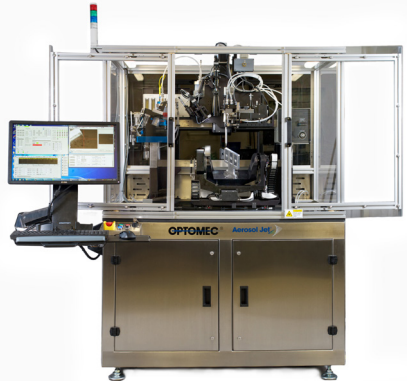
OPTOMEC®
Production Grade 3D Printers... with a Material Difference

AEROSOL JET® 5X SYSTEM

For 3D Printed Electronics Applications

The Aerosol Jet 5X System has been developed specifically for 3D printed electronic applications such as fully printed antennas, sensors, and MID's.



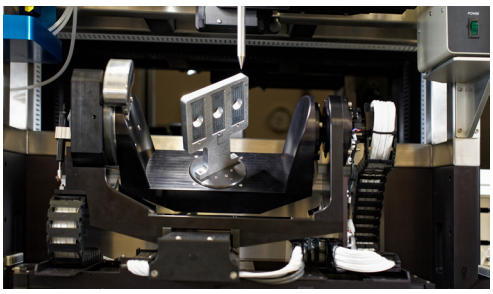
Aerosol Jet 5X System

Driven by manufacturing requirements for flexibility and reduced product cost, the system enables multi-axis deposition capabilities addressing R&D, rapid prototyping and low volume production needs.

Aerosol Jet 5X is a modular digitally driven 3D electronics material print solution supporting 5-axis of coordination motion with a 200mm x 300mm x 200mm (x, y, z) print envelope. Automation platforms configured with multiple closely-coupled print modules are also available to meet high volume production needs.

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 interchangeable fine feature print heads 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 350mm x 250mm heated vacuum chuck.



Aerosol Jet 5X System

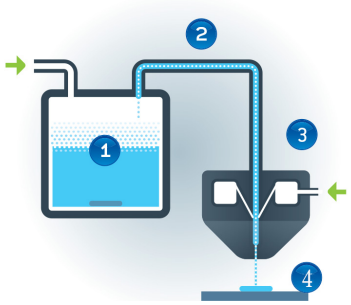
KEY FEATURES

- Features sizes ranging from 10 microns to millimeters
- Dispensing support for wide variety of inks / materials
- Repeatable recipe driven dispense
- 3D Capabilities
- CAD import eases toolpath generation
- R&D to rapid prototyping flexibility

APPLICATIONS

- 3D Antenna for Smartphones and Notepads
- Complex Molded Interconnect Devices (MIDs)
- Embedded Sensors
- Cost Effective 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.

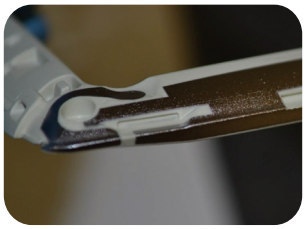
3. The aerosol is focused within the Print Head by an annular sheath of nitrogen focusing and accelerating the material onto the substrate as it travels through the nozzle.

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.

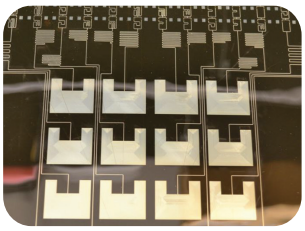
Aerosol Jet 5X System Specifications

	SPECIFICATIONS	AEROSOL JET 5X 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)	200 x 300 x 200 (x,y,z)
	Positional Accuracy (µm)	±10µm (100mm range)
	Positional Repeatability (µm)	±2µm (x,y,z axis)
	Rotational Pivot Axis	
	Rotational Positional Accuracy	80 arc sec
	Rotational Repeatability	03 arc sec
	Pivot Axis Positional Accuracy	80 arc sec
	Pivot Axis Repeatability	03 arc sec
	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
	Heated Vacuum Chuck (mm)	350 x 250

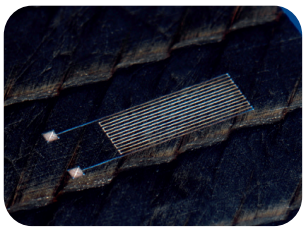
Aerosol Jet Printing Examples



Smart Phone Main Antenna



Phased Array Antenna



Strain gauge on Aluminum Structure
Courtesy: Fraunhofer IFAM

ABOUT OPTOMEC

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.

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