

PROCEDURE FOR PDMS CASTING

PDMS casting uses a patterned silicon wafer to produce channels of different sizes for microfluidic applications.

Chemicals: Sylgard 184 base, Sylgard 184 curing agent, Acetone, 2-Propanol.
Required Equipment: Weighing Scale, Vacuum Chamber, Curing Oven.
Supplies: 250 mL weight boat, stirring fork, vinyl tape

Start by placing the SU-8 patterned 100 mm Silicon wafer on a 150mm plastic petri dish. Secure Silicon wafer to the bottom of petri dish using clean room vinyl tape. Spray the weighing boat with nitrogen gas to remove any particles. Place large 250 ml weight boat on weighing scale and measure the out Sylgard 184 curing agent (use 10% of the amount of Sylgard 184 pre-polymer base you plan to use). Tare balance and add the desired amount of Sylgard 184 pre-polymer base. Take care not to spill Sylgard onto surfaces and wipe nozzle before replacing the cap.



Wipe a plastic fork with 2-propanol to clean and remove link. Mix well to a milky color consistency. Improper mixing will leave behind un-reacted curing agent with detrimental bonding results



Pour mixed PDMS onto the petri dish-Silicon wafer assembly, replace petri dish cover and place the whole assembly inside vacuum chamber for the removal of air bubbles. Vacuum should be maintained between 25 and 20 inches of mercury. NOTE: Degassing of the PDMS may take from 30 min to 2 hrs depending upon the pattern density and geometry size on the wafer. Some bubbles could remain on the surface after the degassing time but will burst upon the backfilling of air into vacuum chamber.



Place the degassed PDMS assembly in the curing oven at 65°C for 24 hours. Upon completion of the curing cycle PDMS is ready for sectioning and hole perforations. The size of the device determines the size of the glass to be used. Also the size of the tubing determines the size of the hole-punch to be used.



Record your name and the amount of PDMS used in the PDMS room logbook.