XTPL®

shaping global nanofuture

XTPL® Delta Printing System

First truly additive method for printing conductive single micron lines

Award Winning Technology

I-Zone

Printed Electronics AWARDS

R&D 100

The 27th International Display Workshops IDW '20

INNOVATION & ENTREPRENEURSHIP INTERNATIONAL COMPETITION Shenzhen.China

BENEFITS

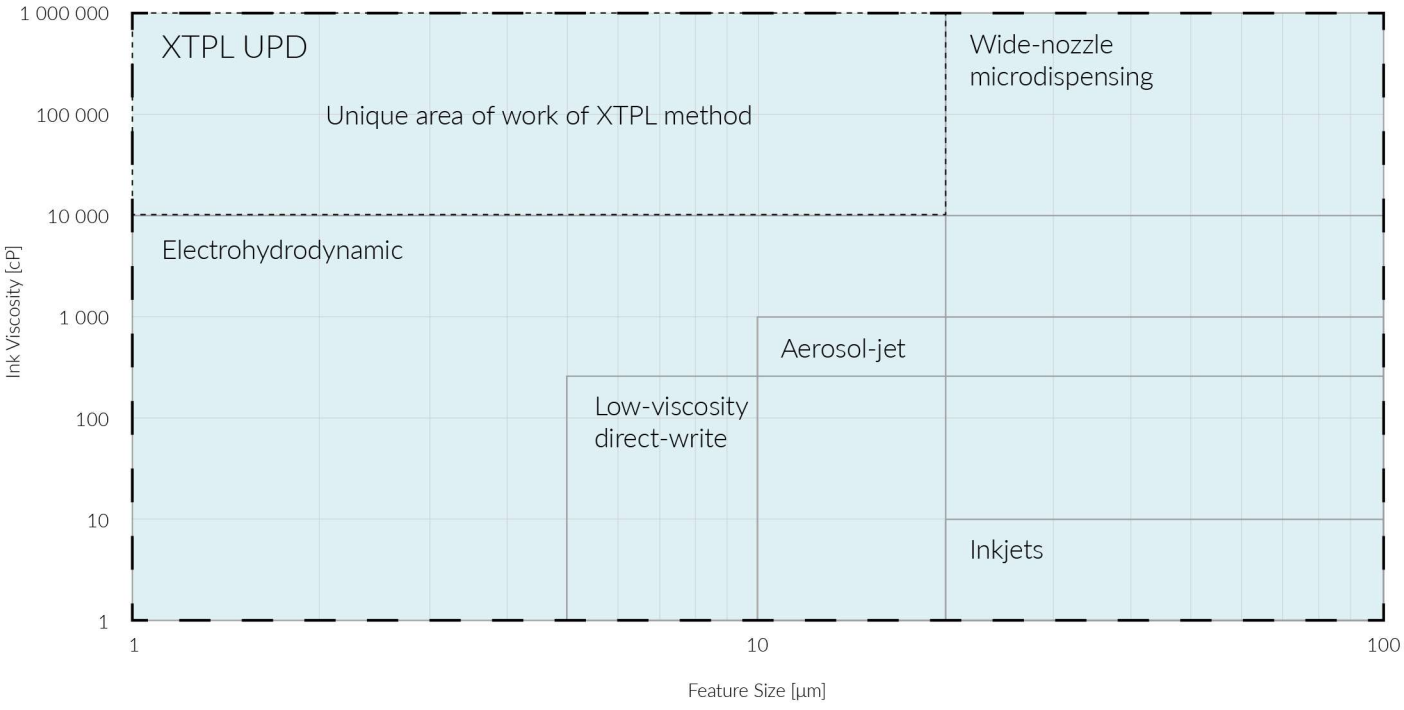
- Features down to 1 µm, conductive after single pass
- Up to 500 nm single pass layer thickness at 5 µm
- Up to 45% of bulk Silver conductivity after sintering
- Conductive and not conductive material support
- Printing on heterogeneous materials and 3D topographies
- Uniform & clean features geometries: 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

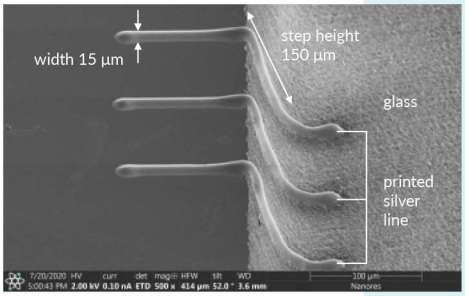


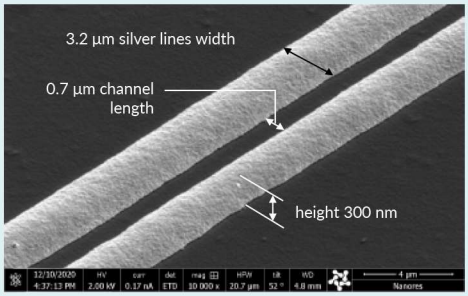
LEGEND:

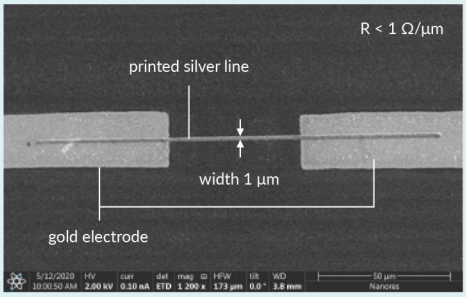
----- unique area of work where there are no competitive methods exists

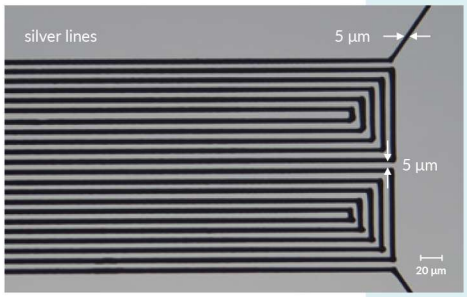
– – general area of work of XTPL

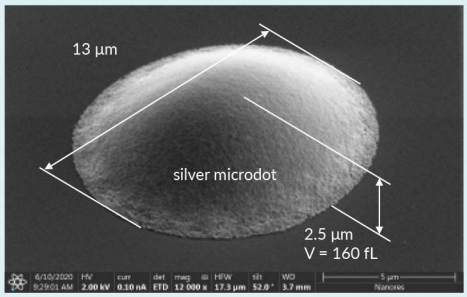
High-precision microdispensing system for rapid prototyping of microelectronics, advanced IC packaging, MEMS, microwave, RF components, FPD etc.

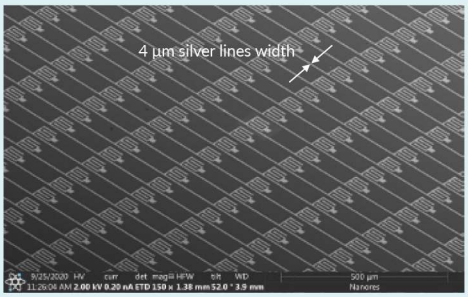






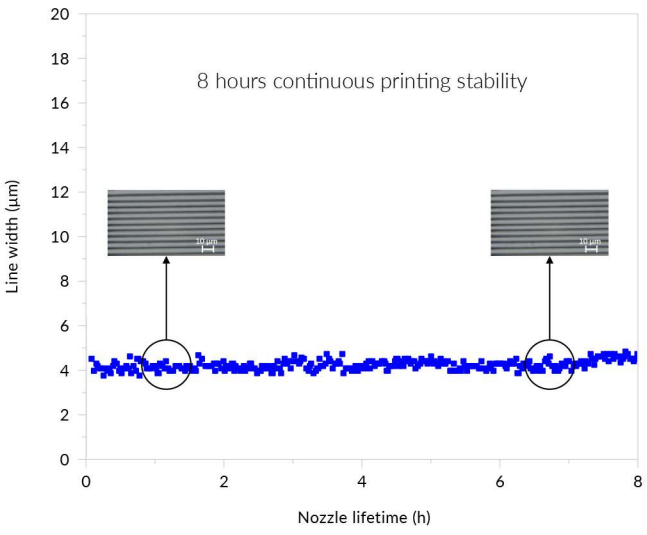


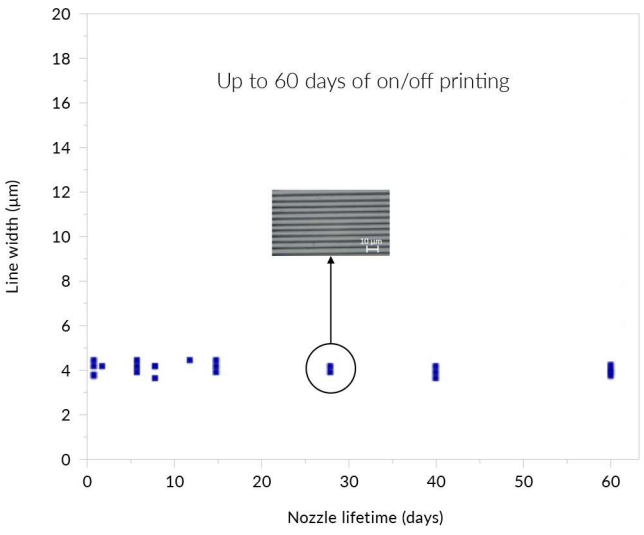




SUPERIOR PRINTING PROCESS STABILITY

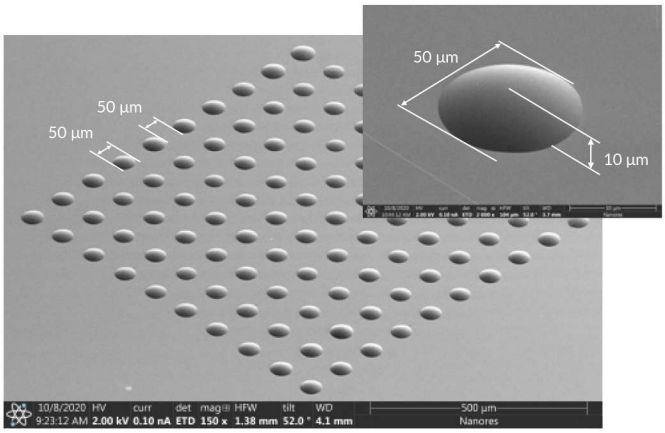
The users of XTPL Printing System benefit from a demonstrated best-in-class printing stability: sustained 1 day of continuous printing, and up to 60 days of on and off printing with XTPL CL85 conductive Silver nanopaste.



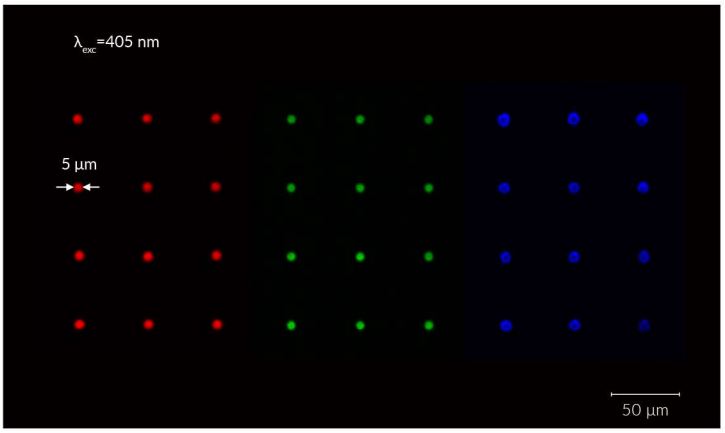


BROAD VARIETY OF MATERIALS

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.



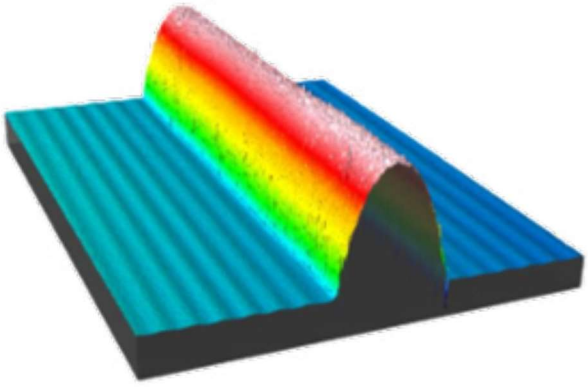
Printed material: Photoresist AR-P 3110
Viscosity = 12 cP

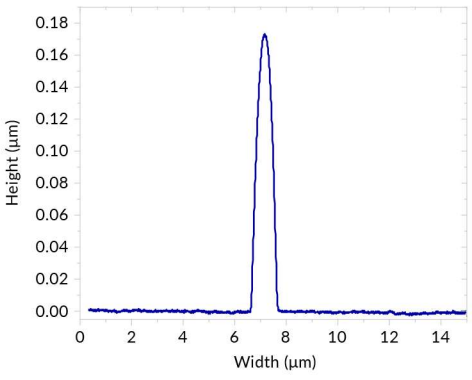


Printed material: QNA.dots from QNA Technology
Viscosity ≈ 20 cP

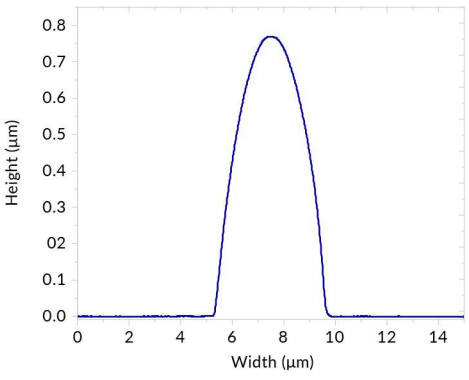
EXCELLENT HEIGHT TO WIDTH ASPECT RATIO

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.

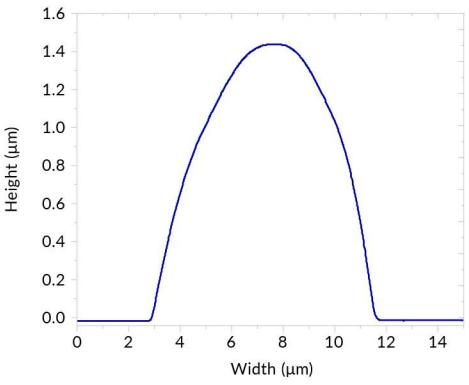




Height: 0.17 µm
Width: 1.0 µm



Height: 0.75 µm
Width: 5 µm



Height: 1.4 µm
Width: 9 µm

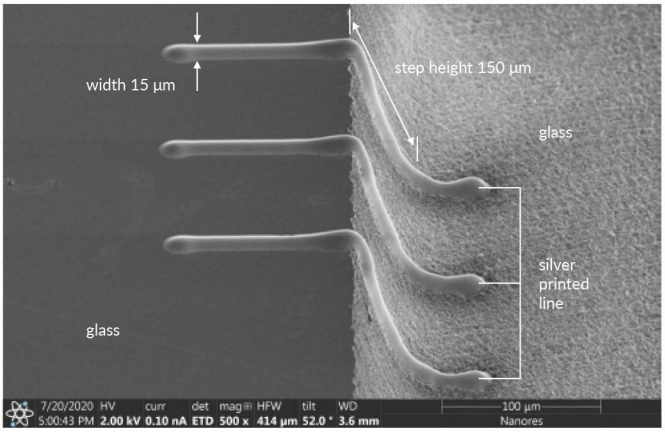
HIGH STEP COVERAGE

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



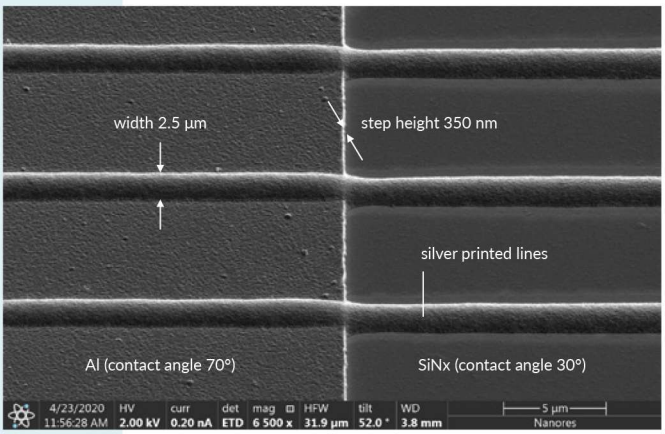
HETEROGENEUS SUBSTRATES

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



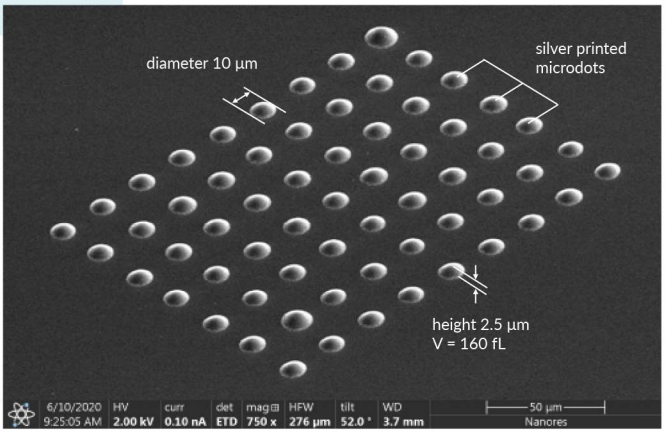
PRINTED CONDUCTIVE MICRODOTS

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



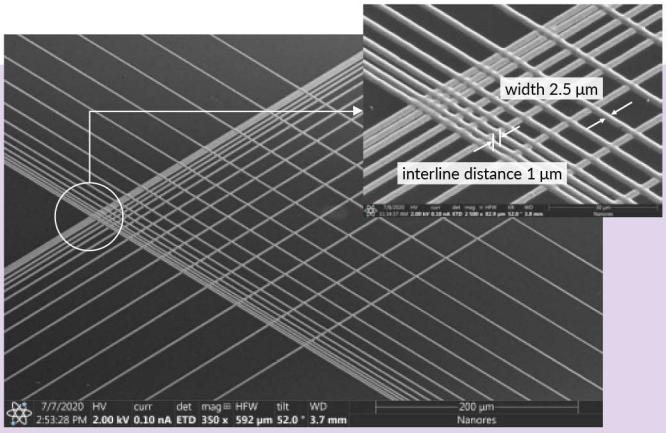
FINE PRINTED LINES AND MESHES

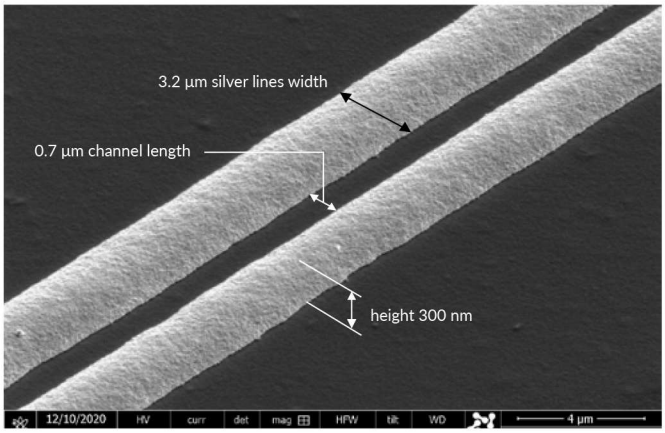
ABILITY TO:

print regular and repeatable conductive meshes with high resolution and precision

APPLICATIONS:

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





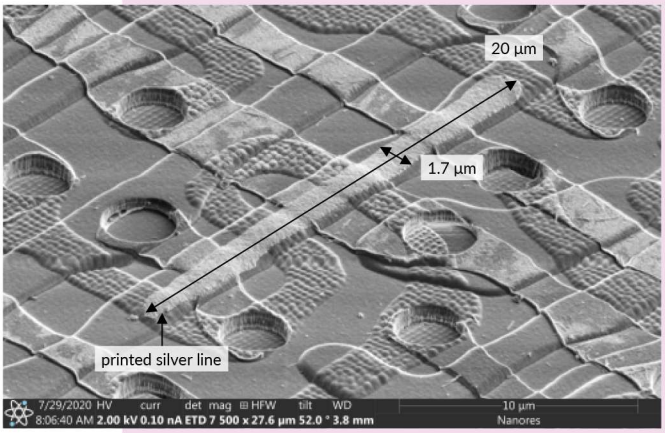
INTERLINE DISTANCE

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



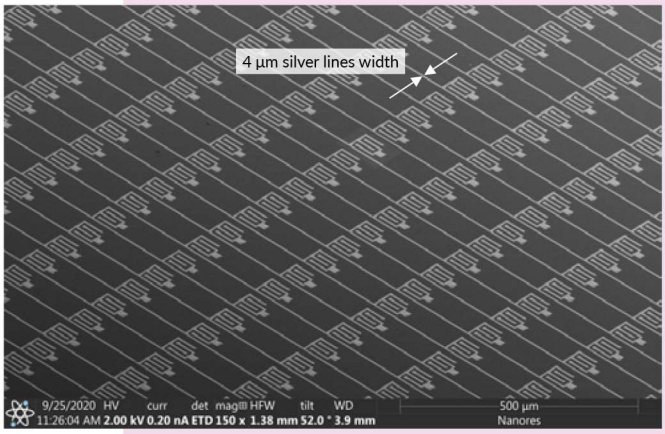
OPEN DEFECT REPAIR FOR OLED

ABILITY TO:

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

APPLICATIONS:

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



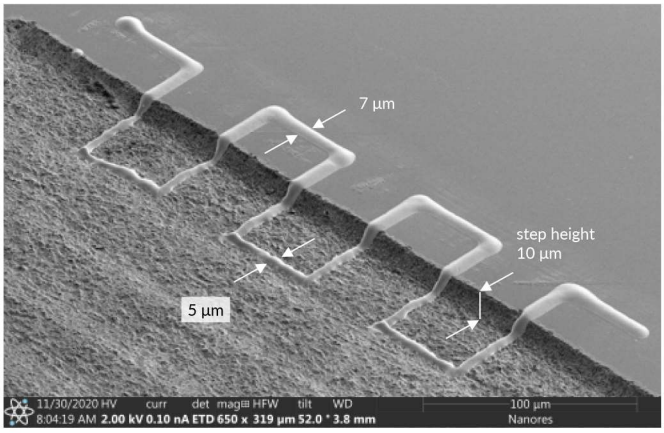
ARRAY OF S/D METAL LAYER FOR PRINTED FPD

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:

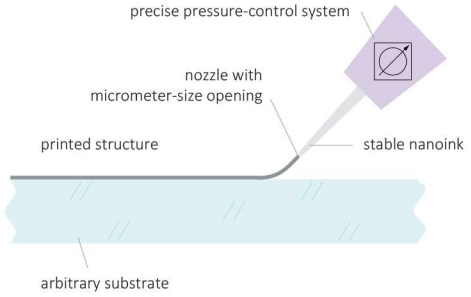
print highly adhesive and conductive structures over complex topographies with varying surface roughness

APPLICATIONS:

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

DEVICE DETAILS

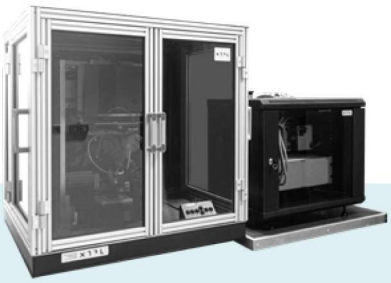
ITEM	VALUE
Feature size	down to 1 µm
Material viscosity	up to 1 000 000 cP
Substrate alignment	3-point leveling table with rotation error correction
Substrate size	50 mm x 50 mm
Maximum printing speed	10 mm/s
Process preview	Live video with recording
XY motor movement accuracy / repetability	2 µm / 0.5 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

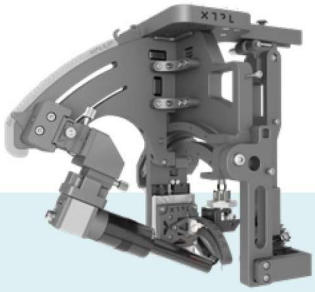
- Pressure-based direct writing
- Tailored high-viscosity inks
- Ultra-narrow flexible nozzle
- Purely additive
- No electric field required

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

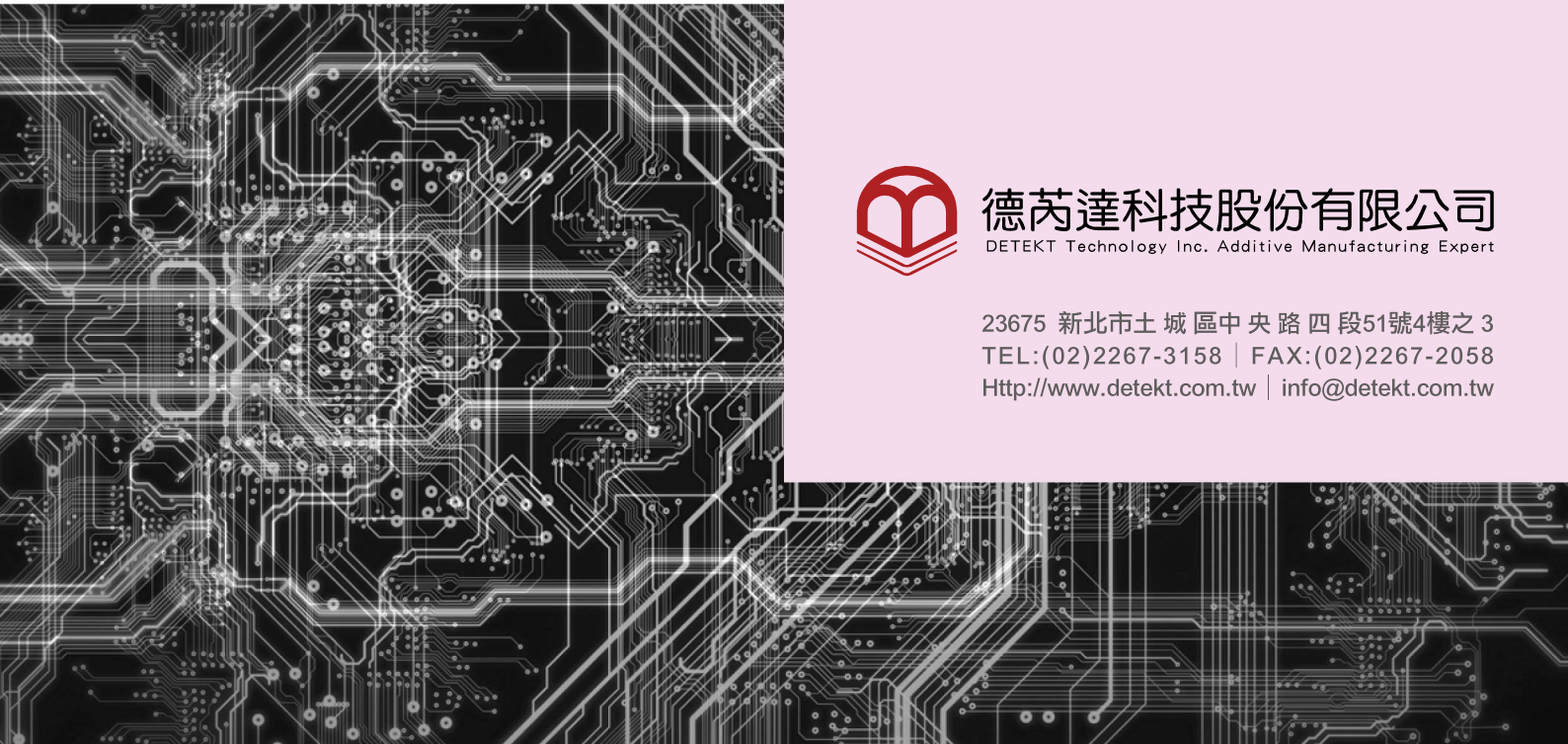
highly-concentrated silver inks characterised by superior stability and homogeneity

XTPL SERVICES

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

XTPL®

shaping global nanofuture



德芮達科技股份有限公司

DETEKT Technology Inc. Additive Manufacturing Expert

23675 新北市土 城 區中 央 路 四 段51號4樓之 3

TEL:(02)2267-3158 | FAX:(02)2267-2058

Http://www.detekt.com.tw | info@detekt.com.tw