SILICON DIOXIDE WET ETCHING SOP

UNIVERSITY OF LOUISVILLE
Micro/Nano Technology Center

Revised May 2020

NOTE: This process is to be performed at the Acid Wet Bench. A bath of buffered oxide etchant (BOE) is provided within this bench specifically for etching silicon dioxide.

PROCESS

1. Log into FOM.
2. Before etching, calculate the time needed to etch through the oxide. The etch rate of the BOE bath at ambient conditions is approximately is 100 nm/min. It is suggested that this operation be started within 30 minutes of the completion of a hard bake from the photolithography process if using photoresist as a masking layer.
3. Adorn the appropriate personal protection equipment (PPE) of a chemically resistant blue apron, face shield and chemically resistant orange gloves.
4. Place your wafer into the wafer cassette that provided on the deck of the acid wet bench and use the slingshot to transfer the wafer cassette into the BOE bath.
5. Etch the wafer for approximately half of the estimated time.
6. At the end of the initial etch remove the sample from the BOE solution and examine the front or back of the wafer. If the silicon dioxide has not been completely etched away the BOE solution will adhere to the etched surface and will appear wet. If the silicon dioxide is completely etched the surface will be hydrophobic and BOE solution will not adhere to the surface.
7. If the sample is not etched completely place it back in the BOE bath for 30 second intervals and recheck the wafer as mentioned in step 5.
8. Repeat step 6 until the silicon dioxide is completely etched.
9. When the etch is complete, remove the wafer cassette and place it into in the quick-dump-rinse (QDR). Operation of the QDR can be found in the Wet Benches SOP.
10. Following the QDR process place the wafer cassette in the lower spin-rinse-dryer (SRD) by opening the door and placing the wafer cassette into the SRD. Press the start button and wait approximately 4 minutes for the process to finish. DO NOT PLACE YOUR SAMPLE IN THE UPPER SRD FOR IT IS RESERVED FOR RCA CLEAN WAFERS ONLY.
11. Dispose of any wipes on the acid wet bench.
12. Wash your gloves and dry them. Inspect and remove your PPE and place it back in the correct location for the next client.
13. Inspect your samples visually with one of the optical microscopes available in the cleanroom.
14. Record your bench usage in the log book.
15. Log out of FOM.