

REGIONAL CENTRE FOR BIOTECHNOLOGY**F. No. RCB/NIO/02/17-18/ATPC****REVISED TENDER SPECIFICATIONS**

Bids are invited for a state-of-the-art high voltage high resolution thermal Schottky emitter FE-SEM capable of imaging as conventional SEM, Serial block face imaging and EDS analysis on biological samples. The system should be capable of high resolution imaging of non-conducting samples without coating. The OEM will manufacture, supply, deliver, position, install, test and commission FE-SEM and required accessories at the Advanced Technology Platform Centre, Faridabad.

Specifications:

No.	Attribute	Specs	Marks
1.	Electron Microscope	<p>1. Electron Gun/Source: Schottky FEG and should be stable, consistent and monochromatic at particular accelerating voltage. Vendor Should provide emitters to be used/required during warrantee periods (5 yrs after installation) along with the equipment</p> <p>2. Resolution: Must be equal to or better than 0.8nm at 15kV (best resolution) for SE, Equal to or better than 1.3 nm at 1kV for SE</p> <p>3. Magnification: 50X to 10,00,000X</p> <p>4. Accelerating Voltage: 200V to 30kV</p> <p>5. Stage: Computer controlled, fully eucentric goniometer type stage with 5 axes motorized movements with backlash correction and software controlled. Specimen stage movement must be, X =100 mm or better, Y= 100 mm or better, Z=35 mm or better, Specimen tilt: -4° to +70° or better, Rotation:360° continuous, Repeatability: <3 µm (x and y)</p> <p>6.Probe Current: up to 100 nA or better, Probe current should be adjustable through software control.</p> <p>7.Vacuum System: Fully automated vacuum system with ion pumps (IGP), turbomolecular pump (TMP) & rotary pump, SIP or other combinations. Chamber vacuum (high) < 4 x 10⁻⁴ Pa, Suitable protection mechanism is required for sudden failure of vacuum pump. Pump down time should be less than 5 minutes.</p> <p>8.Specimen exchange: Suitable vacuum system having ion pump/Oil free Pump, Penning gauge for accurate detection of pressure detection, all the specimen exchange must be performable without breaking the vacuum of the chamber. Specimen exchange time should be within 5 minutes.</p> <p>9.Calibration: Standards for calibration of magnifications, dimension and resolution. Desirable: traceability of the standards</p>	30

		10.Quoted configuration should be compatible with Serial Block Face Imaging and EDS systems. The Chamber should be large with at least 10 accessory ports and should be able to accommodate Serial Block Face Imaging system set up.	
2.	Detectors	<ol style="list-style-type: none"> 1.In-lens SE detector: 2.BSE detector 3.SE2 detector 4.CCD Camera with IR illumination for viewing sample in chamber 5.Any other detector for the efficient execution of required workflows may be quoted 6.Changing mode for SE to BSE should only be software controlled (no manual change) 7.The system should be equipped with in lens SE/BSE filters to filter the SE/BSE signals or parallel detection of SE/BSE signals. There should be also requirement of mixing the SE/BSE signals. 	20
	SBFI system	<ol style="list-style-type: none"> 1. Serial Block Face Imaging system with in-situ ultra- microtome and all required accessories for optimal data collection of large 3D datasets. 2. The switching between these SBFI and conventional SEM should not be complicated and take minimal time. 3. The in-situ ultra-microtome should be capable of in creating the slices <15 to 200nm in thickness. 4. Multiple Licenses of Appropriate software of high quality should be provided to achieve successful Serial Block-Face Imaging 	15
	EDS System	<p>Retractable EDS system Should have liquid nitrogen free SDD (Silicon Drift Detector) type Peltier cooled detector with active area at least 60 mm Sq and resolution should be less than 130 eV. Mn K alpha and Carbon Resolution should be at least 67 eV to be tested on site.</p> <p>Should have motorized detector movement. Element detection range would be from Beryllium to Uranium. Precise element detection and quantification should be possible along with Peak deconvolution to separate overlapping peaks.</p> <p>User interactive standard less analysis software like automatic background subtraction or Manual background subtraction option. Standard less quantification method based software should be quoted. Calibration of the system should be possible and calibration standards should be provided.</p> <p>Latest version of Appropriate softwares for data acquisition and analysis should be provided.</p> <p>All software should be licensed for the main computer and additional licenses should be provided for offline analysis.</p>	10

3.	Essential Accessories	<p>a) Chiller.</p> <p>b) Compressor.</p> <p>c) Adequate Computational infrastructure should be provided for data collection and analysis. High Performance desktop system with latest processors, 4 TB HDD or better, 16 GB RAM or better, DVD writer, sufficient USB ports and window operating software. additional three computer with all software related work as outside jobs and data storage having 4 Tb HDD or better, 16 GB RAM or better, DVD writer, sufficient USB ports and window operating software should be provided for offline data analysis. All computers should be provided with >23" or better Full HD LED backlit IPS display flat screen square monitor / TFT high resolution Monitors. External data storage with 40 TB of disk space allowing large volume datasets to be stored and accessed easily from microscope PC or local Ethernet network may be provided</p> <p>1. User Interface: Keyboard, Mouse, Hard Panel with multifunction for the control and adjustment of frequently used SEM parameters like contrast, focus, scan rotation etc. Manual Joystick control for stage axis.</p> <p>2. Software: Particle size analysis and image processing software, multiple image saving function, Windows based softwares, multiple offline licenses for analysis. The latest version of software for the quoted model should be included., Remote diagnosis and remote monitoring of SEM parameters, Digital video recording (.avi), For off-line analysis suitable interfacing, if required, should be provided for another computer for further analysis, Data formats (ACSII, TIFF, JPEG, BMP, etc.), Backup software must be provided on optical media. Any further version of the software and updates must be provided free of cost within the warranty period. The data file for the image should be accessible.</p> <p>d) All accessories required for installation, routine operation and breakdown maintenance, to be quoted</p>	10
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4.	Desirable Specifications	<p>1. Sample Holders: Multi-stub holder capable of holding a minimum of 5 samples(OR More) Single stub mount, mounts directly onto stage 100 mm diameter x 40 mm height or better</p> <p>2. The system should allow for correlative microscopy. System should be capable of interfacing with confocal microscope to Mark ROI in optical & move to SEM for point to point localization for further studies to be used biological applications. It should have the feature to correlate SBFi data or SEM data with optical microscopy data.</p> <p>3. All these capabilities should be applicable for labeled biological samples, fractured samples and nanostructured particulate systems. Software backup must be provided in optical storage/any other compatible storage media. Any further version of the software and updates must be provided free of cost during the warranty period.</p>	5
5.	Critical Point Dryer (CPD)	<p>CPD with all required accessories. The chamber should be able to take samples of different sizes and should be illuminated to view the process. Safe operation should be possible with software controlled temperature and pressure cut off function, safety bursting membrane and minimal CO₂ consumption.</p> <p>Desirable: cut off (80bar) and Max. operating pressure (79bar). Heating and cooling range adjustable. 30°C to 45°C with controllable heating ranges (1°C/min to 3°C/min). Cooling range adjustable 5°C to 25°C</p>	10

Evaluation

80% marks for minimum eligibility criteria Total = 100 marks A Minimum of 80% required in to qualify for price bid. The technical part of tender will be 80% and price bid will be given a weightage of 20%. 8 E. (ii) Financial bid evaluation:- The bidder quoting to lowest rate will be awarded full points out of 20. Others will be awarded pro-rata.

The remaining terms and conditions remains the same. Any discrepancy between the earlier version and the latest version this version of the document will prevail over the previous one.