

**INDIAN ASSOCIATION FOR THE CULTIVATION OF SCIENCE  
2A & 2B, Raja S.C. Mullick Road, Jadavpur, Kolkata-700032**

**Tender Notice No: IACS/MS/SR/2017-18/92      Date: 24-01-2018**

Sealed tender in two bids system (technical bid and price bid) is invited from bonafide, resourceful and eligible manufacturer/exclusive distributor/vendors for the purchase of **Low Temperature and High Magnetic Field measurement System** in the Technical Research Centre (TRC), IACS

Part-I (Technical Bid) of the tender should contain technical specifications in detail as well as commercial terms and conditions. Part-II (Price Bid) should clearly indicate group-wise price, if needed, as mentioned in the technical bid. The Technical Bid and Price Bid are to be submitted in separately sealed envelopes, distinctly marked accordingly and both to be put inside another envelop, that should be sealed and superscribed with tender notice no. and due date. The bidders may submit bids duly signed in their own letterheads.

Completed tender bids should reach the office of the **Registrar, Indian Association for the Cultivation of Science (IACS), 2A & 2B Raja S. C. Mullick Road, Jadavpur, Kolkata-700032** on or before the scheduled date and time specified below:

Tender Notice No.	<b>Tender Notice No: IACS/MS/SR/2017-18/92 Date: 24-01-2018</b>
Last date and time of submitting tender	20/02/2018, 12 noon
Pre-bid meeting to discuss technical specification	09/02/2018, 12 noon
Date and time of opening tender (Technical Bids)	20/02/2018, at 1.00 PM
Place of opening tender	Will be notified
Date and time of opening of Price Bid	The Price Bids of the bidders qualifying the technical bid will only be opened, the date of which will be intimated to the short-listed bidders at their email addresses. The rest of the bids will be rejected.
Contact	Prof. Sugata Ray Email: mssr@iacs.res.in Tel.+91 33 2473 4971 [Extn. 1226]

The technical bids will be opened first to judge/evaluate the technical specifications of the said instrument and thereafter the price bids of only technically qualified bidders will be opened.

Technical Bid Evaluation: The Technical Bids will be evaluated in the presence of the representatives of intending bidders who will be able to clarify technical aspects of their bids, if any, required by the Technical Evaluation Team.

Opening of price-bid: The Price Bids of the bidders qualifying the technical bid will only be opened, the date of which will be intimated to the short-listed bidders at their email addresses. The rest of the bids will be rejected.

Please note that IACS will not provide any accommodation or reimburse any expenses to any of the bidders for attending opening of technical bid.

Quotations received incomplete or beyond the stipulated time will be summarily rejected.

Bidders should submit their past experience for supplying and successful installation of similar **Low Temperature and High Magnetic Field measurement System** to other research Institutes/Universities/other organizations in India **and abroad**. Please provide documentary proofs of such successful installation and supportive documents that the instruments are running successfully

## **1. TECHNICAL BID**

The technical bid should contain technical specifications and should be kept in a separate sealed envelope duly super scribed as 'TECHNICAL BID' on the outer cover of the envelop as already detailed above. It should be clearly mentioned on the envelope as "Technical Specification for Forward Osmosis Unit".

### **Technical Specification for Low Temperature and High Magnetic Field measurement System:**

All the committee members have carefully discussed the required parameters of a cutting edge "Low Temperature and High Magnetic Field measurement System" as well as the requirements of the scientists of IACS and finalized on the following technical specifications to be included in the tender notice.

#### **Basic unit:**

- Computer controlled cryogen-free high magnetic field low temperature system with working temperature range (2 K-400 K) for holding broad range of measurements options such as AC-DC electrical transport, vibrating sample magnetometry, heat capacity and AC susceptibility at variable magnetic fields and temperatures for different kind of samples in polycrystalline, single crystal and thin film forms.
- Single two-stage Pulsed tube cryocooler is required to cool both the superconducting magnet and the temperature control system (variable temperature insert, VTI). Only small amount of Helium gas is to be used for its fully automated startup and operation.
- The system should be fully cryogen free, and initial cool down should be possible using He-gas only (without using liquid He). Temperature control modes should have (i) Fast Settle, No (ii) Overshoot, and (iii) Sweep mode options with rate between 0.1-6 K/min. Temperature stability should be  $\pm 0.1\%$  or better for  $T < 10$  K and  $\pm 0.2\%$  or better for  $T > 10$  K. During magnetic field sweep, the sample temperature should remain stable within the accuracy range mentioned above.
- The system should come with a fully automated temperature control in the range 2 to 400 K with continuous low temperature control (No Needle valve / manual control). The sample should cool from the highest temperature to the lowest temperature at the highest specified cooling rate at any magnetic field (within  $\pm 9$  Tesla) without affecting the system performance including the heating of magnet. The procedure should also be applicable during heating as well.

- The base temperature should be achieved from room temperature with the fast cooling within 45 minutes. Sweep across the helium temperature (4.2 K) should be smooth and monotonic. Measurement below 4.2 K should be possible continuously long time.

#### **Superconducting magnet:**

- It should be conduction cooled switch-less magnet in “longitudinal configuration” with maximum field of  $\pm 9$  Tesla. It should have a highly stable bi-polar power supply with over voltage protection.
- The magnet should have both *Persistent* and *Driven* modes with No Overshoot, Linear and Oscillating provisions. Field uniformity should be  $\pm 0.01\%$  in the sample space region over 3 cm on axis or better.
- The magnet should be quenching protected with proper built in safety measures. An integrated magnetic shield is required to maintain stray field  $< 5$  Oe at a distance  $\sim 30$  cm from the outer jacket of the cryostat, allowing the scope of installing other sensitive instruments nearby.

#### **Vibrating Sample Magnetometer:**

- Standard VSM system with the vibration along the longitudinal direction. The diameter of the coil bore should be at least 5 mm.
- The system should be sensitive to measure moment value as low as  $10^{-6}$  emu.
- The system should be equipped with vibrating rod and proper sample holders.
- The system should operate between 2-400 K and for fields  $\pm 9$  Tesla.
- The system should be upgradable for high temperature measurement (300-1000 K).
- The system should be equipped with hardware and software for the measurement of first order reversal curve of magnetization.

#### **Electrical Transport (AC and DC):**

- Four probe AC and DC electrical measurements system working between 2-400 K and for fields  $\pm 9$  Tesla.
- The system should be capable of measuring electrical resistance, magneto-resistance, Hall effect and I-V characteristics.
- The system should be capable of measuring resistance (both AC and DC) at least between  $20 \mu\Omega$  to  $2 \text{ G}\Omega$ . The absolute accuracy in the measured resistance should be 0.2% or better.

#### **Heat Capacity:**

- Heat capacity measurement system is based on the relaxation technique. The system should have corrections of back grounds from sample platform, adhesives etc. through sophisticated software routines that is fully integrated to the main system software.
- The measurement system should work between 2-400 K and for fields  $\pm 9$  Tesla.
- The sample mass should be 1-100 mg.
- The relative accuracy of measurement should be less than  $\pm 5\%$ .

**AC Susceptibility:**

- The system should be capable of measuring AC susceptibility between 2-300 K and for DC fields  $\pm 9$  Tesla. The AC frequency range should be 10 Hz to 10 kHz, with amplitude of the AC field being between 0.1 to 6 Oe.
- The system should be capable of measuring moment as low as  $10^{-7}$  emu. The sensitivity should be as low as  $2 \times 10^{-8}$  emu for ac measurement, and the phase accuracy should be as low as 0.5 degree.
- There should be option for higher harmonic measurements integrated with the software.
- Along with the AC measurement, DC magnetic measurement should be permitted without any change of hardware or sample mount.
- The system should be upgradable for future sub-Kelvin measurement (down to 50 mK) using Dilution Refrigerator.

**General:**

- The capability of system performance including various measurement options has to be supported with documental proofs (published data, list of installation worldwide along with contact details of the customers).
- Standard magnetic sample should be provided for the calibration of VSM and AC susceptometer.
- The software module for controlling and data acquisition should be provided.
- The system should come with the computer (at least 4 GB of RAM and 1TB of ROM) for data acquisition, where operating system and the data acquisition software are preloaded.

**Warranty:** Minimum 1 year while 3 years extendable warranty is preferred. The warranty will be valid from the date of actual installation.

Proper installation and training should be provided by the vendor. Onsite after sales service, within 48 hours of reporting any problem, is mandatory. It is preferable to have technical person stationed at Kolkata.

A list of other places where the instrument has been installed should also be provided.

A compliance table (see below) must be prepared and submitted along with the technical bid

Sr. No	Tender specification	Your offered instrument specification	Extent of compliance

**2. PRICE BID**

The financial bid indicating (item-wise) price for the item(s) mentioned in the technical bid should be kept in a separate sealed envelope duly super scribed as 'PRICE BID' on the outer cover of the envelop as already detailed above. Price bids of only technically qualified bidders will be opened and they will be intimated the date and time of the opening of price bid at their e-mail ids. Rest of the bidders will stand rejected.

PRICE: Price to be quoted on CIF Kolkata and also FOB basis.

### **3. BID SECURITY:**

a. An Account payee Demand Draft/Pay Order for Rs. 6,00,000 (Rupees Six Lakh only) drawn in favour of “Indian Association for the Cultivation of Science (State Bank of India, Jadavpur University Branch, A/C No. 11079699211, IFSC: SBIN000093, MICR Code: 700002048)” is to be furnished by the bidders except those who are registered with the Central Purchase Organizations, National Small Industries Corporation or the concerned Ministry or Department, as Bid Security money or Earnest Money Deposit (EMD). Alternatively, bid security can also be provided in terms of Bank Guarantee.

b. The Demand Draft for the Bid-Security should have at least about 90 (ninety) days validity period of opening of the bids.

c. In case of non-award of the work the Bid Security money would be returned to the unsuccessful Bidders.

### **4. PERFORMANCE SECURITY:**

An Account Payee Demand Draft on any nationalized bank of India of 10% of the order value in the name of “Indian Association for the Cultivation of Science” is to be furnished by the successful bidder as Performance security. Performance security money should remain valid for a period of 60 days beyond the date of completion of all contractual obligations of the supplier including warranty obligations. Bid security money or EMD will be refunded to successful bidder on receipt of the Performance security money.

### **5. TERMS OF PAYMENT:**

Payment will be made through irrevocable Letter of Credit in two installments. 90% of the money will be released on submission of shipping of documents. Remaining 10% will be released after successful installation of the instrument.

### **6. GENERAL INSTRUCTIONS**

1. Validity of tender: Tender submitted should remain valid for at least six months from the date of opening the tender. Validity beyond six months from the date of opening of the tender shall be lapsed by mutual consent.

2. The tender should accompany a compliance chart.

3. Incomplete and conditional tenders as well as tenders received after the due date will be summarily rejected without assigning any reasons thereof.

4. At any time prior to the bid due date, IACS may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidder during pre-bid meeting, modify the bidding documents. The amendment(s) will be notified on the institute website.

Prospective bidders are advised to occasionally to visit the website ([www.iacs.res.in/tender](http://www.iacs.res.in/tender)) for any amendment.

5. Installation/Demonstration/Application training at site: Installation & user training at IACS, free of cost by the supplier.

6. Service facility: In India, preferably Kolkata, supplier should mention their details of service setup and man powers who are responsible for after sales support. Response time should be within 24 hrs.

7. The model number, make and a printed literature of the product should be submitted positively.

8. Proposed delivery schedule should be mentioned clearly.

9. Manufacturers / exclusive distributors / vendors should have history of supplying this type of instruments to this or other scientific organizations. Availability of a list in this regard would be preferred.

10. Authorized dealership certificate should be provided in case of principal manufacturing company is not quoting directly.

11. Guarantee certificate, users manuals etc. are to be handed over to the user after successful commissioning of the system.

12. In the event of date being declared a closed holiday for purchaser's office, the due date for submission of bids and opening of the technical bids will be the following working day at the appointed time.

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

14. For any clarification regarding technical specifications, information etc., please send your queries to Sugata Ray ([mssr@iacs.res.in](mailto:mssr@iacs.res.in)).

15. The authority of IACS reserves the right to reject any or all of the tenders received without assigning any reason thereof.

**Acting Registrar**