

## **Semiconductor Device Processing**

### **Optical lithography**

The procedures given here are for optical lithography using **Clariant** AZ 4110, which is a positive photoresist.

#### **Spin on Photoresist**

1. Place cleaned wafers on the aluminum tray, place the tray on the aluminum block in the furnace. Dehydration bake for 3 minutes at 120 °C.
2. Let wafer cool for about 2 minutes.
3. Place wafers under the HMDS vapor deposition hood for 3 minutes.
4. Place a dummy wafer on the spinner and set the spinner speed at 4500 RPM and the spin time at 30 seconds.
5. Place the actual sample on the spinner ( shiny side up ) and put on a few drops of resist until all of the wafer is covered.
6. Spin the wafer for 30 seconds at 4500 RPM.
7. Pre-bake for 1 minute at 95 °C on the hot plate.

#### **Exposure using Suss MJB-3 mask aligner**

1. Turn on <POWER>
2. Slide out mask holder and put correct mask in with pattern toward wafer.
3. Put your wafer on the chuck and slide tray under mask
4. Rotate lever to raise chuck. Make sure you actually are in <CONTACT>.
5. Put wafer in <SEPERATION>and align mask to your pattern, (if needed)
6. Set exposure <TIMER> (UV=7.5 mW/cm<sup>2</sup>) recommended for resist in use (20 seconds).
7. Bring wafer and mask in contact and press <EXPOSE>
8. Lower chuck and remove your wafer. (DO NOT REMOVE WAFER PRIOR TO LOWERING CHUCK!)

### **Developing (AZ 400K )**

1. Place the wafer in the holder and immerse into a beaker containing 4:1 DI H<sub>2</sub>O:AZ 400K developer for the appropriate time (approx 60 sec) with mild agitation.
2. Rinse in DI H<sub>2</sub>O for 60 seconds.
3. Blow dry with N<sub>2</sub> gas.
4. Inspect for photoresist residue under the optical microscope. Make sure there is a yellow filter in microscope during inspection of photoresist. If resist is not fully developed, continue developing and inspect again.

### **Caution:**

- \* Spinner will not start unless the vacuum chuck is turned ON.
- \* Always **wear eye protection** in the lithography room.
- \* Do not touch any parts of the MJB-3 Aligner with bare hands.
- \* Do not use plastic tweezers while handling hot wafers.
- \* Do not throw any Developer down the drain. Put it in the appropriately marked container.