Microdispensing and Inkjetprinting in Industrial Applications

Wilhelm Meyer
microdrop Technologies GmbH, Germany
contact: wilhelm.meyer@microdrop.de

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Products and Services for Microdispensing and Material Deposition

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

- Viscosity 1 – 150 mPas
- 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

AD-K-901 Micro Pipette

New

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AD-K-901 Micro Pipette

- Dispensing volume: 30 – 300 pl
- Storage volume: 37 µl
- 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 µm
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

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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
Conductive Isotropic Adhesive (ICA)

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

Courtesy of IFAM Fhg
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 15µm
- Multiple Head Control
Smal Droplets from Large Nozzles

![Image showing drop diameters: 80 µm and 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

Wilhelm Meyer
microdrop Technologies GmbH, Germany
contact: wilhelm.meyer@microdrop.de

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