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SPECIALISTS IN RESIST TECHNOLOGY

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SML Resist – Datasheet

Features

Film Thickness:

0.5 – 5 µm

Very High Aspect Ratio

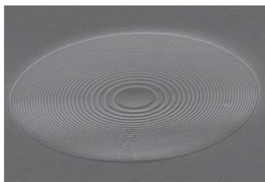
Very High Resolution

Excellent Etch Selectivity

Introduction

SML resist is a positive tone resist that has been specifically designed for electron beam lithography. It is a polymer that can be processed in exactly the same way as other polymer resists such as PMMA or ZEP. SML provides the user with a high resolution, high aspect ratio positive tone resist. It has excellent dry etch selectivity and can be processed with standard cleanroom chemistry.

Processing Conditions



Substrate Preparation

SML 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

SML products are coated on the substrate using a spin coating process. The film thickness spin curves for the product range are shown below.

Soft Bake

A soft bake is typically performed at 180C for 120 – 180 seconds directly after spin coating.

Exposure

Exposure of SML resist is performed using an electron beam lithography tool. Clearing dose is between 200 – 500 C/cm2. However, a dose scale is suggested as this can vary between processes and acceleration voltage.

Develop

SML can be developed using any standard developer that will work on PMMA or ZEP resists. The most commonly used developers for SML are MIBK:IPA (1:3) and IPA:Water (7:3). Develop for 30s followed by an IPA rinse for 15s.

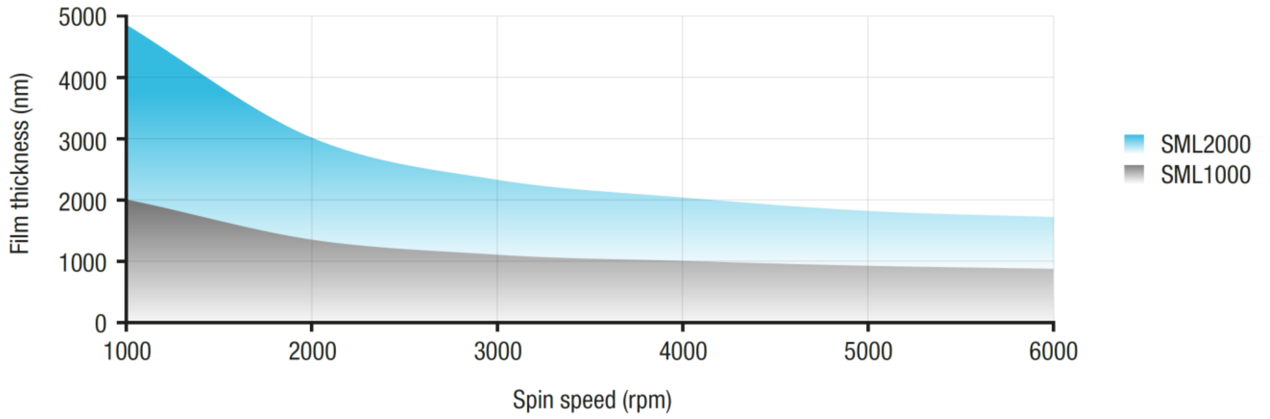
Hard-bake

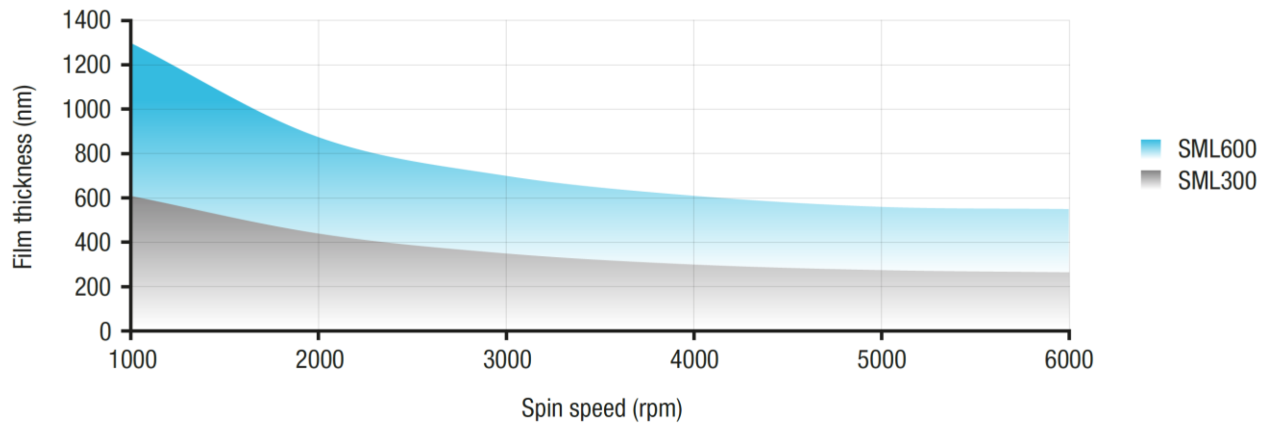
SML resist can be hard baked following development at 80C for 30 minutes.

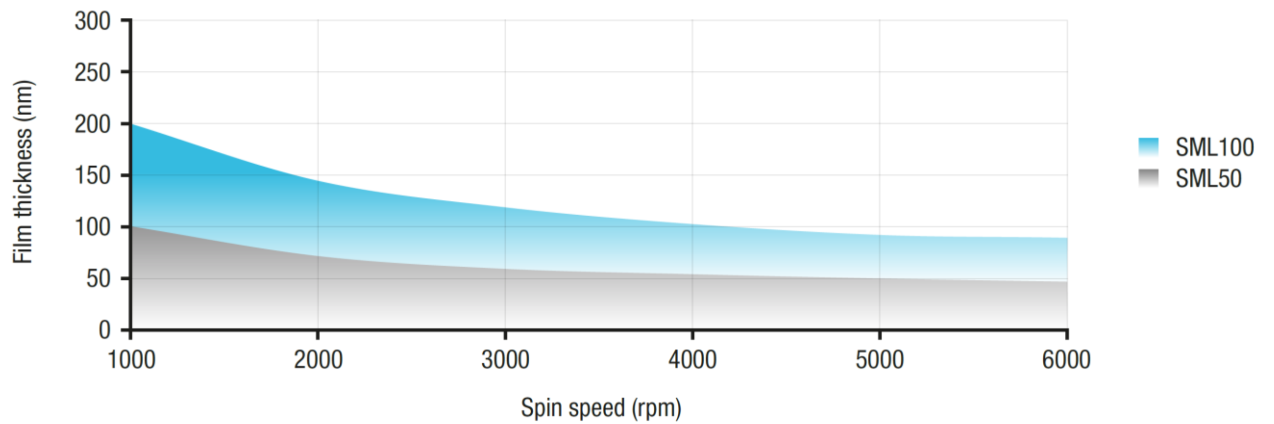
Removal techniques

SML resist can be removed with acetone.

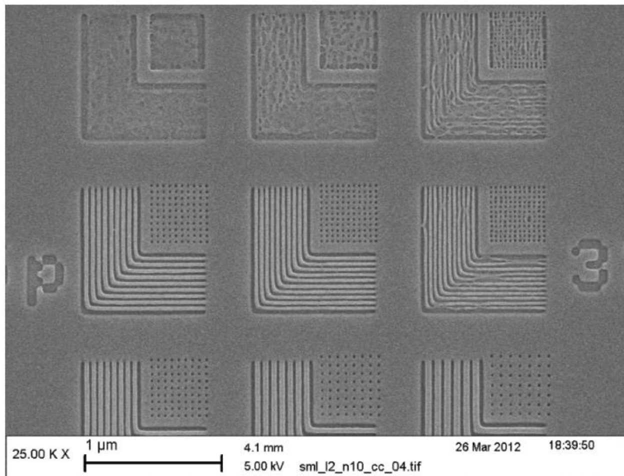
Spin Curves

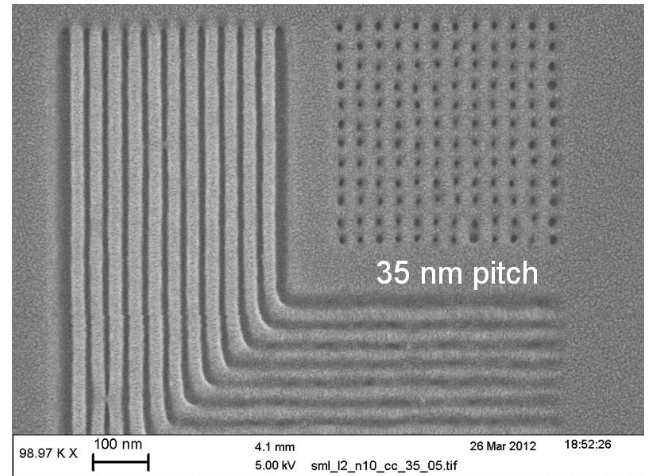




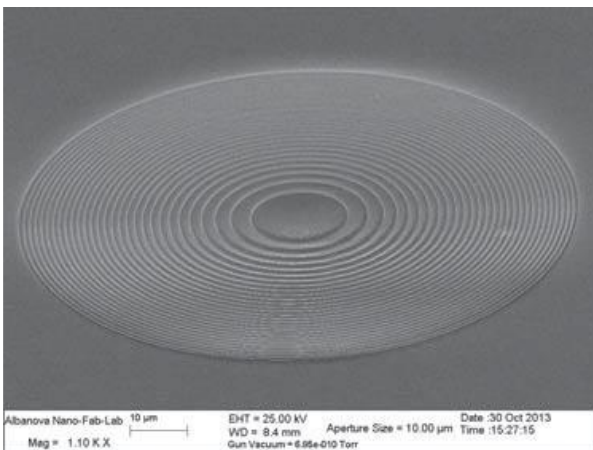


Example Exposures

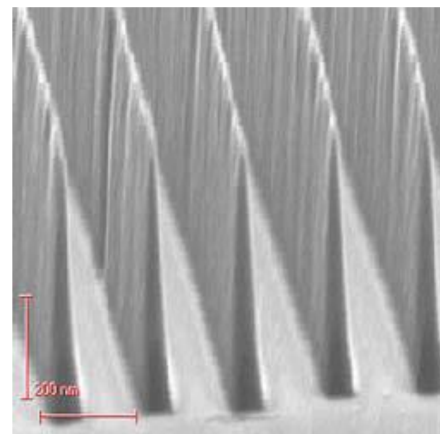




- Exposure of SML50 film using a Vistec EBPG 5000+ at 100kV. Performed at Caltech
- Film thickness was 50nm.
- 40nm pitch.
- Line width measured as 9nm when cleared.



- Exposure of SML300 performed at KTH
- Fresnel lens pattern
- Film thickness was 300nm



- Pattern transfer of lines exposed in SML600
- Aluminium lift-off process
- Film thickness was 600nm
- 60nm lines, 500nm tall, 180nm pitch