

**Department of Physics**  
**University of Kerala, Thiruvananthapuram-695581**

**TENDER –PHY/PURCHASE/RFS-RTR/01/23**

Date: 27/12/2022

**E-Tender Notice**

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

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| Start Date and time for submission of tender online                | 27.12.2022 : 5pm  |
| Last date and time for submission of tender online                 | 13.01.2023 : 5pm  |
| Last date and time for submission of tender offline                | 16-01-2023 :03pm  |
| Date and time of opening of tender                                 | 17-01-2023 : 11 am  |
| Cost of tender document  | Rs: 3600/-  |
| Validity of tender   | 120 days  |
| Completion/delivery period   | 60 days   |
| Hard copies of the sealed tenders to be submitted to the office of | The Head,<br>Department of Physics,<br>University of Kerala, Kariavattom Campus,<br>Thiruvananthapuram - 695581   |
| For technical details contact                                      | <b>Dr. Deepa K. G., Assistant Professor, Department of Physics,<br/>University of Kerala, Thiruvananthapuram,</b><br><br><b>Ph. No.9632784886</b><br><br>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 RF magnetron sputtering system**

| Sl. No. | Part name                                     | Specifications  |
|---------|---|---|
| 1       | Sputtering Chamber                            | <p>Stainless steel SS-304, front-loading, high vacuum and water cooled, D shaped chamber is having approximate dimension of 400mm (D) x 400 mm (W) x 500mm (H).</p> <p>A front opening quick access door is provided for loading &amp; unloading of the substrate and materials.</p> <p>A high vacuum compatible, toughened glass view port with a manual shutter to avoid material deposition on the view port is provided on the door.</p> <p>One set of removable stainless steel liner for easy cleaning.</p> <p>Baffle plate to prevent debris from being deposited on electrodes and the high vacuum valve.</p> <p>The chamber, all stainless steel components &amp; sub-assemblies are electro-polished.</p> |
| 2       | Magnetron guns for sputtering                 | <p>2" indirectly water cooled, flexible sputter source in sputter up configuration – 1 No.</p> <p>High power Nd-Fe-B magnet isolated from water which can be easily replaceable, user adjustable tilt angle (<math>\pm 45^\circ</math>) with respect to the plane of the substrate</p> <p>Electro-pneumatically operated target shutter.</p> <p>Provision to include at least one additional gun in future upgradation</p>  |
| 3       | Substrate holder Assembly with sample holder. | <p>Substrate size of 4 inch dia or multiple substrates of 1" 4 Nos and 2"- 2 Nos.</p> <p>Substrate temperature 500°C with temperature uniformity equal or better than <math>\pm 5^\circ\text{C}</math>.</p> <p>A rotary drive mechanism for the substrate holder to achieve substrate rotation with variable speed of 5 – 20 rpm.</p> <p>PID controlled programmable temperature controller; K type thermocouple for temperature measurement.</p>   |
| 4       | RF power supply and matching network          | <p>One number of M/s. T &amp; C make (Imported) 300W, 13.56 MHz RF power supply with auto matching network, network controller and with necessary cable &amp; RF Grounding. Facility to ramping to set-point. Seren, T&amp;C, AE or equivalent.</p>   |
| 5       | High vacuum pump                              | <p>Oil diffusion pump having the pumping speed of 600ltrs/sec for nitrogen</p> <p>or</p> <p>turbo vacuum pump with similar capacity</p>   |
| 6       | Backing Vacuum pump for Sputtering chamber    | <p>Rotary Vacuum pump 12m<sup>3</sup>/hr or higher with Electro pneumatically operated auto shut off valve, etc</p>   |
| 7       | Vacuum Gauges                                 | <p>Digital gauge with two numbers of high pressure pirani gauge monitor the pressure in the range of 1000 mbar to 10<sup>-3</sup> mbar.</p> <p>Digital gauge with one number of inverted magnetron sensor monitor the pressure in the range of 10<sup>-2</sup> mbar to 10<sup>-7</sup> mbar.</p>  |
| 8       | Vacuum lines & valves                         | <p>Stainless steel vacuum pipelines.</p> <p>Inbuilt liquid nitrogen trap of 1.4 Lt Capacity.</p>  |

|    |                         |  |
|----|-------------------------|--|
|    |                         | <p>1-inch electropneumatic right angle valves for roughing and backing. The valves should be electrically interlocked to avoid accidental opening by operators.</p> <p>A fine needle control valve to admit N<sub>2</sub> gas into the process chamber.</p> <p>A vent valve to break the vacuum at the end of the process to open the chamber.</p> <p>Motorized high vacuum valve of suitable size to be mounted above the high vacuum pump and can be operated in throttling mode during Sputtering.</p>  |
| 10 | Safety and interlocks   | Necessary safety devices and interlocks are provided for the entire unit for operator's safety.  |
| 11 | Frame                   | Support frame for the system with corrosion resistant material or coating (Powder coated) and clean room compatible.   |
| 12 | Instrumentation on rack | For mounting all the electronics and controls, with corrosion resistant material or coating (powder coated) and clean room compatible.   |
| 13 | Spares                  | Additional full set of O-rings, gaskets etc. necessary for vacuum-tight joints/seals.  |
| 14 | 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.   |
| 15 | 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 should be mounted on 4 castor wheels.  |
| 16 | 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) The thickness uniformity is <math>\pm 5\%</math> over a 50 mm diameter substrate.</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> |
| 17 | Warranty                | The item should be under comprehensive warranty for 1 year or more.  |

**Optional items:**

|    |  |   |
|----|--|---|
| 1  | Mass Flow Controllers for Argon and Oxygen | 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 |
| 2. | Water Chiller                              | M/s. Daichi/Equivalent make water chiller unit of capacity of 0.5 TR for closed loop water cooling along with Tubing to support all the Cooling requirements of the deposition system with temperature indicator.   |
| 3. | Digital thickness monitor                  | Two additional quartz crystals should be supplied.  |
| 4. | Additional warranty                        | 2 years   |

**General Conditions::**

1. Every tenderer should submit Tender fee of Rs. 3600/-
2. 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.
3. 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.
4. **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.**
5. 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.
6. Incomplete & conditional tenders and tenders received after the due date will be summarily rejected without assigning any reasons thereof.
7. 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.
8. Payment Terms: after the supply installation and commissioning of the equipment
9. 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.

**10. 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.**

11. Service facility: Supplier should mention their details of service setup and manpower in Thiruvananthapuram who are responsible for after sales support.

12. The model number, make, and a printed literature of the product shall submit positively.

13. In case of any dispute, the decision of the University authority shall be final and binding on the bidders.

14. The undersigned reserves the right to reject any or all of the tenders received without assigning any reason thereof.

15. The quoted item should be under **comprehensive warranty for 1 year or more**.

16. 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.

17. For any queries please contact, Dr. Deepa K.G. Assistant Professor, Department of Physics, University of Kerala, Thiruvananthapuram, Ph. No. 9632784886 E-Mail: [deepa@keralauniversity.ac.in](mailto:deepa@keralauniversity.ac.in)

#### **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

**The Head,  
Department of Physics,  
University of Kerala,  
Kariavattom,  
Thiruvananthapuram,  
Kerala - 695 581**