

AEROSOL JET[®] MICRO DISPENSE 300/470 SYSTEMS

For micro-electronic packaging applications

As electronic component functionality increases and overall product package size decrease current dispense solutions are not keeping pace with manufacturing needs. The Aerosol Jet Micro Dispense (MD) Series takes dispense functionality to a whole new level. Aerosol Jet's production proven dispense solution is capable of printing features ranging from 10 microns up to millimeters in size with a single pass.

Two Aerosol Jet models are offered with different work envelopes. The MD 300 model supports a 300 X 300 mm range of motion while the MD 470 model supports 470 X 370 mm range of motion.

A wide variety of dispense applications are supported by the Aerosol Jet MD platform including die/component attach (AgE); underfill and component encapsulation (epoxy); 3D interconnects (Ag) and other related applications areas. With its unique ability to print 10 micron and up feature sizes, Aerosol Jet is capable of addressing dispense needs with package-to-package spacing of <50 microns.

The MD series comes equipped with the latest in machine control software, KEWA workstation control. Standard KEWA features include programmable dispense recipes tailored for specific materials and their application, a vision system for automated pattern recognition with programmable lighting for automated fiducial recognition and unique pattern matching, and a teach and learn module for assisting in dispensing process steps. A robust graphical user interface simplifies work piece setup and provides levels of user to system administrator programmability. Optional, in-situ, IR Laser, UV cure, tilt head, and automated platen rotation solutions are available.

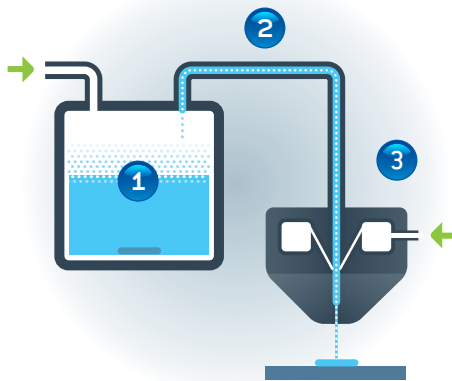


FEATURES

- ▶ Features Sizes Ranging from <10 microns to Millimeters
- ▶ Dispensing Support for Wide Variety of Inks / Materials
- ▶ Repeatable Recipe Driven Dispense
- ▶ Planar and Non-Planar Capabilities
- ▶ Advanced Vision and Lighting Control
- ▶ Low Temperature Processing
- ▶ CAD import Eases Toolpath Generation

RESEARCH AND DEVELOPMENT APPLICATIONS

- ▶ Component / Die Attach
- ▶ Component Underfill and Encapsulation
- ▶ 3D Interconnects for Stacked Die & Other Complex Packaging Applications
- ▶ Embedded Passives on Rigid & Flex Substrates
- ▶ Small Footprint Packaging
- ▶ Repair & Re-Work of Production Defects
- ▶ Cost Effective Low Volume Manufacturing



How the Aerosol Jet process works:

- 1 A liquid sample is atomized, creating a dense aerosol composed of droplets with diameters between approximately 1 and 5 microns.
- 2 The aerosol is transported to the deposition head using an inert carrier gas.
- 3 The aerosol is focused within the deposition head by an annular sheath gas. The resulting high-velocity jet is deposited onto planar and 3D substrates, creating features ranging from 10 microns to millimeters in size.

Motion	
XY per axis accuracy	+/- 6 µm (.0002 in) 3 sigma
XY per axis repeatability	+/- 2 µm (.0001 in)
XY acceleration	1 G peak
XY Velocity	200mm/s peak (7.9in./s)
Z Accuracy	+25 microns (.0001 in)
Vision & Lighting	
Camera Resolution	1288 x 964 pixels
Field of View	7.0 x 5.0 mm (.28 x .20 in)
Lighting	Red, white or blue LED, with dynamic light
Computer Control	
	level control Integrated Intel I7 Quad Processor with Windows 7 OS, Sprint Process Control Module
Software	KEWA Plus for Windows 7
Dual Dispense Solution	1-10cP viscosity
Sprint Ultrasonic Atomizer:	1-1000cP viscosity
Sprint Pneumatic Atomizer	Fine Feature with 5 interchangeable tip
Sprint Printhead:	dispense sizes from 100um to 300um with integrated shutter
Sprint Interchangeable Printhead	Wide Nozzle with 3 interchangeable tip dispense sizes: 0.75mm round; 1.5mm & 3.0mm slotted with integrated shutter
Dispense Area AJMD-300:	300mm x 300mm [11.81 x 11.81 in.]
Dispense Area AJMD-370:	470mm x 370mm [18.50 x 14.57 in.]

Facilities	
AJMD 300/470	1020 x 1375 x 2240 mm
System Footprint:	(40.16 x 54.13 x 88.19 in.)
	Not including Ergo Arm
Weight	795Kg (1753 Lbs.)
Electrical	110/220V, 50 or 60Hz, 30 Amps
Nitrogen in Supply	28 LPM (1CFM) @ 80 psi (80 psi =
Coolant	552 kPa, 5.5 atm)
	For Sprint Ultrasonic Atomizer operation
	Temp Range: 10C – 40C;
	Heating/Cooling Capacity: 240 W at set point;
	Pump Flow: 15LPM; ¼ inch tube connection
	In-House H2O supply not recommended
Ventilation	
	Negative pressure, downdraft
Standards Compliant	
	CE Compliant
Other Standard Features	
	Recipe driven dispense control
	Dynamic FID auto focus
	Temperature controlled work surface with vacuum hold down
	Flexible work surface fixturing
	Precision pressure regulators
	CAD Toolpath Import
Optional Products	
	700mW, 830nm IR Laser with laser safe hood
	Panasonic UJ35 UV Cure Subsystem
	Manual tilt- up to 45 degrees
	Auto-platen rotation - up to 180 degrees

Aerosol Jet Printing Examples



Conductive Epoxy Component Attach



Conductive Epoxy, 50µm spot size



Ag 3D stacked-die interconnects

ABOUT OPTOMECH

Optomec® is the world leading provider of additive manufacturing systems for high-performance applications in the Electronics, Biomedical, Photovoltaic, and Aerospace & Defense markets. These systems utilize Optomec's patented Aerosol Jet technology for printed electronics and LENS technology for 3D printed metals.



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