

Minnesota Nano Center Standard Operating Procedure

Equipment Name: Asher

Coral Name: asher

Model:

Location: Bay 2

Revision Number: 2

Revisionist: Tony Whipple

Date: 9/03/13

1 Description

The Technics Oxygen Asher uses oxygen plasma to chemically remove photoresist and other organic compounds 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



Fig 1 Control Panel

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 ~30Sec.

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7 Operating Instructions

- a Open the chamber door to the open when vented.
Switch **PURGE** to **OFF**.
- b The samples can be loaded inside the chamber two way.
 - 1 Perpendicular loaded in a quartz boat. The boats are stored above the Asher system.
 - 2 Horizontally directly on the system grate or on a foil boat, it has a faster rate, but the wafer heats up faster.

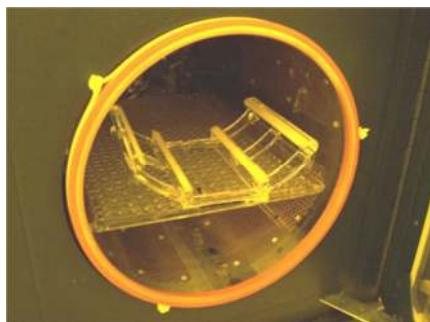


Fig 2 chamber with door open

- 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 in about 1 to 2 min. This can be monitored on the Torr gauge located on the upper left front panel.



Fig 3 Pressure gauge

- 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, it might damage the system. 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.
- g Switch the **RF POWER** toggle **ON**. Adjust the **RF POWER LEVEL** control until the **RF POWER** meter indicates forward power between 50 and 400 watts. The plasma should strike and the glow should be barely visible – light blue. 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 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.

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- 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 1 to 2 min. 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 setup conditions
 Wafer processing parameters for 4 inch silicon samples
 1 minute hot plate *pre-bake* at 115° C
 HMDS fumes 2 minutes
 Dispense resist and spin for 30 seconds
 1 minute hot plate *soft-bake* at 105° C
 1 minute hot plate *hard bake* at 120° C

	Vertical		Horizontal	
	S1813	S1818	S1813	S1818
100 Watts	38 Ang/min	51 Ang/min	68 Ang/min	88 Ang/min
250 Watts	354 Ang/min	592 Ang/min	298 Ang/min	260 Ang/min

Resist removal rate values, various resists, power, and orientation.