

INDIAN ASSOCIATION FOR THE CULTIVATION OF SCIENCE
2A & B, RAJA S.C.MULLICK ROAD, JADAVPUR, KOLKATA -700032

NOTICE INVITING TENDER NO. IACS/CSS/SA/15-16/29 DATED 29.12.2015

Sealed tenders in two bid system (Technical Bid & Financial Bid) are invited from bonafide, resourceful and eligible manufacturers/exclusive distributors for “**Atomic Force Microscope**”

Part – I (Technical Bid) of the tender should contain technical details and commercial terms and conditions and **Part-II** (Price Bid) should indicate group wise price as mentioned in the Technical Bid where applicable. The Technical Bid and Price bid are to be submitted in two separately sealed envelopes distinctly marked accordingly and both to be put inside another envelope, which should be sealed and super scribed with tender notice no. and due date. The bidders may submit bids duly signed in their own letterheads.

Complete tender should reach to the Acting Registrar, Indian Association for the Cultivation of Science, 2A & B Raja S. C. Mullick Road, Jadavpur, Kolkata-700032 on or before scheduled date & time specified below. The technical bids will be opened first to evaluate the technical specifications of the equipment thereafter, the **Price bids** of only technically qualified bidders will be opened.

1) 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.

Notice Inviting Tender No.	IACS/CSS/SA/15-16/29 Dated 29.12.2015.
Last date and time of submitting tender	29. 01.2016. Before 3:00 hrs.
Pre bid meeting to discuss Technical Specifications (Date, Time & place)	19. 01.2016 at 1:00 hrs. in SN Bose Seminar Hall
Date, Time and place of opening Tender	01. 02.2016 at 1:00 hrs. in SN Bose Seminar Hall
Contact Details	a) Dr. Somobrata Acharya, Associate Professor, Centre for Advanced Materials, e-mail : camsa2@iacs.res.in b) Dr. Sudip Malik, Associate Professor, Polymer Science Unit, e-mail : psusm@iacs.res.in

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 expenses to any of the bidders for attending opening of technical/price bids.

2) Technical Bid:

The Technical Bid should contain technical specifications and kept in a separate envelope duly super scribed as “**Technical Bid**” on the outer side of the envelope as detailed above.

3) Technical Specifications for Atomic Force Microscope:

The Atomic Force Microscope should have a state-of-the-art design and with latest technology for use to analyze various kinds of samples from different fields of science and technology towards higher end research.

Applications: Research with nanomaterials, soft matters and polymers with the best possible resolution and low noise level. The instrument should work both in the solid and liquid environments.

AFM instrument should have a state-of-the-art design to perform high performance contact Mode, Tapping Mode, Lateral Force Microscopy, Electric Force Microscopy, Magnetic Force Microscopy, Piezoresponse Force Microscopy, Switching Spectroscopy Piezoresponse Force Microscopy Nanoindentation, Nanolithography and Conductive AFM measurements.

Main System Specifications:

Scanning Features:

- (1) The AFM system must have sample-scanning technique in XYZ, maintaining the X, Y and Z position of the tip constant with respect to the laser and photo-detector position at all times.
- (2) The AFM should have atomic resolution scanning capability of the samples.
- (3) The AFM must additionally have the facility to scan large areas for low resolution scanning.
- (4) The AFM should provide auto-tune and auto-phase-adjust, finding cantilever resonance and adjusting phase measurement automatically.
- (5) Thermal drift should be as small as possible in addition to the low noise measurements.

Minimum Requirement for System Performance:

The AFM system must have top loaded sample-scanning technique scanner in X-Y-Z. There should be two different scanner options. One scanner should be up to 90 μ m x 90 μ m or more for viewing large scale for low resolution experiments. Another scanner should be ~ 10 μ m x 10 μ m or preferably smaller for high resolution imaging is preferable. Options for both these scanners to be quoted separately. The system should achieve demonstrable atomic resolution (graphite or mica) with either of these scanners. System with one large area scanner $\geq 90 \mu\text{m XY}$, however, capable of atomic/molecular resolution will be accepted. Z scanner with $\geq 10 \mu\text{m}$ with Z- noise level $< 0.05 \text{ nm RMS}$ will be preferred. System noise floor in Z, open loop $< 0.05 \text{ nm}$ ($< 50 \text{ pico-meter}$) RMS or better, on large area (90 $\mu\text{m XY}$) scanner, Closed-loop XY noise $< 0.5 \text{ nm RMS}$ at 1kHz, Open loop XY drift should be $< 1 \text{ nm/min}$. Proper cantilever and holder for the liquid samples is mandatory. The C-AFM must be with user-selectable gain range around $10^3 - 10^{11} \text{ Volts/A}$ and typical noise of around 250 fA at highest gain range.

Optics Features:

Optics with advanced optical resolution for sample and cantilever observation. Standard microscope, Video Camera or CCD Camera for sample approach and viewing cantilever is required. Capable of attaining 0.75 μm or better optical resolution is preferred. The approach should be motorized/manual, however, must be automated software driven for the final approach.

Standard Modes required:

The AFM system must be able to perform following modes:

- (1) Contact mode
- (2) Non contact mode
- (3) Tapping mode
- (4) Lateral Force Microscopy
- (5) Phase Imaging
- (6) Liquid mode
- (7) Dual pass scanning technique highly preferred
- (8) Piezoresponse Force Microscopy (PFM)
- (9) Magnetic Force Microscopy (MFM)
- (10) Kelvin Probe Force Microscopy (KPFM)
- (11) Electric Force Microscopy (EFM)
- (12) Conductive AFM (C-AFM) $\sim 10^{-12}$ Amp measurable range
- (13) Force Mapping Mode
- (14) Nanomanipulation
- (15) Vibration isolation table.

The best possible resolution for the above mentioned modes will be preferred. An item wise demonstration from the interested vendors is invited during the pre-bid meeting. The vendors are also encouraged for the item-wise quotation submission for the bidding.

Optional Modes / Advanced Modes (for future up gradation as & when needed):

- (i) Scanning Tunneling Microscopy (STM)
- (ii) Scanning Thermal Microscopy (SThM)
- (iii) Force Modulation
- (iv) Viscoelastic mapping
- (v) Sample heating accessory package up to 60°C. The system should be capable of in-Situ heating of samples in air and liquid with precise temperature control. Both heating element & digital temperature controller to be coated.

Control Electronics:

The AFM system must have state-of-the-art controller and related electronics.
The controller should have:

- (1) Automatic scan control in X, Y and Z
- (2) Ultra-low noise high voltage amplifier (say around, <0.1% or better)
- (3) Software controlled lock-in amplifiers for amplitude and phase outputs
- (4) Completely automatic engage under software control
- (5) Suitable Data Acquisition Software must be included in the system configuration

Probes / Tips/substrates:

(1) The respective tips / probes/ substrates for the standard modes asked in the tender must be included for as per applications. The special tips if any needed for the applications should be quoted.

Warranty:

24 months from the date of completion installation and commissioning. Please quote warranty for additional 24 months after completion of 24 month standard warranty.

Installation Base of the quoted model:

The vendor should give a user list of Atomic Force Microscope with the above mentioned mandatory criteria supplied / installed. They should have a number of installations in reputed institutions / organizations.

After Sales Service and Application Facilities:

The vendor must have excellent after sales service and applications support with a number of service engineers and service centre at Kolkata, and they should have facility to give training to the students.

The service engineers and applications specialists must be experienced and factory trained – will be able to train the deputed person for operations and basic maintenance of the complete AFM system. The response time of the engineer must be within 24 Hrs.

Installation and Training:

- (1) The installation and commissioning of the complete system should be carried out by experienced factory trained engineers at our site.
- (2) The respective training to the deputed personnel should be given for required number of days.

Additional Accessories:

Please quote recommended additional accessories and consumables like Tips/Probes, Mica, HoPG, other substrates etc. required for operating the system smoothly.

Technical compliance chart should be provided following the following format*

Sr. No.

Tender specification

Your offered instrument specification

Extent of Compliance

***Tender will not be accepted if the technical compliance chart is not provided following the above format.**

4) **User List:** The supplier should provide a list of current users (with contact no, Email address etc) for the quoted item.

5) **Service facility:** Trained technicians should install the instrument and ensure it is operating correctly and within specifications. User training at site should also be provided. Supplier should mention their details of service setup that are responsible for after sales support.

6) 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 envelope as already detailed above. The price bids of only technically qualified bidders will be opened and they will be intimated the date and time of opening of price bids at their email id-(s). Rest of the bids will stand rejected.

7) **Price:** Price to be quoted both on FOB/CIF basis. Name of the particular port from where our authorized forwarder will lift the consignment must be mentioned clearly with FOB price.

8) Bid Security:

1. The financial bid should be superscribed as "**PRICE BID**" on the outer cover of the envelope

2. **Bid Security (EMD):** An Account Payee Demand Draft of Rs.2,50,000/-(Rupees Two Lakhs and fifty thousand only) in the name of "**Indian Association for the Cultivation of Science**" is to be furnished by the bidders, as Bid Security money or Earnest Money Deposit (EMD).

3. The Demand Draft for the Bid-Security money should have at least 90 (ninety days) days validity period after the opening of the Bids.

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

9) Performance Security:

An Account Payee Demand Draft of an amount 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 will be refunded to successful bidder on receipt of the Performance security money.

10) General Instructions:

1. Incomplete & conditional tenders and tenders received after the due date will be summarily rejected without assigning any reasons thereof.

2. 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 visit the website (www.iacs.res.in/tender) for any amendment.

3. **Payment:** 100% against delivery and successful installation subject to submission of performance guarantee.

4. **Warranty:** Minimum 5 years or 2 years warranty + 3 years annual maintenance contract.

5. **Installation/Demonstration/Application Training at site:** Free of cost by the supplier.

6. **Service facility:** Supplier should mention their details of service setup for Kolkata/India who are responsible for after sales support. Response time should be within 24 hours.

7. **Validity of tender:** Tender submitted shall remain valid at least for three months from the date of opening of the tender. Validity beyond four months from the date of opening of the tender shall be by mutual consent.

8. The tender should accompany a compliance chart.

9. The rate should be inclusive of all taxes, transportation etc. Nothing extra will be paid in addition to the quoted rate.

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

11. Proposed delivery schedule should be mentioned clearly.

12. Manufacturers/exclusive distributors/vendors should have history of supplying this type of instrument to this or other Scientific Organization.

13. Authorized Dealership Certificate is must in case of principal manufacturing company is not quoting directly.

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

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

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

17. For any clarification regarding technical specifications etc. please send your queries to camsa2@iacs.res.in ; psusm@iacs.res.in by email only.

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

Acting Registrar