

OLED Laser Ablation Tools

The Resonetics OLED Laser Ablation Series is a family of laser systems designed to meet advanced research, development, prototype, pilot production and manufacturing of Organic LEDs (OLED), Polymer LEDs (PLED) and flexible display devices. The OLED Laser Ablation system selectively patterns polymer & thin film metal films on ITO/Glass and silicon substrates. The laser system exposes contact pads, wire bond pads as well as isolates and singulates individual display devices.



The OLED Laser Ablation Series is developed to:

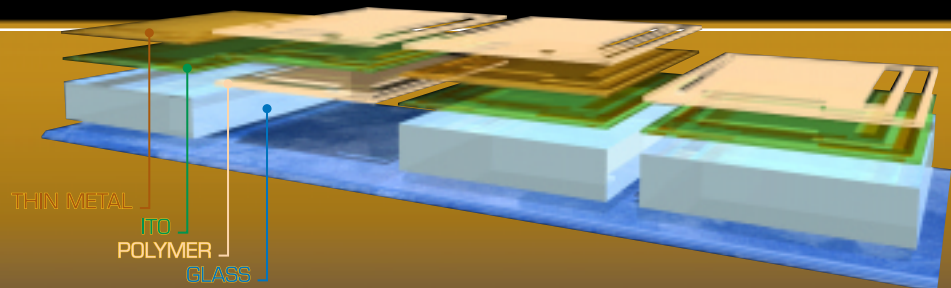
- Maximize display life span
- Show a pathway to high volume automation
- Provide design versatility.

Key System Features

- Proprietary debris nozzle designed to keep the active display area debris free
- Nitrogen process enclosure to prevent oxygen or water vapor from contaminating the display devices
- Robot effector interface to production equipment, such as polymer spinners and evaporators
- *Single Stop Solution* to handle from advanced research & development to high volume production
- Metrology, machine vision and auto-alignment options to maximize throughput

Laser Ablation Process

The ultra-violet laser beam etches away the overlying polymer or thin film metal from the substrate without damage. This is accomplished by a phenomena called "ablation" where the laser beam breaks the material's molecular bonds, resulting in the high velocity ejection of the "vaporized" materials into the collection path of the debris nozzle. This material removing process is done in a closed-cycle nitrogen environment to maximize the device lifespan.



TECHNOLOGY & EXPERIENCE

PROCESS & AUTOMATION



Research Tool



Pilot Production



OLED Production



Debris Nozzle



Nitrogen Enclosure



Robot Effector Interface



Camera Vision



Optical Beam Delivery
Beam Homogenization



Machine Vision Software

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OLED Laser Ablation System Features

Resonetics is the largest independent laser micromachining company in the United States with over thirty excimer laser systems in its facility for process and production development. The company has an extensive Custom Laser Systems Group whose mandate is to design, develop and manufacture both prototype and production laser system systems, incorporating a wide palette of engineering, process and production automation experience. Coupled with the company's extensive Application Laboratories and facilities, Resonetics is an ideal partner for introducing laser tools for the development and manufacturing of consumer products, microelectronics, semiconductor or telecommunications, to name just a few.

◆ Laser

Wavelength: 248nm
Average Power: 3W to 100W
Repetition Rate: 50 hz to 300 hz

◆ Substrate Size

100mm x 100mm
150mm x 150mm
200mm x 200mm
300mm x 300mm
400mm x 400mm

◆ Optical Beam Delivery

Method: Mask Projection, high speed scan, step and repeat
Target Beam Size: Variable
Energy Distribution on target: +/- 5%
Mask Changer: Programmable, automatic
Optical Design: Proprietary beam homogenizer
Laser Energy: Programmable external attenuator

◆ Process Enclosure

Clean Room Compatible: Yes
Compact Configuration: Beam Bend option
Process Environment: Nitrogen, vapor-free
Debris Nozzle: High vacuum extraction with proprietary air flow design
Moisture Sensor: Optional
Heater Control Unit: Optional
Enclosure Window: Nitrogen purged

◆ Part Handling

X-Y Table Travel:
100mm x 100mm
200mm x 200mm
300mm x 300mm
600mm x 600mm
600mm x 1000mm
Rotary stage: Yes
Manual load/unload: Glovebox
Automated Line Integration: Robot effector interface to equipment such as polymer spinner and evaporator.
Gate valve design: Optional
Tunnel Interlink: Optional

◆ Vision System

Machine Vision: Four point auto-alignment with fiducial pattern recognition
Off-axis camera: Substrate alignment

◆ Diagnostics and Control Software

System Controller: Multi-level access (operator, service, engineering) PC-based
Automatic Laser Energy Control: Yes
Nitrogen Flow Monitor: Yes
Humidity Monitor: Yes
Temperature Monitor: Yes
Substrate Thickness Monitor: Optional
Beam Profiler at the Mask Plane: Optional
Target Energy Monitor at the Substrate: Optional

OLED LASER ABLATION FAMILY



Experience. Technology. Process. Automation. Global Support.
From the largest laser micromachining company in the United States.

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