

Microfluidics Lithography 2: UV Exposure and Development

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Abstract



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Before start

This protocol is derived from

[Reference: Processing guidelines for permanent epoxy negative photoresist SU8 2025, SU8 2035, SU8 2050 and SU8 2075, MicroChem company]

Protocol

UV exposure

Step 1.

Most of the microfluidics laboratories use mask aligners for patterned UV exposure on photoresist coated wafers.

NehirBT uses maskless UV laser lithography device made by local friend companies.

The microfluidic channel patterns are sketched by any design software and converted into gcode to be transferred on photoresist.

The focus and power of laser beam and the speed of motors are adjusted before application. All effect the correct formation of microchannel pattern and minimum feature sizes.

* Expected result:

By cUrrrent application, the minimum feature size becomes one-third of the photoresist thickness.

Post UV exposure baking

Step 2.

Post exposure baking is done depending on the thickness of the film.

Wafer is heated on heater plate device.

For 25-40 micron thickness; 1 minute of baking at 65°C and 5 minutes of baking at 95°C are applied.

For 45-80 micron thickness; 2 minutes of baking at 65°C and 6-7 minutes of baking at 95°C are applied.

*Warning

Longer durations of baking causes lift-off of SU8 mold during or after development process.

SU8 mold development process

Step 3.

Post exposure baking is done depending on the thickness of the film.

Wafer is left to cool down for a few seconds and then developed with SU-8 developer chemical. Development is performed at room temperature inside foom hood and within a suitable glass plate.

For 25-40 micron thickness; SU8 mold development time is 5 minutes.

For 45-80 micron thickness; SU8 mold development time is 5-7 minutes.

* Reagent

NehirBT prefers 'Propylene glycol methyl ether acetate' as SU8 mold development chemical.

*Warning

Please learn well about the hazards of SU8 development chemicals.

Washing

Step 4.

Wafer is washed with isopropanol and then dried with nitrogen gas.

Wafer is heated at 95°C for 10 minutes and then left to cool down for a few seconds.

Microfluidics mold is ready for PDMS chip preparation, put in petri dish and label by all appropriate information.

Warnings

- * All the related steps must be done in a clean room classD (minimum) and under yellow or red light.
- * All spin coating procedures must be performed inside the fume hood.
- * Please learn well about the hazards of SU8 development chemicals.