The Oriel Mask Aligner is a low-resolution mask alignment system. It can handle masks and substrates as large as 6” X 6”. The system is used primarily for copying masks or for single exposures where little or no alignment is required.
Operating Instructions

Process Flow

Overview:

1. Turn UV Lamp power supply ON. The lamp Allow at least on-half hour for lamp to stabilize before proceeding with an exposure. Do not adjust the output power. It is pre-set for optimum lamp performance and lifetime. Press the ignition button and hold it in momentarily. On release, the lamp should start. If not, try one more time. If the lamp still doesn’t ignite, contact FabLab staff for assistance.

2. Main Vacuum Switch OFF

3. Open Mask door

4. Load Substrate

5. Load Mask

6. Close Mask Door

7. Align Substrate to Mask

8. Main Vacuum Switch to ON

9. Slide fixture under UV light

10. Expose

11. Remove fixture from under UV light Source

12. Main Vacuum Switch to OFF

13. Open Mask Door

14. Remove exposed substrate and mask.

15. Shut off lamp power.

To Load Substrate and Mask

1. Open door

2. Place substrate against three pins

3. Close door. This turns the substrate vacuum on and holds substrate securely in place

4. Load Mask

5. Set the separation between the mask and substrate to 1-2 mils (25 -50 ums).

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6. Elevate the substrate by turning the thumbwheel to the right until soft contact with the mask is made. Soft contact is indicated when the mask door just begins to lift.

7. Rotate the thumbwheel to the left to separate the mask from the substrate by the desired spacing for exposure. Each line on the thumbwheel corresponds to 1 um of spacing. For best results, minimize the mask-substrate spacing. **Make sure that the mask and substrate are not in contact and that the substrate moves freely during alignment.**

Alignment Procedure

1. Use the micrometers to move the substrate relative to the mask until the alignment marks overlap completely

2. Turn the main vacuum ON. Check that the substrate and mask are still aligned. If there has been a shift during evacuation, shut the vacuum off. Any small shift may be compensated for by aligning the substrate an equal distance in the opposite direction. Turn the Vacuum ON and re-check the alignment. Repeat this step as often as necessary to get good alignment.

Exposure Details

1. Do not change power output. The power should never be run below 75% of its max power for best lamp operation

2. It is energy rather than power which determines how much photochemical change takes place. The exposure (dose) is measured in energy density with units of millijoules per square centimeter (mj/cm²).

   
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   \text{Energy density} = \text{power density} \times \text{exposure time in seconds}
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   \text{Mj/cm}^2 = \text{mW/cm}^2 \times \text{Sec}
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3. Total does is controlled by opening and closing a shutter between the lamp and the mask. The Model 84350 Electronic Exposure Control Timer has two modes of operation:

   a. Opens the shutter for the selected time when activated by the front panel switch. Exposure time is selected from 0 to 999.9 seconds in steps of 0.1 sec. This is the preferred mode of operation.

   b. Opens the shutter from a front panel switch and leaves it open until closed by resetting the front panel switch.