TECHNICAL SPECIFICATION FOR MAGNETRON SPUTTERING SYSTEM

1. VACUUM CHAMBER:

 stainless steel, front-loading, high vacuum, D shaped, water-cooled chamber and having

dimension 400mm (W) x 400mm (D) x 500mm (H) with view port in chamber door. It

should have provision for three targets.

 A set of easily removable stainless steel chamber liners.

2. MAGNETRON SOURCE:

 Two numbers of 2” flexible sputter sources. Provision for adding one more source.

 High power Nd-Fe-B magnets which needs to be isolated from the water.

 Easy to change target without breaking any internal seals.

 User-adjustable tilt angle (45°) with respect to the plane of the substrate

 The magnetrons to be arranged in “sputter up”, confocal configuration.

 An electro pneumatically operated target shutter to be provided for each source.

3. POWER SUPPLIES:

 Two numbers of 1 kW DC power supply. Provision needs to be provided to add one more AC

power supply.

4. SUBSTRATE HOLDER WITH HEATER:

 The rotary substrate work holder and associated fixture to be designed to hold up to

a 4- inch substrate.

 The rotary drive mechanism to be provided for the continuous rotation of the

substrate with adjustable speed up to 30 rpm.

 Resistive substrate heater to be provided to heat 4” substrate from R.T to 500 deg. C.

Provision needs to be provided for 100 deg. C.

 Temperature measurement using ‘K’ type thermocouple.

 Temperature controlled using digital PID controller.

 An electro pneumatically operated substrate shutter should be provided.

5. MASS FLOW CONTROLLER:

 Mass flow controller for Argon and Oxygen gas with necessary fitting is provided - 2No’s. However, provision needs to be provided for one more controller.

6. VACUUM PUMPING SYSTEM:

 A dual stage rotary pump with displacement capacity of 12 m3/hr

 A diffusion pump having a pumping capacity of 600 lit/sec .

 An inbuilt liquid nitrogen trap to be incorporated below the high vacuum valve.

 Stainless steel vacuum pipelines.

 1 inch electro pneumatic right-angle valves for roughing and backing.

 The valves needs to be interlocked to avoid accidental opening by operators.

 A vent valve is necessary

 Motorized high vacuum valve(poppet) of suitable size to be

mounted above the high vacuum pump and can be operated in

throttling mode during sputtering.

 A needle valve is necessary.

 A digital gauge with two numbers of high pressure pirani gauge

monitor are necessary to look at the pressure in the range of 1000

mbar to 10-3 mbar.

 A digital inverted magnetron sensor is necessary to monitor the

pressure in the range of 10-2 mbar to 10-7 mbar.

 The ultimate vacuum of better than 1 x 10-6 mbar range needs to

be achieved in clean, cold, degassed, chamber after high vacuum

valve opens and initially back filled with pure and dry nitrogen

gas and liquid nitrogen trap filled with liquid nitrogen.

7. CONTROL CONSOLE:

 A separate control is provided for mounting the gauges display

unit and control for substrate rotation, heating, and magnetron

power supply, etc.

 Manual ON/OFF switches

 All necessary safety interlocks

8. WARRANTY:

 Two years from the date of installation.