Direct patterning by Sub-micron super-inkjet:—A powerful tool for nanotechnology—

Kazuhiro Murata, CEO, Founder SIJTechnology, Inc.
k-murata@sjitechnology.com
http://www.sijtechnology.com/

Large factory

Width: 0.5μm
Pitch: 2.5μm

Dot pitch 3μm

Desktop factory by super Inkjet
Advantages of SIJ 1

Disposable head

- Easy to change the ink
  - Nanometal
  - UV polymer

Precise patterning

- Less than 1/1000 in volume
  - 1 pl
  - 13μm

Conventional Inkjet

- Conductive polymer
- Biomaterials

Super-Inkjet

- 50μm L&S

- 5μm L&S

etc.
Advantages of SIJ 2

High Viscosity ink

3D structures

10000 1000 100 10 1

Viscosity (cps, mPa sec)

1μm 10μm 100μm

Resolution (width, diameter)

1fl 1pl 1nl

Droplet Volume

SIJ

Dispenser

Ink jet

7μm

200.00

109.00

SIJ Technology
Application example 1

High performance all printed organic TFT

1 μm channel has been achieved by using SIJ printer.

Prof. Someya and Prof. Sekitani in Tokyo Univ.
High performance organic semiconductor

Highly oriented crystalline thin film has been printed by SIJ printer.

with Prof. Takeya and Prof. Okamoto in Osaka Univ.

Thin semiconductor layer printed by SIJ.

cf. Poly crystalline structure in a large size of droplet.

High performance than vacuum process (5 times) was obtained by single pass printed process.
Fine-Pitch Copper Wiring Formed with Super-Inkjet and Oxygen Pump (supported by NEDO project)


The Japan Society of Applied Physics

Low resistivity of 8.1μΩcm and 5μm line and spaces
Application example 4

Microarrays of Phospholipid Bilayers

"Microarrays of Phospholipid Bilayers Generated by Inkjet Printing"

Misato Yamada †, Hiromasa Imaishi †‡, and Kenichi Morigak,
Langmuir, 2013, 29 (21), pp 6404–6408
Application example 5
Electroless plating seed ink for plastic

For printed board by inkjet process  With 3D printer
Our services

Trial printing services

Contracted R&D services

Product sales
  Super inkjet
  Normal ink jet, Spotter, dispenser etc.
  Conductive ink, Plating seed ink etc.
  CAD software
Summary

We have developed a super-fine inkjet technology (SIJ) that enables extremely fine pattern formation using droplets measuring less than 1 micrometer in diameter.

By using conductive ink based on nano-metal particles, direct fabrication of circuits and three-dimensional structures having a feature size of just a few microns are achieved.

The SIJ is capable of printing with a wide variety of inks, for example, insulators, organic semiconductors, light emitting polymers, bio-materials and UV curable polymers.