

University of Minnesota Nano Fabrication Center

Standard Operating Procedure

Equipment Name: Asher

Coral Name: asher

Revision Number: 1

Model:

Revisionist: K.Burkland

Location: Bay 2

Date: 5/12/05

1 **Description**

The Technics Oxygen Asher uses oxygen plasma to chemically remove photoresist and other organic compounds isotropally from the surface of substrates.

2 **Safety**

a Do not adjust the gas flow above 400. If this is done, the damage to the machine could be irreversible.

3 **Restrictions/Requirements**

a Completed the Photolithography Short Course

4 **Required Facilities**

a Oxygen gas

5 **Definition**

6 **Setup**

a Set the toggle switch for MODE should be set to MANUAL

b The following switches should be set to OFF: VACUUM, PURGE, RF POWER and GAS FLOW.

c Move the door handle to unlock prior to purging.

d Switch PURGE to ON to vent the chamber.. This will take 15 - 20 seconds.

7 **Operating Instructions**

a The door to the chamber will open when vented. Switch the PURGE toggle to OFF.

b The samples can be loaded inside the chamber two way.

1 Perpendicular loaded in a quartz boat. The boats are located by the bake ovens.

2 Horizontally directly on the system grate or on a foil boat.

c Close the door and turn to lock it.

d Switch the VACUUM toggle to ON. The pressure should fall to less than .200 Torr within 30 seconds. This can be monitored on the Torr gauge located on the upper left front panel.

e Switch the GAS toggle to ON. The flow can be monitored on the FLOW gauge located on the upper right front panel. Adjust the reaction gas flow rate with the needle valve dial located on the right front panel.

Do not adjust the gas flow above 400. If this is done, the damage to the machine could be irreversible the chamber pressure should be within .500 – 4.0 Torr

f Zero the RF POWER by dial by rotating the dial counter clockwise until it stops.

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- g Switch the RF POWER toggle ON. Adjust the RF POWER LEVEL control until the RF POWER meter indicates forward power between 50 and 250 watts. The plasma should strike and the glow should be visible. Adjust the power level to the desired level and start timing your run.
- h The FWD (forward) or REFL (reflected) power may be monitored by flipping the toggle. This is located just below the RF POWER meter.
- i To terminate the plasma, switch OFF the RF POWER.
- j Switch OFF the GAS FLOW toggle switch.
- k When the Chamber has pumped down to .200 Torr, switch OFF the Vacuum toggle switch.
- l Unlock the door and turn the to PURGE toggle switch ON. The door should vent within 1 minute.
- m Turn off the PURGE toggle switch and unload the completed samples.
- n Close the chamber door and turn the lock. .
- o Switch the VACUUM toggle to ON. The pressure should fall to less than .200 Torr within 30 seconds. Turn to Vacuum toggle switch to switch OFF. The chamber should remain pumped down the Vacuum off when not in use.

8 Problems/Troubleshooting

- a If there is no plasma after turning the power on, recheck the POWER and Gas flow parameters. If these are normal, stop processing and notify process personal.

Sample Etch Rates

Wafer processing parameters for 4 inch silicon samples

1 minute hot plate *pre-bake* at 115° C
 HMDS fumes 3 minutes
 1 minute hot plate *soft-bake* at 105°C
 Expose 5.5 seconds on MA6
 Developed 25 seconds
 1 minute hot plate *hard bake* at 120°C

Asher Parameters

Resist	O ₂	Power/watts	Time/min	Etch Rate Å/min
1813	100	100	10	134
	200	200	15	248
1818	O ₂	Power/watts	Time/min	Etch Rate Å/min
	100	100	10	210
	200	200	15	186