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SU-8 GM 1030 – Datasheet

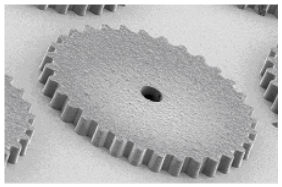
Features

Film Thickness:

0.5 – 1.2 µm

High Aspect Ratio

Excellent Sensitivity



Introduction

SU-8 is an epoxy based, chemically amplified resist system with excellent sensitivity and high aspect ratios. The primary applications are Micro-fabricated Mechanical Structures (MEMS) and other Microsystems. Examples are sensors, micro-fluidic components, electronic coils, inkjet print head nozzles, multi-chip modules, actuators, LCD spacers and moulds for plastic, stamps for hot embossing and electroplating.

Processing Conditions

Substrate Preparation

SU-8 can be spun on a range of substrates without adhesion layers. Ensure that the substrate is clean and dry. Substrate cleaning can be performed using solvents, O_2 plasma and O_3.

Coat

SU-8 products are coated on the substrate using a spin coating process. The film thickness spin curve for GM1030 is displayed below.

Recommended coating conditions

Acceleration/Deceleration Ramp	100 rpm/s
Step 1	40 seconds at desired spin speed

Resting (Optional)

Let the resist film rest from 5 min up to 15 min, depending on the resist thickness. If there are some bubbles after spin-coating they can be burst using a clean and thin tip. The created hole should fill during the resting time. Finally this resting time should improve the uniformity of the layer, and evaporate some portion of solvent.

Soft Bake

Softbake the coated substrate in two steps. All the temperature ramps should be about 2°C/min. Firstly increase the temperature from room temperature up to 65°C. Note that you can also start from 50°C. Then leave the substrates at 65°C for 5 to 10min (depending on the resist thickness). The temperature can be then be increased to 95°C where the wafers should be left as much time as necessary such that, when holding them with some tweezers, no tweezer marks are left behind in the resist layer. When baking is complete, switch off the power or decrease temperature until they slowly reach room temperature.

Exposure
Expose the coated substrate with a mask. This exposure dose adjusts the negative wall profile, the slope is close to 90°. Select an exposure dose as a function of your thickness that does not result in cracks, un-sticking or "stairs effect".

Note: Exposure doses refer to i-line (365nm). A standard mask aligner with a 350W Hg light source has approx. 6-15 mW/ cm2 i-line intensity, while in many cases 20-30 mW/cm² are measured meeting the total (g-, h- and i-line) intensity.

Ideally you should try multiple exposures around the given exposure dose on the exposure curve. Results may not be exactly the same as this will depend on the UV lamp parameters. The exposure dose must be optimised to match the exposure system.

Resting
Following the exposure, leave the resist to rest at room temperature for at least 10 min.

Post Exposure Bake (PEB)
After resting, bake the coated substrate with the same conditions as the soft-bake. Oven baking is not recommended.

Develop
Develop in PGMEA or DRGM. When the structures have cleared, to finalise the side wall profile, add another 10% of development time in a clean development bath.

Rinse and Dry
Upon completion of the development process and to prevent scumming, the resist should be immersed in IPA immediately.
Leave in IPA until all white traces have been removed, then remove immediately.
Substrates are air dried in a cabinet or wet bench with appropriate air flow.

Hardbake (optional)
A postbake or hardbake can be used to remove any cracks or unstuck SU-8. Only the smallest cracks (<5um) will be totally removed after this step.

Oven: 135°C for 2 hours - ramp progressively at 2°C/min

Removal techniques
SU-8 can be removed using the available stripper - Strip 1

Spin Curve