



Advancing the Art of Microdispensing

microdrop
TECHNOLOGIES

Microdispensing and Inkjetprinting in Industrial Applications

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microdrop Technologies GmbH

Products and Services for Microdispensing and Material Deposition

- Micro Technology
- Life Science / Medical Technology
- Plastic Electronics
- Material sciences



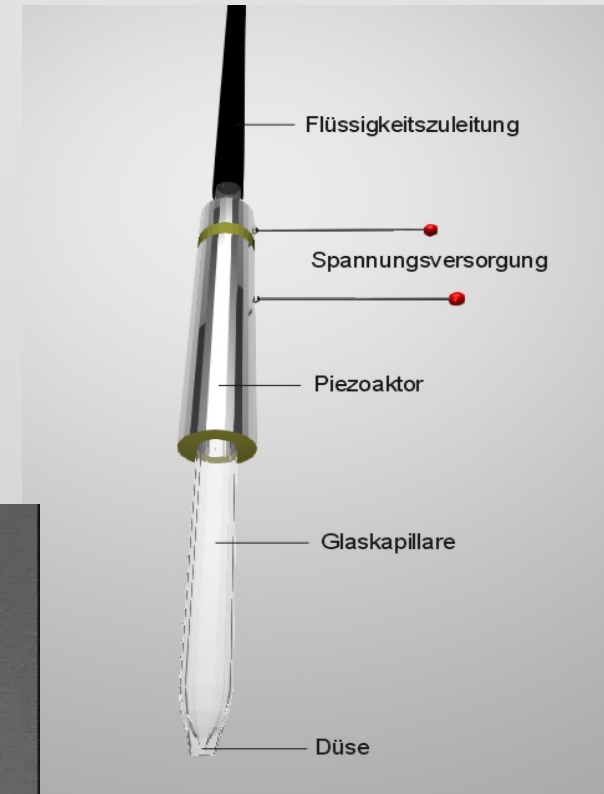
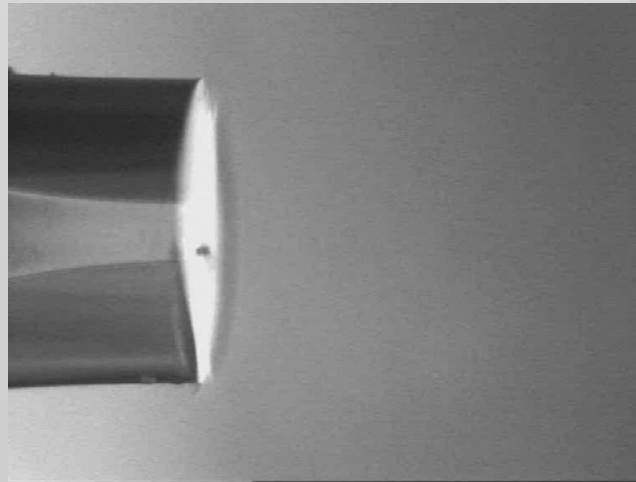
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Droplet Generator

- Viscosity 1 – 150mPas
- Material resistance: glass and PTFE
- Parameter control $v_{\text{drop}} = f(U, t, T)$
- refilling: design of fluidic inlet
- results comparable with other inkjet heads
- No follow on costs



Microdrop Technology

Head Types



MD-K-130



AD-K-801 → 160°C



AD-K-501 Micro Pipette

New



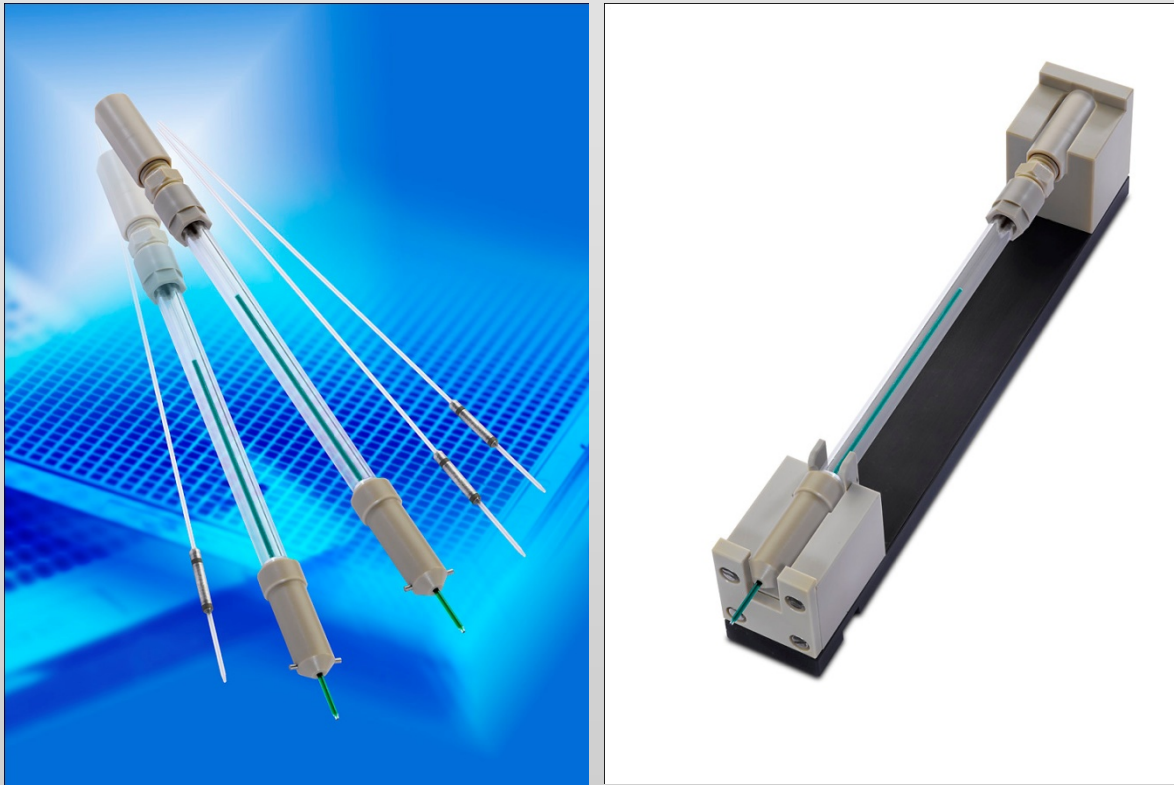
AD-K-901 Micro Pipette



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AD-K-901 Micro Pipette



- Dispensing volume: 30 – 300 μ l
- Storage volume: 37 μ l
- Readable liquid level
- Easy refilling and cleaning
- Quick change adapter



Industrial Applications

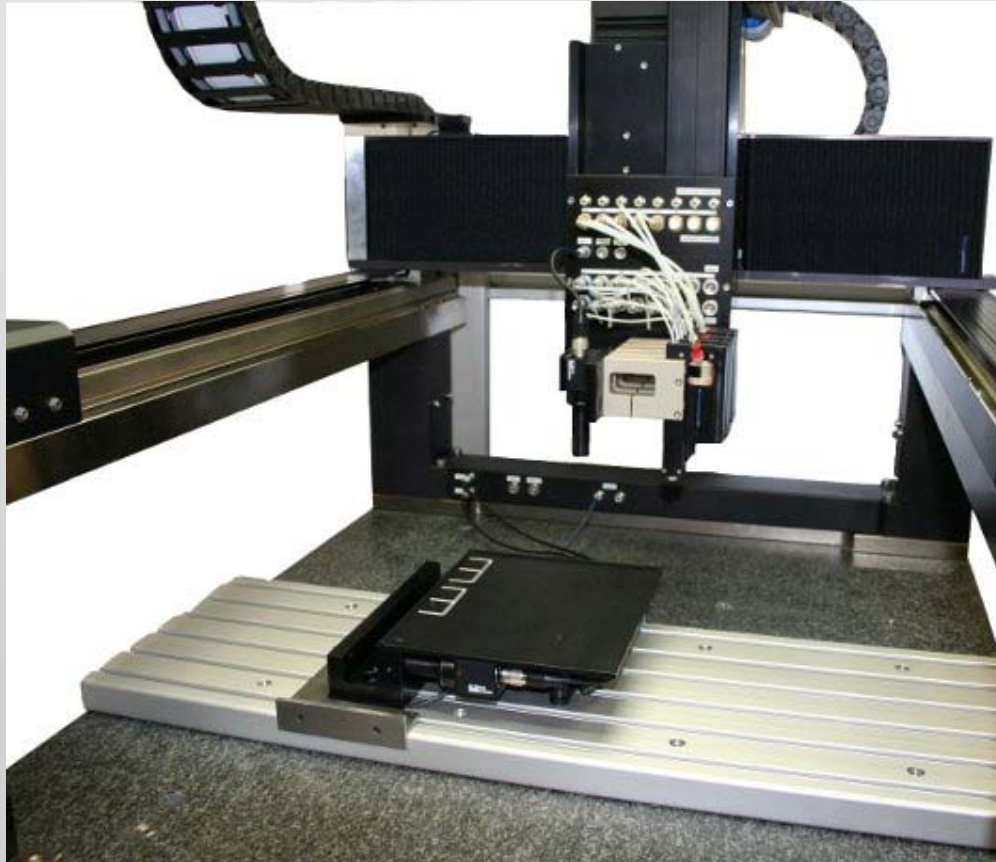


Autodrop Professional

- yxz: 200 x 200 x 80 mm³
- Up to 8 Dispensers or Pipettes
- Accuracy +/- 1 μ m



Industrial Applications



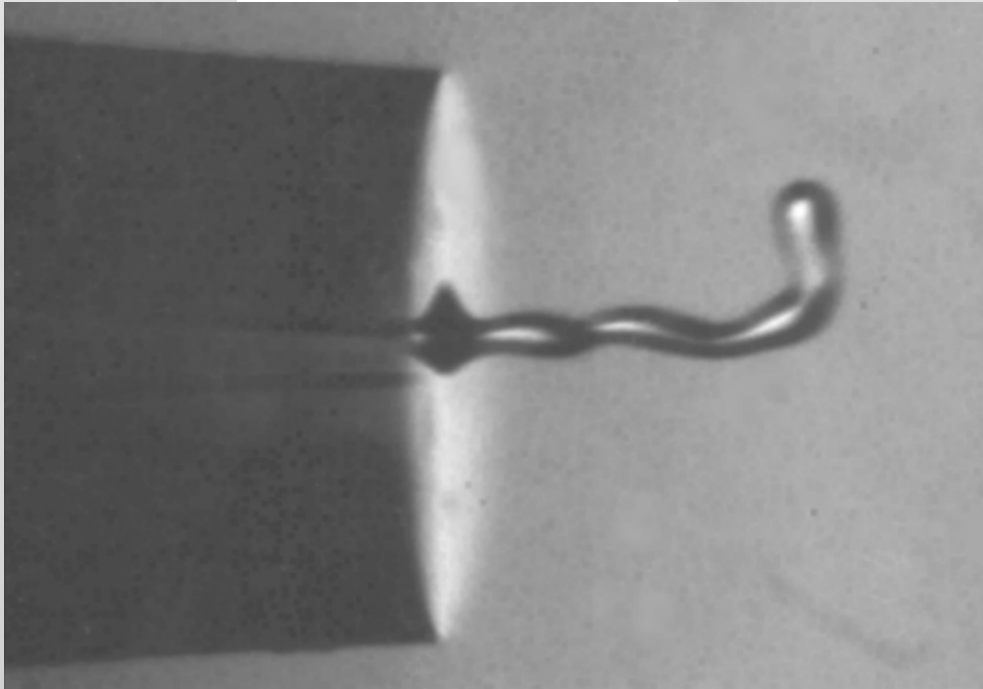
Autodrop Gantry System

- large printing area
- yxz: 370 x 560 x 100 mm³
- designed for inline production
- Accuracy +/-10 μm

- trajectory printing
- matrix printing



Microdrop Competences



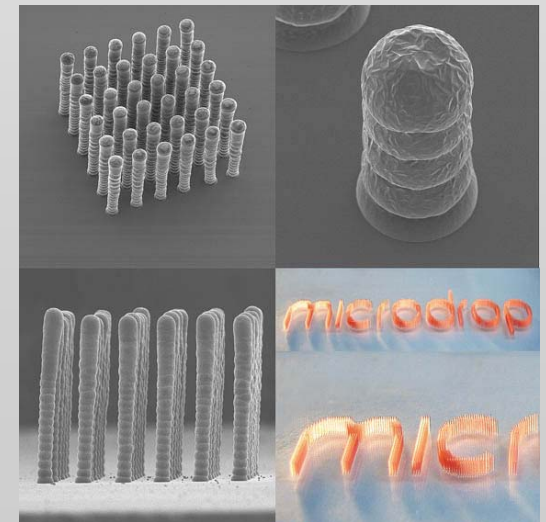
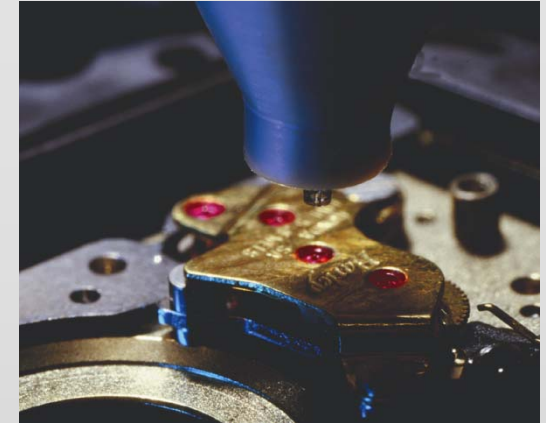
- **Training**
- **Lab services**
- **Evaluation Kits**
- **Customized projects**
- **Strategic partnership**
- **Small series production**



Applications

Examples

- **Minimal Lubrication**
bearings, watches, hard drives, drills (aircraft production)
- **Microbonding**
loudspeakers, microlenses, optical fibres & connectors, solder flux
- **3-D Printing**
waxes, hotmelts, rapid prototyping, bio-fabrication
- **Sensors and Diagnostic Chips**
coatings, drugs, DNA, proteins, enzymes and cells, coating, conductive tracks
- **Micro- and Polymer Electronics**
conductive inks, conductive adhesives



Applications

Material science

- Combinatorial Chemistry
- High Throughput Experimentation
- OLEDs / Functional Polymers

Bioprinting

- Biochip production
- Cell printing
- Tissue engineering
- Coating of implants

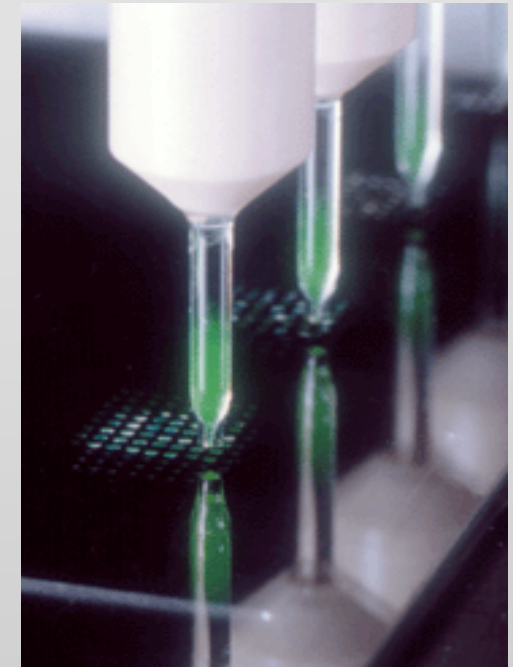
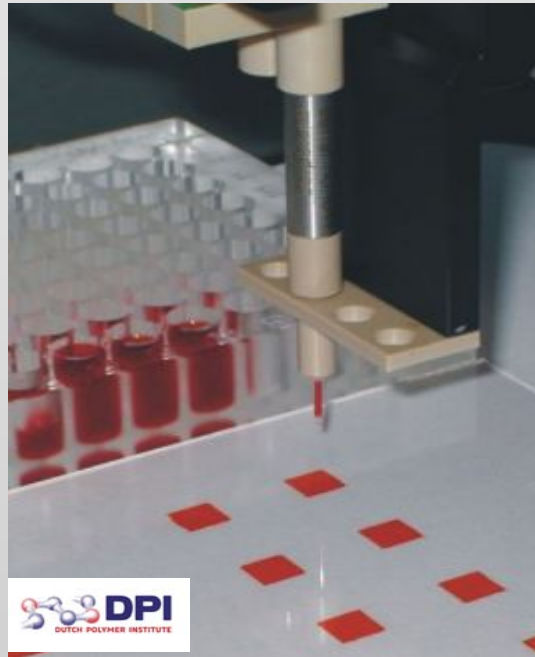
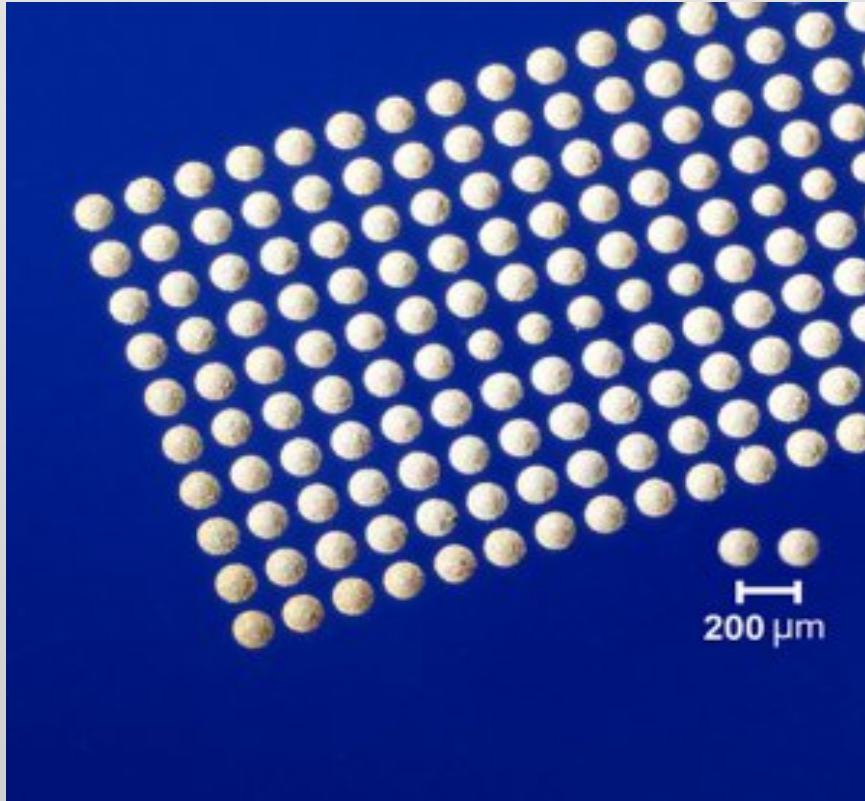


photo: PerkinElmer



Conductive Isotropic Adhesive (ICA)



Courtesy of IFAM Fhg

Ink characteristics

- Acrylate-epoxy matrix
- Radical Mechanism for UV curing
- Tunable bond strength by initial epoxy group concentration
- Low base viscosity, newtonian behavior
- 70 wt% Ag loading (~20 vol%)
- particle size ~ 2.4 μm

Process flow

- Jetting into final form (bumps, lines)
- Pre-cure using UV
- Store <4°C for later processing
- Components assembly
- Final thermal curing



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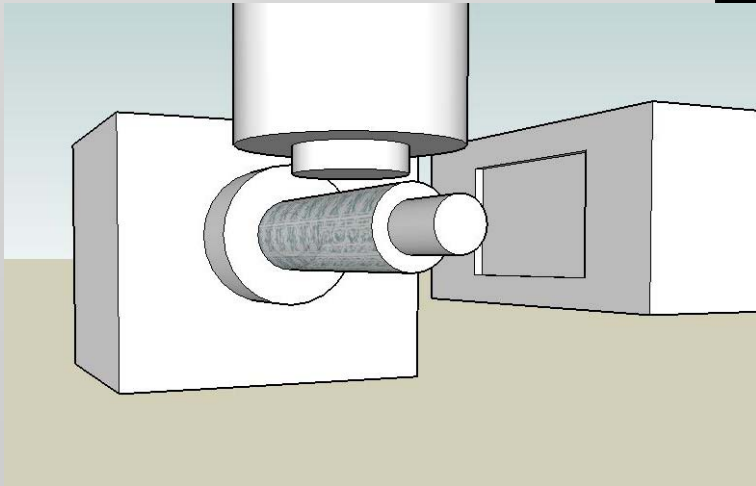
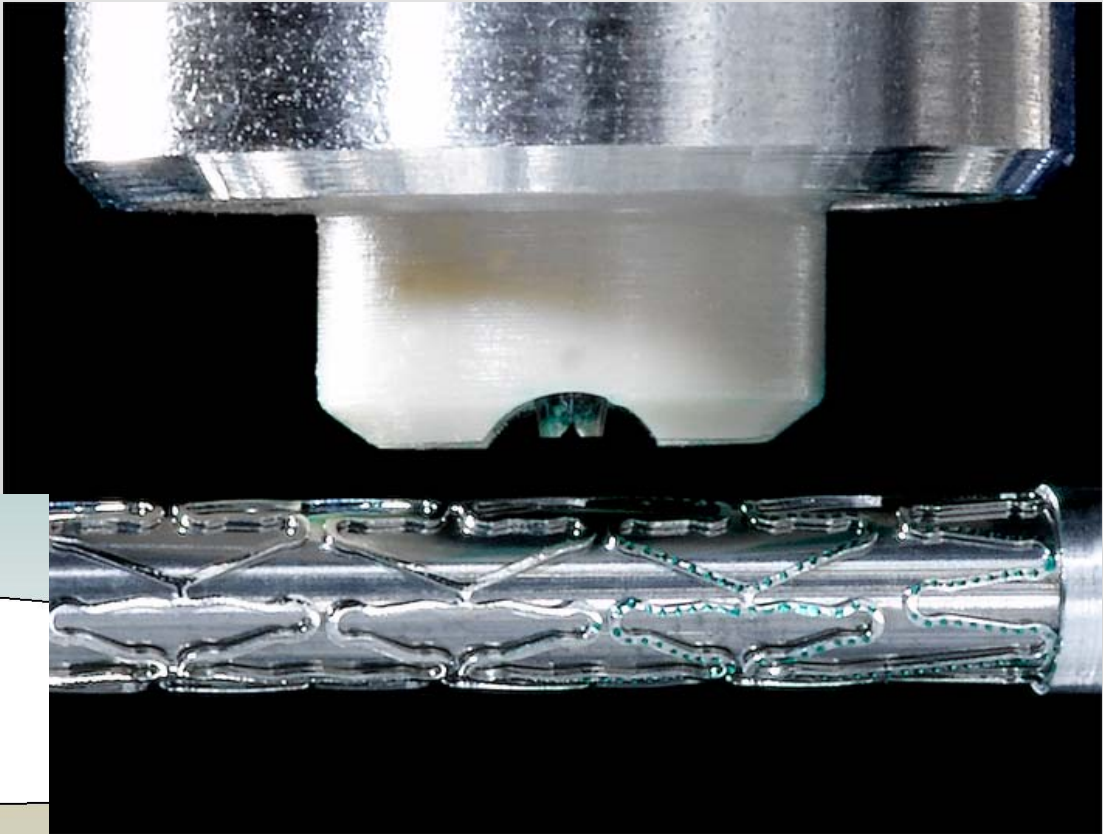
EC funded project

G1RD-CT-2002-00656

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Coating of Stents

- different algorithms for different strut regions
- high precision by:
 - no. of drops
 - drop pitch



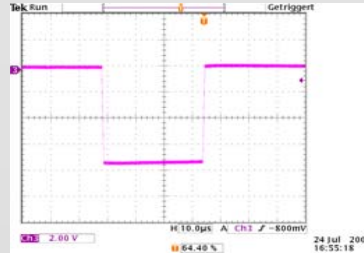
Control Unit MD-E-3000



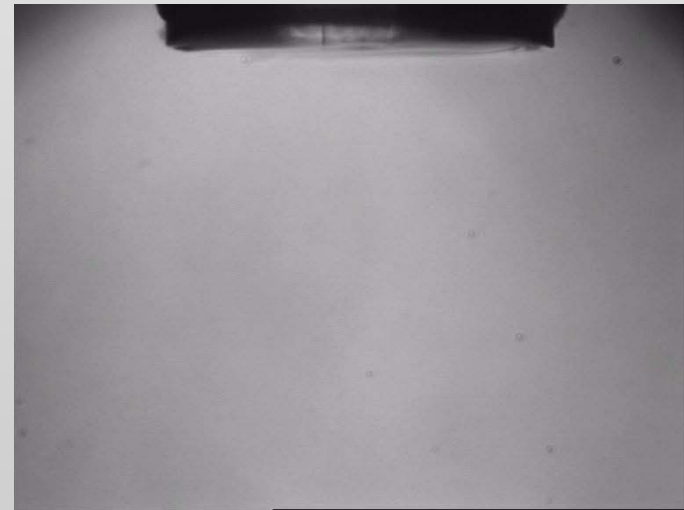
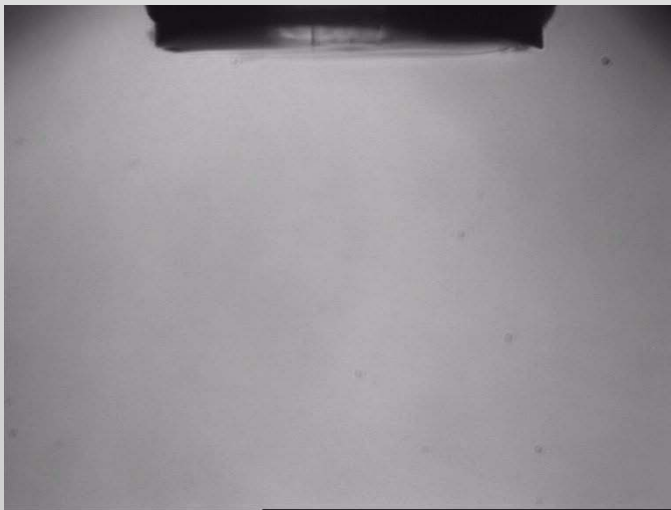
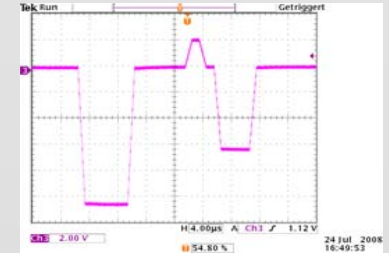
- Touch Panel User Interface
- Programmable Waveform
- Droplet diameter: from 15 μ m
- Multiple Head Control

Small Droplets from Large Nozzles

drop diameter:
80 μm



drop diameter:
30 μm



Harima Silver Nano Ink with 80 μm nozzle diameter



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Thank you for your attention!

**Please visit us:
Booth H18/E1**

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