



Indian Institute of Technology Kanpur

Advanced Center for Materials Science

Enq. No.: ACMS/ AU/ 2012-13/ E-5

Enquiry Dated: March 02, 2013

Closing Date: March 18th, 2013

ACMS requires the quotation for **Field-emission-gun based Scanning Electron Microscope (FEG-SEM)**. The specifications for the equipment are in the addendum. The quotation should also include following attachments: EDS and EBSD detectors and following accessories: **Gold/ Pt sputterer and carbon coater**. The closing date for the above item is **March 18th, 2013**.

The prospective suppliers are required to send quotation in two parts in sealed envelopes, as “Technical Bid” and “Financial Bid”. The Technical Bid should contain detailed technical specification of the product being offered and should not mention any prices. The Financial Bid should include the detailed price quotation clearly including the cost of the equipment, taxes, service charges if any, shipping and handling charges. The two separate and sealed envelopes should be clearly marked appropriately as “Technical Bid” and “Financial Bid”.

Terms and Conditions:

1. Maximum education discount, if any should be offered
2. Validity of quotation should be at least for 60 days
3. Prices should be on CIF and FOB separately (if imported)
4. Prices should include the installation and training cost
5. Warranty should be for at least three years after installation
6. Normal payment terms for the Institute will be applicable (90% on delivery of the items and the remaining 10% after satisfactory installation/ inspection)
7. Quotation should carry proper certifications like agency certificate, proprietary certificate, etc.
8. An undertaking that the vendor will supply all the spares and services for the equipment for at least 5 years from the date of commissioning
9. Delivery must be within 9 months (updated March 7th, 2013)

Kindly send the Technical and Financial bids in sealed envelopes latest by 18th March 2013 by 5pm, to:

Dr. Anish Upadhyaya
Head, Advanced Center for Materials Sciences
IIT Kanpur, U.P. 208016, India.
e-mail: anishu@iitk.ac.in

Technical Specifications for FEG-SEM

Sr. No.	Parameter	Required Specification*
1.	Description	One field emission scanning electron Microscope
2.	Make and Model Name	Clearly mention make, model and model number of the equipment being offered.
3.	Emitter	a. Thermal Field Emission with beam deceleration/ boosting capability / Gentle Beam Mode (revised March 9 th , 2013) (Clearly Mention emitter life and its replacement cost) b. Include one spare emitter with the package
4.	Accelerating Voltage	200V to 30KV or better
5.	Resolution	a. SE detector: 1.2 nm or better at the highest voltage & better than 3.0 nm at 1 kV b. BSE detector. 2.5 nm or better at highest voltage & better than 4nm at 1 kv (Please indicate clearly what is achievable for your system)
6.	Working Modes	High Vacuum (state clearly the capabilities of your system at low vacuum)
7.	Probe current	Upto 200 nA (Please indicate clearly what is achievable for your system)
8.	Magnification	25 X to 1,000,000 X or better
9.	Detectors	a. Solid state secondary electron detector (in-lens type) b. Solid state back scatter electron detector (in-lens type) c. Four quadrant BSE detector is desired d. Specimen current detector e. Energy selective and angle selective detectors/ filters desirable f. (Specify other possible detectors with price list)
10.	Chamber	At least 350 mm X 260mm size with CCD camera and IR illumination
11.	Ports	At least 7 accessory ports should be provided which are compatible for EDS, EBSD, heating and cooling stages
12.	(a) Main Stage	a. 5 axis motorized eucentric-tilt stage, Range of X= 100 and Y = 80 mm and Z=25mm or better (revised March 9 th , 2013) b. Tilt = 0 to 70 or better c. Rotation 360 degree d. Stage should support at least 1 Kg weight with x-y translation possible under this load e. Stage resolution should be better than 5 micrometer
	(b) Hot-tensile Stage	Hot-tensile stage (facilitating in-situ SEM and EBSD imaging) is required with following specifications a. Load cell upto 2KN b. Resolution better than 20N or 0.1 % of full scale c. Speed range: 0.5 µm/sec to 6 µm/sec or better d. Displacement range better than +/- 5mm e. Electronically controlled f. Heating upto 1000 degree C
13.	Image processing	a. 6 mega pixel or better b. Wide range of dwell time c. Single frame or 4-quad image display ability d. Frame averaging capability

Technical Specifications for FEG-SEM

14.	Vacuum system	Automatic Turbo Molecular Pump (TMP) Rotary pump (RP) Ion Getter Pump,(IGP) based differential vacuum system, oil free rotary pump with silencer box, should give ultra clean dry fast vacuum using air cooled Turbo Molecular pump. Safety measures for electron column against any vacuum failure. Power backup for ION pumps should be included
15.	Supporting software	<ol style="list-style-type: none"> a. All possible option for this configuration (please list each), 3-D and AVI imaging capability b. The instrument should be installed with latest available version of software for control, operation and analysis. c. The supplier should upgrade the software as and when the upgradations become available for at least five years from installation d. Should have intelligent calibration logic e. Continuous automatic hardware diagnosis
16.	(a) EDS Detector	EDS: 50mm ² or larger SSD, LN2 free detector (Maximum energy resolution of 129 eV guaranteed for Mn Ka, measured according to ISO 15632:2012). The element range should be from B to U. The detector active area should be 50mm ² or better
	(b)EBSD Detector	EBSD detector: High sensitivity EBSD detector with better than 100 frames per second and included forward scatter detectors (with most recent version of data acquisition and powerful analysis software). Standard reference samples like Ni and Silicon single crystal should be included
17.	Sample holder	Single and multiple specimen stubs, specimen handing tools and stage tools, pre-tilt sample holder for EBSD
18.	Accessories (to be included in the quotation)	<ol style="list-style-type: none"> a. High precision Gold sputter –with pumping system, thickness controller, appropriate targets, rotary, planetary-tilting stage, preferably with turbo molecular pump for fast vacuum, with suitable accessories b. High precision carbon coater –with pumping system, thickness controller, appropriate targets, rotary, planetary-tilting stage, preferably with turbo molecular pump for fast vacuum, with suitable accessories c. Active vibration isolation system for chamber and column separation d. Plasma cleaner (state clearly whether it is integrated in the system or external) e. Size calibration standards
19.	Additional Features	<ol style="list-style-type: none"> a. Online fault diagnosis and networking, b. Acoustic touch alarm mechanism to eliminate charging effects c. System should have a mechanism to permit high resolution work in the low accelerating voltage range (100V to 3KV) d. Provide vibration protection system for SEM room
20.	Computer and Printer	<ol style="list-style-type: none"> a. The SEM should come with a high performance computer with all the requisite software installed on it b. Minimum Configuration: intel dual core processor, 4 GB RAM, 500Gb Hard Disk, 24” Display with other essential peripherals. (3 PC: one for SEM, one for EDS/EBSD and one for hot stage control) c. Laser printer should be provided with the computer

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21.	Power Supply and UPS	<ul style="list-style-type: none"> a. Specify the requirements of the power supply for the offered system b. UPS and the required batteries should be provided with the system with the minimum back-up of 30 minutes to run the system, computer and printer c. Power backup for FEG source should be completely taken care off
22.	Documentation	<ul style="list-style-type: none"> a. Two sets of operating manuals for the equipment and control system should be provided in hard copies b. A soft copy of the above manuals should also be provided in a CD/DVD
23.	Safety Norms	<ul style="list-style-type: none"> a. The instrument should include safety devices for protection against vacuum, water , power etc b. The instrument should be compliant with international norms for safety and environment
24.	Installation, Commissioning and Training	<ul style="list-style-type: none"> a. The delivery of the Microscope should be considered complete only after successful commissioning of the instrument b. The pre-installation requirements should be communicated to IIT Kanpur well in advance of the installation c. The Installation, commissioning and training should be done only by well trained factory engineers d. The supplier should provide training to at least two candidates at the installation site to make them familiar with smooth operation of the instrument
25.	Guarantee/ Warranty	Preferably 3 years
26.	After-sales Service	<ul style="list-style-type: none"> a. The supplier should provide a prompt after-sales service such as regular instrument maintenance, troubleshooting and fixing b. The list of service centers in India should be included.
27.	Spares	<ul style="list-style-type: none"> a. List of standard spares to be provided for each year starting from 1st to 5th year along with cost and discounted rates b. An undertaking that the vendor will supply all the spares and services for the equipment for at least 10 years from the date of commissioning
28.	Annual Maintenance Cost	Include the cost of annual maintenance for each year for five years after the guarantee/ warranty period. Provide the amount and the terms, Note that those providing better after sales service and support with proven track record will be given preference
<p>*Additional optional accessories should be indicated separately along with their price. The above specs are desirable and the actual numbers achievable for your system should be indicated.</p>		