R·I·T Title: Aluminum Etch/Solvent Strip Bench

Semiconductor & Microsystems Fabrication Laboratory **Revision: F** **Rev Date: 08/27/2008**

Approved by:

__________________/ / ______________________/ /

Process Engineer Equipment Engineer

1 SCOPE

The purpose of this document is to detail the use of the Wet Bench for wet etching of Aluminum and solvent stripping photoresist. All users are expected to have read and understood this document. It is not a substitute for in-person training on the system and is not sufficient to qualify a user on the system. Failure to follow guidelines in this document may result in loss of privileges.

2 REFERENCE DOCUMENTS

- Material Safety Data Sheets for Aluminum Etch Phosphoric Acid, Nitric Acid, Acetic Acid and PRS-2000.
- Operating Manual (for programming the constant temperature bath)

3 DEFINITIONS

DI -De-Ionized Water

4 TOOLS AND MATERIALS

4.1 General Description

4.1.1 This bench is set up with two stainless steel temperature controlled tanks to do solvent stripping of photoresist on wafers and one temperature controlled quartz tank for wet etching Aluminum. There is also a sink which can be used to manually rinse wafers.

4.2 Wafer Boats

4.2.1 Only Teflon wafer boats and handles should be used for etching on this bench.

5 SAFETY PRECAUTIONS

5.1 Hazards to the Operator

5.1.1 Read and understand the MSDS for the chemical being used.
5.1.2 Safety Glasses are mandatory at all times in the lab.
5.1.3 When using this bench safety gloves, chemical apron and a face shield are required, in addition to your safety glasses.
5.1.4 The temperature-controlled baths are capable of heating chemicals to high temperatures which creates an additional burn hazard.

5.2 Hazards to the Tool

5.2.1 Never operate the heated tanks without the proper fluid level.
5.2.2 Operate the bench controls with clean gloves only. The chemicals used will cause damage.
5.2.3 Tanks are breakable, carefully place wafers in them and never bang a cassette on the side.
5.2.4 All tanks in this bench are to remain dedicated to a process. Do not interchange chemicals.

6 INSTRUCTIONS

6.1 Initial State Check

6.1.1 Verify that the chemical you want to use is filled to the proper level.
6.1.2 Make sure that the bench has power, DI water and nitrogen.
6.1.3 Make sure that you have reserved the bench with the Tool Reservation System.

6.2 Resetting the System

6.2.1 The bench may be reset by cycling the bench power on and off. This is done using the **Main CTRL Power On** and **Emergency Power Off** buttons on the top right side of the bench.

6.3 Etching Aluminum

6.3.1 Turn on the main power to the bench with the **Main CTRL Power On** button on the upper right side of the bench.
6.3.2 Start the **Bench Power Timer**. It will power the bench for 3 hours and will need to be reset if you need the bench longer.
6.3.3 Turn on the Aluminum etch tank by pressing **Power** on the controller above the Aluminum etch tank.
6.3.4 On the controller, press **Reset** to remove the system from the hold state. Next to the controller, press **Heater ON** to begin heating. The set point is posted.
6.3.5 To silence an alarm, press the **SIL** button.
6.3.6 Do not adjust the level sensor tube. It should be bubbling slowly.
6.3.7 To rinse the wafers use a tank in the sink for 5 minutes with the water running. There is a small hole in the bottom that will allow it to drain out automatically.
6.3.8 When the etching is finished, turn off the controller above the Aluminum etch tank.
6.3.10 Turn off the bench power using the **Emergency Power Off** button on the top right of the bench. Make sure that the water is off.

6.4 Stripping Photoresist in the Solvent Strip Tanks

6.4.1 The solvent strip tanks are not intended for photoresist that has been ion implanted, plasma etched or silated. It should also not be used for lift off processing.
6.4.2 Turn on the main power to the bench with the **Main CTRL Power On** button on the upper right side of the bench.
6.4.3 Start the **Bench Power Timer**. It will power the bench for 3 hours and will need to be reset if you need the bench longer.
6.4.4 Turn on the solvent strip tanks using the **Heater On** button on the upper left side of the bench. The tanks should heat up to a set point of 90C.
6.4.5 When the tanks have reached the set point, place the wafers in the left tank (PRS-2000) for 5 minutes and then move them into the right tank (PRS-2000) for 5 minutes.
6.4.6 To rinse the wafers use a tank in the sink for 5 minutes with the water running. There is a small hole in the bottom that will allow it to drain out automatically.
6.4.7 When finished turn off the bench power using the **Emergency Power Off** button on the top right of the bench. Make sure that the water is off.

6.5 Errors during Run

6.5.1 If the controller alarms or does not heat, an interlock may be tripped. Verify that the liquid level is correct and that the level sensor is bubbling. Contact an SMFL staff member for assistance.

6.5.2 If a wafer falls out or breaks, do not attempt to retrieve it. Contact an SMFL staff member.

7 Appropriate Uses of the Tool

7.1 This tool is intended for solvent stripping of photoresist and wet etching of aluminum. The solvent strip tanks are *not* intended for photoresist that has been ion implanted, plasma etched or silated.

7.2 Only Teflon wafer cassettes and handles may be used.

7.3 Process temperatures are set and should not be changed without SMFL approval.

7.4 No lift off processing.

REVISION RECORD

Summary of Changes	Originator	Rev/Date
Original Issue	Sean O'Brien	A-10/01/2002
Sections 4.1.1 and 6.3.10 changed to specify which tank is used for stripping wafers and which is used for cleaning track parts.	O'Brien	B-01/08/2003
4.1.1 removed ref to cleaning track parts, 6.3, 6.4, 7.1 clarified photoresist stripping process	O'Brien	C-12/10/2003
Added sections 6.3.2, 6.4.3 for Bench Power Timer	O'Brien	D-08/02/2004
Updated section 6.4.5 to show PRS-2000 in both tanks.	O'Brien	E-06/31/2006
Removed 6.3.5 because N2 bubbler is not used	O'Brien	F-08/27/2008