

**INDIAN INSTITUTE OF SCIENCE EDUCATION AND**  
**RESEARCH-THIRUVANANTHAPURAM**  
**[IISER-TVM]**

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**CET CAMPUS, ENGINEERING COLLEGE. P.O**  
**THIRUVANANTHAPURAM 695016,**  
**KERALA, INDIA.**

IISER/PUR/PT/04/10

Date: 12<sup>th</sup> July 2010

**INVITATION TO TENDER**

Dear Sirs,

**SUB: (1) MULTICHANNEL SOURCE THERMAL EVAPORATION UNIT – 1 NO**  
**(2) PARAMETER ANALYZER – 1 NO.**

We invite Sealed Tenders for above Equipments as per 'Schedule' attached.

Please quote your lowest rate and shortest delivery period. "Instructions to Tenderers" [Imports & Indigenous] attached are to be followed strictly.

***YOUR OFFER IN SEALED COVER SUPERSCRIBING TENDER NUMBER AND DUE DATE***  
***SHALL REACH US ON OR BEFORE 30<sup>TH</sup> JULY 2010 (3 PM). LATE AND DELAYED OFFERS***  
***WILL NOT BE CONSIDERED UNDER ANY CIRCUMSTANCES.***

Thanking You,

Yours Faithfully

  
**CONSULTANT**  
**(PURCHASE & STORES)**

**IISER-TVM**  
**PUBLIC TENDER NO. IISER/PUR/PT/04/10**  
**SCHEDULE**

**1. TENDER NO. IISER/PUR/683/10**

**MULTI SOURCE THERMAL EVAPORATION UNIT – 1 No.**

Purpose and General Requirements:

(i) evaporating metals e.g. Au, Ag, Cr, Al, In etc.

(ii) evaporating specific elements/compounds e.g. MgF, LiF

The user should be able to control and deposit the evaporant  $\leq 5\text{nm}$  within 10% accuracy as read by the in-situ thickness monitor.

**Specifications:**

- 1) Multiple (min 3) evaporation cells (W baskets, spirals or boats)
- 2) Power Supply
- 3) Fitted with turbo molecular pumping system (chamber base pressure preferably  $\sim 10^{-7}$  mbar) and
- 4) Rotary vane pump
- 5) Compatible Valves, connectors and electronics.
- 6) Integrated manual shutter (with option of monitoring evaporation rate without deposition on substrate)
- 7) Thickness monitor (water cooled Quartz Xtl holder + sensor + detection unit), minimum evaporation rate  $\leq 0.1$  nm/s and thickness resolution  $\sim 0.1$  nm.
- 8) Stage capable of holding substrates of size (A) 150 x 150 mm (B) 50 x 50 mm
- 9) Vacuum gauge capable of measuring chamber pressure over entire range of operation +the backing line.
- 10) Vacuum chamber with suitable ports for pumping + incorporating various accessories and electrical feed throughs + 2 diametrically opposite view ports. System tested for leak to  $\sim 10^{-9}$  mbar.

**Optional Add-ons:**

1. Substrate heating (T  $\sim 500$  -700 C) facility for item 8(A and B) above.
2. Substrate rotating stage for item 8(A and B) above.
3. Optional co-evaporation facility for 2 cells
4. One view port fitted with a quick access door.
5. Ion cleaning facility
6. Cryo-pumping facility

The offer shall include Technical drawing of the system, details on service support and comprehensive warranty.

**2. TENDER NO. IISER/PUR/684/10**

**PARAMETER ANALYZER WITH PULSED AND TRANSIENT IV AND WITH NEEDED ACCESSORIES – 1 No.**

**SEMICONDUCTOR IV/CV CHARACTERIZATION SYSTEM**

**General description:**

A Semiconductor Characterization System to perform device characterization, real-time plotting, and analysis with high precision and resolution, while remaining a highly integrated, flexible, upgradable and user-friendly package.

### **Features and functionality**

The System must be integrated in that (a) it must include the specified functionality within the same physical mainframe, and (b) all hardware modules must be controlled from within the same overall software application / test executive. The System must include: two (2) DC source-measure channels (SMU) and one (1) multi-frequency CV meter as detailed below.

1. Each DC channel SMU must be capable of sourcing and measuring in the following range:

#### **Voltage**

- Voltage Source:  $\pm 5$  fV to  $\pm 210$  V
- Voltage Measure:  $\pm 1$  fV to  $\pm 210$  V

#### **Current**

- Current Source:  $\pm 5$  pA to  $\pm 1$  A (at least on one channel and 100mA on the other channel)
  - Current Measure:  $\pm 100$  fA to  $\pm 1$  A (at least on one channel and 100mA on the other channel)
2. Each DC channel must provide following forcing and measuring functions:
- Bias; Common; Sweep; List sweep (custom point-by-point user-defined sweep); Step S
  - source readback (i.e. when programmed to sweep voltage, report back actual measured voltage values, instead of programmed)
3. The multi-frequency CV module must support:
- Measuring parameters: Cp-G, Cp-D, Cs-Rs, Cs-D, R-jX, Z-theta
  - Frequency range: 10kHz to 10 MHz
  - AC drive level: 10 mV to 100 mV
  - DC drive level: -30 V to +30 V
  - Programmable DC output modes: Bias, Sweep, List Sweep
  - The software must include libraries for automatic CV parameter extraction for:
    - Oxide Thickness
    - Series Resistance
    - Flatland C and V
    - Threshold Voltage
    - Bulk Doping
    - Debye Length
    - Bulk Potential
    - Average Doping
    - Interface Trap Density
    - Effective Oxide Charge Density
4. The System must include PC operating capabilities as follows:
- Standard operating system (e.g. Windows)
  - User interface and data storage functionality
  - Interactive point-and-click software for device characterization
  - High-resolution LCD screen
  - Keyboard and mouse control
  - Built-in large capacity hard drive, CD/DVD drive,
  - Built-in GPIB, Ethernet, USB and RS-232 ports
  - VGA (video graphics array) port with support for external monitor.

**Optional Instrumentation modules for Ultra Fast -IV and switching between IV, CV and Pulse IV**

- Maximum current: +/-0.8A
- Maximum voltage output: +/-40V
- Pulse width with current measure: 60 ns to 999 ms
- Autoranging for current measurements
- Current measure ranges full scale: 100uA, 10mA, 200 mA, 800 mA
  - Remote Amplifier/Switch
- Has 6 low current measure ranges: 100 nA, 1 uA, 10 uA, 100 uA, 1 mA, 10mA
- Enables user to switch between SMU, CVU, and PMU
  - Provided with many supported applications including
- Charge pumping
- AC stress for reliability
- Charge Trapping
- Non-volatile memory testing: Flash and PCRAM
- Load Line Effect Compensation: a mathematical algorithm that compensates for the PMU output resistor as well as the voltage drops due to the interconnect resistances
- Simultaneously measures current and voltage: the PMU has 2 A/D per channel (or 4 A/D per PMU)
- Connection Compensation: enables the user to "zero out" the voltage drops due to cables, adapters, and probe pin-to-pad resistances

Provides both 2 level pulsing and transient I-V (waveform capture), as well as Segment ARB for multi-level pulse waveform source and measure

**NOTE:**

1. **LEAFLET/CATALOGUE OF THE ITEMS QUOTED SHALL ACCOMPANY THE QUOTATION WITHOUT FAIL.**
2. **ALONG WITH THE TECHNICAL DETAILS PROVIDE A TABULAR COLUMN INDICATING WHETHER THE MODEL OF THE EQUIPMENT OFFERED BY YOU MEETS THE SPECIFICATIONS BY INDICATING 'YES' OR 'NO'. IF 'YES' SUPPORT THE CLAIM WITH PROOF.**
3. **NAMES OF INSTITUTES WITH CONTACT PERSON AND TELEPHONE/ EMAIL WHERE SIMILAR EQUIPMENT SUPPLIED BY YOU IN INDIA [PREFERABLY SOUTH] SHALL BE MENTIONED IN THE BID.**
4. **LATE OR DELAYED TENDERS SHALL NOT BE CONSIDERED UNDER ANY CIRCUMSTANCES.**

  
**CONSULTANT  
[PURCHASE & STORES]**

**IISER – TVM**  
**INSTRUCTIONS TO TENDERERS [INDIGENOUS].**

1. Tenders should be sent in sealed envelopes superscribing the relevant tender no. and the due date of opening. Only one tender should be sent in each envelope.
2. Late tender and Delayed Tenders will not be considered under any circumstances.
3. Sales Tax and /or other duties/levies where legally levies and intended to be claimed should be distinctly shown separately in the tender.
4. (a). Your quotation should be valid for a minimum period of 60 days from the date of opening of the Tender. Quotation with firm prices will be preferred.  
(b). Prices are required to be quoted according to the units indicated in the Invitation to Tender. When quotations are given in terms of units other than those specified in the tender form, relationship between the two sets of units must be furnished.
5. (a) Preference will be given to those tenders offering supplies from ready stocks and on the basis of delivery at IISER site.  
(b) Preference will also be given to those who agree our payment terms of within 30 days of receipt and acceptance of the item at our site.
6. (a) All available technical literature, catalogues and other data in support of the specifications and details of the items should be furnished along with the offer.  
(b) Samples, if called for, should be submitted free of all charges by the tenderer and the IISER shall not be responsible for any loss or damage thereof due to any reason whatsoever. In the event of non-acceptance of tender, the tenderer will have to take back the samples at his own expense.  
(c) Approximate net and gross weight of the items offered shall be indicated in your offer. If dimensional details are available the same should also be indicated in your offer.  
(d) **Specifications:** Stores offered should strictly conform to our specifications. Deviations, if any should be clearly indicated by the tenderer in their quotation. The tenderer should also indicate the Make/Type number of the stores offered and provide catalogues, technical literature and samples, wherever necessary along with the quotations. Test Certificates wherever necessary should be forwarded along with supplies. Whenever specifically mentioned by us the tenderer could suggest changes to specifications with appropriate reasons for the same.
7. IISER shall be under no obligation to accept the lowest or any tender and reserves the right of acceptance of the whole or any part of the tender or portion of the quantity offered and the tenderers shall supply the same at the rates quoted.
8. Corrections, if any, in the Quotation must be attested. All amounts shall be indicated both in words as well as in figures. Where there is difference between amounts quoted in words and figures, amount quote d in words shall prevail.
9. The tenderer should mention the name of his bankers, Sales Tax Registration, PAN number etc in the tender.
10. The authority of the person signing the tender, if called for, should be produced.
11. The purchaser reserve the right to accept or reject the lowest or any other offer in whole or in part without assigning any reason.
12. IISER being a Govt of India Educational and Research Institute, is exempted from payment of Excise Duty and Customs Duty under Notification No. 51/96- Customs dated 23<sup>rd</sup> July 2009. Also, we can issue Form16 as per VAT Rules.
13. There is no EMD or Tender Cost.

  
**CONSULTANT**  
**(PURCHASE & STORES)**

**IISER-TVM**  
**INSTRUCTION TO TENDERERS [IMPORTS]:**

1. **PRICE:** The price quoted shall be firm. The terms of FOB/EXW/FCA/CIF/CIP etc shall be clearly mentioned.
2. **AGENT & AGENCY COMMISSION:** In case Tenderer is represented by any agent in India, their name and address shall be furnished. The amount of commission included in the price shall be clearly shown in the offer; which will be paid directly to the Indian Agents by purchaser in equivalent Indian Rupees. In case Indian agents existing and their agency commission is not shown in the Tender, reasons for the same shall be clearly mentioned in Tender. Details of Indian agent's statutory registration shall be stated. If Agency Commission is paid by Principals in foreign currency, the reasons for the same and exemption from Enforcement Directorate in India shall also be provided.
3. **LEAFLET/CATALOGUE:** Tenderer should furnish all necessary leaflet/catalogue etc., of the stores offered by him to enable the Purchaser to evaluate his offer correctly.
4. **MODE OF DESPATCH:** Tenderer shall indicate the mode of dispatch (*i.e.*, Sea/Air-freight/Parcel Post, etc.) depending upon the normal mode of dispatch adopted by him for the type of stores offered for consideration of the Purchaser.
5. **COUNTRY OF ORIGIN:** Tenderer shall indicate in his offer the country of origin of goods offered and the name and address of the manufacture.
6. **INSURANCE:** If insurance of the goods is felt necessary, the same shall be advised by the Tenderer in the offer.
7. **DELIVERY/SHIPMENT:** The time for and date of delivery quoted shall be reasonable/realistic and shall strictly be adhered to in case of placing order on the Tenderer.
8. **MODE AND TERMS OF PAYMENT:** Payment in full (excluding the amount of Agency Commission included in the price payable directly by the Purchaser to the Indian Agents in Indian Rupees) will be made immediately on presentation of the prescribed documents against SIGHT DRAFT or LETTER OF CREDIT.
9. **WARRANTY:** Period of warranty and conditions shall be clearly mentioned in the Tender.
10. **GENERAL:** The Tenderer shall also be complied with the following:
  - a. Mention your Banker's name and address.
  - b. Show approximate net and gross weight and dimensions of packages/cases.
  - c. Furnish list of recommended spares for satisfactory operation for a minimum period of one year if the quote is for Plant & Machinery, Equipments etc.
  - d. Details of any technical service, if required for erection assembly, commissioning and demonstration.
  - e. Conform that the prices quoted are inclusive of all taxes, levies, duties arising in the tenderer's country.
  - f. The offer is valid for a minimum period of 90 days from the due date of opening of the tender.
  - g. Samples, if called for, will be sent free of all charges.
  - h. Late tenders and Delayed will not be considered.
  - i. Offers made by Indian Agents on behalf of their Principals, should be supported by the Proforma Invoice of their Principals.
  - j. The authority of person signing the tender, if called for, shall be produced.
  - k. The purchaser reserves the right to accept or reject the lowest or any other offer in whole or in part without assigning any reason.

  
**CONSULTANT**  
**[PURCHASE & STORES]**