

**Domestic Tender**  
**Request for Quote (India-based vendors only) for a Custom**  
**Electron Beam Evaporator compatible with a Glovebox workstation.**  
**(Last date: 17<sup>th</sup> October 2024)**

This is a Request for Quote (RFQ) from **Class I and Class II local suppliers/manufacturers** only for the procurement of a Customised Electron Beam Evaporator in the Glovebox workstation (**Glovebox not required**), for the Centre for Nano Science and Engineering (CeNSE) at the Indian Institute of Science (IISc), Bangalore. IISc is India's best institution of higher learning and the Center for Nano Science and Engineering is home to one of the best academic fabs in the world that houses a 14,000 sq. ft. cleanroom.

**Only the Indian Original Equipment Manufacturer (OEM) or their distributor shall submit a response demonstrating their capabilities to produce the requested equipment to the primary point of contact listed below. The quotations should be on FOR-IISc Bangalore basis in INR only.**

With respect to this tender, the rules laid out by the Government of India in order No. P45021/2/2017-pp-BE-II issued by the Public Procurement Section, Department or Promotion of Industry and Internal Trade, Ministry of Commerce, and Industry, dated 4th June 2020 will be followed. The bidders must go through the Government of India order stated above and follow all the rules and regulations therein.

Relevant definitions as per Government of India order:

- **Class-I local supplier** - A supplier or service provider, whose goods, services or works offered for procurement, has local content equal to or more than 50%.
- **Class-II local supplier** - A supplier or service provider, whose goods, services or works offered for procurement, has local content more than 20% but less than 50%.
- **Local content** – The amount of value added in India which shall, unless otherwise prescribed by the Nodal Ministry, be the total value of the item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all custom duties) as a proportion of the total value, in percent.
- Bidders offering imported products will fall under the category of non-local suppliers. They cannot claim themselves as Class-1 local suppliers/Class-2 local suppliers by claiming the services such as transportation, insurance, installation, commissioning, training, and other sales service support like AMC/CMC, etc., as local value addition.
- Purchase preference as defined by the recent edits to GFR (within the “margin of purchase preference”) will be given to the Class-1 supplier.
- MSMEs can seek an exemption to some qualification criteria. IISc follows GFR2017 for such details.

1	Section 1	Bid Schedule	
2	Section 2	Eligibility Criteria	As specified by IISc
3	Section 3	Terms and conditions	As specified by IISc
4	Section 4	Specifications	Technical specifications
5	Section 5	Technical Bid	Annexure 1: Bidder details
			Annexure 2: Declaration regarding experience of bidder
			Annexure 3: Declaration regarding clean track record of the bidder
			Annexure 4: Declaration of acceptance of tender
			Annexure 5: Terms and conditions. Details of item quoted
6	Section 6	Commercial Bid	Quotation with Price, Technical specifications of the equipment

## **Section 1- Bid Schedule**

1	Tender No	CeNSE/SG/RFQ/07
2	Tender Date	25th September 2024
3	Item Description	Procurement of a Customised Electron Beam Evaporator
4	Tender Type	Two bid system (i) Technical Bid (Part A) (ii) Commercial Bid (Part B)
5	Place of tender submission	Chairperson Office, Attn: Dr. Sreetosh Goswami, Centre for Nano Science and Engineering Indian Institute of Science, Bangalore 560012
6	Last Date & Time for submission of tender	<b>17th October 2024, 5.00 PM (IST)</b>
7	For further clarification	Dr. Sreetosh Goswami Assistant Professor Centre for Nano Science and Engineering Indian Institute of Science Bangalore – 560012, India. Email: <a href="mailto:sreetosh@iisc.ac.in">sreetosh@iisc.ac.in</a>

- Vendors will be required to submit a technical proposal and a commercial proposal in **two separate sealed envelopes**. The technical bid should contain all commercial terms and conditions, except the price. **Only vendors who will be adjudged by the committee to meet the technical requirements will be considered for the commercial negotiation.**
- The covering letter should clearly state that whether the vendor is a Class-I or Class-II local supplier distinguished by their “local content”. Failing this the bid will be automatically rejected.
- The vendor must state the percentage of the local content and provide self-certification that the item offered meets the minimum local content requirement. They should also give details of the location(s) at which the local value addition is made.
- Separate detailed justification needs to be given to substantiate the qualification as Class 1 and Class 2 suppliers and the intender reserves the right to cross-check the factual validity of the same and one if some foreign parts or equipment is being put forward then please submit the “*bill of material*” details for the same for evaluation.

**The deadline for submission of proposals is October 17th, 2024, 5:00 pm Indian Standard Time.** Proposals should arrive at the Main office, GF-15, Centre for Nano

Science and Engineering, Indian Institute of Science, Bangalore 560012, India, on or before the above deadline.

## **Section 2 – Eligibility Criteria**

Prequalification criteria:

1. The Bidder's firm should have existed for a minimum of 5 years. (Enclosed Company Registration Certificate)
2. The Bidder should have qualified technical service personnel for the instrument(s) based in India.
3. The bidder should sign and submit the declaration for Acceptance of Terms and Conditions as per Annexure 4.
4. The Bidder must not be blacklisted/banned/suspended or have a record of any service-related dispute with any organization in India or elsewhere. A declaration to this effect has to be given as per Annexure 3.

## **Section 3 – Terms and Conditions**

### **A) Submission of Tender:**

1. All documentations in the tender should be in English.
2. Tender should be submitted in two envelopes (two bid system).
  - a. **Technical Bid (Part-A)** – Technical bid consisting of all technical details and check list for technical specifications. The technical bid **must not contain** any price information.

The technical proposal should contain a technical compliance table with 5 columns.

- i. The first column must list the technical requirements, in the order that they are given in the technical requirement below.
- ii. The second column should provide specifications of the instrument against the requirement. Please provide quantitative responses wherever possible.
- iii. The third column should describe your compliance with a “YES” or “NO” only. Ensure that the entries in column 2 and column 3 are consistent.
- iv. The fourth column should state the reasons/explanations/context for deviations, if any.
- v. The fifth column can contain additional remarks from the Indian Original Equipment Manufacturer (OEM) or from their distributors. You can use this opportunity to highlight technical features, qualify response of previous columns, or provide additional details, compare your solution with that of your competitors or provide details as requested in the technical requirements table below.
- vi. **Tender documents without technical compliance documents will not be considered.**
- vii. Technical capabilities of any suggested accessories/add-ons that may enhance the usability, capability, accuracy or reliability of the tool. Vendors are encouraged to quote for as many add-ons as their tool portfolio permits.
- viii. Vendors are encouraged to highlight the advantages of their tools over comparable tools from the competitors.
- ix. Items in addition to those listed in the technical table that the vendor would like to bring to the attention, such as data sheets, technical plots etc. can be listed at the end of the compliance table. Vendors are also

encouraged to highlight the advantage of their tools over comparable tools from the competitors.

- x. If multiple systems can fulfil the requirements, vendors can submit multiple bids.
  - xi. The RFQ must include references to 3 previous relevant installations, preferably in India. Please provide the names and contact addresses of the referees, so that the committee can contact them independently. Details of such systems with model numbers and users should be provided.
  - xii. The technical proposal will be evaluated against the technical requirement. Deviations from the technical specifications requested are allowed. Such deviations must be highlighted and justified. Their acceptance or rejection will be left to the discretion of the technical committee. Only the vendors, adjudged by the committee to be suitable to meet the technical requirements, will be considered for the commercial negotiation.
- b. **Commercial Bid (Part-B)** – Indicating item wise price for the items mentioned in the technical bid, **as per the format of quotation provided in the tender**, and other commercial terms and conditions. The commercial bid should contain:
- i. Itemized cost of the system and required accessories, such as software, power supply, etc.
  - ii. All accessories needed for the instrument to function as per the technical specification must be listed.
  - iii. Itemized cost, as an option, for any suggested accessories/add-ons that may enhance the usability, capability, accuracy or reliability of the tool. Vendors are encouraged to quote for as many add-ons as their tool portfolio permits.
  - iv. Please indicate the warranty provided with the tool. A warranty of 1 years or more is preferred.
  - v. Provide itemized cost for required/expected spares for 3 years of operation. For sake of this calculation, the vendor may assume active tool usage of 40 hours/week. This number will be used to estimate the life cycle cost of the tool.
  - vi. The cost of annual maintenance contract (AMC). The details of AMC are given below. This number will be used to estimate the life cycle cost of the tool.

- vii. Length of time that the tools will be supported with service and spares from the date of installation. Our requirement is that the tools be supported for at least 5 years from the date of installation. To quote the lowest price, vendors often quote for obsolete or soon-to-be obsolete equipment. This is NOT acceptable. For a user-facility like CeNSE, it is vital that the equipment be serviceable and supported for the foreseeable future. The length of guaranteed support will be used to estimate the life cycles cost of the tool.
  - viii. The commercial bid should indicate the following separately: (a) equipment price (b) optional items (c) insurance cost (d) Shipping cost and (e) the Total cost.
  - ix. The quotations should be in INR only.
3. The technical bid and price bid must be placed in separate sealed covers, superscripting on both the envelopes the tender no. and the due date. Both these sealed covers are to be placed in a bigger cover which should also be sealed and duly superscripted with the Tender No, Tender Description & Due Date.
  4. The SEALED COVER superscripting tender number / due date & should reach Chairperson Office, Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India, on or before due date mentioned in the tender notice. In case due date happens to be holiday the tender will be accepted and opened on the next working day. If the quotation cover is not sealed, it will be rejected.
  5. All queries are to be addressed to the person identified in “Section 1 – Bid Schedule” of the tender notice.

6. GST/other taxes, levies etc., are to be indicated separately. The BIDDER should mention GST Registration and PAN in the tender document (Indian Bidders only).
7. If price is not quoted in Commercial Bid as per the format provided in tender document the bid is liable to be rejected.
8. The vendor should have qualified technical service personnel for the equipment based in India and should assure a response time of <48 hours.
9. A technical evaluation by the purchase committee may include a demonstration to verify the functionalities and capabilities of the system quoted. The purchase committee reserves the right to reject the bids based on their technical evaluation of the quality of data, capability demonstration, and service. If the data/requested capability demonstration does not happen within a stipulated timeframe, the bid will be rejected. Any discrepancy between the promised specifications and
10. The purchase committee reserves the right to accept or reject any bid or to annul the bidding process and reject all bids at any time prior to the award of the contract, without thereby incurring any liability to the affected bidder or bidders or any obligation to inform the affected bidder or bidders.
11. Incomplete bids will be summarily rejected.
12. The decision of the purchase committee will be final.

**B) Cancellation of Tender:**

Notwithstanding anything specified in this tender document, IISc Bangalore, in its sole discretion, unconditionally and without having to assign any reason, reserves the rights:

- a. To accept OR reject lowest tender or any other tender or all the tenders.
- b. To accept any tender in full or in part.
- c. To reject the tender, offer not confirming to the tender terms.

**C) Validity of the offer:**

The offer shall be **valid 90 Days** from the date of opening of the commercial bid.

**D) Evaluation of the offer:**

1. The technical bid (Part A) will be opened first and evaluated.
2. Bidders meeting the required eligibility criteria as stated in Section 2 of this document shall only be considered for Commercial Bid (Part B) opening. Further, agencies not furnishing the documentary evidence as required will not be considered.



3. Pre-qualification of the bidders shall not imply final acceptance of the Commercial Bid. The agency may be rejected at any point during technical evaluation or during commercial evaluation. The decision in regard to acceptance and / or rejection of any offer in part or full shall be the sole discretion of IISc Bangalore, and decision in this regard shall be binding on the bidders.
4. The award of contract will be subject to acceptance of the terms and conditions stated in this tender.
5. Any offer which deviates from the vital conditions (as illustrated below) of the tender is liable to be rejected:
  - a. Non-submission of complete offers.
  - b. Receipt of bids after due date and time and or by email / fax (unless specified otherwise).
  - c. Receipt of bids in open conditions.
6. In case any BIDDER is silent on any clauses mentioned in these tender documents, IISc Bangalore shall construe that the BIDDER had accepted the clauses as of the tender and no further claim will be entertained.
7. No revision in the terms and conditions quoted in the offer will be entertained after the last date and time fixed for receipt of tenders.
8. Lowest bid will be calculated based on the total price of all items tendered for Basic equipment along with accessories selected for installation, operation, pre-processing and post-processing, optional items, recommended spares, warranty, annual maintenance contract.

**E) Pre-requisites:**

The bidder will provide the prerequisite installation requirement of the equipment along with the technical bid.

**F) Warranty:**

The complete system is to be under a warranty period of a **minimum 1 year** from the date of functional installation. The vendor should include the cost of any spares that are expected to be needed during the warranty period, including electronics, subcomponents, and software. If the instrument is found to be defective, it must be replaced or rectified at the cost of the bidder within 30 days from the date of receipt of written communications from IISc, Bangalore. If there is any delay in replacement or rectification, the warranty period should be correspondingly extended.

**G) Annual Maintenance Contract (AMC):**

An annual maintenance contract for a period of 3 years post warranty should be provided on completion of the warranty period. If not possible, ample justification is needed.

**H) Purchase Order:**

1. The order will be placed on the bidder whose bid is accepted by IISc Bangalore based on the terms & conditions mentioned in the tender document.
2. The quantity of the items in the tender is only indicative. IISc, Bangalore reserves the right to increase /decrease the quantity of the items depending on the requirement.
3. If the quality of the product and service provided is not found satisfactory, IISc, Bangalore reserves the right to cancel or amend the contract.
4. After the award of the purchase order, the vendor must provide an Order Acknowledgement within 30 days from the receipt of the Purchase Order

**I) Delivery, Installation and Training:**

1. The bidder shall provide the lead time to delivery, installation and made functional at IISc, Bangalore from the date of receipt of the purchase order.
2. The system should be delivered, installed, and made functional within 8-10 months from the date of receipt of the purchase order.
3. The supply of the items will be considered as effected only on satisfactory installation and inspection of the system and inspection of all the items and features/capabilities tested by the IISc, Bangalore.
4. After successful installation and inspection, the date of taking over of entire system by the IISc, Bangalore shall be taken as the start of the warranty period.
5. No partial shipment is allowed. The bidder should also arrange for technical training to the local facility technologists and users.
6. The bidder should provide onsite application training for the local facility technologists and users.
7. The bidder should also arrange technical training for the local facility technologists and users

**J) Payment Term:**

The payment will be through a Letter of Credit and the milestone of the payment will be determined after mutual discussions with the successful bidder.

**K) Statutory Variation:**

Any statutory increase in the taxes and duties subsequent to bidder's offer, if it takes place within the original contractual delivery date, will be borne by IISc, Bangalore subject to the claim being supported by documentary evidence. However, if any decrease takes place the advantage will have to be passed on to IISc, Bangalore.

**L) Dispute and Jurisdiction:**

Any legal disputes arising out of any breach of contract pertaining to this tender shall be settled in the court of competent jurisdiction located within the city of Bangalore, India.

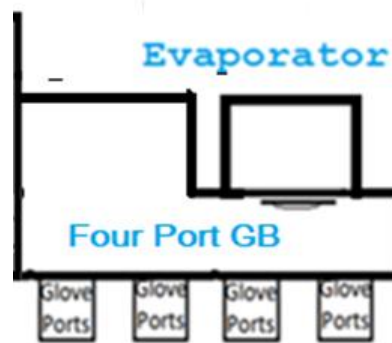
**M) General:**

1. All amendments, time extension, clarifications etc., within the period of submission of the tender will be communicated electronically. No extension in the bid due date/time shall be considered on account of delay in receipt of any document(s) by mail.
2. The bidder may furnish any additional information, which is necessary to establish capabilities to successfully complete the envisaged work. It is however, advised not to furnish superfluous information.
3. The bidder may visit the installation site before submission of tender, with prior intimation.
4. Any information furnished by the bidder found to be incorrect, either immediately or at a later date, would render the bidder liable to be debarred from tendering/taking up of work in IISc, Bangalore.

## Section 4 - Technical specifications of Electron beam evaporator unit

### Tender specification

Electron beam evaporator unit which can be customized in Glove Box (Glove box not required)



#### 1. BASE SYSTEM

##### System frame (QTY. 1)

- System frame of the Electron Beam Evaporator should be made of Aluminum profiles for housing the chamber and pump system, including adjustable feet and detachable supporting frame for transportation.
- Front cover panel should be made of stainless steel.
- Dimensions (approx.) w/o support frame should be 1,500 mm (Width) x 1,000 mm (Depth) x 2,150 mm (Height).

##### Vacuum chamber (QTY. 1)

- Cubic stainless-steel chamber should be with sliding door on Glovebox side for easy access to the process equipment and hinged door on the rear for service purpose.
- Stainless steel doors, each should be equipped with an observation window (diameter 100 mm) and an exchangeable protection glass.
- Doors should be sealed with O-ring, in which the sliding door has a closing mechanism with pneumatic cylinders while the rear door is manually locked.
- The front side door flange should be designed to connect a Glovebox.
- As a standard, the sliding door should open to the left.

- Inner dimensions should be:

Width	500 mm
Depth	500 mm
Height	650 mm
Side wall	1 x DN 200 ISO (for pump system) 1 x DN 40 KF, 1 x DN 25 KF, 2 x DN 16 KF
Top	1 x DN 250 ISO (substrate stage) 4 x diameter 34.5 mm (blank flanged if not used)
Bottom	2 x diameter 34.5 mm (blank flanged if not used)

### Protective liners (QTY. 1)

- There should be set of easily removable stainless-steel liners for protection of inner chamber walls and doors against deposition with scotch-brite surface finish.

### Gauges & chamber accessories:

The accessories must have following specifications:

- Combined transmitter with dual filament combining the hot cathode ionization and the Pirani principle (QTY. 1):

Measuring range	1,000 mbar down to $5 \times 10^{-10}$ mbar
Accuracy	15% of reading (b/w $1 \times 10^{-2}$ and $1 \times 10^{-8}$ mbar)
Connection flange	DN 25 KF

- Low pressure safety switch, for correctly indicating vented chamber status (QTY. 1) :

Fixed switching pressure	approx. 6 mbar below atm
Connection flange	DN 16 KF

- Overpressure safety valve, in accordance with the regulations ISO 4126-1, to safely prevent excessive overpressures inside the chamber (QTY. 1):

Responding Pressure	1150 +/-40 mbar, overpressure
Connection flange	DN 16 KF

- Electro-pneumatic right-angle valve DN 16 KF, for chamber venting **(QTY. 1)**

**2. Pump system, (DN 250 ISO-F)**

- There should be magnetically levitated turbo molecular pump with integrated converter and power supply. Including water-cooling. Profibus and 25-pin I/O interface. (Mounting in any orientation) **(QTY. 1)**

Pumping Speed:

N <sub>2</sub>	2,200 l/s
Ar	2,000 l/s
H <sub>2</sub>	1,030 l/s
Ultimate pressure	< E-08 mbar
Max. fore-vacuum pressure N <sub>2</sub>	1.1 mbar
High vacuum flange	DN 250 ISO-F
Fore vacuum flange	DN 40 KF

- There should be purge gas and venting valve 24 V DC, 36 sccm **(QTY. 1)**
- Electro-pneumatic right-angle valve, mounted to the fore vacuum flange. **(QTY. 1)**

**3. High vacuum valve / Pressure regulation:** It must have following specifications:

- **High vacuum gate valve, DN 250 ISO-F :**

Insertable gate valve with double-action pneumatic actuator, Viton-sealed, including pilot valve and position indicators. Mounting in any position. **(QTY. 1)**

Flange connection	DN 250 ISO-F
Material body	Aluminum
valve seat	Stainless Steel
Leak tightness valve seat and body	$\leq 1 \times 10^{-9}$ mbar $\times$ l / s
Differential pressure for opening	$\leq 30$ mbar

- Right-angle valve (for Bypass), bellow-sealed with pneumatic actuator, electro magnetic pilot valve, electrical as well as optical position indicators. Valve normally closed. **(QTY. 1)**

Flange connection	DN 40 KF
Material body	Aluminum
Sealing material	Viton
Cycles	10 Million

- **Pressure measurement gauge, for measuring the backing pressure:**

A Pirani gauge should operate using the principle of thermal conductivity in which the rate of heat loss from a heated filament is dependent on the pressure of gas surrounding the filament. **(QTY. 1)**

Measuring range	1000 to 5 E-04 mbar
Measuring uncertainty	± 15 % (at 100 mbar to 1E-03 mbar)
Flange connection	DN 16 KF
Supply voltage	15 to 48 VDC
Signal output	0 – 10 V
Electrical connection	8 pol. RJ45 / FCC68
Integrated electronic setpoints	1

- **Bypass-Line**

Including vacuum hose, T-piece and further required fittings **(QTY. 1)**

4. **Equipment for electron beam evaporation:** It must have following specifications:

- Multi-pocket electron beam evaporator, standard crucible volume 4 x 8 cm<sup>3</sup>, direct water-cooled, with motorized crucible indexer and 270° primary beam deflection by permanent magnet. Including tool kit. **(QTY. 1)**

Power max	6 kW
Acceleration voltage	4-10 kV
Filament current max	50 A @10 VAC

- **Set of required accessories and safety equipment such as (QTY. 1):**

- High voltage vacuum feed through
- Vacuum feed through for x/y deflection signal
- Water flow monitor for cooling water 1-10 l/min
- Safety door switch for high voltage applications
- Grounding rod, approved up to 30 kV
- Two-hand-circuit with push buttons on the system front allows crucible rotation with chamber door open.
- Source shutter, plug-in design for easy cleaning, with electro-pneumatic actuator and height-adjustable stainless-steel shutter blade. **(QTY. 1)**
- Multi-function integrated electron beam controller, managing high voltage power control, crucible indexer control and extended sweep function. Including single touch screen interface and hand-held universal remote. **(QTY. 1)**

- **Filament power supply FPS 3 (QTY. 1)**

Filament supply	8-50 A @ 10 VAC, 50/60 Hz
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- **Power supply for electron-beam evaporator**

High voltage power supply, Primary switched mode power supply with arc detection and fast suppression. **(QTY. 1)**

Output power max	6 kW
Emission current	0-600 mA
High voltage output	2-10kV

#### 5. Ion source:

- Gridless Ion Source, End-Hall type, with robust tungsten cathode filament to provide both the plasma discharge and the automatic beam neutralization. It can be used for substrate cleaning and Ion Assisted Deposition IAD (evaporation process only). Source should operate for extended periods with either inert or reactive gases. **(QTY. 1)**

Anode power max	600 W
Anode current max	3.5 A
Anode voltage	40-300 V
Beam current max	875 mA
Beam energy (mean)	35– 210 eV
Operating pressure max	$1 \times 10^{-3}$ mbar
Beam divergence	60°
Gas flow	1-50 sccm

- Discharge Controller, Power Supply to provide DC voltage and current to the ion source anode for ion production. Front panel selectivity for local/remote mode. **(QTY. 1)**

Output power max	1,500 W
Output voltage max	300 VDC
Output current max	5 A

- Filament Controller, Filament controller for beam neutralization of the ion source. It contains a filament power supply, emission read-back, and an



integrated control system to regulate filament emission current. The desired emission current is set by either local or remote control. **(QTY. 1)**

Output power max	40 VAC
Output voltage max	25 A
Emission current max	6 A

- **Ion Source Support (QTY. 1):**

It should be made of stainless steel, height adjustable, with tilt-able mounting paddle for flexible alignment of source to substrate geometry. Designed for Ø 34.5 mm mounting bore.

- **Source Shutter (QTY. 1):**

Plug-in design for easy cleaning, with electro-pneumatic actuator and height-adjustable stainless steel shutter blade.

6. **Gas inlet:** controlled gas distribution package should be consisting of:

- Thermal Mass Flow Controller with integrated shut-off valve. The MFC should consist of a thermal mass flow sensor, a precise control valve and a microprocessor-based pc-board with signal and fieldbus conversion. As a function of a setpoint value, the flow controller swiftly should adjust the desired flow rate. For extra efficiency or safety, the EL FLOW should select features an integrated, electrically operated shut-off valve. **(QTY. 1 Nos Each for Ar, N2, and O2)**

Full scale range	100 sccm for Ar
Full scale range	100 sccm for N2
Full scale range	20 sccm for O2
Control Range	2 – 100 % of full scale
Accuracy	± 0.5 % RD plus ±0.1% FS
Materials: Wetted parts Seals	Stainless steel 316L, Viton

- 2/2 Way electro-magnetic isolation valve, direct-acting, media separated pivoted armature valve, normally closed, with 6 mm OD pipe connection.  
1 × used for MFC isolation (reactive gas requires an additional shut- off valve on the inlet side) **(QTY. 1)**
- Gas-ballast purging unit, 6 slm  
For safe operation with combustible or explosive gas mixtures. Unit is connected to the gas-ballast intake of the backing pump and activated whenever combustible or explosive gases are used in the process. The flow monitor is blocking the gas flow as soon as it is signaling insufficient flow or having malfunction. Including automatic isolating valve for gas-ballast and

pressure reducer on device intake to set required pressure (compressed air or Nitrogen). **(QTY. 1)**

**7. Film-Thickness measurement:** Thin-film deposition monitor/controller must have:

- PC-based film-thickness monitor, Equipment should be for high accuracy real-time rate and film thickness monitoring/controlling, driving any type of crystals. Two high resolution sensor head inputs. Layer definition and deposition process programming via system PLC. **(QTY. 1)**

Frequency Resolution	0.1 Hz at 10 readings/sec
Sampling frequency	0.5 to 10 Hz
Quartz oscillator type	6 MHz
Reference frequency stability	0.5 ppm
Sensor input	2xBNC female

- Single quartz crystal sensor head, for 0.550" (14 mm) diam. Crystals. Flexible design with cooling-water tubes, vacuum feedthrough, compression fittings and sensor head fixation allowing holding the sensor in a defined position. **(QTY. 1)**
- Remote Oscillator kit, including necessary BNC cables **(QTY. 1)**
- Set of gold-coated quartz crystals, 6 MHz, 0.550" (14 mm) diam. Carousel dispenser with 10 pieces. **(QTY. 1)**

**8. Substrate stage: Rotating, heating/cooling substrate stage 8"**

- Substrate table should be made of copper with internal water channels for direct contact heating/cooling. Including spring-loaded clamps to fix a single substrate with max. 8" diam. or multiple smaller wafers. **(QTY. 1)**

The substrate table should be mounted to a drive unit with Ferro-fluidic rotary feed-through, slip-ring for heating power and temperature measurement, rotating coupling for coolant feed-in and a computer controlled stepper motor for continuous wafer rotation at adjustable speed (about 0-20 rpm).

**Selective heating or cooling mode:**

- Resistive heating to max. 400°C heater temperature. Precise PID temperature control via system PLC (deviation +/-1 °C), including Pt100 temperature sensor.
- Substrate cooling is effected by water circulation whereas the achievable cooling temperature is depending on the provided water intake temperature.

Stage should completely assembled on a DN 250 ISO-K base flange for simple service or exchange.

9. **Electrical Cabinet:** Electrical cabinet with PLC system control must have (**QTY. 1**):

- Freestanding electrical cabinet which should be made of lacquered sheet metal, including power supply stage, cooling fan, main switch and 19" rack with free slots for housing of process control, supply units, etc. BECKHOFF embedded PC (Windows 10-based with TwinCAT 3 Runtime which is acting independently from Windows), fast Intel®- AMD-Ryzen™-V1202B-CPU, 8 GB RAM, 1 x 40 GB flash memory, 1 x 32 GB USB-stick and LAN-connection. Hinged front door with 15.6" colored touch screen, key-secured service switch, USB-slot and emergency stop button.

operating software with standard system functions & displays in manual or semi-automatic mode:

- Automatic evacuation sequence
- Automatic venting sequence
- Safety interlocks
- Pressure display
- Failure indication
- Operation hour counters for vacuum pumps
- Trending for main parameters. Charts can be configured and stored individually. Historic trend charts are made available.
- Analysis of recorded data for monitoring the system condition and for preventive maintenance.
- Data-logging (CSV-file) and graph display for main parameters. User administration, supporting multiple user levels, secured by password. User levels are individually configurable. Individual system functions:
  - Source selection and operation
  - Film-thickness and rate control with shutter operation
  - Substrate rotation
  - Substrate temperature control
  - Ion source operation
  - Gas inlet control
  - Recipe control allowing programming, store and modifying recipes with adjustable parameters for different single or multiple layers. Recipe building for complete coating batch from chamber pump down up to vent (max. 100 recipes, each with up to 100 steps)

10. System information & requirements

System base pressure should be capable to achieve vacuum  $\leq 5 \text{ E-07 mbar}$ , under clean and dry condition.

Power supply: 440 V, 3ph/ N/ PE, 50 Hz, power consumption depending on the installed equipment.

System completely assembled, wired and leak-checked including internal water piping, gas and compressed air distribution. Functional test after completion.

**11. Additional:**

System installation, commissioning, and user training

## **Acceptance**

- The institute reserves the right to accept or reject any bid, or to annul the bidding process and reject all bids, at any time prior to the award of the contract without thereby incurring any liability of the affected bidder or bidders.
- Previous installations can be used by the committee to disqualify vendors with a poor track record of service, build quality, system performance or poor availability of spares.
- Institute will expect acceptance tests, post installation. These can be recorded in the presence of representatives of the OEM. Inability to pass these tests will be a counted as a technical failure and breach of contract.

## **Section 5 – Technical Bid**

The technical bid should furnish all requirements of the tender along with all annexures in this section and submitted to

The Chairperson,  
Attn: Dr. Sreetosh Goswami  
Centre for Nano Science and Engineering Indian Institute of Science  
Bangalore – 560012, India  
Email: [sreetosh@iisc.ac.in](mailto:sreetosh@iisc.ac.in)

## **Annexure-1**

### Details of the Bidder

The bidder must provide the following mandatory information & attach supporting documents wherever mentioned:

### Details of the Bidder:

Sl No.	Items	Details
1.	Name of the Bidder	
2.	Nature of Bidder (Attach attested copy of Certificate of Incorporation/ Partnership Deed)	
3.	Registration No/ Trade License, (attach attested copy)	
4.	Registered Office Address	
5.	Address for communication	
6.	Contact person- Name and Designation	
7.	Telephone No	
8.	Email ID	
9.	Website	
10.	PAN No. (attach copy)	
11.	GST No. (attach copy)	

Signature of the Bidder

Name

Designation, Seal

Date:

**Annexure-2**

**Declaration regarding experience**

To,  
The Chairperson,  
Centre for Nanoscience and Engineering, Indian Institute of Science,  
Bangalore – 560012, India

Ref: Tender No: XXXXXXXXXX Dated: XXXXX

Supply and installation of a Custom Electron Beam Evaporator compatible with a Glovebox workstation at CeNSE, IISc Bangalore.

Sir/Madam,  
I've carefully gone through the Terms & Conditions contained in the above referred tender. I hereby declare that my company / firm has \_\_\_\_years of experience in supplying and installing \_\_\_\_\_

(Signature of the Bidder)

Printed Name

Designation, Seal

Date:

**Annexure-3**

**Declaration regarding track record**

To,  
The Chairperson,  
Centre for Nano Science and Engineering Indian Institute of Science,  
Bangalore – 560012, India

Ref: Tender No: XXXXXXXX Dated: XXXXX

Supply and installation of a Custom Electron Beam Evaporator compatible with a Glovebox workstation at CeNSE, IISc Bangalore.

Sir/Madam,

I've carefully gone through the Terms & Conditions contained in the above referred tender. I hereby declare that my company/ firm is not currently debarred / blacklisted by any Government / Semi Government organizations / institutions in India or abroad. I further certify that I'm competent officer in my company / firm to make this declaration.

Or

I declare the following

Sl.No	Country in which the company is Debarred /blacklisted case is Pending	Blacklisted / debarred by the Government / Semi Government/Organizations //Institutions	Reason	Since when and for how long

(NOTE: In case the company / firm was blacklisted previously, please provide the details regarding period for which the company / firm was blacklisted and the reason/s for the same).

Yours faithfully

(Signature of the Bidder)

Name

Designation, Seal

Date:



**Annexure – 4**

**Declaration for acceptance of terms and conditions**

To,  
The Chairperson,  
Centre for Nano Science and Engineering Indian Institute of Science,  
Bangalore – 560012, India

Ref: Tender No: XXXXXX Dated: XXXX

Supply and installation of a Custom Electron Beam Evaporator compatible with a Glovebox workstation at CeNSE, IISc Bangalore.

Sir/Madam,  
I've carefully gone through the Terms & Conditions as mentioned in the above referred tender document. I declare that all the provisions of this tender document are acceptable to my company. I further certify that I'm an authorized signatory of my company and am, therefore, competent to make this declaration.

Yours faithfully,

(Signature of the Bidder)

Name

Designation, Seal

Date:

## **Annexure – 5**

Details of items quoted:

- a. Company Name
- b. Product Name
- c. Part / Catalogue number
- d. Product description / main features
- e. Detailed technical specifications
- f. Remarks

Instructions to bidders:

1. The bidder should provide technical specifications of the quoted product/s in detail.
2. Bidders should attach product brochures along with technical bid.
3. Bidders should clearly indicate compliance or non-compliance of the technical specifications provided in the tender document.

## **Section 6 – Commercial Bid**

The commercial bid should be furnished with all requirements of the tender with supporting documents as mentioned under:

S.No	Description	Cat. Number	Quantity	Unit Price	Sub total
1	Essential items noted in the technical specification				
1.a	...(details of essential items)				
1.b	...				
2	Optional items noted in the technical specification				
2.a	... (details of essential items)				
2.b	...				
3	Accessories for operation and installation				
4	All Consumables, spares and software to be supplied locally				
5	Warranty (3 years)				
6	AMC 2 years beyond warranty				
7	Cost of Insurance and Airfreight				
8	CIP/CIF IISc, Bengaluru				

Any additional items

S.No	Description	Cat.	Number Quantity	Unit Price	Sub total

Addressed to

The Chairperson,  
Attn: Dr. Sreetosh Goswami  
Centre for Nano Science and Engineering Indian Institute of Science  
Bangalore – 560012, India  
Email: [sreetosh@iisc.ac.in](mailto:sreetosh@iisc.ac.in)

## **Section 7 – Checklist**

(This should be enclosed with technical bid- Part A)

The following items must be checked before the Bid is submitted:

(1) Sealed Envelope “A”: Technical Bid

- a. Section 5- Technical Bid (each page signed by the authorized signatory and sealed) with the below annexures:
  - i. Annexure 1: Bidders details
  - ii. Annexure 2: Declaration regarding experience
  - iii. Annexure 3: Declaration regarding clean track record
  - iv. Annexure 4: Declaration for acceptance of terms and conditions
  - v. Annexure 5: Details of items quoted.
- b. Copy of this tender document duly signed by the authorized signatory on every page and sealed.

(2) Sealed Envelope “B”: Commercial Bid

- a. Section 6: Commercial Bid

Your quotation must be submitted in two envelopes: Technical Bid (Envelope A) and Commercial Bid (Envelope B) super scribing on both the envelopes with Tender No. and due date and both of these in sealed covers and put in a bigger cover which should also be sealed and duly super scribed with Tender No., Tender description & Due Date.

Thanking you,

Dr. Sreetosh Goswami  
Assistant Professor  
Centre for Nano Science and Engineering  
Indian Institute of Science, Bangalore, India 560012.  
E-mail: [sreetosh@iisc.ac.in](mailto:sreetosh@iisc.ac.in)