**Alignment protocol for Lithography**

**Important note: DO not under any circumstances turn the micrometers past 10 or 0. This will break the micrometer and the entire stage will need to be replaced, at very high expense!!!!**

**Center position is 5-5-5. All users must be trained prior to using equipment.**

1. Begin EVG lithography per SU-8 protocol.
2. Align mask to itself by finding alignment marks on left side by using left optic and left camera. Note the ZLeft position for later.
3. Find right side marks with right optic and right camera. Note the ZRight position for later.
4. Use the split screen to align the left half of the left alignment mark to the right half of the right side alignment mark. This may involve using the rotational knob (z-axis micrometer aka diagonal one below the center of the stage).
5. Once the halves are aligned, press continue. The mask is now in position and will not change. Press continue.
6. Remove Load frame and set aside on the table.
7. Insert the substrate and press continue.
8. Find the substrate level and note the position (Z).
9. Find the left alignment mark using the left optic.
10. Find the right alignment using the right optic.
11. Align the two halves using the split screen. You may need to use the rotational knob to shift the positions of the two halves. **AGAIN- DO NOT GO PAST 10 or 0‼**
12. Once the substrate is aligned to itself, find the mask layer directly above it by zooming out (clockwise on the optic joystick- or lower in number).
13. Find an alignment mark and go back down to the substrate level.
14. Adjust the substrate using the X and Y directional knobs so that the alignment mark on the substrate is below the alignment mark on the mask. Do not use the z direction or your substrate will no longer be aligned to itself.
15. The mask will be a shadow over the area. Choose a feature such as the corner of a box or the edge of a plus sign and place the cursor arrow there. This will help you determine the location to match the other layer to. Repeat for other side.
16. Once you are satisfied with the alignment of the features you chose, push continue and let the EVG begin the exposure.
17. Post Exposure bake (SU8) and Develop (SU8 and Shipley) as normal and check the features under the microscope.
18. You may need a lot of practice with aligning your devices if you don't have good clear alignment marks on your substrates to begin with. Always check your features under the microscope and photograph them so you can use that as a reference during alignment.
19. When you are finished with the EVG, turn off the vacuum using the valve on the wall behind the EVG so it doesn’t pull in dust and have “Low Vacuum Errors” the next time it is used.