

Item Description: Field Emission Scanning Electron Microscope with Energy Dispersive Spectroscopy (FESEM-EDS)

Reference No: NIPER-G/177/EQP/FESEM- EDS/2020-21 dated:04.03.2021

With reference to the tender enquiry No: NIPER-G/177/EQP/FESEM- EDS/2020-21 dated:04.03.2021 NIPER-G has been invited open tender enquiry for the procurement of HPLC with Detectors. The following point has been discussed during the pre-bid meeting held on 09.03.2021 and the necessary amendment has been made in the tender document. Bidders are here by requested to quote the bids accordingly.

Technical Specification of High-Resolution Field Emission Scanning Electron Microscope with Energy Dispersive Spectroscopy (FESEM-EDS)

Item	Original Specifications	Amended Specifications
Electron Gun:	Highly stable Schottky Field Emitter. A battery back-up power supply should be standard in addition to normal external UPS to eliminate the need for gun bake-out and realignment. Emitter should be guaranteed for 3 -5 years.	Highly stable Schottky Field Emitter. A battery back-up power supply should be standard in addition to normal external UPS to eliminate the need for gun bake-out and realignment. Emitter should be guaranteed for 5 years.
Resolution:	1nm or better at 15KV and 2nm or better at 1KV (should be demonstrated during the installation using appropriate standards)	0.8nm or better at 15/20KV and 1.3 nm or better at 1KV (should be demonstrated during the installation using appropriate standards)
Magnification:	x20 to x1000,000 with the facility to enter desired magnification	No Change
Accelerating Voltage:	20 v or less to 30KV or more on higher side: Should be controlled through software	No Change
Chamber:	Large chamber with at least 10 ports or facilitate future expansion. Specimen exchange through Draw-out mechanism Chamber camera must be provided. Chamber Camera should display both color images to be checked with visible light and monochrome images to be checked with an IR light source. Chamber should be large enough to accommodate the wide variety of samples without any damage to the sample. (at least 200 mm diameter and 100mm height). The chamber must also be capable of accommodating multiple EDS detectors simultaneously and accommodating EDS, WDS, and EBSD simultaneously. The EDS and EBSD detectors should be co planar. The stage tilt should be perpendicular to the dedicated EBSD port. The chamber must have dedicated fully focused inclined WDS Port.	Large chamber with at least 10 ports or facilitate future expansion. Specimen exchange through Draw-out mechanism Chamber camera must be provided. Chamber Camera should display both color images to be checked with visible light and monochrome images to be checked with an IR light source. Chamber should be large enough to accommodate the wide variety of samples without any damage to the sample. (at least 170 mm diameter and 45 mm height or better). The chamber must also be capable of accommodating multiple EDS detectors simultaneously and accommodating EDS, WDS, and EBSD simultaneously. The EDS and EBSD detectors should be co planar. The stage tilt should be perpendicular to the dedicated EBSD port. The chamber must have dedicated inclined WDS Port.
Stage:	5 axis motorized stage with motorized and include computer eucentric rotation stage movements equivalent to or better than X= 130 mm or more; Y= 130 mm or more; Z= 50 mm or more Tilt = -5 - 70°; R=360° The stage automation system should be	5 axis motorized eucentric stage with computer control movements equivalent to or better than X= 100 mm or more; Y= 100 mm or more; Z= 50 mm or more Tilt = -5 to 70°; R=360° The stage automation system should be controlled through mouse control,

	controlled through mouse control, programmable trackball and magnification linked touch pad and allow the following functions: a. Computer eucentric rotation b. Continuous movement with the speed linked to magnification. c. Click centre and zoom d. Stage return to location of any stored image	programmable trackball and magnification linked touch pad and allow the following functions: a. Computer eucentric rotation b. Continuous movement with the speed linked to magnification. c. Click centre and zoom d. Stage return to location of any stored image
Probe Current:	1 pA up to 100nA	1 pA up to 100nA or better
Detectors:	Standard detectors must include a. Chamber secondary electron detector (SEI) detector b. Solid state Back Scattered Electron detector (BSED) c. In-lens SEI detector for high resolution imaging in high vacuum. d. Specimen current detector can be quoted as optional item	Standard detectors must include a. Chamber secondary electron detector (SEI) detector b. Solid state Back Scattered Electron detector (BSED) c. In-lens SEI and BSE detector for high resolution imaging in high vacuum with energy filters. d. Low vacuum secondary electron detector e. Specimen current detector can be quoted as optional item
User Interface:	keyboard, mouse, control panel with multifunction for control and adjustment of frequently used SEM parameters, Manual joystick control for stage axis. The microscope should employ an auto-alignment correcting procedure that automatically presents all the lens parameters for ultimate imaging and analytical performance. By pressing an AUTO button, the user should be able to auto-focus, auto-stigmata and automatically adjust the brightness/contrast ratio of the image.	No change
Electron Optics:	Beam deceleration technology or equivalent for high resolution imaging at low KV.	The system should have lens design of combination of Electromagnetic & Electrostatic lenses technology or Super Hybrid Lens design or equivalent lens design technology. The system should be able to achieve high resolution imaging of magnetic materials like quantum dots etc. even with shorter working distances. The offered system's lenses must be water cooled in nature.
Display and Image processing system:	2nos of 24 inch HD LCD/LED monitors for FESEM Live conditions of operating parameters, holder graphics and airlock status are visible on GUI. •Parallel detection, processing and display up to 4 channels is possible. Software should be compatible of automatic generation of report in MS-Office or equivalent platform which should be provided. All the operating conditions should be stored.	No Change

	Annotations should present on the saved images.	
Vacuum System:	Fully automatic and controlled by software Suitable vacuum system having ion pump, turbo pump and rotary pump and variable pressure. Values should be visible on the UI on system.	Fully automatic and controlled by software Suitable vacuum system having ion pump, turbo pump and rotary pump and variable pressure of 50 pascals or better with control from software. Values should be visible on the UI on system.
Essential Accessories:	<ol style="list-style-type: none"> Electrostatic beam blunker unit with electronics Chiller Compressor Conducting carbon tapes double sided – 5nos Specimen stabs – 100 nos Multiple specimen stab – 2nos EDS: LN2 free SDD detector with 30 mm² crystal area and 129eV resolution or better. The EDS should be capable of selective element mapping, line scan, selected area analysis, quantitative analysis, qualitative analysis, multi-point analysis. Phase mapping and drift correction should be provided. Sputter coater for gold and platinum along with required accessories and coating material should be provided. Online UPS, 10KVA with 1hr backup should be provided Nitrogen cylinder and other gas cylinder as per the requirements Computers with latest OS and necessary software and 1TB or more storage capacity, 8 Gb RAM for smooth handling of the system software, CD reader and write option for taking the necessary data. Colour laser printer 	<ol style="list-style-type: none"> Vendors should quote for critical point dryer Chiller Compressor Conducting carbon tapes double sided – 5nos Specimen stabs – 100 nos Multiple specimen stab – 2nos EDS: LN2 free SDD detector with 30 mm² crystal area and 129eV resolution or better. The EDS should be capable of selective element mapping, line scan, selected area analysis, quantitative analysis, qualitative analysis, multi-point analysis. Phase mapping and drift correction should be provided. Sputter coater for gold and platinum <i>with built-in display for sputtering time and sputtering thickness</i> and with required accessories and coating material should be provided. Online UPS, 10KVA with 1hr backup should be provided Nitrogen cylinder (2 Nos) and argon cylinders (2 Nos) as per the requirements Computers with latest OS and necessary software and 1TB or more storage capacity, 8 Gb RAM for smooth handling of the system software, CD reader and write option for taking the necessary data. Colour laser printer

<p>Optional Accessories</p>	<p>A. Integrated WDS-4 crystal fully focused with set of standards. B. Peltier stage with temperature limit of -25C to 50C C. Necessary standards, switch box etc D. Cathodoluminescence imaging module. E. Two micromanipulators with probes for current-voltage (I-V) measurements in nanoscale. F. Vendors are requested to coat for glow discharge system separately. G. Sample preparation accessories also need to be quoted. H. Vendors should quote for critical point dryer I. Vendors are required to quote for cryo in stage raman spectroscopy and the quoted instrument should have the facility for future upgradation.</p>	<p>A. Integrated WDS-4 crystal with set of standards. B. Peltier stage with temperature limit of -25C to 50C C. Necessary standards, switch box etc D. Cathodoluminescence imaging module. E. Two micromanipulators with probes for current-voltage (I-V) measurements in nanoscale. F. Vendors are requested to coat for glow discharge system separately. G. Standard Sample preparation accessories also need to be quoted. H. Electrostatic beam blanker unit with electronics I. Vendors are required to quote for cryo in stage raman spectroscopy (630 or 780 nm) and the quoted instrument should have the facility for future upgradation.</p>
<p>General:</p>	<p>FESEM quoted must be complete in all respect with state of art technology. It should have the capability of imaging thin films, polymers, ceramics semiconductors and magnetic specimen at high magnification. FESEM should have suitable technology for optimum performance of all the detectors particularly In-lens SEI. The quoted model should be latest version or series and support in all respect for future upgradation.</p>	<p>FESEM quoted must be complete in all respect with state of art technology. It should have the capability of imaging thin films, polymers, ceramics semiconductors and magnetic specimen at high magnification. FESEM should have suitable technology for optimum performance of all the detectors particularly In-lens SEI and In-lense BSED.</p>

Note:

There is no change in general terms and conditions mentioned earlier.

Sd/-

Stores and Purchase officer

Sd/-

Registrar In charge