Making PDMS device

A good reference: https://cmi.epfl.ch/packaging/PDMS.php

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Process steps

- **SU8 mold**
  - clean Si wafers
  - HMDS prim
  - SU8 coating
  - optical lithography
  - Silane coating
- **PDMS device**
  - mix PDMS epoxy
  - pour PDMS mixture to SU8 mold and degas
  - PDMS curing
  - PDMS device making
Wafer cleaning and HMDS prim

- Acetone, ultrasonic 5’
- IPA, ultrasonic 5’
- Bake 3’ @ 120C
- RIE: O2 plasma cleaning(chamber cleaning recipe), 5’
- HMDS vapor prim(2Torr, 150C for 30’)

Making SU8 molds

- Spin coat SU8-3050, cover full wafer
  Spin recipe: 1900-2000rpm for 1’, bilayer
  $\rightarrow$ 120-130um
Remove edge beads by q-tip+ acetone
- Prebake: 5’ @65C + 45’ @95C, for both layers
- Expose: 25” on Suss(14mW/cm2)
- Postbake: 3’@65C + 5’ @95C
- Develop: 20’ on shaker, fresh developer for each wafer
- Hardbake 30’ @ 200C
- Coat silane on molds: put wafer and a few drop of silane together in the desiccator and evacuate, then wait 10’ for vapor prim
  (once primed, can be used forever)
Making PDMS devices

• Weight PDMS A/B=10:1 and mix together in a dish, stir for mixing
• Cover the inner side of a dish with Al foil and place the SU8 mold inside
• Pour PDMS mixture into the dish and put the dish in the desiccator, then pump for degasing(10’, use a valve to control the degasing, not too fast), finally leave the desiccator in vacuum for 30’, until no bubbles seem in the mixture
• Put the dish in an Oven for PDMS curing: 65C for overnight, or at least 2 hours
• After PDMS get dry, peel off PDMS from the dish. Then punch holes(from pattern side) with a syringe tube.
• Finally put the PDMS and a 3’ glass in the plasma cleaner, do oxygen plasma cleaning(30’’). Once done, take them out and put PDMS and the glass together, then a PDMS device is done!