

Aluminum (Al) Etch Instructions

The CEPSR cleanroom stores Aluminum Etchant Type A, a pre-made product used for removing or etching away aluminum. This etchant is stored inside the acid or corrosive storage cabinet in the large yellow room. The etch rate of this particular etchant is about 100 angstroms/sec at 50 degrees centigrade (process are best done at these temperature). Depending on how old the bottle is and the fluctuation in lab room temperatures, the etch rate may vary. It is recommended to perform an etch rate test. Once this is done, the user can then calculate the amount of time needed for the etchant to remove away a specific thickness of aluminum that is desired.

Note: Once the bottle is empty or you find that it's etch rate is almost doubled, empty any residual etchant into its waste disposal bottle (labeled Aluminum Etch Waste), the waste bottles are located below the wet bench. After disposal, rinse the now empty bottle with DI water THREE times. Place the rinsed bottle next to the 5 gallon solvent waste container, located next to the eye wash in the large yellow room. A clean room staff member will take it for proper disposal and will restock the corrosive case with a new, fresh bottle.

Process

Prior to using the wet bench, please have all materials ready: tweezers (anti-acid or Teflon), a Teflon or glass container for the liquid etchant, your PPE [your correct size of orange, rubber acid gloves (w/nitrile gloves under), acid apron and face shield], timer and your Au coated sample prepared to be etched. When rinsing inside the fume hood, DO NOT use maximum pressure on the DI gun because it will then splash any contamination among the fume hood or possibly spray anyone near you. Please let it be known that you are using Al etchant to anyone inside the large yellow room.

- 1) Based on the product's etch rate or your etch test, calculate the time needed for etching your specific thickness of Al.
- 2) Put on your PPE, first acid apron, then gloves and finally face mask. Take out the Al etch waste container and place inside the sink of the acid fume hood.
- 3) Place the container that will hold your wafer and the liquid etchant onto the wet bench. During handling, use your tweezers. Place your timer next to you tools for easy access.
- 4) Go into the corrosive storage box and take out the Aluminum Etchant Type A bottle and place on the wet bench.
- 5) Carefully pour enough etchant into the glass or Teflon container so that when you insert your sample, it is fully immersed in the Al etchant. Take the Aluminum Etchant bottle back inside the corrosive storage box.

- 6)** Using your tweezers, fully submerge your chrome coated substrate or sample. Begin your timer.
- 7)** As time progresses, visually, you will see a change of color on your wafer's surface. After your calculate etch time ends, inspect your wafer. If the Al is not fully removed, fully immerse your wafer again into the etchant solution for more time. Periodically you may have to repeat this step to inspect when the metal is fully removed.
- 8)** When done, take your sample out of the etchant and rinse with DI water then nitrogen dry your wafer and place into its carrying case.
- 9)** Take the container that holds the used etchant and dispose of it inside the Al waste bottle. Take the bottle and place it back below the wet bench where the rest of the waste bottles are kept. (DO NOT leave waste container inside fume hood sink).
- 10)** Your glass or Teflon container that held the etchant should then be rinsed fully with DI water, do this with gentle pressure applied on the DI water gun. Dry your container with the nitrogen gun.
- 11)** Rinse well with DI water all your tools such as tweezers, containers and your acid gloves.
- 12)** Remove any Tex wipes you used in this process and dispose of it in the acid contaminated waste can located near the acid fume hood. If your orange acid gloves are stained or appear over used, dispose of them in the same waste container, otherwise place them on the glove rack located above the acid storage cabinet.
- 13)** Clean up the wet bench after you have completed your process.