

**FOUNDATION FOR INNOVATION AND TECHNOLOGY TRANSFER  
(FITT)**

Ref: FT/03/2171/2022

Date: 27<sup>th</sup> June, 2022

**Notice Inviting Quotation**

**TECHNICAL SPECIFICATIONS OF THERMAL VAPOUR DEPOSITION UNIT**

- 1) Vacuum Chamber:
  - Material of Construction: SS 304 Nonmagnetic stainless steel or better, “D” Shape Chamber with front door opening
  - Approximate Size: 370 to 400 mm (W) x 370 to 400 mm (D) X 410 to 420 mm (H) or better
  - Ports: 2 Nos. View Ports, Pumping port, gauge port, Other Accessories, etc.,
  - Supporting frame and work holder made of SS; SS mesh filter for pumping port.
  - Electro Polishing required
- 2) Rotatory Vane Pump:
  - Pumping capacity: 250 l/min or larger
  - Ultimate vacuum:  $\leq 1 \times 10^{-3}$  or better
  - Built in anti-suck back valve
- 3) Oil Diffusion Pump Diffstack Type with Liquid Nitrogen trap, etc.,
  - Nominal diameter: 114 mm
  - Pumping speed: 280-300 l/sec or larger
  - Ultimate Vacuum required with backing pump:  $\leq 5.0 \times 10^{-6}$  mbar or better
  - Heater: 500W-1 kW or better
- 4) Digital Vacuum Gauges with Pirani, Penning Sensors, etc.,
  - For Measuring roughing, backing and high vacuum level
  - Pirani Gauge measurement range: 0.5 to  $1 \times 10^{-3}$  mbar or better
  - Penning Gauge measurement range:  $1 \times 10^{-3}$  to  $1 \times 10^{-6}$  mbar or better
- 5) Vacuum Valves:
  - Single Combination Valve only for Backing & Roughing Operation. 4” Butterfly Type / Gate Valve for High Vacuum Operations
- 6) Digital Thickness Monitoring Unit
  - Rate Display: 3-digit auto ranging from 0.00 to 999  $\text{\AA}^\circ/\text{sec.}$  or better
  - Thickness Display: 4 digit LED auto ranging from 0.000 to 999.9 K  $\text{\AA}^\circ$  or better
  - Update Rate: Automatic varied 4/5 updates/second or better
  - Minimum resolution: 1  $\text{\AA}^\circ$  or better
  - Measurement range Typically 5000  $\mu\text{g}/\text{cm}^2$  till 20000  $\mu\text{g}/\text{cm}^2$  to max. limit or better
  - Tooling factor, density and acoustic impedance table to be supplied
- 7) Vacuum Collar, Vent Valve and Fine Control needle valves
- 8) Evaporation source holders with LT Electrode assemblies: 02 Sets or more
- 9) LT Power Supply with Thyristor Controller : 200 Amp at 10 V transformer or better
- 10) Thyristor Controlled HT Power supply with H.T. Cleaning with feedthrough and 5000V DC open circuit, 3500 V and 50 mA or better
- 11) Substrate to source distance should be between 20 mm or greater
- 12) Source Shutter for evaporation sources
- 13) Mounting Frame with castor wheels and lock pad for mobility
- 14) Control Console for operating the On / Off switches, shutter, mains, DTM, etc.,
- 15) Safety Interlocks like water flow switch, thermostat, vacuum pump wired through circuit breakers, vacuum switch for LT line, Overload protection devices for vacuum pump motors, etc.,
- 16) Operation Manual and first charge of oils for rotatory and diffusion pumps to be provided.

- 17) Separate meters to be provided for LT/HT current read outs. Thyristor controller/8 Amp Dimmer set based operation for output power variation.
- 18) Substrate heater: Max rating 350 °C or better with resolution of 1 °C or smaller/Temperature control on front panel
- 19) Substrate rotation: 20 RPM or better. Thyristor control for varying rotation speed.
- 20 ) Water Chiller: Water Chiller of 1.0 TR Capacity with 50-60 L Water Tank Capacity or better specification for cooling purpose of thermal evaporation system. Water Chiller Should be of OEM make or Reputed make with Service Support in Delhi
- 21) Spares & Consumables
  - a. 200 Amp Dimple Type Molyboats for Gold Deposition- 10 Nos.
  - b. 200 Amp Tank Type Moly Boats for other material Deposition- 10 Nos.
  - c. 100 Amp Tungsten Basket- 20 Nos.
  - d. Quartz Crystals for Thickness Monitor- 20 Nos.
  - e. Diffusion Pump Oil- 200 ml
  - f. Rotary Pump Oil- 5 Litre
  - g. Gold Granules- 10 grams
  - h. Chromium Granules- 100 grams
  - i. Silver Granules- 100 Grams
- 22) Minimum Warranty: 2 Years. 4 Service Visits (Quarterly Visits) are mandatory during Warranty Period for periodic maintenance of System.
- 23) System Breakdown: System can't be under breakdown more than 72 Hours during Warranty. If System is under break down more than 72 Hours, Supplier has to provide Coating Services to user locally in Delhi at Supplier cost.

**Mandatory Requirements:**

Leak Testing ( $10^{-9}$  mbar lit/Sec range) should be demonstrated with HMSLD at IIT Delhi.  
 Services to be provided by OEM payroll engineer only. Services by Agents not acceptable.  
 Prebid Visit: Supplier/ Bidder has to visit Purchaser Site before submitting quotation is mandatory.  
 Inspection: Purchaser will visit Supplier for Inspection of system before despatch at Supplier Cost.  
 Necessary travel arrangement has to be made by supplier.

**Installation and Commissioning to be done at IIT Delhi for fully functional operation.**

**Terms & Conditions Details**

**Preparation of Bids:** The offer/bid should be submitted in two bid systems (i.e.) Technical bid and financial bid. The technical bid should consist of all technical details along with commercial terms and conditions. Financial bid should indicate item wise price for the items mentioned in the technical bid

**Opening of the tender:** The bid will be opened by a committee duly constituted for this purpose. The technical bid will be opened first and it will be examined by a technical committee (as per specification and requirement). The financial offer/bid will be opened only for the offer/bid which technically meets all requirements as per the specification.

**Acceptance/ Rejection of bids:** The Committee reserves the right to reject any or all offers without assigning any reason.

**Two separate sealed envelopes to be submitted for technical and financial bid (clearly labelled as "technical bid" and "financial bid") respectively.**

**Last date of submitting the bids will be 4<sup>th</sup> July, 2022 before 5:00 pm to :**

The quote should reach the following address on or before last date.

PROF. Prof. Sameer Sapra  
Department of Chemistry  
Indian Institute of Technology Delhi,  
Hauz Khas, New Delhi 110016  
Email: [sapra@chemistry.iitd.ac.in](mailto:sapra@chemistry.iitd.ac.in)  
Ph: 2659 1561

Please quote prices for FOB New Delhi, inclusive of all taxes and duties.

Quote should be in Indian Rupees for agents of Indian manufacturers, or in foreign currency, for agents of foreign manufacturers, and needs to be valid for at least three months.

Attach all the technical literature and a list of similar installations done in India.

If the quote is being submitted by a representative of the manufacturer, a valid agency-ship or dealership certificate authorizing the agent to quote to IIT Delhi on behalf of the manufacturers should be enclosed. The principal and the vendor, both, are not allowed to quote for the same product.

Complete set of manuals for the operation of the equipment should be given.

Please specify all of your terms and conditions clearly, including delivery period.

Mode of payment for purchases in foreign currency are through irrevocable letter of credit, or through wire transfer on delivery. Only bank charges within India are payable by FITT, IIT Delhi, all bank charges outside India are the responsibility of the seller. For purchases in INR, payment is on delivery.