	INDIAN INSTITUTE OF TECHNOLOGY BOMBAY **MATERIALS MANAGEMENT DIVISION** **Powai, Mumbai 400076.**

Ref. No. 122 (PR: 1000018311) **RFx. No.6100000842**

Technical specifications for Plasma Asher

1.Process Chamber Module:

1.1 Process chamber

a- Chamber size: Φ380 mm x 250mm (H) - indicative

b- Chamber material preferably Aluminum or SS

c- Wafer loading/unloading type: Top plate open type

d- Port: Viewport, Gauge port, pumping port, Gas port

1.2- Showerhead unit

a- Process gas injection through a showerhead

b- Uniform gas flow suitable for 4” wafer process

c - Showerhead material: Aluminum

d- RF isolator: Ceramic

e- PE (Plasma Enhanced) compatible 1-stage showerhead

1.3 -Substrate chuck

a- Substrate size: ≥ 4 inch

b- Capacity: 1(one) substrate

2.Power supply Module

2.1 RF generator

a. Frequency: 13.56MHz

b. Output power: 600W in a 50Ω

c. Digital RF power meter

2.2 RF matching network

a. Operation type: Automatic type

b. Frequency: 13.56MHz

2.3 RF cable kit

3. Vacuum Module:

3.1 Vacuum pump

a. Rotary pump: 600 L/min
b. Oil rotary pump
c. Ultimate pressure: < 5×10^{-3} Torr

3.2 Vacuum Pressure gauge

a. Convectron gauge: 760 torr ~ 5×10^{-3} torr
b. Pressure readout & cable kit
c. ATM switch

3.3 Vacuum valves & lines

a. Main valve: Pneumatic type angle valve
b. Line: Auto vent line, SUS hard line and flexible bellows line

4. Gas Delivery Module:

4.1- Used gases & flow control

a. Process:
   - O_2: MFC (100-200 sccm)
   - N_2: MFC

b. Purge & Vent: N_2: Metering Valve

4.2- Gas valves & gas line

a. Swagelok Pneumatically operated diaphragm valve, which is Air-actuated
b. The tubing of 316 L stainless steel, micro-polished
c. Metering valve for N2 purge & vent
d. All gas lines are welded with VCR fitting.
e. The gas line is helium-leak tested to 10^{-9} Torr·L/s

5. Control Module:

5.1- System control

a. The system is controlled by PC automatically & manually
b. Touch panel
c. Including analog & digital input/output card
d. User-friendly screen & easy Graphic User Interface (GUI)
e. Process data logging, process control software
f. Malfunction interlock
g. Vacuum pressure, RF power, Temperature configuration
h. Recipe edit, save, download, run system control

5.2- Electrical control panel

a. Electrical power drive panel (ON/OFF/Emergency switch)
b. RF generator control panel

c. Vacuum gauge controller panel
d. MFC controller panel

6. Frame Module:
   a. Mild steel made system frame
   b. 19-inch control panel mountable
   c. Easily movable casters & leveling foots

7 -Warranty:

Manufacturer warrants for a period of one (1) year from the final acceptance.

8- Process control in manual:

a. Please provide flow, pressure, and temperature dependence on etch rate and uniformity.

9- Process Demonstration for onsite acceptance:

The demo process of etching on standard polymer samples should be carried out todevelop the process. The process recipe needs tobe replicated by the installation engineers on asimilar set of samples after the installation of themachine is completed at the IITB site.

Vendor should provide measurement results offactory etch profiles, like SEM images, AFM results and profilometry step height and it should latermatch with onsite etch and measurement profiles,using IITBNF in house SEM, AFM, and profilometer for side wall angle, roughness, and etch rateparameters.

a. Leak Check < 3mTorr/min
b. Leak Rate 1e-10 Torr L/sec
c. PR High Rate NU (>100 nm/min)
d. PR Low Etch rate NU (10nm/min)
e. Linear etch rate with time (does not saturate till 5000 um & 180s)
f. Process control of power vs etch rate should be linear
g. Heater uniformity < 3%
h. Plasma stable at power <20W

10- Packaging and shipment

- Each Package should not exceed 900mm W, 1900mm D, and 1900mm H

11- Essential Requirements:

a. List of at least 5 international semiconductor industrial customers.
b. List of 5 international academic/lab customers.
c. List of Indian customers (note repeat purchases if any).

12- Mandatory Documentation:

a. The results obtained from the system (before and after ashing microscope/ SEM images, etc) and the other necessary and supporting documents to be provided
b. The tender must provide an installation scheme showing the physical space (footprint) of the machine(s) as well as space required for routine access and all installations including the gas lines, MFCs, and other related accessories.
c. The compliance sheet should be provided by the vendor. The absence of the compliance sheet may result in the cancellation of the purchase order.
d. For each compliance, supporting evidence such as manuals, SEM images, AFM results and other necessary and supporting documents needs to be provided.
e. The complete manuals of the system, the parts of the system, and troubleshooting
f. The safety features and precautions for the system to prevent errors, emergency shut down options, and procedures should be provided.
g. System applications are to remove resist and their residues, ashing, and descum.
h. System capabilities to be listed and the list of recipes to be provided.
i. Cleaning procedure of the chamber between the process to be provided.
j. The user manual, Maintenance, troubleshoot events, necessary and supporting documents for the system, and other parts used in the system to be provided.
k. The library of recipes and other necessary and supporting information for deposited materials to be provided.
l. The vendor should have an Indian representative which can take care of the urgent troubleshooting or any process related queries on an urgent basis.

13- Process:

a. Ashing material: resist descum and strip
b. Substrate size: small pieces- Max. 4inch wafer
c. Product yield: 1 wafer/run for 4inch.

14- Configuration (to match or exceed)

a. Substrate size & load capacity: Piece-Max. 4inch wafer
b. Source (gas) injection type: Showerhead type
c. RF generator & Matching network: 600W (@13.56Mhz)
d. Rotary pump
e. PC control with Touch panel
f. System body: 800mm(w)* 800mm(d)* 1,200mm(h) - indicative

   The substrate holder with substrate heater with maximum temperature 300 deg C