

Pl.A1/Phy/2505-3/2021

**Department of Physics, University of Kerala, Kariavattom,  
Thiruvananthapuram, Kerala, India – 695 581, Ph: 91 471 2308920**

Date: 08/11/2021

**E-Tender Notice**

Department of Physics, University of Kerala, Thiruvananthapuram invites open tenders through e-Procurement (in two bid system) for the purchase of Sputtering unit suitable for the fabrication of thin film devices.

Last date and time for submission of tender online	:07/12/2021 5 pm
Last date and time for submission of tender offline	: 07/12/2021 5 pm
Date and time of opening of tender	: 10/12/2021 11 am
Hard copies of the sealed tenders to be submitted to the office of	<b>The Registrar, University of Kerala, Senate House campus, Palayam Trivandrum- 695 034, Kerala Tel: +91-471-2305631, 2386202 (O)</b> <b>e-mail: regrku@gmail.com</b>
For technical details contact	<b>Dr. Deepa K. G., Assistant Professor, Department of Physics, University of Kerala, Thiruvananthapuram, Ph. No.9632784886</b>  E-Mail: deepa@keralauniversity.ac.in

For further details logon to [www.etenders.kerala.gov.in](http://www.etenders.kerala.gov.in)

**Technical specifications of the required DC and RF magnetron sputtering system**

Sl. No.	Part name	Specifications
1	Sputtering Chamber	SS 304 cylindrical/ rectangular D shape chamber with water cooled appropriate size, of 300X300X400 or more SS liner and easy access door. Provision to upgrade future with other process. 2 ports for sputter guns in confocal arrangement and sputter-up configuration and 2 View ports for viewing target and substrate.
2	Magnetron guns for sputtering	Magnetrons with 2 inch flexible sputter sources, sputter up configuration, high power Nd-Fe-B magnets which can be easily replaceable, user adjustable tilt angle ( $\pm 45^\circ$ ) with respect to the plane of the substrate Electro-pneumatically operated target shutter for each magnetron. Provision to include at least one additional gun in future upgradation
3	Substrate holder Assembly with sample holder.	Substrate size of 4 inch dia or multiple substrates of 1'' 4 Nos and 2''- 2 Nos. Substrate temperature 800 °C with temperature uniformity equal or better than $\pm 5^\circ\text{C}$ . A rotary drive mechanism for the substrate holder to achieve substrate rotation with variable speed of 5 – 20 rpm. PID controlled programmable temperature controller; K type thermocouple for Temperature measurement.
4	DC Power supply	DC supply reputed Make, 1kW along with all the necessary cables; Front panel display and controls, with arc suppression capability Input: $\approx 230\text{V AC}$ , 50 Hz, Single Phase Output : 150 – 1000 V, 0 to 1A (DC) Output power – 1 kW (DC)
5	RF power supply and matching network	300W RF supply 13.56MHz with auto matching network along with all the necessary cables to connect to both magnetrons. Suitable for sputtering and

		capable of automation. Facility to ramping to set-point. Seren, T&C, AE or equivalent
6	High vacuum pump	High Vacuum pumping system having the capacity of min of 400Liters/sec or more. Future provision to Upgrade to turbo vacuum pump
7	Backing Vacuum pump for Sputtering chamber	Rotary Vacuum pump 12m <sup>3</sup> /hr or higher with Electro pneumatically operated autoshut off valve, etc
8	Vacuum Gauges	Digital High Pressure Pirani gauge with two Pirani gauge head to monitor the Roughing and backing pressure on the Pirani gauge in the 1000 mbar to 1x10 <sup>-3</sup> mbar range. Digital Inverted Magnetron gauge with set point controller having one gauge head with measuring range of 10 <sup>-3</sup> mbar to 10 <sup>-7</sup> mbar.
10	Vacuum lines & valves	Stainless steel vacuum pipelines. Inbuilt Liquid Nitrogen Trap is incorporated below High Vacuum Valve. All the valves have to be electrically interlocked to avoid accidental opening by operators. Electromagnetically operated vent valve. N <sub>2</sub> vent valve
11	Safety and interlocks	Necessary safety devices and interlocks are provided for the entire unit for operator's Safety.
12	Frame	Support frame for the system with corrosion resistant material or coating (Powder coated) and clean room compatible.
13	Instrumentation on rack	For mounting all the electronics and controls, with corrosion resistant material or coating (powder coated) and clean room compatible.
14	Chiller	Chiller of sufficient capacity along with Tubing to support all the Cooling requirements of the deposition system with temperature indicator.
15	Spares	Additional full set of O-rings, gaskets etc. necessary for vacuum-tight joints/seals.
16	RF grounding	Proper RF grounding as per the standards for the Sputtering system is to be done with copper strips and earth pit during the time of installation of the system by vendor.
17	Housing cabinet	A standalone Industrial standard control console is provided which will be integrated to the system. All the controllers and display units will be mounted on the control console. The unit is mounted on 4 castor wheels for mobility and easy maneuverability
18	Mass Flow Controllers	M/s. Bronkhorst/MKS / similar reputed make Two numbers of mass flow controller for Argon, Oxygen gas having flow rate of 2-100 sccm and 2-50 sccm

		respectively each controlling the flow rate of the gas along with necessary electromagnetic valve, manual valves, filters, tubing and fittings are to be provided.
19	Gas cylinders	47 litres ultrahigh purity filled Argon and Oxygen gas cylinders.
18	General terms	<p>a) Base Vacuum: better than or equal to <math>1 \times 10^{-6}</math> mbar. Pump down to <math>1 \times 10^{-6}</math>mbar in 1 hour or less from clean dry and empty after N<sub>2</sub> vent.</p> <p>b) Sputtering uniformity within 5%.</p> <p>c)Pre-despatch inspection should be allowed and complete operation of the system and process should be demonstrated.</p> <p>d) Original invoice and AWB to be submitted for all imported items with warranty details.</p> <p>e) Copies of Brochures of all imported parts should be presented along with the Tender.</p>

**Optional:**

- 1) Digital thickness monitor with two additional quartz crystals
- 2) 2 years annual maintenance

**Warranty: 2 Years**

### **General Conditions:**

1. Every tenderer should submit Tender fee of **Rs. 2,500/-**
2. Every tenderer should submit Earnest Money Deposit (EMD) of **Rs. 20,000/-**
3. The tender shall be submitted in the two bids viz. Technical Bid and Financial Bid. Only those qualified in technical bid will be eligible for participating in financial bid. A presentation regarding the technical specification and item to be supplied shall be done before the technical evaluation committee if requested.
4. The bidder should be a manufacturer or their dealer specifically authorized by the manufacturer to quote on their behalf for this tender as per Manufacturer Authorization Form and Indian agents of foreign principals, if any, who must have designed, manufactured, tested and supplied the equipment(s) similar to the type specified in the "Technical Specification". Such equipment must be of the most recent series/models incorporating the latest improvements in design. The models should be in successful operation for at least one year as on date of Bid Opening.
5. **Compliance Statement:** Along with the technical details provide a tabular column indicating whether the equipment quoted by you meets the specifications by indicating 'YES' or 'NO'. If 'YES', support the claim by providing original brochures. **Venders should provide clear brochures/data sheets about the equipment and its working. Also include adequate proof for the claim regarding the performance.**
6. **Reference:** Names of Institutes with contact person and telephone/ email where similar equipment supplied by you in India [Preferably South India] shall be mentioned in the bid.
7. Incomplete & conditional tenders and tenders received after the due date will be summarily rejected without assigning any reasons thereof.
8. The price should be inclusive of all taxes, duties, transportation, insurance, installation etc. Nothing extra will be paid in addition to the quoted rate. Any amount in Indian rupees for installation, commission, labour, spares, service etc shall be entered in item 2 of BoQ.
9. **Payment Terms:** 90% payment shall be made through irrevocable LC on presentation of complete and clear shipping documents and balance 10% of the amount shall be released after the receipt, installation commissioning and acceptance of the equipment.

10. Validity of tender: Tender submitted shall remain valid at least for 120 days from the date of opening the tender. Validity beyond 120 days, from the date of opening of the tender shall be by mutual consent.
11. Delivery and installation: Proposed delivery schedule should be mentioned clearly. Delivery and installation and training (one week) should be made at the Department of Physics, University of Kerala, Kariavattom campus, Trivandrum without extra cost(inclusive of documentation, demurrage, customs duty, clearance and transportation charges). University of Kerala will provide customs duty exemption certificates if required.
12. Service facility: Supplier should mention their details of service setup and manpower in Thiruvananthapuram who are responsible for after sales support.
13. The model number, make, and a printed literature of the product shall submit positively.
14. In case of any dispute, the decision of the University authority shall be final and binding on the bidders.
15. The undersigned reserves the right to reject any or all of the tenders received without assigning any reason thereof.
16. The quoted item should be under **comprehensive warranty for 2 years** or more.
17. If any component is found to be defective during the warranty period, the vendor has to replace the defective item immediately at their own cost.
18. For any queries please contact, Dr. Subodh G. Assistant Professor, Department of Physics, University of Kerala, Thiruvananthapuram, Ph. No. 9633983404 E-Mail: gsubodh@gmail.com

**Documents to be Uploaded**

- 1 Signed Compliance Matrix
2. Detailed Technical Brochure
3. Under taking of support for next 10 Years
4. BoQ
5. Detailed Financial Bid
6. Hard copy of Bank Guarantee if opted

**The Head,  
Department of Physics,  
University of Kerala,  
Kariavattom,  
Thiruvananthapuram,**

**Kerala - 695 581.**