

Protocol Double Layer Photolithography (Oracoli)

Aim: Produce a Master mold on a Silicon wafer for microfluidic fabrication

Materials

- 2" – Silicon wafer
- TI Prime (MicroChem)
- SU-8 2000.5 (MicroChem)
- SU-8 2025 (MicroChem)
- PGMEA (MicroTec)
- Spin Coater
- Hot Plate
- Mask Aligner (Suess MicroTec)
- 2 Foil Masks (Zitzmann)
- Serological Pipettes
- Cotton swaps
- Scissor

Procedure

Preparation

- The master mold was prepared in a cleanroom under yellow light.
 - Crop of serological pipette with scissor to get a larger outlet for viscous photoresist
1. Dry the Si-wafer for 10 min @ 150°C on the hot plate
 2. Center it on a vacuum chuck of the spin coater.
 3. Cover the wafer fully with primer before spinning it off @ 3000rpm
 4. Immediately, pipet 1-2ml of SU8 2000.5 in the wafer's center and spin it to the desired thickness
 5. Softbake the wafer on the hot plate for 2 min @ 95°C to remove the remaining solvent and prevent it from adhering to the photomask.
 6. Position the mask and the processed wafer in the mask aligner
 7. Align the photomask for optimal wafer coverage
 8. Expose the resist for 10s to the UV-source
 9. Develop the presumed locations of the alignment marks with a cotton swap dipped in PGMEA until they are clearly visible
 10. Plug the wafer again into the spin coater and apply the SU8-2025 with the prepared serological pipette
 11. Spin the photoresist again at 3000 rpm
 12. Softbake the wafer at 95°C for 10 min
 13. Plug the second mask and the wafer into the mask aligner and lay the alignment marks over each other
 14. Expose the wafer for 60s to UV light
 15. Develop the chip under a fume hood for 5 min in PGMEA assisted by gentle agitation or in an ultra sonic bath
 16. Rinse the developed chip with Isopropanol and dry it with compressed air/nitrogen

Hardbake the wafer for 1h @ 150°C on the hot plate