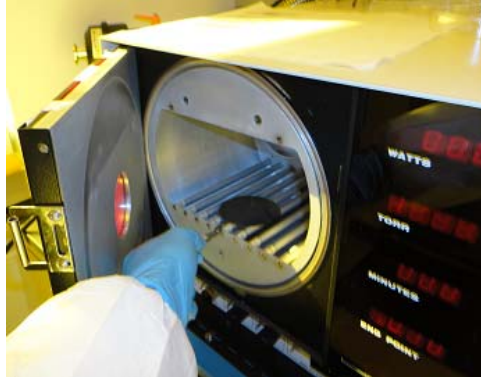


PROCEDURE FOR MAKING SU-8/Silicon MOLD-MASTER

Microfluidics Core Facility, Harvard Medical School

1. **Clean** the wafer (5 mins exposition to Plasma treatment 200 W) and dry. This will remove organic films and residues to obtain process reliability.



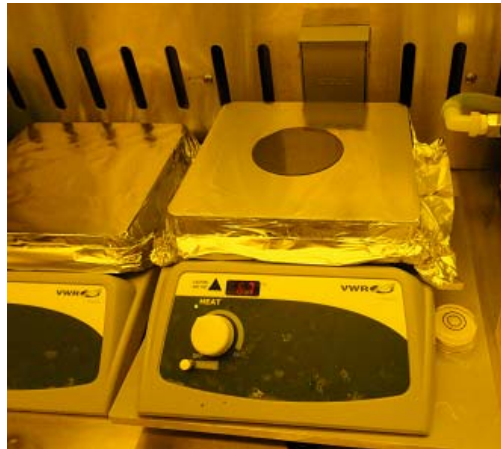
2. **Dehydrate** the wafer baking it in 150°C or 200 C hot plate for 5-10 mins



3. **Coat:** Check the recipe conditions for:
 - a. Spin speed (Step 1 500 rpm for 5-10 sec and acceleration of 100 rpm/sec, step 2 30 sec depends on thickness).
 - b. Apply a good amount of SU-8 resist at the center of the wafer without avoiding the formation of bubbles.



4. **Soft baked or pre baked:** to evaporate the solvent and densify the film. (check for wrinkles, cooling to room temp a putting back on the hotplate.
 - a. Determine the baking time required depending on the thickness.
 - b. **Ramping :** For better controlled rate evaporation conditions, start with 65 C and then 95 C. This will minimize bubbles on the surface of the substrate.
 - c. Allow the wafer to cool to room temperature. (There should be no wrinkles otherwise, repeat the process).



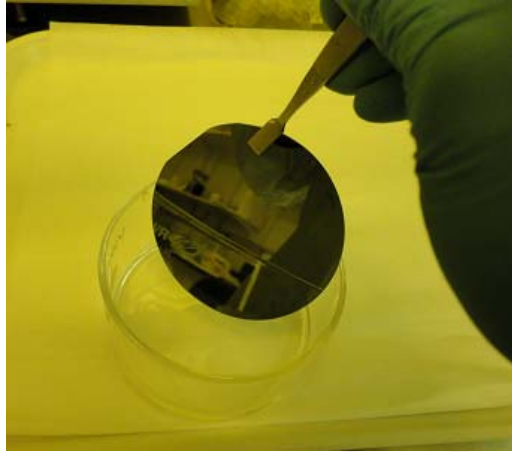
5. **Expose:** Use the Mask Aligner based on the table with the exposure energy according to the thickness (Calculate the exposure time $\text{Exposure dose} / \text{Measured Intensity or power}$) the power of the Mask Aligner is 25 mW/cm², then multiply by the tolerance factor (3).
 - a. Expose the wafer.
 - b. If soft or hard contact was used, clean the mask.



In this process strong acids are formed in the exposed areas, which initialize the activation of these.

6. Let the wafer cool.
7. **Post exposure bake:** For stress relaxation and cross link the epoxy areas exposed to the UV.
 - a. Determine the time required depending on the thickness.
 - b. **Ramping :** For better controlled rate evaporation conditions. (65 C and then 95 C).
8. **Development:**
 - a. Determine the required development time (base on the thickness)

- b. Use of SU 8 developer and keep the wafer in agitation.



9. **Rinse and dry:** Use Isopropanol for 10 secs and then pressurized air to dry up.
10. **Hard bake (final cure):** To ensure the SU 8 properties do not change when expose to thermal processing operation. It helps for annealing any surface crack.
 - a. Bake the wafer in Hotplate 150C for 5 mins