NATIONAL INSTITUTE OF TECHNOLOGY
ROURKELA – 769 008, ODISHA

Advertised Tender Enquiry

Department: Biotechnology and Medical Engineering

Tender Notice No: NITR/PW/BM/2019/107 **Date: 25/03/2019**

To

Through
CPP Portal
(E-procurement)

Important Dates

Event	Date	Time
Pre-bid Conference	**-NA-**	**-NA-**
Last Date of submission of bid	**22/04/2019**	**11:00 AM**
Date of opening of technical bid	**23/04/2019**	**11:00 AM**

Dear Sir,

We intend to purchase the commodities specified below and invite quotations in accordance with the terms and conditions detailed in the bid document. If you are interested, kindly send your offer with prices and complete terms within the time mentioned above.

For any technical query contact to

Attention: Dr. Devendra Verma
Department of Biotechnology and Medical Engineering
National Institute of Technology
Rourkela – 769 008, Odisha
Phone: 0661 – 2462286
Email: vermad@nitrkl.ac.in

Yours sincerely,

Name: Dr. Devendra Verma
(PIC)

Encl:

1) Schedule of requirement, specifications, dates etc.
2) Bid document containing detail terms and conditions.

1. **Schedule of requirements**

Sl. No.	Description of Goods/Service	Quantity
1	High Resolution Biomedical Atomic Force Microscope (BioAFM)	1

2. **Specifications and allied Technical Details**

For detailed specification see **Annexure 1**
Please submit list of users along with the quotation.

3. **Format of Quotation** (tick appropriate box)

☑ It is a two-part bid with separate technical and price bids.

4. The Bid should be submitted through https://eprocure.gov.in/eprocure/app
5. Quotations should be valid for a period of **90 days** from the closing date of the bid.
6. **Some important dates:**

i.	**Pre-bid Conference:**	**Date: NA**	**Time: NA**
ii.	**Last date for submission of bid**	**Date: 22/04/2019**	**Time: 11:00 AM**
iii.	**Opening date of technical bid**	**Date: 23/04/2019**	**Time: 11:00 AM**

7. **Warranty**: Warranty must be **2 years** onsite which should be clearly mentioned along with the quotation.
8. **Technical Evaluation Criteria:** As per the detail equipment technical specifications given in Annexure –I. If required, the bidder may be asked to provide clarification regarding the technical aspects.
9. The comparison will be made for award of contract on the overall price basis.
10. **GST** should be charge as per the applicable rates.
11. **Bid Security and Tender Cost:-** Bid security in shape of DD (Demand Draft) for **INR 2,00,000/-(Rupees Two Lakh Only)** and Tender Cost (Non- refundable) in the form of DD for **INR 1000/- (Rupees One Thousand Only)** in favour of **Director, NIT Rourkela Payable at Rourkela** from any Scheduled Commercial Bank except Co-operative and Gramin bank. And DD for the Bid security should remain valid for a period of 45 days beyond the bid validity period from the date of opening of bids. Bid security of unsuccessful bidders should be return to them at the earliest and latest on or before the 30th days after the award of the contract. Bid security and Tender Cost should reach physically through speed post/ register post/courier, containing in an envelope & superscripted with subject, tender reference number addressing to **Registrar, NIT Rourkela - 769008, Odisha; Attention: HOD(BM) on or before 23/04/2019 at 11:00 AM**
12. **Performance Security:** Rs. 5,00,000/- (Rupees Five Lakh Only) in shape of Bank Guarantee/Demand Draft (DD) in favor of Director, NIT Rourkela payable at Rourkela from any Scheduled Commercial Bank except Co-operative and Gramin bank. Performance security should remain valid for a period of 60 days beyond the date of completion of all contractual obligations of the supplier including warranty obligation. And EMD (Earnest Money deposit) amount of successful bidder will be returned after the receipt of performance security in case of award of contract to successful bidder.

13. Please go through the enclosed “bid document” carefully for other bidding instructions. Please send your quotations through https://eprocure.gov.in/eprocure/app

14. For technical details, you may contact

Dr. Devendra Verma
Department of Biotechnology and Medical Engineering
National Institute of Technology, Rourkela – 769 008
Phone:0661–246-2286
E-mail: vermad@nitrkl.ac.in

NB: Please furnish your Dealership Certificate (must) and Proprietary Nature Certificate (If applicable)

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BID DOCUMENT

1. Instructions to the bidders

1.1 Bids are invited on behalf of the Director, National Institute of Technology (NIT), Rourkela – 769 008, Orissa, from the intending bidders for supply of the goods/stores/ equipment for the Institute as detailed in the enquiry letter.

1.2 The bidders should quote their offer/rates in **BOQ** in clear terms without ambiguity.

1.3 In case of any discrepancy between the rates in figures and that in words, the rate in words will be accepted as correct.

1.4 The last date for receipt of the bid is marked in the tender document.

1.5 The Bid should be uploaded in https://eprocure.gov.in/eprocure/app. Please follow the guideline of the site.

1.6 If a prospective bidder requires any clarification in regard to the bidding documents, he may make a request the concerned officer or faculty member at least 15 days before the deadline for receipt of bids.

1.7 Bids received after the deadline of receipt indicated in Para1.4 above shall not be taken in to consideration.

1.8 Each bidder shall submit only one bid. A bidder, who submits more than one bid, shall be disqualified and considered nonresponsive.

1.9 (In respect of high value plant, machinery etc. of a complex and technical nature). The bids may be submitted in two parts, viz., technical bid and financial bid.

1.10 The bidder has to sign in full at all pages of the scanned part of the bidding document. No over-writing in those pages is acceptable.

1.11 If any bidder does not fulfil technical specification, his/her eligibility will be cancelled even if his/her price got L1 status.

2. Conditions of the bid

2.1 The rates quoted should preferably be net, inclusive of all taxes and duties, packing, forwarding, freight, Insurance and all other incidental charges. In case these charges are quoted extra in addition to the quoted rates, the amount thereof or Ad Valorem rate must be specified. Packing, forwarding, freight etc., when quotes separately are reimbursable at actuals. If external agencies are employed, their receipts must be enclosed with the invoice.

2.2 Duties and Taxes are to be quoted separately. Ad Valorem rates thereof should be clearly indicated with reference to the relevant Acts and Rules.

It may be noted that the Institute is availing custom duty exemption in terms of notification no 51/96- Customs dt. 23.07.1996, Notification no. - 47/2017- Integrated Tax (Rate) dt. 14.11.2017 and Notification No- 45/2017- Central tax (Rate) dt. 14.11.2017[vid Registration No.: TU/V/RG-CDE (227)/2016, dated: 13.11.2018]

2.3 The goods are required to be delivered at the indenting Department of NIT, Rourkela, and must be reached within **90 days** from the date of placement of the supply of order under the risk and arrangement of the bidder and offers with delivery beyond the above period shall be treated as unresponsive. In case the delivery time is higher, the same must be mentioned clearly in the quotation.

2.4 The bid should remain valid for a period of **90 days** from the date of opening. In case your offer has a different validity period that should be clearly mentioned in the quotation.

2.5 Conditional discount, if any, offered by the bidder shall not be considered at the time of evaluation.

2.6 The goods offered should strictly conform to the specification and technical details mentioned in **Annexure I**.

2.7 The Institute may like to conduct pre-dispatch inspection of goods, where applicable.

2.8 Period of guarantee/warranty, where applicable, should be specified in the bid.

2.9 If the successful bidder, on receipt of the supply order, fails to execute the order within the stipulated period, in full or part, it will be open to the Director, NIT Rourkela to recover liquidated damage from the firm at the rate of 1 percent of the value of undelivered goods per month or part thereof, subject to a maximum of 5 percent of the value of undelivered goods. Alternatively, it will also be opened to the Director, to arrange procurement of the required goods from any other source at the risk and expenses of the bidder.

2.10 The successful bidder may be required to execute a contract, where applicable.

2.11 The bidder has to furnish up to date Income Tax Clearance Certificate along with the bid.

2.12 Payment (100 percent) will be made by Account Payee Cheque/Bank Draft, within 30 days from the date of receipt of the goods in good condition or receipt of the bill, commissioning of the equipment, where applicable, whichever is later/latest.

2.13 In case of Advance payment, the payment will be made on either in Foreign Demand Draft or Wire Transfer only. The proforma invoice copy need to be sent for advance payment.

2.14 In the event of any dispute arising out of the bid or from the resultant contract, the decision of the Director, NIT, Rourkela shall be final.

2.15 The bid document/resultant contract will be interpreted under Indian Laws.

ANNEXURE-1

Specifications of High Resolution Biomedical Atomic Force Microscope (BioAFM)

A complete and versatile Biomedical Atomic Force Microscope (BioAFM) System suitable for multi-user environment with all accessories to be quoted as per the following specifications. The BioAFM should be specially designed to handle biomaterials and biological samples in high resolution mode.

This AFM should be configured to mount on top of an inverted optical microscope (IOM). The IOM should also be quoted with the AFM and the IOM should be fully functional.

AFM Modes:

- Contact mode
- AC Tapping mode
- Lateral Force Microscopy
- Amplitude and Phase Imaging
- Force Spectroscopy and Force Volume Mapping
- Force Volume spectroscopy and Force scanning mode
- Electric force microscopy
- Magnetic force microscopy
- Kelvin Probe Force Microscopy
- Nanolithography and nanomanipulation capabilities with complete software control
- Piezoresonance Force Microscopy
- Viscoelastic mapping

The Bio-AFM should offer High Resolution imaging in both air and fluid. Required air cantilever holder for imaging in air and fluid cantilever holder for imaging in air or fluid to be supplied with the BioAFM.

The AFM control software must automatically recognize ("plug and play") the heads, scanners, probe holders (for both liquid and air) and configures the software appropriately (e.g. calibration parameters).

The tip sample engagement must be controlled by software automatically. Manual tip movement only for coarse movement is acceptable. The engagement of sample must be trough piezo/motorized movement.

Suitable Vibration Isolation Platform to be included.

AFM Scanner

The AFM to have sample scanning or tip scanning, preferably sample in XY and Tip Scanning in Z.

The AFM should use flexure guided decoupled scanner with piezo scanning in all three axis (xyz). Typical tube scanner arrangement is not acceptable.

AFM should have decoupled closed loop scanners in all X, Y and Z directions. XY (actuator) scanning direction should be decoupled with Z-actuator.

The Scan range must be at least 100 µm in the X and Y direction and 15 µm or more in the Z direction. The closed loop operation should be possible in all X, Y and Z directions.

The AFM should use a single scanner for high resolutions imaging and large scanning. Multiple scanners are not preferred.

XY Sensor Noise should be ≤ 0.5 nm RMS (closed-loop), ≤ 0.1 nm RMS (open-loop).

Height Sensor Noise should be ≤ 0.06 nm RMS (typical with appropriate vibration and acoustic isolation).

Extended Z scan range up to 24 µm or greater must be available and included with same noise specification.

The above specifications should be demonstrated in the lab after installation.

AFM Controller

Full featured high end, low noise and high-speed controller to run the AFM system should be included.

Controller should have at least 6 ADC channels, 18 bit or better

Controller should have at least 4 DAC (24 bit or better) for scan signal generation

At least two fully digital Lock-in amplifier

Digital Lock-in amplifiers operating on these fast ADCs at 5MHz to provide quadrature outputs.

5000x5000 or more pixel resolution required for all channels.

Controller should have independent ADCs available for USER inputs.

Cantilever calibration up to 2MHz should be possible.

Entire Signal Access Panel and signal input/output should be controllable/interfaced by the included software.

Sample Specification:

AFM should be compatible with sample heights of 5 mm or higher. Maximum permissible sample size that is compatible must be 80mm x 80mm or greater.

Typical biological samples like microscope slides (75mm x 25mm) and Glass bottom petri dish of 50 mm diameter or greater should also be compatible.

Mechanical Property measurements and mapping:

Fast force mapping mode for collection and analysis of full force-distance curves at each pixel in an image using linear Z ramping with ramp rates up to 300Hz must be included.

Imaging mode for nano-scale material/mechanical properties including modulus and adhesion, at high resolution (≤ l0nm), at conventional AFM imaging rates (<2 minutes per image, 256x256 pixels), and over a wide modulus range (1 KPa to 50 GPa or more) should be possible.

System must include an imaging mode that is capable of generating quantitative nanoscale maps of storage and loss modulus, and loss tangent, at high pixel resolution (at least 1024x1024 pixels).

Data capture must occur during normal AC mode imaging of topography at normal scan rates (<20 minutes per scan). Proposals for techniques that map storage modulus only are insufficient and will be rejected.

Conventional nano-indentation, higher harmonics imaging, and Dual/multi-frequency AC imaging modes are not acceptable as substitutes.

Feedback loop implemented to maintain maximum tip-sample interaction force with force control down to 10 pN with ramp rates from 25Hz to 2 kHz.

Simultaneous (Real time) acquisition, calculation and display of Topography, Modulus, Adhesion, Stiffness, Deformation and Energy Dissipation in SI units must be available.

5000x5000 or more pixel resolution required for all channels. Offline analysis to analyze data cubes for slices and property maps including modulus (at least 3 models), stiffness, and adhesion.

Mode with ramp rates 2 kHz or greater for advanced mechanical property mapping. Alternatively advanced mechanical property mapping with frequency sweep is also acceptable, provided the sweep rate is 2 kHz or greater.

DMA (Dynamic Mechanical Analysis) or similar technique to study viscoelasticity of material must be available. Deformation to be recorded at different frequency.

Auto-calibration of the tip

System must include a feature that automatically calibrates the cantilever sensitivity (deflection sensitivity/detector voltage to distance conversion) and spring constant by simply selecting the probe type and clicking a button.

To avoid tip damage, at no point during the calibration may the tip touch the sample (and damage the sharpness of tip even before measurement is started).

The feature must actually calibrate the probe. It must not use nominal tabulated values for the sensitivity and spring constant.

The system must include automated scan parameter optimization of feedback (force) set point, gain & scan speed, in both liquid and air for routine artifact free whole.

Analysis software

The software must include the functionality for the direct overlay of the optical microscope data with AFM data. This overlay procedure must include an integrated procedure to provide registration between both image data sets.

The calibration of optical image should involve at least 25 data points on the optical image.

The force spectroscopy mode should offer features for experimental flexibility.

The user must be able to freely combine segments of force-distance curves to customize advanced force curve procedures.

There must be possibility to set force ramps, temperature ramps, pulling speed or force feedback

A force curve based imaging mode (contact point imaging) should be available for challenging samples.

It must be possible to do Nanoindentation with AFM tip on soft materials like Cells, biomaterials etc.

The system's software must include contact mechanics models for interpreting the sample modulus from a wide range of force-curve tip-sample interactions.

Software for Nanolithography and Nanomanipulation features should be included in the offer.

Control Computer and Monitor

A suitable configuration, preferably a factory recommended branded workstation with Processor 3 GHz or better, professional edition of operating system, two 2TB SATA HOD (RAID1 mirror), DVDROM, video graphics card, at least 4 USB 2.0 and 2 USB 3.0 ports, compatible 2x24 inch LCD monitors or better. Operating system must be Windows.

Inverted Optical Microscopes with Fluorescence Imaging

Inverted Fluorescence Research Microscope of reputed brand for BF, phase and fluorescence imaging to be integrated with the AFM system.

Required condenser unit, camera system and objective/s should be included for ease in operation along with the AFM.

12V, 100W Halogen illumination for transmitted light with housing

100W Mercury Burner for Fluorescence light with required filters.

Ultra-long working distance condenser with minimum 73mm working distance and N.A of 0.3 need to be provided with at least four position for BF, PhI and PhII. Observation tube should be a binocular tube with F.N 22.

High resolution objectives of 10X, 20X and 40X must be available.

Probes

Following probes must be included with the unit:
20 probes for contact imaging mode
30 probes for Non-Contact imaging mode
30 probes for Fast Force spectroscopy, modulation and nanomechanical modes.
10 probes each for EFM, MFM and PFM modes.

Other ancillaries

Site preparation to ensure environment and electrical quality conditions are met for the install and the functioning of AFM in good condition. (AC and UPS).

Online 3kV UPS minimum 1 hour backup and 2 ton inverter split AC must be supplied.

Mandatory requirements

Technical Brochure, Literature and relevant publications to be submitted with technical bid for the authentication of the claims made with respect to specifications.

OEM must have at least 3 installations of Bio-AFM in India during the past 5 years. Please do not include material science or other AFM reference.

Minimum of 5 service engineer located in India servicing India exclusively must be available with the vendor. Vendor must ensure 24 – 48 hrs. response for service calls.

Please provide name and placement details of AFM service engineers in India. Proximity to Rourkela will be taken in to account

TopView Optics

TopView optics module for the standalone AFM operation for the non-transparent sample analysis/imaging must be available.

This top-view optics should be compatible with inverted microscope as well.

Top View system should have integrated camera and light source with software controlled light intensity, for sample and tip visualization.

Installation and Training

Installation and demonstration at site with operational training for a period of one week must be provided.

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