AZ P4620 Photo Resist

1. Overview

This protocol is developed as a ~12.5µm thick resist recipe for use by Nanofab users. This photo resist gives a very thick layer and is primarily used to mask for DRIE.

2. Procedure

1. Use AZ4620 found in bottle in lithography or from the fridge.
    - Bottle in Lithography:
        - If taking the bottle from the fridge, let stand for 30mins to reach room temperature
        - Pour 5-10mL of AZ4620 for each 4" wafer (circle or square)
    - Fill from Fridge
        - Let rest for ~2 hours to warm up
        - Pour into a labeled amber bottle
2. Pour 5-10mL of resist into the center of the wafer and spin the resist at the following settings:
    - Spread
        - 10 seconds @ 500RPM
    - Spin
        - 25 seconds @ 2000RPM
3. Use the hotplate in lithography STATION 1 on the left of the Solitec spinner. You need this hotplate because it has nitrogen flow on the backside of the wafer.

    - Set to 100˚C. This takes ~30minutes to warm up. This is a two-stage softbake. STEP 1 is with the wafer floating on a cushion of nitrogen flow and STEP 2 where it is held to the hotplate by a vacuum.
        - N_2 on: place wafer on the hotplate for 90 seconds
        - N_2 off and Vacuum on: 60 seconds
        - Turn vacuum off and N_2 on. This will lift the wafer and make it easy to remove with tweezers.
4. After softbaking of wafers, place in a box with a damp cleanroom wipe, close, and leave for 2 hours. Alternatively the wafers can be left 24hrs in a dark box. This step is VERY important for proper exposure and developing of the resist.
5. After the hydration period, the wafers are ready to be exposed. The exposure is 730 mJ. To find the number of seconds, use the following formula:

$$ExposureTime\left(s\right)=\frac{ExposureEnergy\left(mJ\right)}{ExposureFactor\left(\frac{mW}{cm^2}\right)}$$

A SAMPLE calculation for this is:

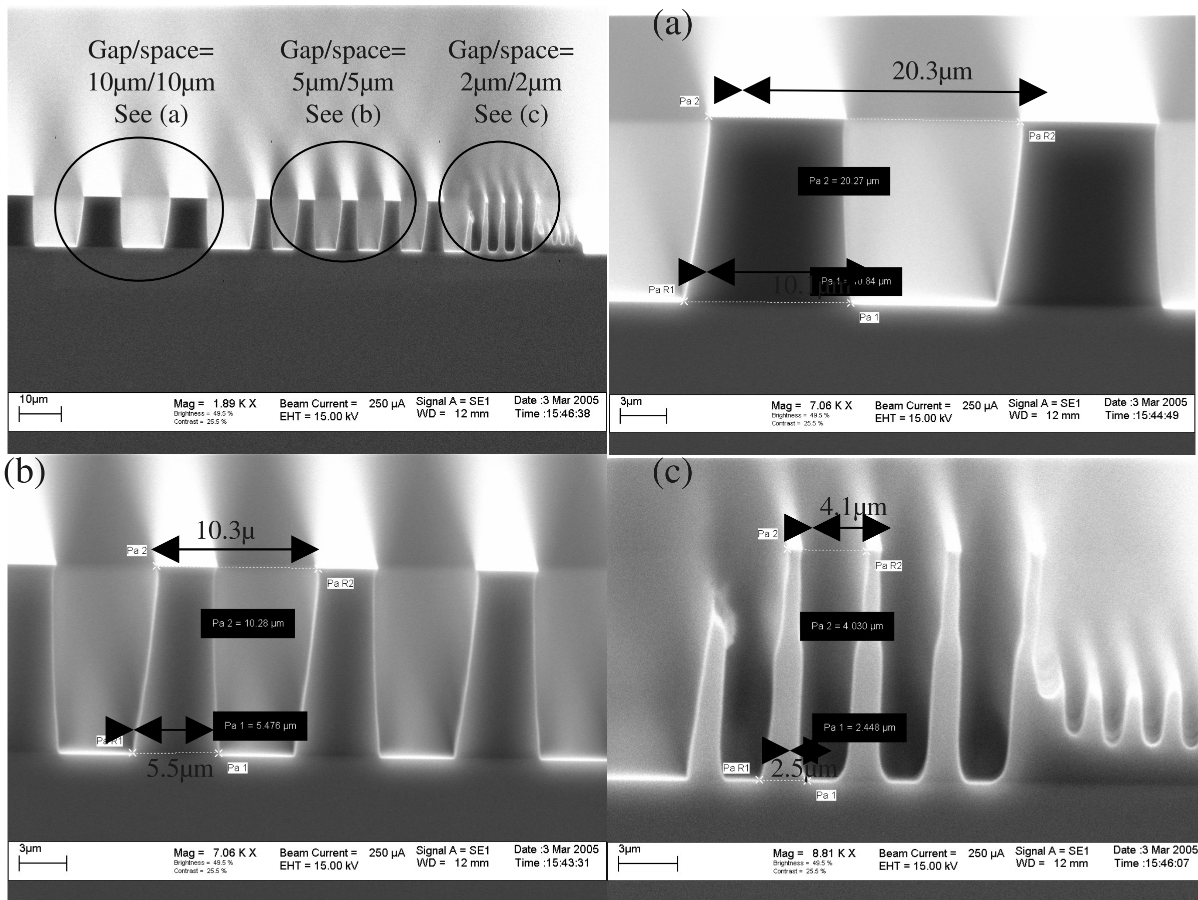
$$ExposureTime\left(s\right)=\frac{730\,mJ}{60.9\left(\frac{mW}{cm^2}\right)}=12\sec$$

This formula will allow the user to use ANY of the lithography tools and have the same amount of exposure. Just read the Exposure Factor on the Sheets on any of the litho tools.

6. The developer used is DILUTED AZ400K developer found at the lithography station. If the exposure explained above is used, the resist should develop in approximately 1 minute: 20 seconds.

3. Technical Data

The resist works extremely well for patterning features down to 5μm. Shown below is a pattern of gap/spacing of 10μm, 5μm, and 2μm. The side profile of the resist does not change for features down to 5μm. It is seen, however, that the profile is affected for the 2μm features and this is the resist's limit for the 12.5μm thickness.



4. Approval

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