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| TENDER REFERENCE | IICB/PUR/599/566/19/2021-22 |
| CONTACT DETAILS | DIRECTOR [ATTN: STORES & PURCHASE OFFICER] CSIR-INDIAN INSTITUTE OF CHEMICAL BIOLOGY 4, RAJA S C MULLICK ROAD, JADAVPUR KOLKATA 700032, W.B., INDIA e-mail : purchase@iicb.res.in |
| CPP TENDER ID | 2021_CSIR_96812_1 |

**SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF
HIGH RESOLUTION AND HIGH SPEED BIO ATOMIC FORCE MICROSCOPE**

**AMENDMENTS TO THE TENDER DOCUMENT FOLLOWING THE PRE BID CONFERENCE HELD ON
15 DECEMBER 2021.**

THE FOLLOWING AMENDMENTS ARE MADE TO THE TENDER DOCUMENT :

1. TECHNICAL SPECIFICATIONS AND OTHER ALLIED REQUIREMENTS

REVISED TECHNICAL SPECIFICATIONS AND OTHER ALLIED REQUIREMENTS ARE ATTACHED.

**2. DELIVERY SCHEDULE [FOR COMPLETION OF THE ENTIRE CONTRACT FOR SUPPLY OF THE REQUIRED
GOODS AND RELATED SERVICES]**

6 months from the date of issue of Purchase Order. However, this would not be the criteria for evaluation for rejection. Bidders are requested to provide the reasonable delivery period from the date of placement of PO.

3. NUMBER OF INSTALLATION REQUIRED FOR THE RELIABILITY & PERFORMANCE OF THE EQUIPMENT

Bidder must have supplied and installed at least **05** numbers of the same equipment/similar instruments [as described in the Technical Specifications – Chapter 4 of CSIR-IICB Tender Document] during last **TEN** years ending on 31.03.2021 to CSIR Laboratories/ Govt. Research Institutes or organizations/ PSUs, out of which at least one should be of the offered model which is in successful operation for the past one year as on the date of bid opening / techno-commercial bid opening. Bidder shall provide copies of Purchase Orders and installation certificates and also relevant service reports or performance reports along with technical bid. It will be the part of the evaluation criteria.

THE TENDER DOCUMENT IS AMENDED TO THE EXTENT DESCRIBED ABOVE. REST OF THE TENDER DOCUMENT REMAINS UNCHANGED.

STORES AND PURCHASE OFFICER

Modified Specifications of High Performance Bio-AFM as on 17/12/2021

Specifications for High Performance Bio-AFM with Inverted Fluorescence Optical Microscope

High Performance AFM for high resolution imaging with single molecules, biological samples like Bacteria, Virus, Tissues, Cells, DNA, RNA, Protein, Nano Particles, Nano Materials etc. The system should include all accessories to allow operation in air & liquids along with temperature controller.

This AFM should be configured to mount on top of an inverted light microscope (IOM). It is Bidder's responsibility that AFM specifications to be demonstrated on the said IOM. The system should also be equipped with a camera system for top view to use this as a stand-alone system for opaque samples.

Following modes should be included in AFM system:

- Contact mode in air and fluids
- AC mode or Tapping mode in air and fluids
- Lateral Force Microscopy (LFM)
- Amplitude and Phase Imaging
- Nanolithography and nano manipulation capabilities with complete software control.
- Force Spectroscopy mode and Force Mapping mode.
- Force volume spectroscopy
- Electric force microscopy (EFM)
- Magnetic force microscopy (MFM)
- Conducting AFM (C-AFM)
- Scanning Tunnelling Microscopy (STM)
- AFM tip based Nano Indentation
- Quantitative Nano-mechanical Properties like Young Modulus, Adhesion, Dissipation and Stiffness etc.,
- Nanolithography and Nanomanipulation capabilities should be integrated in software

AFM specifications:

1. Cables and power ratings for all AFM and microscope parts / accessories should comply with Indian Power configuration.
2. AFM should be Sample Scanning or Tip Scanning design
3. AFM should have decoupled closed loop scanners in X,Y and Z directions. XY (actuator) scanning direction should be decoupled with Z-actuator. All XY & Z Scanner should be of Piezo material and other material not acceptable. Typical tube scanner design is also not acceptable.
4. AFM Scanner should have XY scan range of 100 μm or more and Z-range of 40 μm or more.
5. AFM System Z height noise should be $\leq 60\text{pm}$ or better
 XY Scanner Sensor Noise should be $\leq 500\text{pm}$ or better
 Z Scanner Sensor Noise should be $\leq 300\text{pm}$ or better
 Cantilever deflection noise should be better than 15pm.
 Detector bandwidth should be 5 MHz or better.
 These specifications should be demonstrated in the lab after installation.
6. High Speed AFM controller should have multiple 16 Bit or more ADCs and 20 Bit or more DACs with higher sampling rate for high speed data capture. Bidder to provide detailed specifications of AFM Controller.

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| 7. | Cantilever Thermal Tuning should be ≥ 2 MHz |
| 8 | AFM Sample stage should be Motorized/Manual in XY & Z. Samples of 80mm dia and 15 mm height should be possible to accommodate. Motorized/Manual XY transverse should be >10 mm x 10mm. |
| 9 | AFM should include Top-view optics for both standalone operation (without inverted microscope) of AFM. This top-view optics should be compatible with inverted microscope as well. Top View system should have integrated camera and light source for sample and tip visualization. Top view optics should allow bright field imaging of samples with at least 10X objective or better with zoom option. |
| 10 | Infrared source SLD Illumination |
| 11 | Optical overlay software or equivalent Software for the overlay of optical images on AFM data should be included. Optical Imaging hardware and software should seamlessly integrate so that the user can choose region of interest in optical image to be scanned by AFM tip. Image processing software advanced or expert version may be required multiple system licenses. |

Control Computer and Monitor:

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| 12 | <p>A suitable configuration, preferably a factory recommended branded workstation with processor 3.5GHz multicore or better, 64bit professional operating system, 64GB RAM or better, 4TB HDD (RAID1 mirror), CD/DVD reader/writer, graphics card, at least 3 USB 2.0 and 2 USB 3.0 ports, compatible 2x24 inch LCD monitors or better.</p> <p>Additional Two or more work station with the following specification for Data processing/rendering the images and files.</p> <p>Workstation with Windows 7/10 Professional 64 - 2 Workstation with same configuration or better</p> <p>Processor: 2x Intel® Xeon® E5-2637 v4 Processor (3,5GHz 4c) or better; Operating system: Windows 7/10 Professional 64 - bit (US English); Form factor: Tower 4x6 Mechanical; Motherboard: P710 - TPM Enabled; Total memory: 64 GB; Video adapter: NVIDIA K620 (2GB DP), DP -To - DPI Video Converter; Audio adapter: Integrated Audio;; Flash - 2x 512GB Hard drive: 2x 4TB SATA 2.5" Hard Drive - 7200 rpm, 1x 6TB 2.5" Hard Drive - 7200 rpm; First optical device bay: 16x DVD +/- RW Dual Layer (Windows 7); Networking: Integrated Ethernet 10/100/1000, 1x Intel i350-t2 Ethernet 10/100/1000; Keyboard: USB Preferred Pro Full Size Keyboard - US Euro; Pointing device: Optical Wheel Mouse - USB Primax 400 DPI; Line Cord: US; Language Pack: English compatible 2x24 inch LCD monitors or better.</p> <p>Network Attached Storage Device for 60TB</p> |
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Acoustic and Vibration Isolation

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| 13 | AFM system should include necessary acoustic noise enclosure and active vibration isolation table. The dimension should be able to hold the entire AFM (including top-view optics) and the inverted microscope with extra space for convenient working around the system. Vibration isolation should be active. Active 1.2 Hz to 200 Hz, Passive > 200 HZ |
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14. Starter Kit and Probes should be included:

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| A | AFM probes for contact mode imaging, force spectroscopy and nano-mechanical modes QTY=100 |
| B | Non- Contact / Tapping Mode Imaging QTY- 100 |
| C | EFM/MFM/C-AFM Probes QTY - 20 each |

15. Sample Holders :

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| (a) | Autoclavable liquid cell /Cantilever Holder to accommodate Microscopy Slides, Petri-Dishes, Coverslips and metal discs etc., |
| (b) | Heating Stage with temperature range from ambient to 250 degree or higher centigrade and with 0.1K stability |

Specification for Inverted Fluorescence Research Microscope

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| 16 | <p>Bidder to offer Inverted Fluorescence Microscope with the following specifications :</p> <ul style="list-style-type: none"> The High Resolution Bio-AFM should be integrated fully with IOM System to achieve the following capabilities and required Microscopy Kit to be included in AFM supply. Inverted Optical Microscope should have Bright Field, Phase Contrast (Ph1 and Ph2) and Fluorescence Imaging capabilities with required hardware and software. |
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- The IOM must be possible to run independently with own PC without the need to power on the AFM.

Light Source

100 Watts Halogen with power supply or equivalent
 Objective: 10x, PH1, NA>0.25 and 40x, PH2, NA>0.55, 60x oil emersion or better
 Binocular tube 45°/22 and Eyepieces 10x/22
 Condenser: Universal NA>0.3 and Brightfield, Ph1 and Ph2
 Fluorescence Condenser and 3X filter (DAPI, GFP, mCherry or Cy3)
 8X reflector revolver, and aperture sliders
 Epi-fluorescence light source (Mercury) and
 0.5X C mount adapter with CCD/or CMOS-Camera
 The IOM need to be able to upgrade to other Imaging techniques like TIRF, FRET, FLIM & FCS

17. Infrastructure

- A** 5KVA Online UPS with 1 Hour backup and UPS machine should be noise free.
- B** 24 x7 running Dehumidifier for controlling the entire room humidity level as per requirement of AFM operation.
- C** Furniture - Computer and Controller Table and Operator Chairs

18. Training:

Operator or technical persons and students should be trained for basic to advance level of operation and maintenance over 10 days. Additional training should be provided whenever required without any additional cost during warranty period.

19. Warranty :

Minimum 5 Years comprehensive warranty for hardware and software from the date of successful installation. Any update on the software during the warranty period should be provided free of cost.
 Minimum two numbers of preventive maintenance per year. Minimum two numbers of break down visit per year.

20. After Sale Service facility:

The Bidder needs to ensure that Application Support Scientist / Engineers are available to attend any after sales technical issues within 48 hrs.