

INDIAN ASSOCIATION FOR THE CULTIVATION OF SCIENCE

2A & 2B , Raja S.C. Mullick Road, Jadavpur, Kolkata-700032

NIT No. IACS/CSS/PK/20-21/42

Date: 03.03.2021

Sealed tender in two bids system (technical bid and price bid) is invited from bonafide, resourceful and eligible manufacturer/exclusive distributor/vendors for **Atomic Force Microscope (AFM)**.

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 envelope, 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.	NIT No. IACS/CSS/PK/20-21/42 Date: 03.03.2021
Last date and time of submitting tender	17/03/2021, within 2.00 PM
Pre-bid meeting(date, time & place) to discuss technical specification	09/03/2021, 12.30 PM (online mode, link will be send on receiving the request)
Date and time of opening tender (Technical Bids)	17/03/2021, 03.00 PM
Place of opening tender	Room No. 202, Centenary Building IACS
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	Email: praveen.kumar@iacs.res.in , praiitr@gmail.com , Tel.+91 33 2473 4971 [Ext 2168]

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 units 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 superscribed as 'TECHNICAL BID' on the outer cover of the envelope as already detailed above. **It should be clearly mentioned on the envelope as "Technical Specification for Atomic Force Microscope (AFM)".**

TECHNICAL SPECIFICATION OF ATOMIC FORCE MICROSCOPE (AFM)

1. Modes of Operation:

The Atomic Force Microscope (AFM) is a complete system capable of imaging and measuring of atomic resolution for nanomaterial samples in Rubbers and Polymers. The system provided should be a complete system inclusive of all necessary computers, software, hardware, and accessories for all the specified imaging modes and optional modes.

The main unit with standard microscopy imaging modes operated on Contact, Tapping mode/Intermittent contact/Dynamic Force, Phase Imaging, Lateral Force Microscopy (LFM), EFM, MFM, and Force Modulation, Advanced Mode for Mechanical properties such as Adhesion, Young's Modulus, Elasticity.

Provision for imaging delicate soft samples under air and liquid environments without any loss in resolution and clarity.

The system must include a general-purpose imaging mode with all of the following features:

- Automatic optimization of critical imaging parameters including set-point, gains, scan rate, and Z limit;
- Mode must operate in both air and liquids;
- The cantilever resonance be "tuned"; automatically
- Has conventional imaging rates;
- Directly controls the tip-sample imaging force down to at least 100 pN or better;
- Mode automatically compensates for a drift of the deflection signal

Any other modes, which come as default modes with the quoted system should also be clearly mentioned. The quoted model should have future up-gradation possibilities without changing the scanner head. Other modes like Conductive AFM (CP-AFM), Scanning Tunneling Microscopy (STM/STS) should be quoted as an optional items.

2. Scanner:

The quoted system should be compatible with using one or more Scanners to cover from a large area to the smallest possible areas with the best possible resolution. It should have already been supplied/installed in India at least five quoted AFM model systems. Tailor-made scanners are not accepted.

Large Scanner

- XY scan range of 50µm x 50 µm or above.
- Z scanner range: 5 mm or above, Topography noise $\leq 0.06\text{nm}$
- Prefer to have a 3-year warranty for the scanner.

Should mandatorily demonstrate the scan range and noise number during the installation at the site. The XY scanner must be separate from the Z scanner to eliminate the "bowing" art effect. The scanners should

have closed-loop feedback system in all X, Y, and Z. The quoted scanner must support all imaging modes as required.

3. Controller:

- The system must provide the capability to calibrate the cantilever spring constant by thermal tuning of the cantilever.
- The system must support High pixel density images up to 4k x 4k data points or above
- 24-bit Scan control and inputs or better
- The system must allow for up to 8 simultaneous channels (or better) in real-time scanning
- The lock-ins, if any, must be software controlled, including control of the lock-in bandwidth, routing of an input signal, routing of output signals.
- The controller must provide three independent digitals to analog converters (DACs) per axis (X, Y & Z)
- The controller must include active digital control of the cantilever quality factor Q (Q Control).

4. Light Source/Detector:

- Appropriate laser light source.
- Four Quadrant (or better) position-sensitive photodetector

5. Tip-sample viewing:

SPM scanning cantilever/probe optical surface should be viewable on-axis in real-time optics with 5 Megapixel High-Resolution CCD Camera and video access

6. Sample Holder:

- Appropriate sample holder/s: should be compatible with all operating modes.
- The mounting of the samples and cantilever/probe should be user-friendly.

7. Sample Size: 10mm dia or more and thickness of 5mm or more

8. Power Supply:

- The instrument and computer should be compatible with the power supply specification in India; 220V, 50/60 Hz, (Operating range 210-240V)
- Suitable online UPS with one-hour backup for the operation of the system and computers must be provided.

9. Probes/Cantilevers: Consumables like probes/cantilevers required for operation for a minimum of three years (at least 100 probes) are to be included for all modes of AFM modes as mentioned in the above specifications

10. Acoustic Enclosure: Suitable Acoustic Enclosure with required accessories to be quoted with the main unit. Locally made Acoustic Enclosure will NOT be accepted. The vibration table is available at the Institute.

11. Computer and Software:

- Computer: i5 (or better), 8GB RAM (or better), 1TB Hard drive (or better), 27" LED monitor (or higher), Window 10 (or better), 64 bit (English)
- Computer graphic cards should be provided for the complete operation of all modes of the system as mentioned in the specification.

- Supporting TCP/IP for networking should be included.
- Should be the latest generation for high-speed operation and high data storage
- Appropriate cables and power cables to be provided

Software:

- Microsoft Windows operating system is preferred.
 - Suitable software for data acquisition, optical view, and for image processing, F-d spectroscopy, analysis, and presentation for all modes in SPM should be provided.
12. All standard start-up accessories required for system operation should be included-like calibration gratings, standard samples, and other tools like tweezers, Allen keys, tools, etc., for sample handling and instrument operation.
 13. A complete manual should be provided. Comprehensive onsite training for a week should be provided for selected students and operators during the installation of the instrument. Three days of advanced training for such trained students and operators after three months to be provided onsite.
 14. The quoted AFM must have a standard warranty for one year. Extended warranty for three years to be quoted separately.

Mandatory Requirement:

- Minimum 10 appreciation letters from any organization.
- At-least 5 installations should be done for the quoted model. Provide the details.
- Service should be directly from the manufacturer's engineers. They should be based in this region; provide the contact details. A call should be attended within 24 hours.

Delivery and Taxes:

- Door delivery/CIP: both options should be provided for the quoted model
- All Custom duty and service taxes must be paid by the respective company.

A clear compliance table (see below) including all the technical specifications including the mandatory requirement must be prepared and submitted along with the technical bid. Leaving any specification may be considered as not available with the quoted model.

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. A proof of the all quoted technical specification also must be provided.

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:

An Account payee Demand Draft of any of the Commercial Banks for Rs. 90,000 (Rupees ninety thousand 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 alongwith Technical Bid, except Micro and Small Enterprises (MSEs) as defined in MSE Procurement Policy issued by Department of Micro, Small and Medium Enterprises (MSME) or are registered with the Central Purchase Organisation or the concerned Ministry or Department.

Alternatively, the bidder shall have the option to furnish EMD in the form of Fixed Deposit Receipt, Banker's Cheque or Bank Guarantee from any of the Commercial Banks. The Bid-Security should have at least 90 (ninety) days validity period beyond the final bid validity period.

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 commercial bank of India or Bank Guarantee (BG) of any Commercial Bank preferably located at Kolkata 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 instalments. 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) 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 binding on the bidders.
14. In case of any litigation the matter will be dealt within the jurisdiction of the High Court of Calcutta only
15. For any clarification regarding technical specifications, information etc., please send your queries to **Dr. Praveen Kumar** (praveen.kumar@iacs.res.in).
16. The authority of IACS reserves the right to reject any or all of the tenders received without assigning any reason thereof.

Acting Registrar

N O T E:

- 1) **WARRANTY:** Minimum 1 year while 3 years or more is preferred (as per requirement of the indenter)
- 2) **PRICE:** Price to be quoted on CIF Kolkata and FOB basis or as per the requirement of the indenter (this may be modified as per the requirement of the indenter)
- 3) **BID SECURITY:** Amount of bid security may be accepted in the range between two percent to five percent of the estimated value of the goods to be procured.
- 4) **PERFORMANCE SECURITY:** Performance Security may be accepted for an amount of five to ten percent of the value of the contract as specified in the bid documents.
- 3) **TERMS OF PAYMENT:** As per nature of the transaction
- 4) **GENERAL INSTRUCTIONS:-**

Item No.- 5: Installation/Demonstration/Application training at site : This may be modified as per the requirement of the indenter/technical committee.

Item No. - 6: Service facility: This may be changed by the indenter as per requirement.