



भारतीय विज्ञान शिक्षा एवं अनुसंधान संस्थान पुणे
INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH PUNE
IISER/PUR/1625/23
PREBID CLARIFICATION ON GeM TENDER NUMBER - GEM/2024/B/4549818

Item Description - Procurement of Field Emission Scanning Electron Microscope (FESEM) with integrated EDS, EBSD, and EBL attachments

एकीकृत ईडीएस, ईबीएसडी और ईबीएल अटैचमेंट के साथ फील्ड एमिशन स्कैनिंग इलेक्ट्रॉन माइक्रोस्कोप (एफईएसईएम) की खरीद के लिए संस्थान की वेबसाइट www.iiserpune.ac.in और GeM पोर्टल पर 31/01/2024 को प्रकाशित ओपन टेंडर देखें।

Refer to a Global Open tender published on the Institute website www.iiserpune.ac.in and on the GeM Portal on 31/01/2024 for procurement of Field Emission Scanning Electron Microscope (FESEM) with integrated EDS, EBSD, and EBL attachments.

बोली-पूर्व बैठक 08/02/2024 को अपराह्न 3.00 बजे आयोजित की गई और बैठक का विवरण इस प्रकार है:

Pre-Bid meeting was held on 08/02/2024 at 3.00 PM and minutes of meeting is as under:

प्रारंभ में, समिति ने सभी सदस्यों और संभावित बोलीदाताओं के प्रतिनिधियों का स्वागत किया और सामान्य तौर पर निविदा के दायरे की जानकारी दी और उसके बाद सहायक कुलसचिव (भंडार एवं क्रय) से बोली लगाने वालों को निविदा की मुख्य विशेषताओं के बारे में जानकारी देने का अनुरोध किया।

At the outset, the Chairman welcomed all the Members and the representative of the Prospective Bidders and briefed in general the scope of the tender and thereafter requested the Assistant Registrar (S&P) to brief the bidders on the salient features of the tender.

उपस्थित प्रतिनिधि दिए गए उत्तरों से संतुष्ट थे और यह सूचित किया गया था कि प्री बिड कॉन्फ्रेंस के दौरान की गई चर्चा के अनुसार दिए गए सुधार- / परिवर्धन / स्पष्टीकरण क IISER पुणे की वेबसाइट पर होस्ट किया जाएगा और सभी संभावित बोलीदाताओं को बोली दस्तावेजों में निर्धारित अनुसार अपनी बोली जमा करने से पहले प्री-बिड सम्मेलन की कार्यवाही का संज्ञान लेना आवश्यक है।

The representatives present were satisfied with the replies given and it was informed that the corrections / additions / clarifications given, as discussed during the Pre-Bid Conference would be hosted on the website of IISER Pune and all the Prospective Bidders are required to take cognizance of the proceedings of the Pre-Bid Conference before submitting their bids as stipulated in the Bidding Documents.

हमारी आईआईएसईआर वेबसाइट www.iiserpune.ac.in और GeM portal पर जारी नोटिस के अन्य नियम और शर्तें अपरिवर्तित रहेंगी। इस संबंध में और कोई पत्राचार नहीं किया जाएगा।

The other terms & conditions of the notice issued on our IISER website www.iiserpune.ac.in and GeM portal will remain unchanged. No more correspondence in this regard will be entertained.

बैठक अध्यक्ष के धन्यवाद प्रस्ताव के साथ समाप्त हुई।

The meeting ended with vote of thanks to the Chair.

15/02/2024

Sd/-
सहायक कुलसचिव (भंडारण एवं क्रय)
Assistant Registrar (S&P)

TECHNICAL AND COMMERCIAL QUERIES AND CLARIFICATION

PRE-BID CONFERENCE FOR PROCUREMENT OF FIELD EMISSION SCANNING ELECTRON MICROSCOPE (FESEM) WITH INTEGRATED EDS, EBSD, AND EBL ATTACHMENTS

S. No.	Query/Clarification Sought	Clarification / Amendment
1.	SI. No 1: Dedicated back-up power supply or any other alternative arrangement should be provided for the ion pumps to eliminate the need for gun bake-out and realignment in the event of main UPS power failure. Amendment request– ZEISS doesn't have this arrangement as bringing in additional supply at the emission level brings additional field which will disturb the beam current stability. This is another major reason why ZEISS FESEM deliver the unmatched best beam stability.	Tender specification prevails.
2.	SI. No 10: Low Vacuum pressure range between 10 Pa to 300 Pa & SI. No 12: Detectors: Cascade current detector for 300 Pa or above Amendment request– In connection with the application requirement of Low vacuum is not required for Imaging non-conductive sample as the ZEISS Low kV capabilities addresses this requirement. Moreover with the Low vacuum mode there is always chances of cross contamination from samples as well as the high sensitive internal microscope components in the chamber. However even if low vacuum needs to offered, ZEISS has low vacuum pressure range and detection of SE signal using cascade current detector only upto 133 Pa	Tender specification prevails.
3.	Since you would be going for EDS and EBL system together with FESEM, you would need a special hardware to switch between the scanning signals of EDS and EBL. It is better to mention this point into the tender specifications.	The tender specification has been amended. Under point no. 16 (Standard SEM functions), the following has been added: Original: <i>“Provide standard sample calibration accessories like resolution standards, magnification standards and EDS single/multi element standards.”</i>

		Revised: <i>“Provide standard sample calibration accessories like resolution standards, magnification standards and EDS single/multi element standards.</i> <i>The system should have all necessary hardware/software to switch smoothly between EDS and EBL options without breaking the vacuum.”</i>
4.	if you are planning to add EDS window material into the specification the pls. mention as ‘Polymer / Si3N4’ EDS detector window’ . This will not restrict any vendor from tender process.	Tender specification prevails.
5.	the Parallel Beam WDS spectrometer would also need focusing by the user whereas fully Focusing type does not.	Tender specification prevails.
6.	Resolution of 125 eV at Mn Ka. Resolution of F and C-ka remains same.	Tender specification prevails.
7.	Since tender also includes Integrated Plasma Cleaner, it is recommended to have Silicon Nitride or any other robust window material to prevent damage to the SDD, while plasma cleaning the chamber.	Tender specification prevails.
8.	Energy range from 100 ev to 16 keV	Tender specification prevails.
9.	Spectrometer design should be of Parallel beam technology as fully focussing type and Rowland circle based Spectrometer is an outdated technology.	Tender specification prevails.
10.	Imaging and Spectroscopy is the latest technology which provides user more flexibility in terms of analysis techniques like Unfiltered CL mapping, Wavelength-filtered CL mapping, Wavelength-scanned CL spectroscopy and Wavelengthfiltered CL spectrum imaging (SI)	Tender specification prevails.
11.	Please change to 640 x 480 pixels and we guarantee 99% indexing success rate	Tender specification prevails.
12.	Indexing speed >6,700 Indexing point per second	Tender specification prevails.

13.	Please change to touch sensor, as EDAX EBSD systems with Touch sensor is very effective while analysis going on, unlike Proximity sensor	Tender specification prevails.
14.	Please incorporate the following features in data processing software: Spherical indexing, Dynamic simulation, Triplet indexing	Tender specification prevails.
15.	We use Hybrid pump (SIP& NEG), which is also called as Ion capsule pump which can retain vacuum without power for a week to 10 days. Hence, we won't require additional batteries. We provide integrated additional UPS which takes care of soft shutdown of the system in event of UPS failure.	Tender specification prevails.
16.	You have requested for 20na probe current, means the vendor have 20na and 300na configuration will offer 20na only considering commercial cost, if you get a system with 20na you need to change your FESEM to add WDS to it. 75 % of WDS applications are done in the range of 40 to 200 na probe current only, Hence request you to keep 200na or more so that you can add WDS in future.	Tender specification prevails.
17.	All Ultra high resolution FESEM can go up to 20 lakhs magnification, if you mention 10laks people will offer entry level FESEM and the doesn't add any big cost to the FESEM, but will enable high resolution imaging of your samples.	Tender specification prevails.
18.	Please mention the system should have double condenser to enable probe diameter lower than 2-5nm in 3.5na probe current	Tender specification prevails.
19.	Active vibration isolation system are the system which senses vibration through vibration transducer and correct it through piezo and can correct vibration in all 6-axis. Pneumatic legs type doesn't sense floor vibration especially low frequency ones and you will get white line as interference, as you are going for EBL you need best vibration isolation and 6-axis vibration isolation is the best Hence we request you to mention vibration transducer for measuring vibration and correction using piezo in all 6-axis to get best from your instrument in the site.	Tender specification prevails.

20.	Single condenser will give 40nm spot size for 3.5nA of probe current, (EDS probe current will be of 3 nA or above) whereas double condenser they get around 2nm which is must for high resolution EDS/any analytical work.	Tender specification prevails.
21.	Field-emission based electron gun. The quote should include three spare filaments. We request to delete this line. You have already covered emitter under warranty	The specification has been amended as follows: Original: <i>"The emitter should be covered under 3 years warranty or replaced as and when required within 3 years, free of cost."</i> Revised: <i>"The offer should include the provision for replacing the faulty filament twice beyond the warranty period. The replacement should cover the cost of consumables and service charges."</i>
22.	Less than 0.02 kV to 30 kV or better. Imaging at beam energies down to 50 V or below without sample or stage biasing should be possible. We request to delete "without sample or stage biasing should be possible"	Tender specification prevails.
23.	We request you to Add "in column Backscattered Electron detector". This required to detect low energy BSE.	Tender specification prevails.
24.	Beam Blanking (at Image Freeze), Raster Rotation, Tilt Correction, Image Acquisition, Image Processing and Image Data management. We request you to mention the time resolution or Rise/fall time: < 25 ns for Beam Blanker.	Tender specification prevails.
25.	Vendors should have supplied at least 5 similar SEM with EBL in India. The List of recent installations in India with names, addresses and contact information of the end users in various Indian universities/ institutes / laboratories should be provided. Vendors should have supplied at least 5 similar SEM with EBL in India. The List of recent installations in India/Globally with names, addresses and contact information of the end users in various Indian universities/ institutes / laboratories should be provided.	The specification has been amended as follows: Original: <i>"Vendors should have supplied at least 5 similar SEM with EBL in India. The List of recent installations in India with names, addresses and contact information of the end users in various"</i> Revised: <i>"Vendors should have supplied at least Five similar SEM and EBL in India/globally out of which at least three should be in India in the last 5 years. The list of last five years installations (include only those where EDS and EBL combination is supplied) in India with names, addresses and contact information of the end users in various Indian universities / institutes / laboratories should be provided."</i>

26.	Sr. No. 1 Field-emission based electron gun: The quote should include three spare filaments Our request: - Please delete.	The specification has been amended as follows: Original: <i>"The emitter should be covered under 3 years warranty or replaced as and when required within 3 years, free of cost."</i> Revised: <i>"The offer should include the provision for replacing the faulty filament twice beyond the warranty period. The replacement should cover the cost of consumables and service charges."</i>
27.	0.7 nm or better at 15 kV and 1.2 nm or better guaranteed at 1 kV, 1.5 nm or better at 0.5 kV. Our request: - Please amend as 0.6 nm or better at 15 kV and 1.1 nm or better at 1 kV. The resolution should be achieved without sample or stage biasing. Our request: - Please delete.	Tender specification prevails.
28.	The resolution should be achieved without sample or stage biasing. Our request: - Please delete.	Tender specification prevails.
29.	Minimum 3 pA to at least 20 nA or more with guaranteed stability better than 0.2%/h or 0.4%/10h. Our request: - Please amend as Minimum 3 pA to at least 300 nA or more with guaranteed stability better than 0.2%/h or 0.4%/10h.	Tender specification prevails.
30.	Pneumatically retractable five segmented solid-state, BSE detector (for 10 composition contrast, crystal orientation, topographic imaging, 3D surfaces reconstruction and quantitative 3D metrology) Our request: - Please amend as retractable segmented solid-state, BSE detector (for 10 composition contrast, crystal orientation, topographic imaging, 3D surface reconstruction and quantitative 3D metrology).	Tender specification amended as follows: Original: <i>"Pneumatically retractable segmented solid-state, BSE detector (for composition contrast, crystal orientation, topographic imaging, 3D surface reconstruction and quantitative 3D metrology)"</i> Revised: <i>"Retractable segmented solid-state, BSE detector (for composition contrast, crystal orientation, topographic imaging, 3D surface reconstruction and quantitative 3D metrology)"</i>
30.	Images from different detectors should be displayable at different magnifications. Our request: - Please delete.	Tender specification prevails.
31.	Dual magnification should be possible allowing a user defined area on the left-hand half of a split screen display to be zoomed	Tender specification prevails.

	from 1x to 10x. Our request: - Please delete	
32.	Sr. No. 18 Energy Dispersive X-ray Spectroscopy (EDS) probe And associate software: Mn- α : < 127eV at count rate of 100,000 cps F- α : < 65eV at count rate of 100,000 cps C- α : < 48eV at count rate of 100,000 cps Our Request: - . Please amend as Mn- α : < 131eV .	Tender specification prevails.
33.	Sr. No. 1 Users List of Schottky FE SEM in India : Vendors should have supplied at least 5 similar SEM with EBL in India. The List of recent installations in India with names, addresses and contact information of the end users in various Indian universities/ institutes / laboratories should be provided. Our Request:- Please amend as Vendors should have supplied at least 5 SEM with EBL in India and global .	The specification has been amended as follows: Original: “Vendors should have supplied at least 5 similar SEM with EBL in India. The List of recent installations in India with names, addresses and contact information of the end users in various” Revised: “Vendors should have supplied at least Five similar SEM and EBL in India/globally out of which at least three should be in India in the last 5 years. The list of last five years installations (include only those where EDS and EBL combination is supplied) in India with names, addresses and contact information of the end users in various Indian universities / institutes / laboratories should be provided.”
34.	Sr. No. (1) Wavelength Dispersive Spectroscopy (WSD): The WDS Spectrometer should be Fully focusing type spectrometer having at least 200mm Rowland circle to cover 2θ range of 33° to 135° . Our Request:- Please amend as the WDS Spectrometer should be Fully focusing type spectrometer having at least 200mm Rowland circle to cover 2θ range of 33° to 135° or parallel Geometry.	Tender specification prevails.
35.	Sr. No. (5) Electron Backscatter Diffraction (EBSD): C-MOS based technology for the EBSD camera having 1244 x 1024-pixel resolution or better. - indexing speeds 5000 patterns per second (pps) or better (for strain analysis) Our Request:- Please amend as C-MOS based technology for the EBSD camera having 640 x 480-pixel resolution or better. - indexing speeds 4000 patterns per second (pps) or better (for strain analysis).	Tender specification prevails.

36.	Payment Term	Following additional payment term is incorporated in bid document. Payment Term: Inland Letter of Credit will be established for 100% order value, 90% payment shall be made by us, against the presentation of original Shipping documents. Balance 10% will be released after completion of satisfactory installation, commissioning, demonstration of the whole system, after imparting training and upon receipt of Bank Guarantee for 5% of total Order value towards performance security to be valid for till warranty period from the date of installation.
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Specification Document

Technical Specifications for Field Emission Scanning Electron Microscope (FESEM) with integrated EDS, EBSD, and EBL attachments

S. No.	Feature	Specification	Marks
1	Field-emission based electron gun	High Stability Schottky Field Emission based Electron source with Automated Filament cutoff safety device. <i>The offer should include the provision for replacing the faulty filament twice beyond the warranty period. The replacement should cover the cost of consumables and service charges.</i> Dedicated back-up power supply or any other alternative arrangement should be provided for the ion pumps to eliminate the need for gun bake-out and realignment in the event of main UPS power failure. This is an extra back-up arrangement in addition to external UPS which takes care of the intermittent power failures. <i>The quote should include three spare filaments</i>	6
2	Resolution	0.7 nm or better at 15 kV and 1.2 nm or better guaranteed at 1 kV, 1.5 nm or better at 0.5 kV. The resolution claimed must be fully supported with preprinted literature and should be demonstrated at the time of installation. The resolution should be achieved without sample or stage biasing.	5
3	Acceleration voltage	Less than 0.02 kV to 30 kV or better. Imaging at beam energies down to 50V or below without sample or stage biasing should be possible.	3
4	Probe current	Minimum 3 pA to at least 20 nA or more with guaranteed stability better than 0.2%/h or 0.4%/10h. The higher probe current upper limit but without compromising on the ability	5

		of the microscope to perform EDS, EBL and EBSD will be preferred. Probe current should be adjustable at any intermediate value by software control.	
5	Magnification	Direct image magnification x 10 to x 1, 000, 000 or more, continuously variable.	3
6	Electron Optics	- Hybrid magnetic/electrostatic objective/compound lens or equivalent lens assembly for high-resolution imaging of all types of materials (including paramagnetic, ferromagnetic, insulating, and metallic nanoparticles), with beam acceleration and deceleration within the lens to reduce aberration and improve probe diameter. - The lenses should be thermally stabilized. - Electron channeling contrast imaging (ECCI) should be possible with the supplied optics. - High resolution imaging at low kV and low probe current should be possible. - Low (<1%) beam noise, high stability thermal FEG beam with $\leq 0.2\%$/hour variation.	8
7	Focus	Automatic compensation to minimize focus change over the whole acceleration voltage range.	1
8	Working distance	Minimum 1 mm to 50 mm or better depending on the operating conditions	2
9	Specimen holder	150 mm diameter along with specimen handling & preparation tools/ and the required seals and conductive tapes as well as Multi (> 12) Specimen/Sample Holders.	3
10	Low vacuum/high pressure or Variable pressure mode	FESEM should be equipped with Retractable Low vacuum system. The high-vacuum to low-vacuum switching should be possible through fully automatic software-controlled system without breaking the	2

		chamber vacuum and manual insertions. Vacuum pressure should be adjustable in the steps of 10 Pa or smaller between 10 Pa to 300 Pa or better.	
11	Specimen stage	5-axis eucentric Motorized Specimen Stage having Large motorized Stage with X/Y/Z/T/R movements as X/Y = 100 mm or more, and Z = 50 mm or more, T = -4 to +70 degrees or more, R = 360° (continuous). Specimen current monitor and Standard Specimens should be provided. The stage automation system should be controlled through stage control panel, trackball and should 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	4
12	Detectors	- InLens SE detector: column mounted, scintillator detector with optically coupled photomultiplier - Retractable segmented solid-state, BSE detector (<i>for composition contrast, crystal orientation, topographic imaging, 3D surface reconstruction and quantitative 3D metrology</i>) - Cascade current detector for detecting SE under variable pressure 300 Pa or above (<i>Effective at low kV in samples that demand low vacuum including polymers, bio specimens, powders and fibers</i>) - Chamber mounted Everhart-Thornley secondary electron detector - The specimen current detector (<i>detects the current absorbed by the specimen</i>)	10

		Other specifications of the detection system - Side by side live display on a single monitor of the same field of view using input from multiple detector channels. - Images from different detectors should be displayable at different magnifications. - Dual magnification should be possible allowing a user defined area on the left-hand half of a split screen display to be zoomed from 1x to 10x will be preferred. - Automatic compensation to minimize focus changes over the entire acceleration voltage range. <i>The detected electrons should not be affected by the focusing optics. Images in support with the tender and demonstration at the time of installation is required.</i>	
13	Plasma cleaner	The FESEM should be equipped with an integrated plasma cleaner for insitu removal of hydrocarbon contamination from the sample and the chamber.	1
14	Sample chamber	Chamber should be large enough to accommodate all the detectors and other analytical accessories including the CCD camera with IR Illumination etc., along with at least 10 accessory ports including two coplanar EDS and EBSD ports for simultaneous analyses, as well a WDS port. It should be possible to image the specimen holder and interior of the specimen chamber.	4
15	Sample loading device	Integrated Air lock Mechanism will be preferred	2
16	Standard SEM functions	Beam Blanking (at Image Freeze), Raster Rotation, Tilt Correction, Image Acquisition, Image Processing and Image Data management. The system should have all necessary hardware/software to switch smoothly	4

		between EDS and EBL options without breaking the vacuum.	
17	Evacuation system	Fully automatic, computer controlled dry pumping evacuation system (which includes oil free backing pumps, turbo molecular pumps, ion pumps, etc.) along with appropriate pressure gauges, appropriate safety interlocks, all required power supplies and preferably with anti-contamination traps. Vendor should provide detailed specifications of the evacuation system including pumps, pressure gauges etc. Ion Pump back up power supply should be provided.	3
18	Energy Dispersive X-ray Spectroscopy (EDS) probe And associate software	EDS should be state of art system designed to work in compliance with the ISO 15632:2012 - Liquid Nitrogen Free, Peltier cooled Silicon Drift Detector (SDD) system having sensor area of 60mm² or more with the following energy resolution: Mn-k_α : <127 eV at count rate of 100,000 cps F-k_α : < 65eV at count rate of 100,000 cps C-k_α : < 48eV at count rate of 100,000 cps - The EDS detector should have motorized slide which can be controlled manually or using the software. - The EDS detector should be easily retractable to a safe position when not in use - The associated EDS software should have following features: ➤ Imaging in real time ➤ Spectrum in real time ➤ Elemental mapping in real time ➤ Quantitative and Qualitative assessment based on latest XPP matrix corrections.	8

		➤ Multipoint Area, Line Analysis & Phase Mapping, Peak deconvolution, 2D elemental mapping and 2D compositional contrast mapping softwares. ➤ Drift correction and background removal and eliminating of peak overlaps. ➤ The EDS system should have the feature to separate the mapping information when recorded from overlapped peaks. The system software should prompt for the possible energy line overlaps. ➤ The EDS system software should have provision to add user's standards for improved quantitative Analysis.	
19	Electron Beam Lithography (EBL)	Capable of writing feature size less than 15 nm. Vendor must provide some documentary evidence, which is available in public domain, that e-beam column technology and pattern generator is capable of writing less than 12 nm features. During the time of installation, the vendor should be able to demonstrate the quoted minimum feature size. Beam blanker should be fitted in the column. Beam blanker electronics should be compatible with e-beam writer speed. EBL hardware & software package should be offered which is compatible with the quoted SEM model. Dedicated Pattern Generator Hardware (External DSP Unit): Maximum writing speed should be 20 MHz or higher. Min. dwell time increment should be 1ns or better. Should be equipped with suitable D/A converters for write field corrections, compensations, exposure resolution and speeds, capability of vector scans, geometrical shapes & text scans, arbitrary shapes, circular scans, bit-map and raster scans. Automated Dose control, synchronized exposure and field alignments. Universal Lithography Sample Holder. User license for software.	10

		PC Configuration for Electron Beam Lithography Attachment: Microsoft® Windows 10 operating system, 64 Bit Intel CPU, newest technology with ≥ 3.3 GHz RAM: 8 GB or more Hard Disk: 2x 500GB Hard Disk as RAID1 Networking: Min. 2x 100 Mbit Display: 24" High Resolution Flat Panel or better The lithography software should be capable of writing patterns prepared (preferably in .dxf format) using other CAD software like Adobe Illustrator. Vendors must provide standard EBL calibration samples and accessories.	
20	Calibration Standards	Provide standard sample calibration accessories like resolution standards, magnification standards and EDS single/multi element standards.	1
21	Image Processing	> 10 Mega Pixel, File type: RAW, TIFF (8 or 16 bit), BMP or JPEG, Single frame or 4-quadrant image display, Preferable 4 quadrants live imaging; Live or static signal mixing in color or grayscale; 256 frame average, > 5 average or integration modes, Digital video recording (.avi), Noise reduction, Image histogram and measurement software.	1
22	Sample Preparation Equipment	Turbo molecular pump-based Sputter Coater with: - Carbon - Gold - Platinum coating facility along with the required target materials Two each of C, Au, and Pt targets	2
23	Vibration Isolation Platform for mounting the FE-SEM	Active Damping Vibration isolation platform with pneumatically isolated legs with $\leq 1 \mu\text{m/s}$ for $f \geq 5$ Hz.	4

24	Water Cooling and compressor unit	Required system and its components must be supplied and fully installed by the vendor. Please mention the water flow requirements and provide a tank with capacity > 1.5 times the specified minimum size. Required compressor should be supplied.	1
25	Safety Devices	All necessary safety devices against power/water/vacuum failures including the most important automated Schottky Field Emission filament Safety device. Suitable Online UPS system with required capacity & back up time (minimum three hours at 60% of the UPS capacity in kVA).	2
26	Computer system	- Computer of latest model and associated hardware and software capable of working in Microsoft Windows 10 based workstation. - Mention at least 32 Gb Ram, dual monitors (at least 26" inch monitors), and 4X 64 Gb pen drives. - User friendly software with easy retrieval of data. - Data should be compatible with MS office programs.	1
27	Warranty	Minimum three years of comprehensive warranty including all replacement parts, labor charges and services as required without any additional cost from the date of final technical acceptance of the whole system and its accessories by IISER-Pune in fully operational condition after successful installation and commissioning by the vendor.	4

Other Mandatory criteria

1.	Users List of Schottky FE-SEM in India	Vendors should have supplied at least 5 similar SEM with EBL in India. Vendors should have supplied at least Five similar SEM and EBL in India/globally out of which at least three should be in India in the last 5 years. The list of last five years installations (include only those where EDS and EBL combination is supplied) in India with names, addresses and contact information of the
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		end users in various Indian universities / institutes / laboratories should be provided.
2.	Certificates	Factory Test certificates and compliance to various national and international standards should be enclosed with the system.
3.	Pre-installation requirements	Complete technical details of pre-installation requirements should be furnished along with the technical bid. IISER will only provide the installation room, air conditioning units and required electrical outlets and water connections. Vendors are expected to supply all other installation accessories, infrastructures, facilities and services required for successful installation and smooth operation of the equipment. Vendors must specify the requirements for vibration isolation, acoustic isolation and EMI spectrum of the instrument room and the building floor. Vendors must conduct the site survey before installation at no additional cost.
4.	Documentation	One set of operating manual and service manual (Both Hard and Soft Copy in English) should be provided with the equipment.
5.	Technical training	Necessary technical training should be provided to users from IISER Pune as per IISER requirements and without any additional costs.
6.	Spares	Complete List of essential spares for 5 years including all important PCBs, control electronics and microprocessors and imaging accessories, accessories for detectors and electron source, hoses, pumping accessories, electrical and switching accessories should be provided.
7.	Electrical Mains supply	220 V, 50 Hz
8.	Stand-alone operation	The system should work as a stand-alone unit without the need of any supporting equipment from the buyer side.

List of optional items

(1) Wavelength Dispersive Spectroscopy (WSD): Fully automated Wavelength Dispersive X-Ray Spectroscopy (WDS) Detector (at least 5 diffracting crystal) with Spectral Resolution $\leq 2\text{eV}$, Energy range $\geq 15\text{ keV}$ and complete software and analysis packages, capable of analyzing the elements from Beryllium (Be) to Uranium (U) with Tandem type X-ray detectors consisting of one flow proportional and one sealed proportional counter. The WDS Spectrometer should be Fully focusing type spectrometer having at least 200mm Rowland circle to cover 2θ range of 33° to 135° . WDS

spectrometer with wavelength reproducibility of $\pm 0.000015\text{nm}$ and high spatial resolution using low beam currents ($<5\text{nA}$). The Linearity of wavelength position should be at least $\pm 0.0003\text{nm}$. Slit size motor for controlling the width of receiving slit (0.01-2.0 mm in 0.01mm steps). Slit position motor for positioning slit and detectors with respect to x-rays diffracted from crystal and optimizing x-ray collection for each spectral line. Motorized drives for wavelength position, slit, size, slit position, crystal, gate valves. Vendors must provide standard WDS analytical software and calibration samples and accessories.

(2) Cryogenic cooling stage: a) Peltier Cooling + Heating Stage ($-15\text{ }^{\circ}\text{C}$ to $>200\text{ }^{\circ}\text{C}$) & b) Cryo Stage ($-173\text{ }^{\circ}\text{C}$ to $200\text{ }^{\circ}\text{C}$) stage with the monitoring and indication of temperature range.

(3) CL Imaging: (i) Computer controlled Cathodoluminescence Imaging (CLI) with highly sensitive PMT mounted inside the SEM chamber at the end of a retractable probe with spectral range of Minimum 300 nm to 850 nm over the entire range of SEM magnifications. Vendors must provide standard CLI calibration samples and accessories. (ii) Optional dispersion of light into array detector for live color mixing in Cathodoluminescence Imaging.

(5) Electron Backscatter Diffraction (EBSD):

The EBSD system with software for analyzing EBSD patterns for phase studies, Phase mapping applications and texture related studies.

- C-MOS based technology for the EBSD camera having 1244×1024 -pixel resolution or better.
- indexing speeds 5000 patterns per second (pps) or better (*for strain analysis*)
- Sensitivity 1000 pps/nA
- angular precision less than 0.05°
- Equipped with proximity sensor to avoid collision with sample/stage.
- Bellows SEM interface, maintaining the microscope's vacuum integrity

The EBSD software should be capable of:

- Point Analyses, Line Scans, and Maps
- Combines EDS & EBSD data to identify unknown phases
- EBSD data processing software should include maps, pole/inverse pole figures, ODFs and grain analysis
- Colour visualisation of orientation images using foreshatter detectors
- Predictive and reactive specimen drift correction
- Acquire and stitch multiple fields to characterize large sample areas
- Schedule acquisition of multiple experiments
- Import Crystal Information Files for phase definition
- Pole Figure Software – texture analysis
- The EBSD system should have a feature of simultaneously acquiring EDS and EBSD data from multiple fields over a large sample surface and automatically aligning the images using correlation techniques and stitching the mapped images during data acquisition itself.

Three additional offline licenses

**DECLARATION OF LOCAL CONTENT
AND AVAILABILITY/COMPLIANCE OF ITEM**

(To be given on company's letter head - For item value below Rs.10 crores)
(To be given by Statutory Auditor/Cost Auditor/Cost Accountant/CA for item value above Rs.10 crores)

Date: _____

To,
The Director
Indian Institute of Science Education and Research Pune
Dr.Homi Bhabha Road, Pashan
Pune-411008

Sub: Declaration of Local content and availability/compliance of item

Item No.	Name of item	Only mention Currency (must be INR for local part)	Local content %	Country of Origin	Comply/capable to provide (yes/no)
1					
2					
3					
4					

“Local Content” means the amount of value added in India which shall, be the total value of the item being offered minus the value of the imported content in the item (including all customs duties) as a proportion of the total value, in percent.

“False declaration will be in breach of Code of Integrity under Rule 175(1)(i)(h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151 (iii) of the General Financial Rules along with such other actions as may be permissible under law.”

**Yours faithfully,
(Signature of the Bidder, with Official Seal)**

BIDDER INFORMATION FORM

Company Name : _____
Registration Number : _____
Registered Address : _____

Name of Partners /Director : _____

City : _____
Postal Code : _____
Company's Establishment Year : _____
Company's Nature of Business : _____

Company's Legal Status (tick on appropriate option)
1) Limited Company
2) Undertaking
3) Joint Venture
4) Partnership
5) Others
Company Category
1) Micro Unit as per MSME
2) Small Unit as per MSME
3) Medium Unit as per MSME
4) Ancillary Unit
5) SSI
6) Others

CONTACT DETAILS

Contact Name : _____
Email Id : _____
Designation : _____
Phone No : (_____) _____
Mobile No : _____

BANK DETAILS

Name of Beneficiary : _____
A/c. No. CC/CD/SB/OD: _____
Name of Bank : _____
IFSC NO. (Bank) : _____

Enclose scan copy of cancelled Cheque.

Branch Address and Branch Code: _____

Other Details

Vendor's PAN No. _____

Vendor's GST No: _____ x

**CERTIFICATE
ON COMPANY LETTERHEAD**

CERTIFICATE BY BIDDER- DPIIT REGISTRATION

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that this bidder is not from such a country or, / if from such a country, has been registered with the Competent Authority (copy of the Registration Certificate enclosed) . I hereby certify that this bidder fulfils all requirements in this regard and is eligible to be considered.

Signature with Date and Stamp
Of the Bidder

Compliance of BoQ Specification and Supporting Document

FORMAT OF COMPLIANCE STATEMENT OF SPECIFICATIONS

S. N.	Name of specifications/ part / Accessories of as per GeM bid	Specifications quoted by bidder	Compliance Whether "YES" Or "NO"	Deviation, if any, to be indicated in unambiguous terms	Whether the compliance / deviation is clearly mentioned in technical leaflet/ literature
1	2	3	4	5	6

- **Custom Duty Exemption Certificate:**

IISER Pune has concession from payment of Customs Duty under notification No.51/96 dated 23.07.1996. No other charges than those mentioned clearly in the quotation will be paid. CDE Certificate will be provided as and when required.