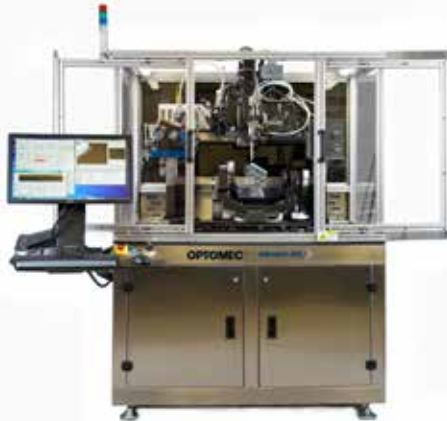




# AEROSOL JET<sup>®</sup> FLEX SYSTEM

## For Conformal Printed Electronics Applications

The Aerosol Jet FLEX System is a modular, conformal printed electronics solution addressing evolving R&D to production requirements.



**Aerosol Jet FLEX System**

Driven by R&D and manufacturing requirements to address evolving product functionality coupled with reduced size, and weight, the system provides maximum scalability starting with planar to multi-axis deposition capabilities, facilitating rapid prototyping through low volume production needs.

The Aerosol Jet FLEX System is a modular, digitally driven print solution equipped with a 350mm X 250mm heated vacuum chuck. It comes standard with closely coupled print modules which include material cassettes and associated print heads. Print cassettes can be loaded with different materials facilitating fast change over from one material to another enabling rapid product R&D and prototyping. The closely coupled print modules provide extended run times of up to four hours without interruption, material dependent. Print modules can be swapped out in a few minutes minimizing down time during long print runs. Optionally, a full 5-axis tilt & rotate trunnion and a wide feature print head can be added to the system.

Aerosol Jet supports a wide variety of functional materials, including conductive inks, dielectrics, polymers, adhesives, etc., which can be deposited onto planar and non-planar substrates.

The System includes a fine feature print head capable of printing features sizes from 10 to 250 microns. Optional products include a wide feature print head capable of expanding print capabilities to millimeters in a single print pass and an interchangeable full 5-axis tilt & rotate motion solution with a print envelop of 200mm x 300mm x 200mm, {x, y, z}.



**Aerosol Jet FLEX System**

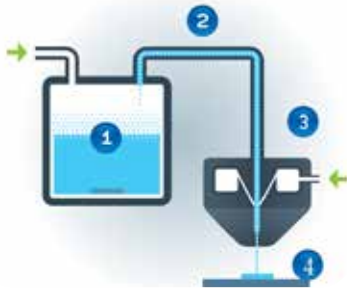
### KEY FEATURES

- ▶ Features sizes ranging from 10 microns to millimeters
- ▶ Dispensing support for a wide variety of inks / materials
- ▶ Repeatable recipe driven dispense
- ▶ Non-planar 3D printing capabilities
- ▶ Optional 4th and 5th-Axis automation capabilities
- ▶ R&D to low-volume flexibility

### APPLICATIONS

- ▶ Process Development
- ▶ Planar and Non-Planar Antenna
- ▶ Complex Molded Interconnect Devices (MIDs)
- ▶ Strain, Temperature, and other Sensors
- ▶ Low Volume Manufacturing

## Aerosol Jet Process



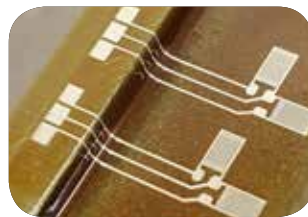
How the Aerosol Jet Process Works:

- 1 An ink, such as a conductor or dielectric, is atomized within the Print Module creating a dense aerosol with a tight distribution of droplet sizing.
- 2 The aerosol is transported to the Print Head using high purity nitrogen as a carrier gas.
- 3 The aerosol is focused within the Print Head by an annular sheath of nitrogen focusing and accelerating the material onto the substrate as it travels through the nozzle.
- 4 The Print Head's in-line shutter facilitates fast feature termination. Interchangeable Print Heads with various nozzle geometries allow for feature size flexibility ranging from 10 microns to millimeters.

## Aerosol Jet Flex System Specifications

	SPECIFICATIONS	AEROSOL JET FLEX SYSTEM
PRINT CAPABILITIES	Minimum Line Width	10µm at 20µm pitch ( Materials and Surface Dependent)
	Layer Thickness	100nm > 6µm (single print pass)
	Ink Viscosity	
	Ultrasonic Atomizer	1 to 15cP
	Pneumatic Atomizer	1 to 500cP
	Material Droplet Size	1 to 5µm Ø
	Nozzle Stand-off Height	Up to 5mm (nozzle tip to substrate surface)
AUTOMATION PLATFORM	Printing Area (mm)	350 x 250 x 200 (x,y,z)
	Positional Accuracy (µm)	±10µm (100mm range)
	Positional Repeatability (µm)	±2µm (x,y,z axis)
	System Approx. Weight (kg)	1088
	System Dimensions (mm)	1020 x 1375 x 2240
	Electrical Requirements	110/220V, 50 or 60Hz, 40 Amps (10 amps continuous oper., typical)
	Gas Input to System	345 to 425 kPa (50-60 psi), >99.9% nitrogen gas, at 20 slpm
OPTIONS	Wide Feature Printhead (mm)	0.635 and 1.0 round, 3.0 x ~0.400 slotted
	UV Cure System	365nm
	IR Laser	830nm, 1W
	Trunnion with Tilt & Rotate Stage	200 x 300 x 200mm (x,y,z) work area w/±90° tilt & 360° rotate

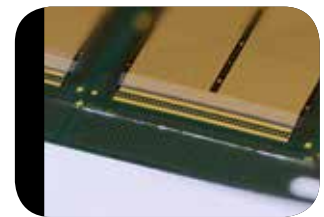
## Aerosol Jet Printing Examples



Strain Sensor Printed on Steel Beam



Fully Printed Phased Array Antenna  
Courtesy: Univ. Massachusetts,  
Lowell



Stacked Die Printed Interconnects

## ABOUT OPTOMECC

Optomec® is a privately-held, rapidly growing supplier of Additive Manufacturing systems. Optomec's patented Aerosol Jet Systems for printed electronics and LENS 3D Printers for metal components are used by industry to reduce product cost and improve performance. Together, these unique printing solutions work with the broadest spectrum of functional materials, ranging from electronic inks to structural metals and even biological matter. Optomec has more than 300 marquee customers around the world, targeting production applications in the Electronics, Energy, Life Sciences and Aerospace industries. For more information about Optomec, visit <http://www.optomec.com>.