eradrop
A MGI GROUP COMPANY

CeraPrinter F-Serie

Hybrid Digital Materials Deposition Platform

- Key solution for industrial multi-field applications
- Latest technologies enabling multitude of operations
- Modular scalable technology for quick & easy upgrade
- User-friendly single interface for all integrated technologies
- From R&D to 24/7 large scale manufacturing equipment range

PRINTED ELECTRONICS
& SMART 3D PRINTING

HYBRID MODULAR-BASED SCALABLE CONCEPT

CeraPrinter F-Serie

All-in-one State-of-the-art Digital Materials Deposition Platform

CeraPrinter F-Serie is All-in-one State-of-the-art Digital Materials Deposition Platform for industrial multi-field applications in Printed Electronics and Smart 3D Printing. In addition to all CeraPrinter advantages, F-Serie is a hybrid platform combining Industrial Inkjet, Aerosol and many other digital materials deposition technologies. Its single user-friendly software opens the way to study hybrid process inaccessible by Inkjet or Aerosol separately. Defined as a modular-based scalable technology able to integrate several post-processes in-line at lowest cost, minimum of footprint, with more capabilities, CeraPrinter F-Serie will enable you to succeed.

Our Offer

The complete CeraPrinter equipment range is highly accurate multi-material deposition systems with in-line multi-curing technologies, in-situ characterization capability embedded simultaneously, enabling high precision deposition of functional materials and full area curing per pass. Evolutionaly at lowest cost and delivered with exclusive software suite developed by CERADROP (CeraSlice, DropAnalyser, FabAnalyser) offering quick start-up, efficiency in use and bottom-up approach for functional components design. To go forward with our customers, we provide strong partnership, highly qualified worldwide maintenance from our support team to deliver assistance through each stage of project development.

WATCH THE VIDEO

ADVANCED SOFTWARE SUITE

CeraSlice

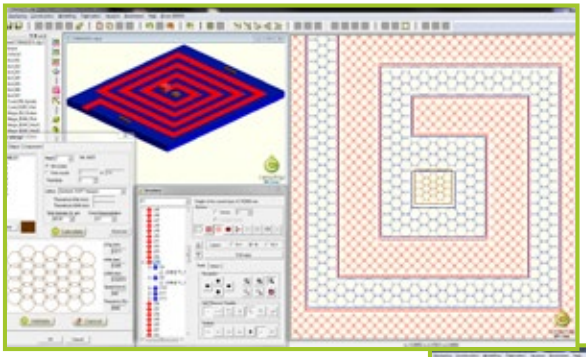
Exclusive CAD/CAM Software

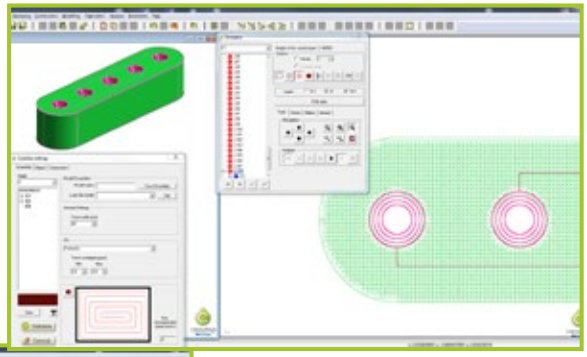
CeraSlice is an exclusive CAD/CAM software for Inkjet & Aerosol printing job generation, provided together with CeraPrinter equipment range. Based on Materials Science strategy, CeraSlice offers a unique bottom-up approach with unlimited possibilities to design, simulate and print complex 2D & 3D multi-material functional devices.

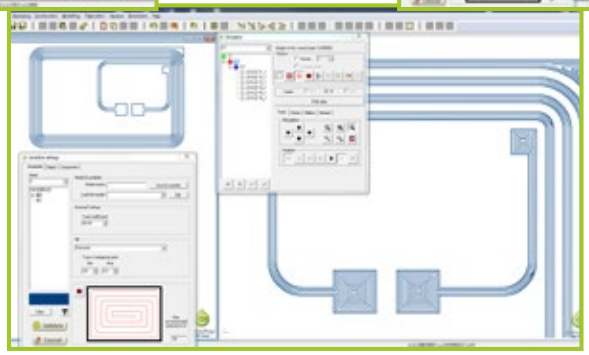
Complex functional multi-material devices
design simulation & printing parameters settings

Advantages

- **Complex Functional Multi-material Components**
  for Inkjet and Aerosol printing job generation
- **Fully Tunable Printing Job Parameters**
  for each part or under part of the components
- **Advanced Simulator Stage**
  ideal for printing strategies validation and high-cost materials saving
- **Easy and Fast Manufacturing Sequence Definition**
  by macro programming







Main Features

Compatible file formats:
- DXF, STEP, Gerber, GDSII,
- BMP (as an option via conversion tool)

Key parameters for pattern filling:
- Droplet diameter, lattice etc.

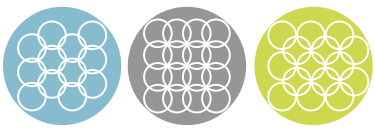
Correction parameters coming from materials science:
- Raster overlapping
- Advanced filling strategy
- Customizable lattice by manual droplet addition or removal

Custom printing job scenario:
- Elements printing order
- Specific actions between printed layers
- Pattern repetitions

Wide range of applications area:
- Multilayer file generation
- Multi-material approach
- 2D & 3D capabilities

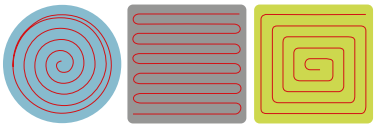
Hybrid manufacturing process management:
- Scenario & pattern filling simulation
- Fully tunable printing strategy
- User parameters library generation

Filling strategy Inkjet



Hexagonal Square Centered Square

Filling strategy Aerosol



Circular Serpentine Perimetric

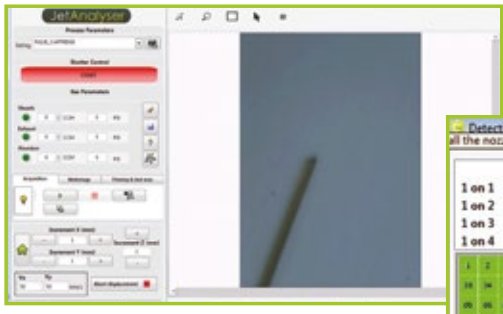
ADVANCED SOFTWARE SUITE

DropAnalyser

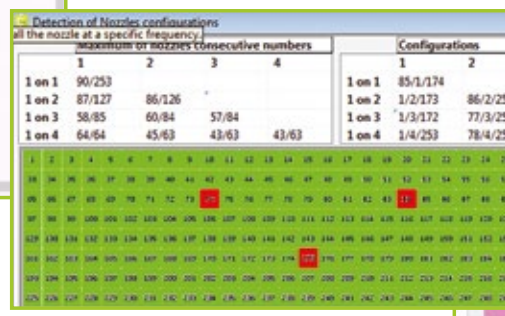
Automated Drop Jetting Analysis Software

- Automated jetting analysis measurements
  (drop volume, velocity, jet straightness)
- Well activated nozzles sorting
- Control of jetting parameters in real time
- Detailed statistics report on whole nozzle plate
- JetAnalyser dedicated to Aerosol

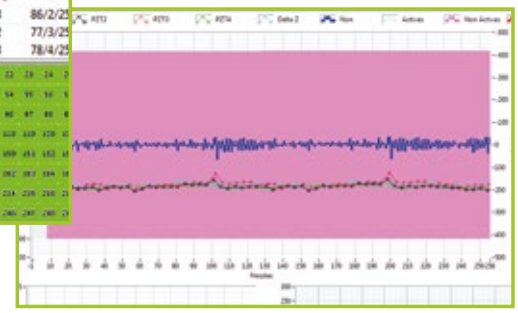
Droplet ejection observation
& drop-in-flight analysis Module



Aerosol Jet® printing on live view



Generic report of active & missing nozzles

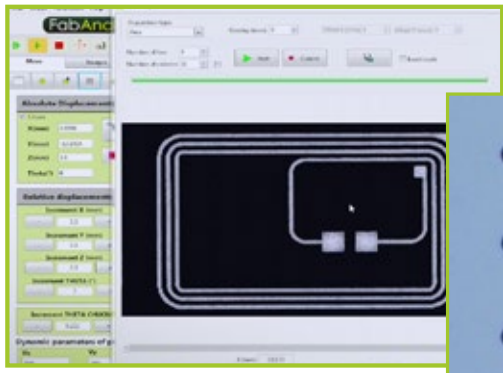


Drop position analysis on the whole nozzleplate
during jetting

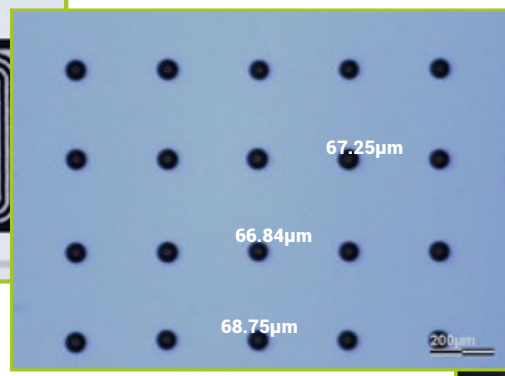
FabAnalyser

Post-printing Characterization Software

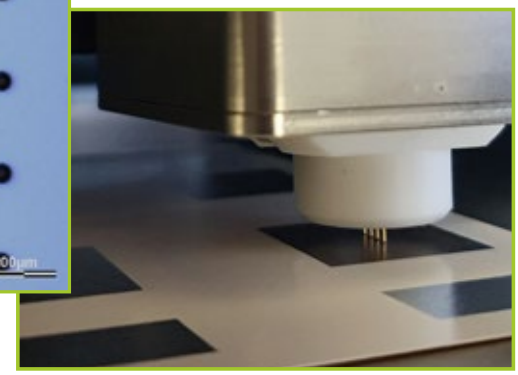
- Full printing area acquisition
  (scanning feature)
- Automated measurements
  (distance, area, angle, diameter etc.)
- Sheet resistance measurement
- Direct location link between CAD file & printed sample
- 3D reconstruction feature



Post-printing inspection



Droplet diameters
on post-printing inspection substrate



4PP sheet resistance measurement

FOR A GREAT DIVERSITY OF APPLICATIONS

Printed Electronics Applications

Manufactured by CeraPrinter F-Serie

SMART IoT

- RFID
- HF Antenna
- Sensors
- Printed memories
- Smart packaging
- Wearable electronics
- E-textiles & smart clothing
- Smart textiles

...

DISPLAYS

- OLED displays
- OLED lighting
- Electrochromic
- Photo detectors
- Flexible touch screen
- In-mold Electronics Electroluminescent

...

ENERGY

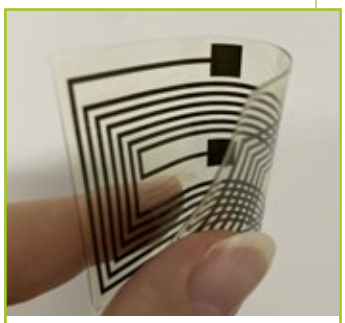
- Organic photovoltaic (OPV)
- Photovoltaic
- Perovskites
- Lithium-ion
- Batteries
- Fuel cells
- Ceramics capacitor
- Thermoelectric
- Supercapacitors

...

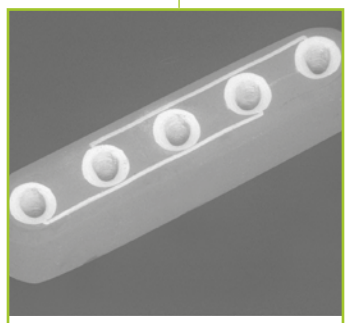
ELECTRONICS

- Interconnection
- Thin film transistors (OTFTs)
- Photodetectors (OPDs)
- Flexible ICs
- Piezoelectric
- Ceramic thick film
- Magnetic

...

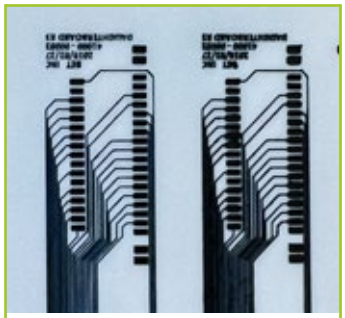


Flexible printed antenna



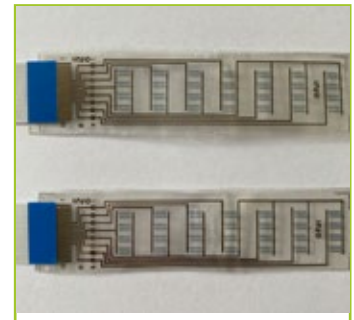
Smart 3D printing of miniaturized components

Smart Packaging

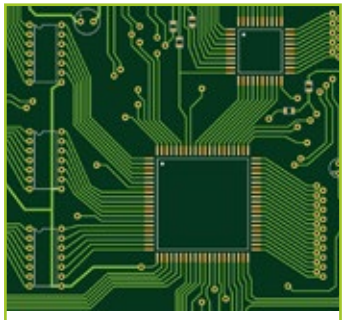


Aerosol printed circuit

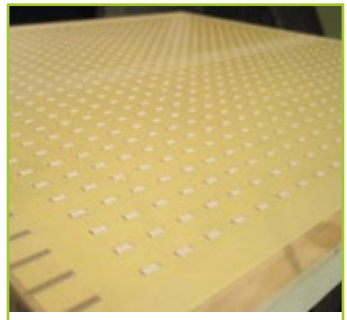
OPV ambient light harvesting for indoor devices



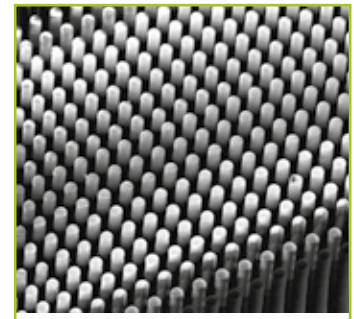
Temperature Sensors



Printed Circuit Board (PCB)



Components batches manufacturing for energy storage



High aspect ratio components shaping

F-SERIE • PRODUCT SPECIFICATIONS

- Substrate up to 305 mm x 305 mm with thickness up to 10 mm (thicker/larger on request)
- High accuracy 5 axis with motorized adjustable printing resolution, substrate alignment (+/-2 µm) & nozzles self calibration (< +/-3 µm)
- Up to 5 printheads (more on request) to deposit wide range of functional inks and high viscous pastes
- Able to print in Raster-Scan Mode (X or Y), Vector Mode (XY) and Single Pass (X or Y)

HARDWARE

MOTION SYSTEM: HIGH ACCURACY CALIBRATED 5 AXIS DEVICE	
3 translation axis and 2 motorized rotations (printheads resolution calibration + substrate alignment)	
X and Y stage accuracy	< +/- 1.5 µm
Z accuracy	< +/- 2 µm (< +/- 2.5µm for special Z axis of 50mm)
X and Y stage repeatability	< +/- 0.5 µm
Z repeatability	< +/- 1 µm (< +/- 1.5µm for special Z axis of 50mm)
Print velocity	up to 500 mm/s

PRINTHEADS HOLDER: MOTORIZED AND PLUG & PLAY	
Embeds easily a wide range of printheads with motorized resolution fine tuning and nozzles position self calibration	
Print resolution	< 5 µm x 5 µm
Printheads number	Up to 4 Inkjet heads and 1 Aerosol head
Printhead types	Single nozzle NEW New generation Samba® Cartridge Dimatix, Konica-Minolta and other on request (Xaar, Kyocera, Ricoh, Toshiba, Seiko...etc.)
NanoJet® Technology	Viscosity : 1-5 cP NEW Working distance : 1-10 mm Resolution : down to 15-20 µm in single pass
Aerosol Jet® Technology (Pneumatic atomizer)	Viscosity : 1-1000 cP Working distance : 1-10 mm Resolution : down to 25-30 µm
Mounting	"Smart door" technology Accurate fast mount for printheads and its electronics
Ink tank	From 2 mL (DMC) to 50 mL Aggressive solvents compatible UV ink compatible
Printhead heating	Up to 60°C
Printhead Maintenance	Automated cleaning station

SUBSTRATE HOLDER: MOTORIZED VACUUM HEATING CHUCK	
Designed to manage a wide range of substrates for many applications	
Substrate size	From 10 mm x 10 mm up to 305 mm x 305 mm Vacuum clamping for different substrate sizes
Heating	Up to 60°C (higher temperature on request)

MECHANICAL	
Machine footprint	1520 mm x 1870 mm x 1970 mm
Machine mean weight	1800 kg
Power	400 V/32A, 3 phases
Certification / Safety	CE (UL & CSA on request)

CAMERA: 3 DEVICES WITH DIFFERENT LIGHT SOURCES	
3 cameras with different light sources to check jetting, to align substrate, to analyze printed components and to follow in-situ Aerosol	
Jetting analysis	
CCD	1624 x 1228 pixels
Visualization area	1.79 x 1.35 mm
Image analysis	Fully automated (DropAnalyser)
Alignment and printed components analysis	
CCD	1624 x 1228 pixels
Visualization area	1.79 x 1.35 mm
Alignment types	Marks, edge or specific if required
Image analysis	Fully automated (FabAnalyser)
In-situ Aerosol process analysis	
CMOS color camera	2592 x 1944 pixels
Visualization area	1.900 x 1.425 mm

UP TO 3 POST-TREATMENT TO DRY & TO CURE PRINTED LAYERS	
Fully integrated and synchronized with the printing jobs	
Post-process compatibility	UV LED, AdphosNIR®, NovaCentrix PulseForge®, Xenon Sinteron, Vacuum Drying
Substrate management	Directly by the linear axis to avoid substrate manipulation
Solvent extraction	Exhaust connection

OPTIONS	
UV, AdphosNIR®	Printhead slot
NovaCentrix PulseForge®, Xenon Sinteron	Laser reflectometer
Vacuum Drying	HEPA filter
Other post-treatment on request	Dedicated software add-on
Specific hardware modification	Automated Handling (on request)
Sheet resistance measurement (4PP)	Special Z-axis of 50 mm NEW

SOFTWARE

CERASLICE: EXCLUSIVE CAD/CAM SOFTWARE	
Bottom-up approach to import, to edit, to simulate and to sequence the printing of a wide range of printed electronics & smart 3D printing designs	
File formats	DXF, STEP, Gerber, GDSII, BMP (as an option via conversion tool)
Job editing	Directly from standard CAD file via CAD/CAM tool
Printing job parameters	Fully tunable for each part or under part of the components
Manufacturing sequence definition	Easy and fast printing job configuration for each step of the printing process (printing vector, nozzle clogging control, Drying/Curing action, printed layer characterization/supervision etc.)
Advanced simulator stage	Raster by raster, layer by layer, material by material
Experimental design	Automated experimental design generation to optimize inkjet process (fully customizable)
Customizable pre-loaded patterns	Square transistors, circular transistors, multilayer capacitors, induction coil, etc.
Hybrid Manufacturing	User friendly Inkjet and Aerosol filling strategy in one interface

DROPANALYSER: AUTOMATED DROP JETTING ANALYSIS SOFTWARE	
Waveform tuning	Real time, fully open, drive per nozzle
Automation	Automatic printheads mapping
Analysis	Volume, velocity, jet straightness error Clogged nozzles detection Nozzles positions calibration Drop to drop variation
Reporting	Detailed statistics report on the whole nozzle plate

FABANALYSER: POST-PRINTING CHARACTERIZATION SOFTWARE	
Layers analysis	Distance, area, angle measurements Automated full printing area acquisition
Substrate alignment	Manual or automatic Can be fully adapted to customer application

CERADROP
MGI Digital Technology
CERADROP
MGIonline
@CERADROP
@MGI_HQ

Ceradrop
A MGI GROUP COMPANY

32, rue de Soyouz
Parc d'Ester Technopole
87068 Limoges, France
+33 555 382 696
contact@ceradrop.fr
www.ceradrop.com