

BOTTOM SIDE ALIGNMENT SOP SUSS MASK ALIGNER MA6/MA6

Revised April 2020

PURPOSE: The wafer is aligned to the mask using the bottom side alignment microscope (BSA).

1. Load mask. Please refer to Step 1-3 in the previous SOP for loading a mask.
2. Activate **BSA MICROSCOPE** key that is circled in the Figure 1 (LED on).



Figure 1

3. Press **SELECT PROGRAM** key. Toggle through the menu up to choose exposure type and confirm by pressing **SELECT PROGRAM** key again. **“VAC”** is recommended by the user manual.



Figure 2

4. Edit parameter to adjust exposure time. Please refer to steps in the **Standard Lithography SOP**.
5. Load wafer chuck for BSA. Move the BSA-chuck placed onto the transport slide into the machine. **DO NOT PRESS ANY KEY AT THIS STEP.**
6. Make sure the BSA MICROSCOPE key is on. Turn the **SPLITFIELD** switch to the middle position. Turn **MAGNIFICATION BSA** to low.



Figure 3

- Turn the **ILLUMINATION** switch to **BSA/IR** and adjust the light intensity by the potentiometers labeled BSA/IR microscope illumination left/right so that two images from left and right bottom microscope display.

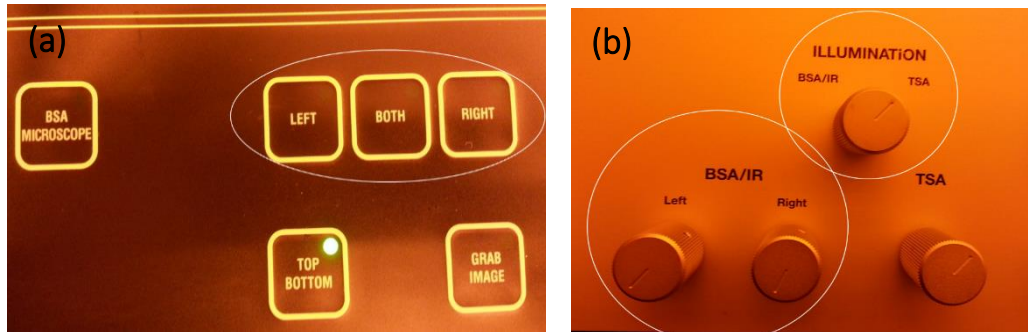


Figure 4

- Turn the **SPLITFIELD** switch to the right position (Either way to start with is fine.). The field of view from the right bottom camera becomes full screen on the monitor.
- Make sure the **TOP/BOTTOM** key LED is on and adjust the fine focus with **TOP SUBSTRATE RIGHT** regulators.

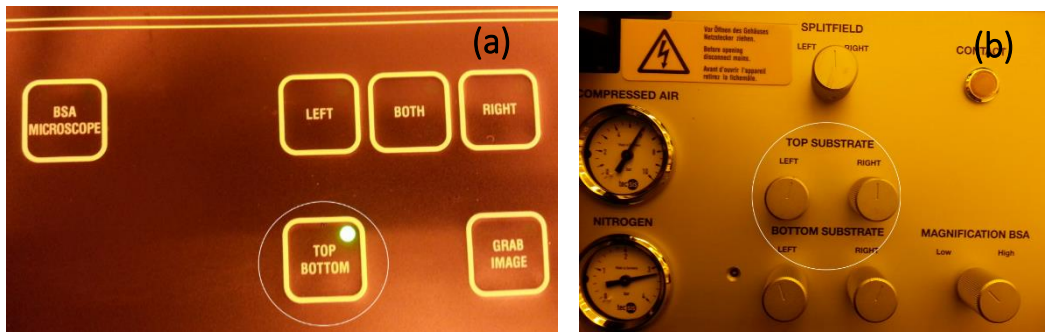


Figure 5

- Move the chuck by using the micrometer screws of the alignment stage for **STG-X-Y-Θ-MOVEMENT**, if necessary so that alignment marks on the mask are in the chuck opening.



Figure 6

If the knob for the x direction is set as **10-0** and the one for the y direction is set at **5.5**. Only minor adjustment is needed to make alignment marks in the chuck opening.

11. Toggle **RIGHT** so that only right bottom camera is movable.
12. Move right bottom camera to find the alignment mark by pressing arrows.

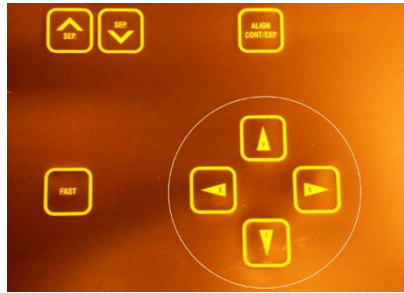


Figure 7

13. Turn the **SPLITFIELD** switch to the left position. The field of view from the left bottom camera becomes full screen on the monitor.
14. Make sure the **TOP/BOTTOM** key LED is on and adjust the fine focus with **TOP SUBSTRATE LEFT** regulators.
15. Move the chuck if necessary so that alignment marks on the mask are in the chuck opening. If the knob for the x direction is set as **10-0** and the one for the y direction is set at **5.5**. Only minor adjustment is needed to make alignment marks in the chuck opening.
16. Toggle **LEFT** so that only left bottom camera is movable.
17. Move left bottom camera to find the alignment mark by pressing arrows.
18. Turn the **SPLITFIELD** switch to the middle position so that images from both cameras can display.
19. Align both alignment marks by either moving right camera or left camera.
20. Turn **MAGNIFICATION BSA** to high. The image grabbed in the following step can only appear for wafer alignment in the high magnification mode.
21. Press **GRAB IMAGE** to take picture of alignment marks shown on the monitor. First keystroke grabs the mask image. The objectives move to the wafer focus plane (**TOP/BOTTOM** key LED). The motor control of the microscope manipulator is disabled. The machine informs: "**ready for load...BSA image stored**". Second key stroke **GRAB IMAGE** key deletes stored image and enables the manipulator again.



Figure 8

22. Load wafer. Please refer to the **Standard Lithography SOP** to load a wafer. The side with features should be down.
23. Toggle the **TOP/BOTTOM** key to make LED light off. Focus the wafer plane by adjusting the **BOTTOM SUBSTRATE LEFT/RIGHT** regulators, correct illumination if necessary.
24. The stored BSA image should display on top of the live image of the wafer. Use the micrometer screws of the alignment stage for **STG-X-Y- Θ -MOVEMENT** to align the wafer alignment marks central symmetrical to the mask alignment marks.
25. Depending on your requirements, an alignment check could be helpful using the SEP keys, **ALIGN CONT/EXP** key or the **ALIGNMENT CHECK** key.

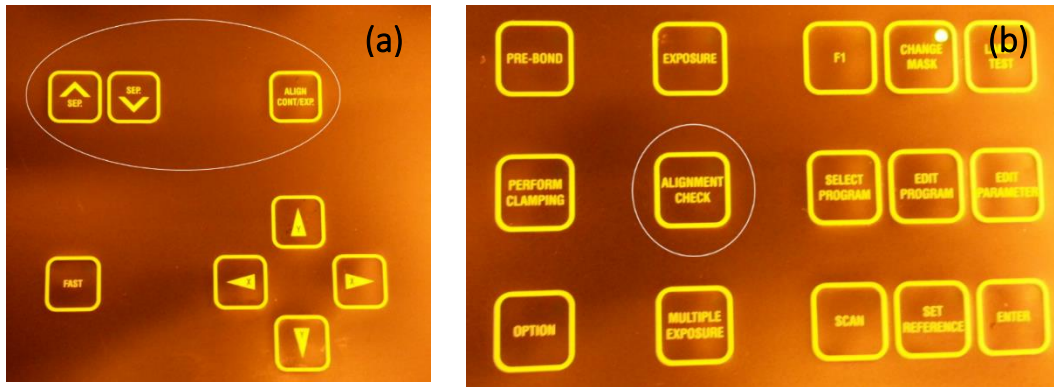


Figure 9

26. Exposure and Unload the mask. Please refer to the **Standard Lithography SOP**.