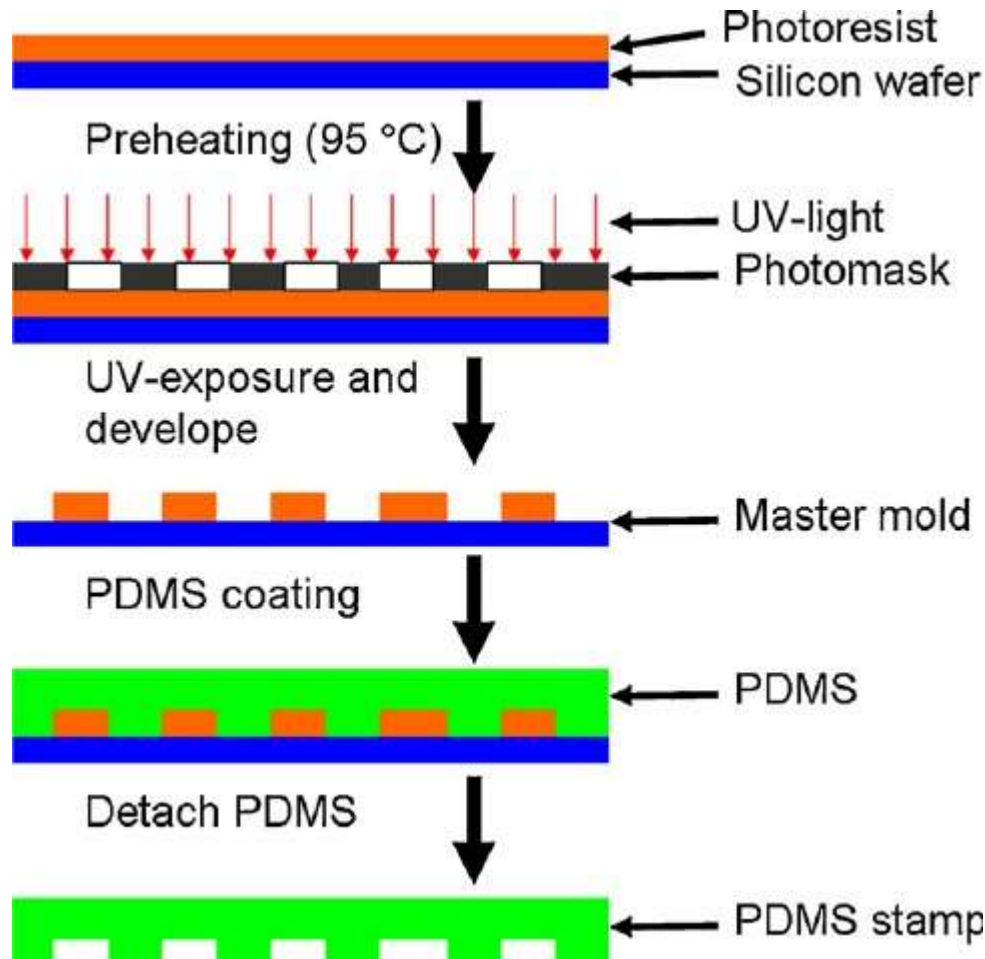


# Making PDMS device



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

Jun Chen  
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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: O<sub>2</sub> 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  
→ 120-130um  
Remove edge beads by q-tip+ acetone
- Prebake: 5' @65C + 45' @95C, for both layers
- Expose: 25'' on Suss(14mW/cm<sup>2</sup>)
- 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!