



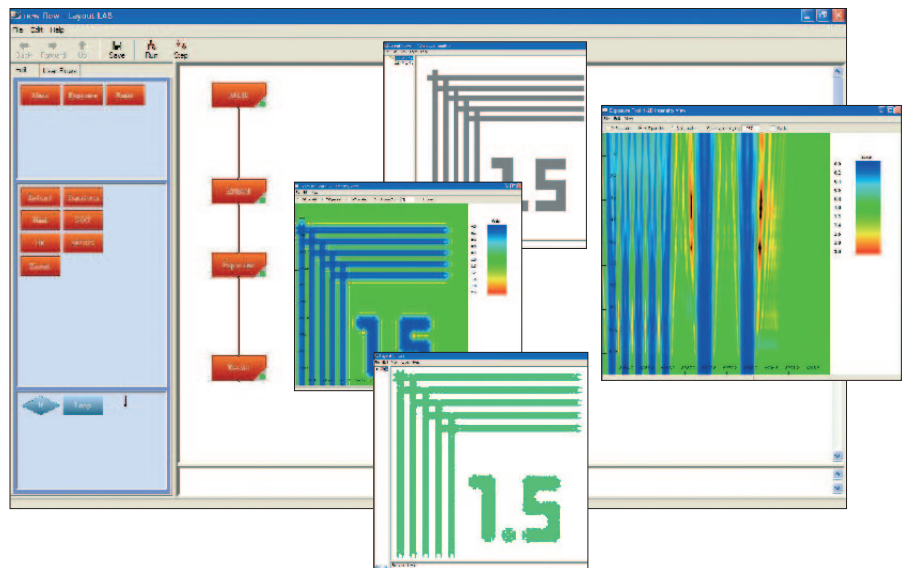
Layout LAB

Simulation Platform for advanced Mask Aligner Lithography processes

Mask Aligner Lithography (proximity printing) is widely used for producing MEMS, optical and electronic devices because of its cost efficiency and capability structure thick resists. The increase of complexity and miniaturization is pushing equipment and processes to the physical limits. Simulation provides a powerful tool for development and optimization of micro-structuring on the computer for saving development time, cost and optimizing yield.

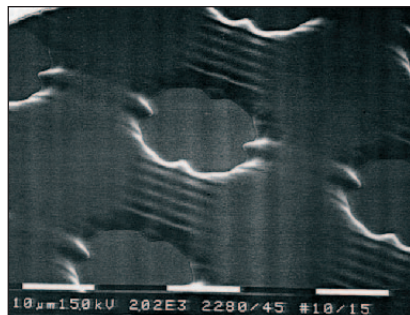
The Layout LAB is a "VIRTUAL PLATFORM" for optimization of micro-patterning processes.

The Layout LAB provides an easy to use software platform for the modelling of typical MEMS manufacturing processes. It includes precise simulation of the lithography process with mask-aligner and resist process to model the result on the substrate. The Layout LAB shortens development cycles and saves cost by verification and optimization of the final printed results without producing masks and running experiments in a real process line.

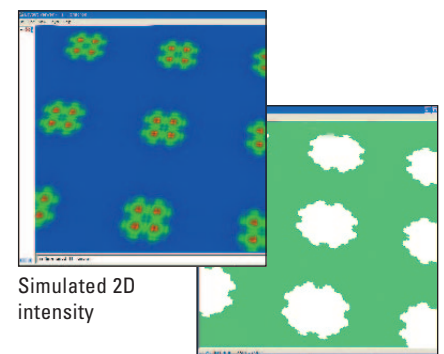


STRONG FEATURES

- ▶ VisualFLOW™ platform for "click-and-go" handling of custom process flows
- ▶ Accurate simulation kernel for mask-aligner lithography and resist process
- ▶ Fast 3-D visualization, verification and optimization functions



Experimental results



Simulated 2D intensity

Simulated resist contour

Dedicated Service

GenISys offers fast and flexible support for integration, customization and development of needed functions.

Mask-aligner exposure of 15 µm rectangle with 100 µm proximity gap

Layout LAB

The “virtual LAB” for lithography processes with mask aligner

Layout LAB is a simulation platform for micro-patterning processes using mask aligner lithography. It enables the flexible design and modeling of processes with mask layout, exposure tool, process parameters, accurate 3-D aerial image and resist contour calculation. Powerful 3-D visualization enables verification and optimization of the printed result on the wafer. The unique database driven, modular, process flow oriented concept combines performance, flexibility and user-friendliness.

GUI Concept

- ▶ VisualFLOW™ GUI for flexible and easy (drag&drop) design of complex hierarchical process flows with optimization possibility by loops and “if-then”
- ▶ Database driven concept with predefined functional modules and possibility to save custom process flows as user defined modules
- ▶ Step by step, interactive execution of process steps with inspection of simulation results and layout
- ▶ Automated batch execution of process flows
- ▶ Fast viewer for mask layout, 3-D Aerial Image (Intensity), Resist Image results; zoom-in/out, measure function

Data Interface and Layout Operation

- ▶ Input of mask layout in major formats (GDSII, DXF, CIF, CTXT/TextLib)
- ▶ Export of layout in GDSII, CIF, CTXT/TextLib
- ▶ Export of simulation results in jpg, gif, bmp, pcx, tif
- ▶ Extraction of layers, datatypes, cells, and regions
- ▶ Layout Operation Bias, Heal, Tone Reversal, Minus, Or

Mask Aligner Exposure Modeling

- ▶ High accuracy calculation of 3-D aerial image (intensity) based on fresnel theory
- ▶ Large simulation area (e.g. 200µm * 200 µm at 0.1 µm grid resolution)
- ▶ Flexible modeling of source (spectrum, shape/coherence, tilt, phase)
- ▶ Free variation of proximity gap and intensity

Resist Modeling

- ▶ Variable threshold, DAIM (Diffused Aerial Image) model for 3-D resist image
- ▶ Boolean operation of x-y resist contour with layout
- ▶ x-z and y-z cross section views

Platform Support and System Requirements

- ▶ PC/Windows 2000
- ▶ PC/Windows XP
- ▶ PC/LINUX (Kernel 2.6 and higher)
- ▶ 1 GB RAM recommended (256 MB minimum)

