

STANDARD OPERATING PROCEDURE (SOP)

February 25, 2004

Process: PDMS Mixing and Curing

Required Eqmt: Weighing Scale, Vacuum Chamber, Curing Oven

Chemicals: Sylgard 184 base, Sylgard 184 curing agent, Acetone, 2-Propanol

Supplies: 250 mL weight boat, stirring fork, vinyl tape

INTRODUCTION

1. Make a reservation prior to processing PDMS.
2. The quantity of PDMS used must be recorded in the log book in the PDMS room
3. The process involves preparation of PDMS elastomer and heat initiated curing in an oven

PROCEDURE

Place SU-8 patterned 100 mm Silicon wafer on a 150mm plastic petri dish. Secure Silicon wafer to the bottom of petri dish using cleanroom vinyl tape.

Place large 250 ml weight boat on weighing scale and measured out desired amount of Sylgard 184 prepolymer base. (Take care not to spill Sylgard onto surfaces)

Tare balance and add 10% of Sylgard 184 curing agent. 10% is from the weighted “pre-polymer base” above. (It is best to weight the curing agent first and then add the pre-polymer base after)

Mix well to a milky color consistency, using a clean plastic fork. Improper mixing would leave behind unreacted 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 degassed PDMS assembly in curing oven at 65oC for 24 hours and 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.