

DEPARTMENT OF PHYSICS
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TENDER DOCUMENT FOR THE PURCHASE OF
ATOMIC FORCE MICROSCOPE (AFM)

Tender No.: PHS-12/37

Last Date for Receipt of Tender: Jan. 30, 2012, 3:30 PM

DATE & TIME OF OPENING: Feb. 06, 2012, 3.30 PM

Tender application Rs. 1000/-

Earnest Money Rs. 25,000/-

Tender Specifications for Atomic Force Microscope (AFM) System

The Scanning Probe Microscope/AFM should be a stand-alone multifunctional system that has top view optical system for cantilever and sample alignment, control electronics and software, computer control workstation, active vibration isolation table, and all necessary accessories and spare parts. The instrument should be able to scan dimensions ranging from about 100 microns to a few nanometers with extreme linearity. Moreover, the image acquired should have a high resolution thus enabling one to get an unattended scan (over a large area) for samples kept under stable conditions.

Please provide a compliance-statement with the technical bid.

The specifications and configuration of AFM are as follows:

(1) GENERAL

Essential measuring modes: In air

- Contact AFM
- Lateral Force Mode (LFM)
- Resonant Mode AFM (semicontact + noncontact AFM)
- Phase Imaging
- Force Modulation
- Adhesion Force Imaging
- Magnetic Force Mode
- Electrostatic Force Mode (EFM)
- Magnetic Force Mode (MFM)
- SFM/STM spectroscopies
- AFM Nanolithography and Nanomanipulation (Force and Electrooxidative)
- Spreading Resistance Imaging (SRI)

Scanning Types:

- Scanning-by-sample
- Scanning-by-probe (additional flexibility to measure larger and heavier samples)

Both types should be available in one instrument.

Offered Scanner must be piezo-tube construction for highest resolution (separate X, Y & Z scanner not allowed).

Scanners:

Scanning Range: 10x10x5 μm

XY sample positioning:

-Range of sample positioning: 5x5 mm

-Positioning accuracy: 5 μm

Scanning Tunneling Microscopy (STM):

Current: 30pA-50nA

Optical System:

Videomicroscope with manual continuous zoom. Numerical aperture up to 0.1, magnification 85x to 1050x or better with CCD camera, horizontal field of view 4.5 to 0.37 mm.

Computer System:

Branded latest configuration high end PC with high capacity hard disk, with CD/DVD writer, 19" TFT color monitor, key board, mouse, laser jet printer equipped with latest license windows operating system for data acquisition and analysis purpose.

SPM Processor Control Electronics:

Should contain all the control and monitor electronics the SPM (AFM and STM) e.g. DP boards, self diagnostics boards, Power supply units etc; DAC signal for control of XYZ scanner movement or Bias voltage application; 16 bit ADC bit for data acquisition with input filter and adjustable gain such as 1,10,100 and 1000; Lock-in-Amplifier with 1 kHz to 2 MHz , facilitating modulation AFM method; suitable PCI interface card and cables (at least 5m long) for interfacing the SPM controller with the PC; Power requirement is 90-240 V 50Hz.

Image analysis Windows-based software features are:

-Cross section analysis

-Roughness measurement

-Grain size analysis

-Depth analysis

- Power spectral analysis
- Histogram analysis
- Fractal analysis
- Fourier analysis
- Image analysis
- Autocorrelation
- Enhanced image filtering tools.

Image modification and presentation software features are:

- Force-distance curve analysis
- 2D Fast Fourier analysis
- Plane-fit
- High pass and low pass filters
- Zoom in/out
- Optional grid on images and curves
- variable shading and display angle, tilt
- Colour bar completely use definable 2D and 3D height presentation
- Menu for image presentation

Image and data export format:

- Export to BMP, JPG, TIFF
- Export to ASCII format and MatLab

Macro-language (built-in programming language) for:

Routine operation automation; Full control of SPM operation; Pre-programmed experiments

Cantilever tips:

Cantilever sets: 10 chips – for contact AFM; 25 chips – for noncontact modes; 5 chips – for spreading resistance; 5 chips – for SKM/SCM; 5 chips – for MFM.

Also quote separately for the additional cantilever sets as mentioned above.

Standards:

Set of 3 linear silicon gratings with silicon oxide calibrating steps (3 different height: TGZ01 – 20nm, TGZ02 – 100nm, TGZ03 – 500nm)

Service Manuals and Toolkits:

Complete set of instruction and reference manuals and required toolkits are provided.

Optional Item:

- Scanning range: 1x1x1 μm
- Probe Scanner (100x100x5 μm) to measure larger and heavier samples
- Special fluid cells
- **Acoustic isolation:** Vibration isolation Table

Future Upgradeability:

- More different scanners can be added including the scanner for operation in liquid environment;
- Can be upgradable to EC (electrochemical) AFM/STM;
- Can be upgraded for low current STM (10 pA-5nA);
- Can be upgraded with heating stage up to 150 °C;
- Upgradable to SCI and SKM modes

WARRANTY

Two years warranty at site basis including all hidden cost. Purchaser will not pay any amount during the warranty period. Down period will be excluded from the warranty period.

SPARES AND CONSUMMABLES

Necessary spares and consumables [is to be provided by the vendor without cost during first 2 years] required for smooth and efficient operation of SPM for 2 years.

It should be clear that all the required features must be clearly mentioned, so that at the time of making comparative statement – we must not end up in any trouble.

SECTION – I

PROCEDURE FOR SUBMISSION OF BIDS

1. There will be **Two bid system** for this Tender: *Techno-Commercial bid* and *Financial bid*
2. The Techno-Commercial Bid of the Tender should be covered in one sealed cover superscribing the words “Techno-Commercial Bid”.

Likewise, the Financial Bid should also be covered in a **separate** sealed cover superscribing the words “Financial Bid”.

The two documents viz., Techno-Commercial bid and Financial bid covers prepared as above should be enclosed in a single sealed cover marked as under:

Tender for the supply of AFM

Due on **Jan. 30, 2012; 5:30 PM** (last date for submission).

Name & Address of the Tenderer.....

Note: Price should not be indicated in the Techno-Commercial bid otherwise the Tender will be rejected

3. Tenders received after the due date will not be accepted. If the last date for submission of Tender falls on any declared holiday in the University, the next working day will be considered as the last date for the same.
4. The bids prepared by the Tenderer and all correspondence and documents relating to the bids, shall be written in English language
5. The contract for the supply of the items is non-transferable.
6. Tender/Offer should be type written, other wise the same will be rejected
7. Each page of the tender document should be signed by the authorized signatory.
8. Each offer should be complete in all respects.
9. Telegraphic/electronic/conditional offers will not be accepted.

SECTION – II
TERMS AND CONDITIONS

1. **Opening of bids:** Techno-Commercial bids will be opened by the Committee after the closing date and studied. The Tenderers will be invited for presentation and clarifications if needed. Financial bids of the Tenderers complying with the prescribed Techno-commercial specifications will be opened by the Committee. Tenderers or their authorized agents may be present if they so desire during opening of the Tenders. The Tendering company should depute the person who is qualified for technical knowledge and be present at the time of opening of the technical bid.
2. **Rejection of bids:** The Committee reserves the right to reject any or all offers without assigning any reason.
3. **EMD:** The Tender bid should accompany an EMD of Rs. 25,000. The EMD should be made by means of an A/c payee DD in favor of the Registrar, Panjab University, Chandigarh-160014 payable at Chandigarh. No interest is payable on EMD.
4. **Refund of EMD:** The EMD will be returned to unsuccessful Tenderer only after the Tenders are finalized. In case of successful Tenderer, it will be retained till the successful and complete installation of the equipment.
5. **CIF value and comparison of Financial bids:** CIF value upto Physics Department, Panjab University, Chandigarh (*shipment by air upto Delhi and insured up to the installation site*) should be quoted and will be considered for comparison of bids. Bids quoted in foreign currency will be converted into Indian Currency at the exchange rate applicable on the day of opening of the financial bids for comparison purposes.
6. **Warranty Period:** The warranty period should be *minimum 2 years (with spares)* from the date of installation with satisfactory performance as per specifications. *2 years free service* to be provided after the warranty period.
7. **PBG:** Tenderer selected for supply of equipment, will have to provide Performance Bank Guarantee (PBG) on any *scheduled bank situated in India, equivalent to 10 percent of the cost of the equipment* which should be valid until the expiry of the Warranty period. The PBG will be provided by the Company along with the letter of acceptance of the order by the Principals. LC will be opened in favour of the Principals only after obtaining the PBG.
8. **Terms of Payment:** LC will be opened for the 100% value of the equipment, 90% of the amount will be released after the shipment and remaining 10% after the installation of the equipment.
9. **Delivery period :** Delivery should be made within *120 days* of opening of the LC
10. **Delayed delivery:** If the delivery is not made within the due date for any reason, the Committee will have the right to impose penalty as under:
 - i First extension for one month or part thereof @ 2%.
 - ii Second extension for an additional month or part thereof @ 3%
11. **Non delivery beyond extended period:** If the Tenderer fails to execute the order within the second extension mentioned above or mutually agreed time frame, the order will be cancelled and EMD

forfeited by the Dept. He will also be liable for all damages imposed by Physics Department for non supply of equipment including the liability to pay the difference between the price accepted by him and those ultimately paid by the Physics department for the equipment, such damages will be assessed by the Committee for the purchase of SPM.

12. Increased statutory levies and duties above the rate quoted in the offer will not be an excuse for the Tenderer to delay the supply beyond the date specified in the Tender.
13. **Validity of rates:** Rates quoted should be valid for at least *4 months* from the closing date of the tenders.
14. **Consistent pricing:** The rates quoted for the Equipments by the supplier shall in no case exceed the lowest price at which the supplier of this Equipment of identical description made to any other person/organization/Institution during the above said period and should attach an undertaking in this regard.
15. **Installation requirements:** The Supplier will clearly mention installation requirements on our part in the *Techno-Commercial bid*.
16. **Installation time:** The company must install the equipment *within a period of two months* of the date of delivery of the equipment at Physics Department, Panjab University, Chandigarh.
17. **Free Installation:** The equipment and software should be installed and tested to the specifications *free of cost*.
18. **Supporting Equipment:** The Tenderer will provide all requisite supporting equipments like isolation transformer, step down transformer, *if needed*. We need the complete installed system.
19. **Licensed Software and its upgradation:** *Two user licences* for analysis software should be provided. The certified/licensed software and programs should be the part of the supplies. There should be *free upgradation of software upto 5 years*
20. **Factory Acceptance Data:** Proposed acceptance criteria for the equipment should be provided by the supplier in order to compare the performance against the quoted specifications. *Manufacturer's test certificate along with test conditions and results* is to be supplied along with the equipment.
21. Tenderers are advised to study all technical aspects and terms & Conditions, of the Tender documents. Submission of Tender shall be deemed to have been done after careful study and examination of the Tender Document with understanding of its implications.
22. **Only Manufacturers or Authorized dealers to bid:** The offering firm should clearly mention whether they are the manufacturer or authorized agent/dealer of the manufacturer. In case of agent for overseas manufacturer, a letter of authorization from the manufacturer should be submitted along with the offer. The Tenderer can also enclose the rates on the letterhead of the manufacturer if he has been authorized to do so by the manufacturer.
23. **Descriptive literature:** A set of specifications, description and illustrated literature of the equipment and related peripherals *should accompany the Techno-Commercial bid*.
24. **User and Service Manuals:** A set of User's manuals and Service manuals of the main instrument, attachments and related equipment (water chiller etc.) should be supplied with the equipment

25. **Equipment must be new:** The Tenderer must ensure that the equipment being offered is a new one and not refurbished or repaired one.
26. **Defective Equipment:** If any of the equipment supplied by the Tenderer is found to be substandard, refurbished, unmerchantable or not in accordance with the description /specification or otherwise faulty, the committee will have the right to reject the equipment or its part. The prices of such equipment shall be refunded by the Tenderer with 18% interest if such payments for such equipment have already been made to him.
27. All damaged or unapproved goods shall be returned at suppliers cost and risk and the incidental expenses incurred thereon shall be recovered from the supplier. Defective part in equipment, if found before installation and/or during warranty period, shall be replaced within 45 days on receipt of the intimation from this office at the cost and risk of supplier including all other charges.
28. **Damage during transit:** In case of any mishappening/damage to equipment and supplies during the carriage of supplies from the origin of equipment to the installation site, the supplier has to replace it with new equipment/supplies immediately at his own risk. Supplier will settle his claim with the insurance company as per his convenience. The Physics Department, PU will not be liable to any type of losses in any form.
29. **Legal jurisdiction:** Any dispute in this regard of any term of the offer and on the supply of equipment is subject to *Chandigarh jurisdiction* only.
30. **Training** Two weeks training should be provided free of charge at the premises of Physics Department out of which one week should be on equipment usage & software and one week in maintenance and application including sample preparation.
31. **Availability of Spares:** The Tenderer must assure the availability of spares for servicing of equipment *for at least 10 years*. Supplier should give an undertaking that spares parts will be supplied within the specified periods as and when ordered.
32. **Infrastructure:** Physics Department will provide required air conditioned space, *single phase power supply* with required electricity outlets.
33. **Clearance:** The Principals will do all types of clearance work to deliver the equipment at the site of installation. Department will provide all types of documentary support including Customs Duty Clearance. Principals will themselves have to procure any requisite permission from the Govt. of country of origin of equipment.
34. **Agency Commission:** Agency commission, if any, should be clearly mentioned by the Principals in the form of a certificate and will be paid in Indian Currency.
35. **Bank Charges:** Bank charges in India will be borne by the Panjab University and Bank charges abroad will be borne by the suppliers.
36. **Similar Models installed:** The Tenderer must mention in the *Techno-Commercial bid* the similar model of equipment installed in India *during the last three years* and the *addresses of contact persons at these places*.

37. **Application Specialist:** The Tenderer should mention in the *Techno-Commercial bid* the availability and *names of Application Specialist and Service Engineers* in the nearest regional office.
38. **Response Time:** The Tenderer should mention in the *Techno-Commercial bid* the response time for attending to a complaint about the equipment.
39. **Change of Indian Representatives:** The original manufacturer/Principals should give an undertaking that the aforementioned warranty and availability of spares clauses will be valid even in the case of change of their representatives in India.