



**MAHATMA GANDHI UNIVERSITY**

**Registrar**

**Tender No: AdBVII/ET/20/SPAP/PHY2/2018**

**Dated: 04/1/2018**

**NOTICE INVITING TENDER**

**(Tender No: AdBVII/ET/20/SPAP /PHY2/2018)**

**The Registrar, Mahatma Gandhi University, Kottayam** invites online bid (technical and financial bid) for supply and installation of the scientific equipment **DC& RF Sputtering unit** from reputed firms

1	Name of the scientific equipment	<b>RF &amp; DC Magnetron Sputtering unit</b>
2	Earnest money deposit (EMD)	Rs. 25000/-
3	Tender submission fee	Rs. 3750/-
4	Period of supply and installation	Within 60 days from the L/C opening date
5	Mode of submission of Bid	Online
6	Tender Documents	Can be downloaded from the website <a href="http://www.etenders.kerala.gov.in">www.etenders.kerala.gov.in</a>
7	Last date and Time of submission of tender by online	14.02.2018 ; 12.00 pm
8	Last date and Time of submission of relevant documents by speed post	16.02.2018 ; 12.00 pm
9	Date and time of opening of bid opening	16.02.2018 ; 2.00 pm

General tender documents and tender schedule can be downloaded in A4 plain size paper free of cost from the website [www.etenders.kerala.gov.in](http://www.etenders.kerala.gov.in). **Duly filled up and signed tender schedule along with relevant documents should also be sent to**

**The Director**

**School of Pure & Applied Physics**

**M.G. University,**

**Kottayam,**

**Kerala Pin-686560**, by speed post so as to reach before the date and time specified. The cover containing the documents should super scribe the name of the scientific equipment, tender number, and last date of submission of tender.

Documents to be submitted along with bid through online/speed post.

Sl.No	Through online	Through speed post
1	Scanned copy of dealership certificate	Copy of valid dealership certificate
2	Scanned copy of duly filled e-payment form	Duly filled e-payment requisition.
3	Scanned copy of other certificates required, if any, for tender acceptance	Copy of other certificates required, if any, for tender acceptance.
4	Scanned Copy of duly filled preliminary Agreement in stamp paper of Rs.200/-	Preliminary Agreement in original
5	BOQ	Not Required

## DC & RF Sputtering unit-Technical specifications

---

### Chamber requirements

- 1) The chamber should be made with high quality non magnetic quality stainless steel with SS 304 grade having approximate dimensions of 14" (W) x 14"(D) x 24" (H), which gives excellent performance in high temperature, corrosive environment without adding to contaminations. It should also be equipped with a motorized lifting system if heavy lifting is required.
- 2) Viewing ports for visual confirmation of depositions
- 3) Appropriate chamber cooling mechanism. The skin temperature should not go beyond 50° C
- 4) Appropriate number of thermocouples for adequate temperature control. additional feed-throughs are desirable
- 5) Base plate must support 1 no. central port for on-axis cathode source, 2 nos. inclined angle ports for confocal cathode sources; one quartz crystal sensor head port; appropriate gas ports (tiltable magnetron sources would also be considered)
- 6) Water chiller with circulation (if required) must be supplied. Chiller strength should be adequate to match any future modifications.

### Pumping requirement/ Chamber Pressure control

- 1) Min Chamber pressure (base pressure):  $\sim 1 \times 10^{-6}$  mbar or better with turbo molecular pumping with fast vacuum attainable.
- 2) Throttle/gate valve for adjusting required operating pressure
- 3) Digital pressure gauges and control systems must be integrated/accompanied
- 4) High stability around controlled set point (within 5%)

### Substrate requirement

- 1) Must support 2" diameter or higher sized substrate wafer and provide uniform heating to the entire substrate
- 2) Substrate rotation to be provided to ensure homogeneous deposition on the entire substrate area
- 3) Manual/PLC controlled substrate shutter must be provided
- 4) Adjustable source to substrate distance will be preferred

#### **Gas supply/mass flow units**

- 1) Two integrated gas manifold must be provided with one mass flow controller for each magnetron
- 2) The MFC should be calibrated for the Argon (up to 100 sccm or better)
- 3) Gas admission must be provided through the sputter gun to increase deposition yield.

#### **Magnetron Source:**

1. Magnetron sputter sources 2 nos. (water cooled) should have semi-flexible head with DC or RF powered capability to sputter like Niobium, Vanadium etc. and should handle magnetic material like Perm-ally, cobalt etc. for 1 mm thick with operating pressure ~ 10-3 mbar (Need adequate technical information and quantitative documents)
2. Planar geometry for "sputter up" configuration incorporating 4 magnetron sputtering electrodes accepting 2" diameter targets.

#### **RF plasma power supply**

- 1) RF output power: 300 watt or higher with auto-matching network (Huttlinger/Advance Energy/Seren make )
- 2) Frequency: 13.56 MHz
- 3) Primary input power: 210-230 VAC/ 50 Hz
- 4) Reflection power: as minimum as possible for >2 hr of continuous operation
- 5) Power stability: +/- 1%
- 6) Low noise and harmonic distortion

#### **DC power supply**

1. Pulsed DC power supply : 1.5-2 kW - 1 No

#### **Matching network**

- 1) Automatic matching network for all operation range must be integrated and demonstrated.

#### **Required deposition parameters**

- 1) Operating temp range: RT-800 C
- 2) Materials deposition rate: >5 microns/hr

- 3) Non-uniformity of thickness over the entire deposition area: <5%

### **Mandatory Requirements**

- 1) The system must be fully upgradable in the future to a three source RF+DC co-sputtering system with additional MFCs for each gun. Vendors must certify that they have the technical capability for this requirement.
- 2) Vendors must furnish a list of competent national/international client base where they installed similar systems with their full contact details.
- 3) CE certification for the power supplies
- 4) Supply appropriate Chiller for cooling.
- 5) Provide UPS for Chiller water circulation for uninterrupted cooling
- 6) A 3 year warranty must be provided

### **Inspection and Training**

- 1) Supplier should furnish all the certificates from competent authorities that are required for instrument safety.
- 2) They should perform a thorough performance check of the involved components and furnish details such as calibration details of thermocouples, controls and set point deviations etc.

### **Installation, commissioning and start-up**

- 1) Supplier is responsible for the installation, commissioning and start up of their system by specialist
- 2) Supplier should provide detailed pre-installation requirements including support staff, utilities, space for installation and process demonstration at SPAP MGU, Kottayam
- 3) The supplier should demonstrate a complete experiment which involves synthesis of a metal/compound semiconductor material, preferably Copper or TiO<sub>2</sub>. The synthesized materials will be characterized by XRD, UV-VIS spectrometer and electron microscopes.

**Vendors must furnish a list of competent national/international client base where they installed similar systems with their full contact details.**

### **Optional**

- 1) UPS system of required strength
- 2) Additional 2 year AMC

### **Special Conditions**

1. Instrument should have a warranty of at least **three years** and should have frequent visits from both service engineer and application scientist. Additional 2 years AMC should be quoted as optional.
2. There should be at least one service engineer and one application scientist based in India with onsite training facility on the same quoted instrument. Training should include operation, software applications, analysis, handling and maintenance of system.
2. A good record in supply and service to other research institutes will be considered as a positive point for a particular company. User list of similar equipment supplied recently in India should be provided with the above mentioned specifications.
3. Laboratory floor space, electrical power requirements, earthing, room temperature/ humidity requirements etc. should be mentioned appropriately.
4. All necessary accessories should be supplied with the instrument, as per standard package offered, including complete set of service and operation manuals for diagnosis, trouble shooting, maintenance and electronic circuitry (hard and soft copies).
5. The Delivery Schedule, Payment Terms & Warranty/Guarantee etc must be clearly indicated in the technical bid.

The bids will be opened at the date and time specified. Further details can be had from the Director, School of Pure & Applied Physics on all working days during working hours. The bidders are advised to submit their bid well in advance to avoid any kind of network issues. If relevant documents through speed post are not submitted with in time, the tenders will not be considered.

The undersigned reserves the right to reject any or all the tender without assigning any reason whatsoever.

**Registrar**