

Microfluidics Lithography 3: PDMS Chip fabrication

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Abstract



Nehir Biyoteknoloji Ltd. www.nehirbt.com

Citation: Serhat Seveli, Seyfullah Yilmaz, C. Yunus Sahan Microfluidics Lithography 3: PDMS Chip fabrication. **protocols.io**

[dx.doi.org/10.17504/protocols.io.gwxbxfn](https://doi.org/10.17504/protocols.io.gwxbxfn)

Published: 14 Jan 2017

Before start

This protocol is also called "soft lithography" in the literature.

The PDMS material is Sylgard 184 silicone elastomer, Dow-Corning.

Protocol

PDMS mixin

Step 1.

By the previous methods, SU8 mold on Si wafer was prepared regarding the microfluidic design.

1 ml of silicone elastomer curing agent is added to 10 mL of base of silicone elastomer and than mixed thoroughly.

Higher volumes can be used by using the 1:10 ratio of curing agent and base. Max 45mL of mixture is suggested inside a 50mL tube.

Elimination of air bubbles

Step 2.

Hard mixing of ingredients causes air bubbles which may disappear themselves more than an hour.

In order to remove air bubbles quickly, the mixture is centrifuged at 500g for 1 minute.

* Warning

Higher speed may cause problems in curing of PDMS.

PDMS on mold

Step 3.

Pour the mixture on the SU8 mold in a petri plate and leave it for around 30 minutes at room temperature.

Leaving for 30 minutes at RT is necessary when air bubbles are showed up during the pouring. If there is no air bubbles then advance directly.

Petri plate is heated at 65°C for 2 hours on a heater plate device.

Stock of PDMS

Step 4.

The excess of mixed PDMS (but not heated) can be stored in a refrigerator (+4°C) up to a week.

Just take from the refrigerator and pour on a new SU8 mold and incubate.

* Warning

Higher duration of storage is not suggested.

Warnings

* All the related steps must be done in a clean room classD (minimum).

* Please learn well about the hazards of Sylgard 184 chemicals.