

Suss Aligner SOP



1. Scope

1.1 This document provides the procedure for operating the Suss Aligner.

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3. Reference Documents

3.1 Referenced within this Document

3.1.1 None

3.2 External Documents

3.2.1 None

4. Equipment and/or Materials

- 4.1 Suss Aligner
- 4.2 Mask
- 4.3 Wafer/Sample

5. Safety

5.1 Follow all Nanofab safety procedures.

6. Setup Procedures

6.1 Turn on UV Lamp Supply

6.1.1 Press Start. See *Figure 1, UV Power Supply*.

NOTE: Display flashes “cold” until the lamp is warmed-up and ready

6.1.2 Make sure LED is on C11 (Constant Intensity is set to 10mW/cm²)

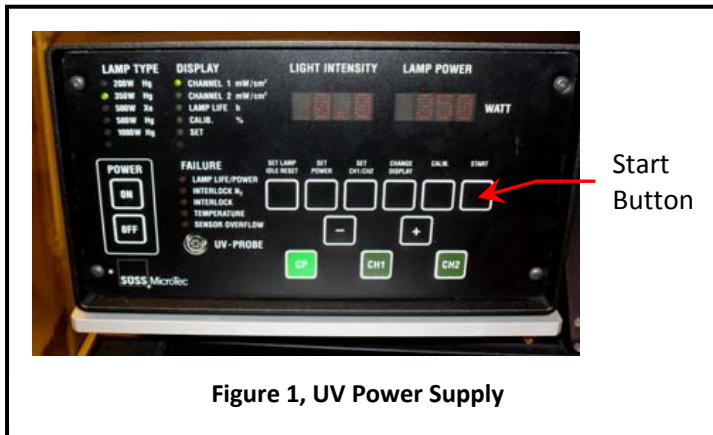


Figure 1, UV Power Supply

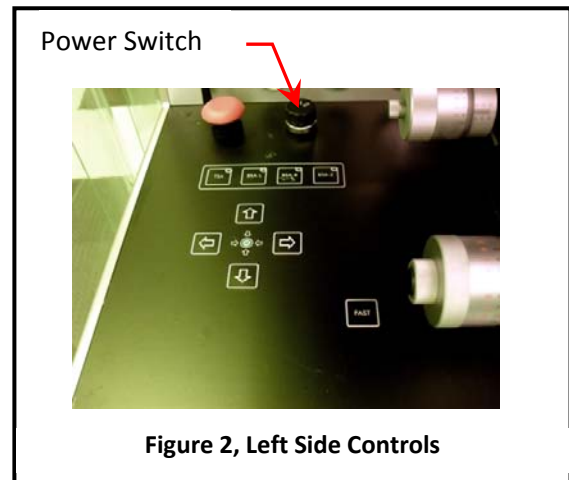


Figure 2, Left Side Controls

6.2 Turn on Machine

6.2.1 Turn on black knob with 0/1 written on it, on left side of machine. See *Figure 2, Left Side Controls*.

6.3 Insert Mask

- 6.3.1 Lift up mask holder.
- 6.3.2 Insert mask into mask holder (mask goes between pins, chrome side up).
- 6.3.3 Put mask holder down and push gently to snap into place.
- 6.3.4 Wait for system to boot up.
- 6.3.5 Turn on Mask Vacuum (knob on left-hand side).
- 6.3.6 Press enter for regular alignment.

6.4 Set Exposure and Gap

- 6.4.1 Press edit twice. See *Figure 3, Right Side Controls*.
 - 6.4.1.1 Arrow to Exp-Type
 - 6.4.1.2 Press edit and use arrows to set desired type.
 - 6.4.1.2.1 Soft for features greater than 5 microns
 - 6.4.1.2.2 Hard for features less than 5 microns
 - 6.4.1.2.3 Vacuum for features less than 2 microns (wafers only)
 - 6.4.1.2.4 Prox-1 and Prox-2 for features greater than 15 microns
 - 6.4.1.3 Press enter. See *Figure 3*.
 - 6.4.1.4 Arrow to Algn-Sep for the gap setting
 - 6.4.1.5 Press edit, arrow to desired value, then press enter
 - 6.4.1.6 Arrow to On Time

6.4.1.6.1 Press edit

6.4.1.6.2 Use arrows to adjust time, then press enter

6.4.2 Press enter again to return to main menu

6.4.3 Select Save and press enter

NOTE: Your program should appear on screen

7. Alignment Procedure

7.1 Load Wafer

7.1.1 Pull slider out (when it is all the way out, the vacuum is off)

7.1.2 Insert wafer

7.1.3 Make sure the cross hairs are lined-up on the front of the machine (glass slides protruding from the front center of the machine, just below the slider).

7.1.4 Rotate knobs to align

7.1.5 Push slider in

7.1.6 Press 'Load Mask' (light should go off). See *Figure 3*.

7.1.7 Press 'First Exp' (so that the light goes off). See *Figure 3*.

7.1.8 Press 'Align Check' (so that the light goes on). See *Figure 3*.

7.1.9 Press 'Start' (microscope moves over). See *Figure 3*.

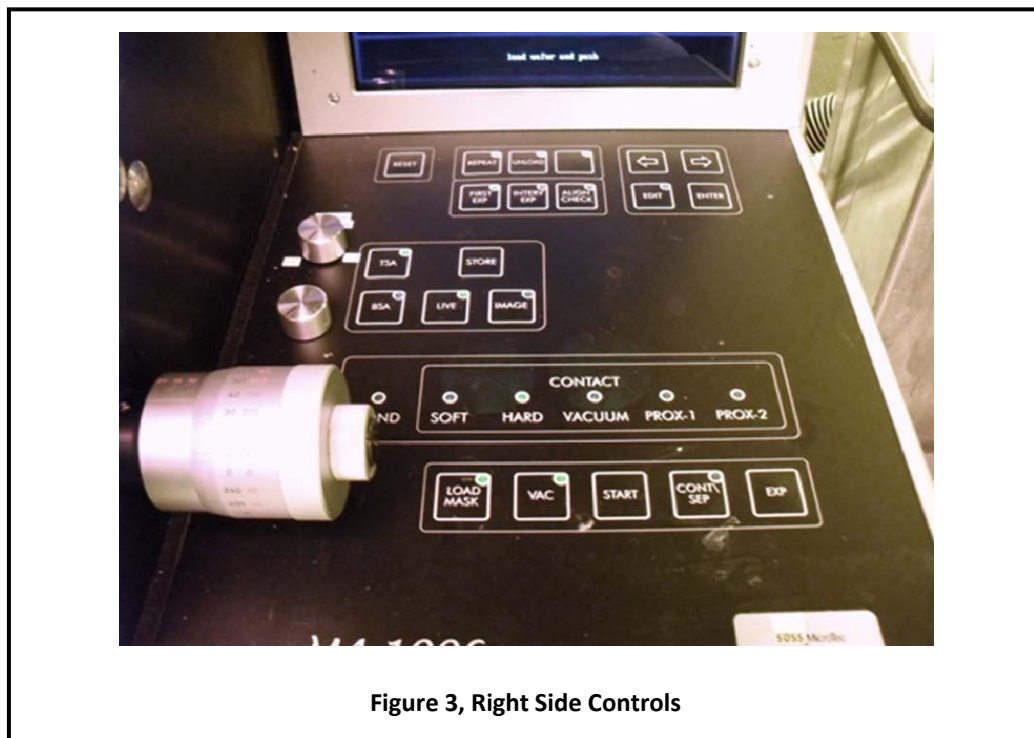


Figure 3, Right Side Controls

7.2 Align Wafer

7.2.1 To align microscope to the mask:

- 7.2.1.1 Align Check can be on or off, Live must be on, TSA on left side must be on
- 7.2.1.2 Use arrow buttons on the left side to move the objectives
- 7.2.1.3 The outside knobs on the microscope are for distance alignment
- 7.2.1.4 The small inner knobs on the microscope move the objectives up/down independently
- 7.2.1.5 The knob coming out at an angle from the microscope is for rotation (theta)

7.2.2 To align wafer to the mask:

7.2.2.1 Use the large knobs on the middle of the machine. Rotate knobs to align. (right y , left x , back left= θ)

7.2.2.2 Course Focus is the back vertical knob on top. RESET is used for ESC.

7.2.3 Press 'Cont/Sep' (light should go off)

7.3 Expose

7.3.1 Press 'Exp' twice (microscope moves off and exposure lamp moves over). See *Figure 3*.

7.3.2 Slider pops out

NOTE: If vacuum is too low, an error can appear at the end of the exposure, reading briefly "no vacuum, pull slider", followed by "z-axis error". Pressing 'RESET' will allow for unloading the wafer.

8. Shutdown Procedure

- 8.1 Remove wafer and push slider in.
- 8.2 Turn off Mask Vacuum.
- 8.3 Press Load Mask (light goes on)
- 8.4 Unload Mask
- 8.5 Turn off machine
- 8.6 Leave UV light on.

9. Process Notes

9.1 Test Run Results

Table 1, Test Results				
Type of Contact	Exp. Time (s)	Aln-Sep (microns)	Development Time (s)	Results
Soft	5	15	45	poor; width of border of micro '5' feature= 9.10 microns
Soft	7	15	45	poor
Hard	6	15	45	good
Hard	5	15	45	good; width of border= 2.35 microns
Hard	4	15	45	good; width of border= 2.82 microns
Vacuum	5	15	45	worse than Hard, better than Soft; width of border= 5.49 microns
Vacuum	5	15	60	better than the previous vacuum test-run; width of border= 2.98 microns

10. Revision History

Rev	Date	Originator	Description of Changes
1	12 Jan 2010	Sam Bell	