



Electron Beam Lithography – PMMA 950 A3

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Summary:

This document describes the pre-processing and post-processing steps for Electron Beam Lithography on Silicon wafer/sample coated with PMMA 950 A3 resist using Vistec 5000+ E-Beam system.



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1 Associated Documents & References

Chemicals used: PMMA 950 A3, MIBK, IPA
MSDS – please see attached sheets

2 Equipment Used

EQUIPMENT used: Thin-film measurement system and Spin-Coater (Positive resist East Wet-bench), Nikon Optical Microscope in the Wallberg Nanolithography Facility.
(The above equipment have to be reserved through the online resource scheduler. If you require assistance from staff, please check availability with them before reserving the equipment. Users have to go through regular training before using this equipment alone.

3 Verifications Prior to Processing

- Ensure wafer is clean by following E-Beam Wafer-Clean process protocol 1a
- Ensure wafer/sample is centered on the spinner chuck

4 Recipe description

PMMA 950 A3 Spinning - Spinner Laurell WS-400B-6NPP-LITE

(i) Spinner parameters: Spin speed – 2000 rpm
Acceleration – 7 -584
Time – 60 s

(ii) Prior to spinning, set hot plate @ 180 °C. After spinning, place wafer/sample on hot plate for 2 mins or 20 mins in the oven

(iii) Verify resist thickness on the Thin-film measurement system

Wafer/Sample development after E-Beam Lithography Exposure

Prepare the volume of chemicals required according to the wafer/sample size

In 2 separate beakers, prepare and place the following:

(i) MIBK: IPA – 1:3

(ii) IPA

Place wafer in the developer MIBK for 60 s and gently agitate the beaker.

After the 60 s, place wafer in the IPA solution for 30 s.

Blow dry gently for about 40 s.

(iii) Inspect using the Nikon Optical Microscope



5 Technical Data

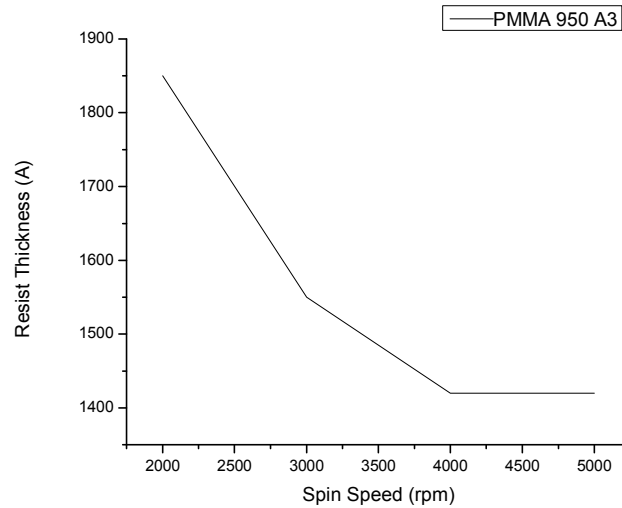


Fig. 1: Spin curve for PMMA 950 A3

6 Measurements & Statistical Process Control

6.1 Measurements

Thin-film thickness measurements are taken for each spin speed and the average is recorded. The tolerance for the resist thickness measurements is ± 2 nm.

7 Record of Revisions

Rev. 0

First Edition