

西湖未来智造
enovate3D

ULTRA-HIGH PRECISION VIA FILLING 3D PRINTER



EP400-FH / EP600-FH



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ULTRA-HIGH PRECISION VIA FILLING 3D PRINTER

Replaces Conventional Electroplating

Simplifies Manufacturing processes

Accelerates Product Iteration



enovate3D's precision via-filling equipment utilizing micro-nano direct-write printing technology, combined with self-developed configurable multinozzle printhead modules, enables metallization of TSV/TGV/TMV interconnects. Users can perform via-filling operations based on CAD specifications. This technology replaces conventional electroplating processes, simplifies manufacturing steps, accelerates product iteration, and is ideal for multi-variety, small-batch production scenarios. The conductive paste materials filled into interconnects include micro/nano silver paste, copper paste, and other metallic conductive materials.

KEY FEATURES

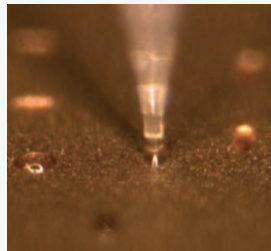
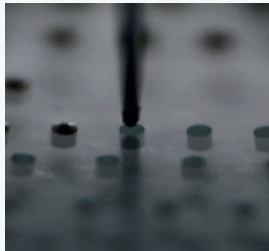
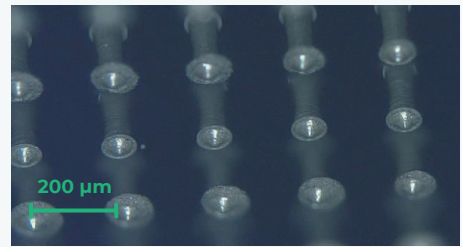
- Eliminate the need for pre-deposited seed layers
- Environmentally friendly process (replacing electroplating)
- Software interface compatible with DXF and CAD file import or parametric programming
- Sintering temperatures as low as 200°C, compatible with PCB, silicon, glass substrates, and other conductive interconnection scenarios
- Self-developed micro-needles enable blind via and through-hole filling
- Proprietary high-solid-content conductive paste achieves tight adhesion to via walls with high packing density
- Supports up to 12-inch processing area

SPECIFICATIONS

Motion System	
Equipment Frame	Granite Motion Stage
Travel Range	400(X) × 400(Y) mm (for 8" wafer); 600(X) × 600(Y) mm (for 12" wafer)
Accuracy	X/Y: ±1 μm ; Z: ±5 μm
Max Motion Speed	X/Y: 500 mm/s; Z: 100 mm/s
Max Acceleration	X/Y: 1 g ; Z:0.2 g
Printing System	
Printing Valve	Specialized printing valve for high-viscosity materials
Ink Volume	3 cc~30 cc syringe barrels
Glass Nozzles	Ceramic nozzles; Inner diameter: 20 μm-70 μm; outer diameter: 30 μm-90 μm
Handling System	
Substrate Dimensions	8 inch or 12 inch
Carrier Materials	Aluminum vacuum chuck
Handling Methods	Manual loading/unloading, vacuum chuck; optional auto-loading
Auxiliary System	
Vision System	5-megapixel vision camera; visual alignment accuracy: ±5 μm
Laser Rangefinder Sensor	Laser coaxial displacement sensor that supports dynamic height tracking of the print nozzles and substrate
Printhead Cleaning Unit	Automated roller brush cleaning or dust-free wiping for the print nozzles
Purification	Equipped with an FFU
Process Capacity	
Via filling diameter	Via diameter: 50 μm smallest; aspect ratio ≥5:1
Operational Efficiency	>2700 vias/hrs (ex. 100 μm via diameter, 250 μm via thickness)
Installation	
Equipment Dimensions	W1650 × D1000 × H2200 mm (for 8 inch);W2200 × D1400 × H2200 mm (for 12 inch)
Equipment Weight	1300 kg (approx.)
Electrical Requirements	220 VAC/ 50 Hz, 4 kW
Air Supply Pressure	≥0.6 MPa(CDA)
Operating Environment	Temperature: 22±2 °C;Humidity: ≤65%

APPLICATIONS

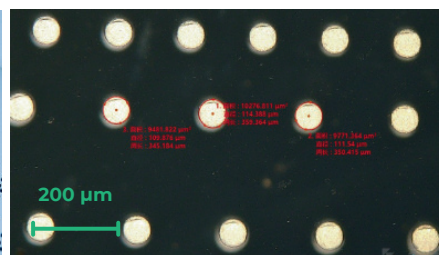
TSV (Through-Silicon Via), TGV (Through-Glass Via), and TMV (Through-Molding Via) vertical interconnect metallization adopts a metal paste filling scheme to replace traditional electroplating processes. This approach is suitable for small-batch via filling, eliminating the need for pre-deposited seed layers. The conductive filling material demonstrates stable adhesion to via walls and passes reliability testing.



SOLUTIONS

The filling material is conductive metal paste or resin ink, utilizing pneumatic extrusion-based printing. The printhead is inserted into the via interior to extrude material, and gradually raised to achieve complete via filling.

EXAMPLES



High packing density, through glass via filling

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