M-SOLV Limited

MSV 300

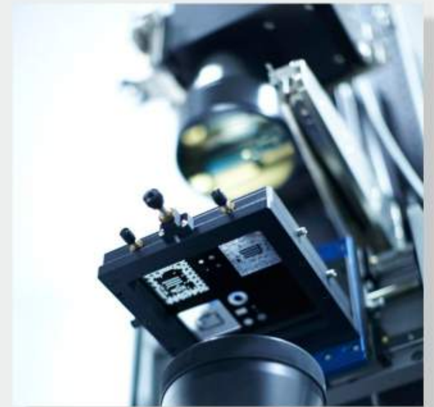
Advanced IC Package Manufacturing tool

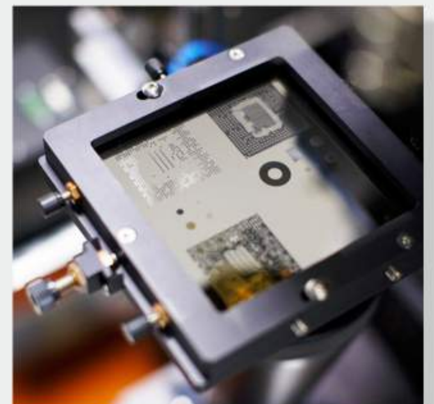
Overview

The MSV-300 is a high volume manufacturing machine specifically designed for high resolution LDA (Laser Direct Ablation) of organic substrates. The ablated structures enable embedded circuitry, required for next generation IC substrates and interposers. The technology allows direct ablative removal of organic materials down to a resolution of a few microns, utilising M-Solv's proprietary 'Scanned Mask Imaging' (SMI) technology. The ablated 3D structures can be subsequently filled with a conducting material to create embedded circuitry.

Built upon an ultra-stable, vibration isolated granite structure, the multi-mode solid state laser beams are scanned at high speed to illuminate a photo-mask, which is subsequently imaged and de-magnified onto the surface of the substrate.

The MSV-300 is capable of processing on 20" x 24" substrates at an average process rate of >7k die/hr. High accuracy, high speed X-Y translation stages and mask positioners allow for accurate registration of image to substrate. This fully industrial and automated tool can include auto-loading from cassette by robot, and is controlled proprietary software. Using solid state lasers and multiple process heads, the MSV-300 ensures high throughput at a low cost of ownership.





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Technology

APPLICATIONS

- Organic IC Substrates
- Wafer Level Packaging
- Organic Interposers
- Micro-machining

PROCESS

- Novel UV solid state laser process.
- Direct ablation of organic substrate materials.
- Direct patterning of thin films on flat substrates.
- Direct imaging / sintering of specialist functional materials.
- Scanned Mask Imaging (SMI)
- Step & repeat
- Scan methods: raster, point & shoot, custom path
- Thru' mask via imaging (photo-mask free via processing)

CAPABILITIES/FEATURES

- High resolution imaging optics (<3µm L:S).
- No constraints on pattern complexity.
- Efficient debris extraction.
- Auto-alignment <5µm, Autofocus.
- Automatic loading (optional)
- Fully flexible process optimisation.
- Accurate depth control / selective material removal.

LASER/OPTICS

- Wavelength: 355nm
- Image field*: 20x20mm
- Resolution*: <3µm
- Photo-mask: up to 7x7”
- Beam shaping optics

CONTROL

- Fast, high accuracy CNC X-Y translation stages
- Mask positioner
- Fast galvo-scanner
- Dynamic autofocus
- Dynamic process control
- Efficient debris extraction
- M-Solv process software
- Auto-loading (optional)
- Auto-alignment (<5µm), fiducial skiving

STAGES

Stages: *X-Y Axis (CNC)

- Drive: Precision linear rails + linear motor + linear encoder
- Travel: 650mm x 650mm
- Speed: 1000mm/s
- Repeatability: ±2µm
- Accuracy: ±2µm
- Resolution: 1.0µm

Stages: *Z Axis (CNC) Focus control

- Drive: Precision linear rails + ball screw + encoder + braked servo motor
- Travel: 50mm
- Repeatability: ±2µm
- Accuracy: ±2µm
- Resolution: 2µm

* Standard specification. Alternative specifications and additional axis available to suit customer requirements upon request.

MACHINE ARCHITECTURE

- Multiple process heads (operate in parallel)
- Ultra stable granite sub base
- Vibration isolated machine core
- Class 1 laser safe, interlocked enclosure
- Touch panel user interface
- Enclosed electronics
- Dimensions: 2.5m(H) x 4.0m(W) x 2.3m(D)
- Weight: 5000kg

In addition to the standard configuration, many options are available , please contact us to find out more.

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