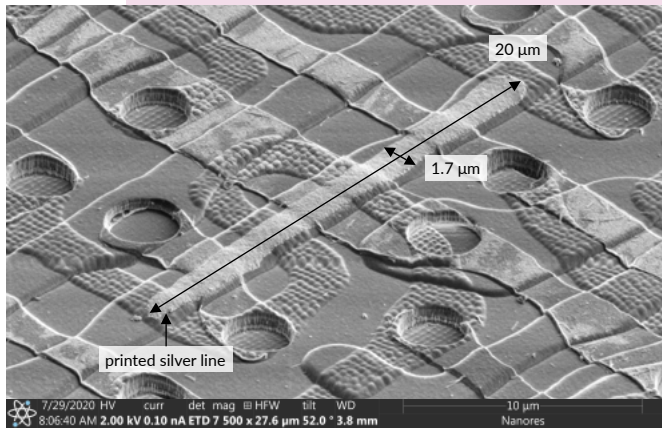
INTERLINE DISTANCE

ABILITY TO:

print lines and other features with high-density without short defects

APPLICATIONS:

printed electronic devices, e.g., transistors, high-frequency RF applications, sensors, RDL (redistribution layers), high density interconnections



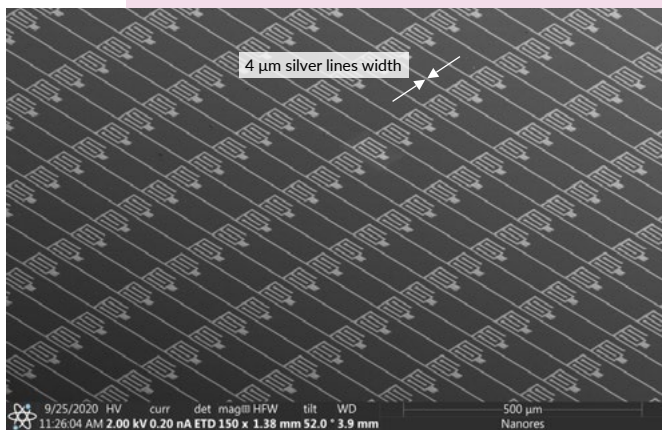
OPEN DEFECT REPAIR FOR OLED

ABILITY TO:

deposit down to 1 μm lines over complex and heterogeneous substrate topographies

APPLICATIONS:

high-resolution displays (OLED, LCD, micro-LED)



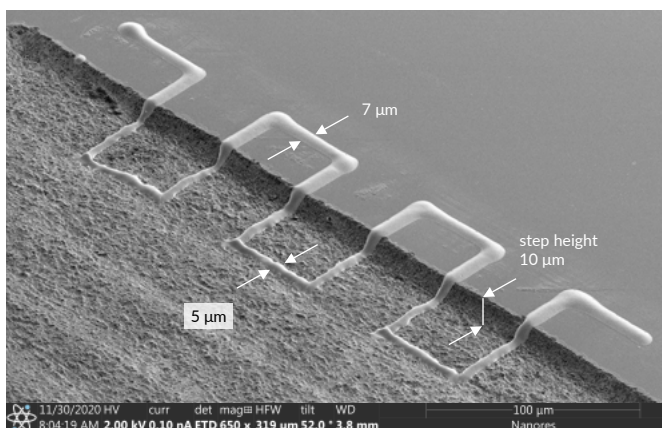
ARRAY OF S/D METAL LAYER FOR PRINTED FPD

ABILITY TO:

print arbitrary complex conductive structures with high precision and repeatability

APPLICATIONS:

power/ground supply networks for printed electronics, TFT array prototyping, RDL (redistribution layers) for advanced IC packaging



HIGH-RESOLUTION CONDUCTIVE CONNECTIONS PRINTED OVER THE STEP

ABILITY TO:

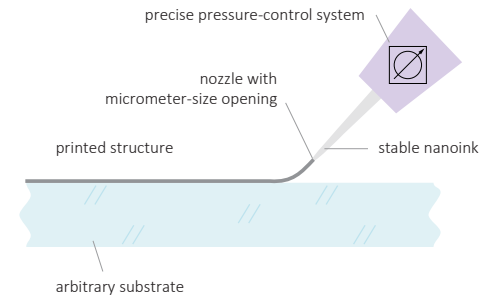
print highly adhesive and conductive structures over complex topographies with varying surface roughness

APPLICATIONS:

displays (lateral micro-LED interconnections), 2.5/3D interconnections for advanced IC packaging, 3D printed (micro)electronics, MEMS

DEVICE DETAILS

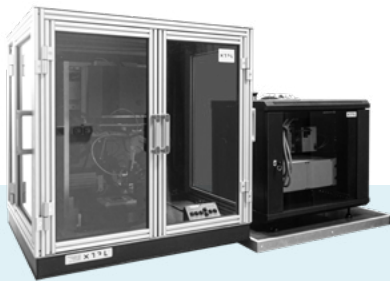
ITEM	VALUE
Feature size	down to 1 μm
Material viscosity	up to 1 000 000 cP
Substrate alignment	3-point levelling table with rotation error correction
Substrate size	50 mm x 50 mm
Maximum printing speed	10 mm/s
Process preview	Live video with recording
XY motor movement accuracy / repeatability	2 μm / 0.5 μm
Z motor movement accuracy / repeatability	0.5 μm / 0.5 μm
Printer cabinet dimensions (excluding peripherals and Printing Workstation)	800 mm x 800 mm x 890 mm
Printer weight	135 kg
Utilities required	compressed gas 10 bar, power supply 110/230V



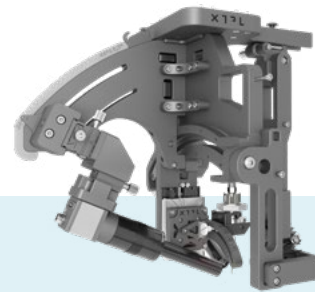
XTPL® ULTRA-PRECISE DEPOSITION

- Pressure-based direct writing
- Tailored high-viscosity inks
- Ultra-narrow flexible nozzle
- Purely additive
- No electric field required

XTPL COMPREHENSIVE SOLUTIONS



XTPL® DELTA PRINTING SYSTEM
high-precision rapid prototyping printing system for microelectronics



XTPL® EPSILON PRINTING MODULE
high-precision integratable Printing Module for industrial applications



XTPL® CONDUCTIVE INKS
highly-concentrated silver inks characterised by superior stability and homogeneity



XTPL SERVICES
the services in the field of the proof of concept and prototyping projects

XTPL[®]

shaping global nanofuture

Get your quotation at

✉ sales@xtpl.com

☎ +48 71 707 22 04

XTPL is a globally innovative company developing breakthrough, additive manufacturing technology for ultra-precise printing of nanomaterials.

Contact us for more details.

XTPL S.A.

Stabłowicka 147, 54-066 Wrocław, Poland

xtpl.com

[f](#) [t](#) [v](#) [in](#)

