



INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH

PUNE

CLARIFICATION ON TENDER NUMBER - IISER-PUR-0458-16

ITEM DESCRIPTION- PROCUREMENT OF HIGH RESOLUTION TRANSMISSION ELECTRON MICROSCOPE

Refer our Press Tender Notice No.IISER/S&P/17/16 dated 7.12.2016 for procurement of High Resolution Transmission Electron Microscope. Tender Reference Number - IISER-PUR-0458-16.

Pre-Bid meeting was held on December 16th , 2016 at 2.30 PM and minutes of meeting is as under.

At the outset, the Chairman welcomed all the Members and the representative of the Prospective Bidders and briefed in general the scope of the Project and thereafter requested Assistant Registrar (S&P) to brief the vendors on the salient features of the commercial terms and the indenting Officer to read out the clarification sought by the Prospective Bidders and replied thereto as detailed in Annexure -II

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.

The other terms & conditions of the notice issued on our IISER website [www.iiserpune.ac .in](http://www.iiserpune.ac.in) will remain unchanged. No more correspondence in this regard will be entertained

The meeting ended with vote of thanks to the Chair

16.12.2016

Sd/-
Assistant Registrar (S&P)



IISER PUNE

**PREBID CONFERENCE FOR PROCUREMENT OF HIGH RESOLUTION TRANSMISSION ELECTRON
MICROSCOPY**
TECHNICAL QUERIES AND CLARIFICATION

TENDER NUMBER - IISER-PUR-0458-16

DATE : 16.12.16

S.No	Query/Clarification Sought	Clarification / Amendment
1	Point # 1: 'HRTEM with Schottky Field Emission Gun (FEG) including High Voltage Supply Unit.' Request to use 200 kV or more	Tender Specification of #1 now reads as 'HRTEM with ≥ 200 kV Schottky Field Emission Gun (FEG) including High Voltage Supply Unit.'
2	Point # 11: 'TEM point-to-point Resolution $\leq 0.2\text{nm}$.' Request to be raised to 0.25nm	Tender Specification prevails. No change in the specification.
3	Point # 18: 'FWHM at Manganese: ≤ 129 eV' One vendor wants this to be ≤ 127 eV which other vendor Objected	Tender Specification prevails. No change in the specification.
4	Point # 8: 'and additional computers' Request to mention the specification of the said computer	No change is made so that any such computer which can work with the mentioned camera specs can work. Camera specs mentioned in # 8 is more

		primary than computer specs.
5	<p>Point # 49:</p> <p>Comment: In-Column and Post-Column EELS are different.</p>	In-column and Post-column EELS are technically two different set of equipment accessories and their specs are now separated as new 49(a) OR 49(b) within the main specification of HRTEM.
6	Point # 18 Requests to add the phrase 'quantitative mapping'.	The improved spec now reads as ' ...multi-elemental, quantitative mapping etc. '
7	Point # 48,49 and 50 were optional items	All these are now included in main specifications of HRTEM and there are no optional items any more.

**IISER PUNE****PREBID CONFERENCE FOR PROCUREMENT OF HIGH RESOLUTION TRANSMISSION ELECTRON MICROSCOPY
COMMERCIAL QUERIES AND CLARIFICATION**

TENDER NUMBER - IISER-PUR-0458-16

DATE : 16.12.16

S.No	Query/Clarification Sought	Clarification / Amendment
	-----NIL-----	-----NIL-----

HRTEM Revised Specifications:

- 1) HRTEM with ≥ 200 kV Schottky Field Emission Gun (FEG) including High Voltage Supply Unit.
- 2) Turbo Molecular Pump based fully Dry-Vacuum system for the HRTEM with all required backing pumps, high vacuum pumps and Ultra-High Vacuum Pumps, suitable Pressure Gauges, Compressors and Suitable Air & Water Chillers etc required for HRTEM operation.
- 3) At least 3 years of FE Gun Operation must be ensured from the date of installation. Free FE Gun Replacements should be carried out if required within this 3 year period. This should be based on as & when necessary basis including all costs of sourcing required accessories, apertures, labor & service charges, applicable taxes and duties, shipping costs etc. Please provide written statement from the Principal Vendor.
- 4) Accelerating Voltages can be tuned in steps.
- 5) In addition, One-touch switch of accelerating voltage directly to 80kV/100kV is desired.
- 6) Energy Resolution of Schottky Field Emission Gun ≤ 0.8 eV at Zero-Loss FWHM.
- 7) Probe current ≥ 0.5 nA for 1nm probe.
- 8) CMOS Imaging Camera at 4k x 4k pixels and ≥ 16 bit dynamic range for HRTEM imaging with all necessary controllers and analysis software(s) and additional computers.
- 9) CMOS based Video Recording with ≥ 25 fps Video Capture at 4k x 4k pixels.
- 10) TEM lattice resolution or information limit ≤ 0.12 nm.
- 11) TEM point-to-point Resolution ≤ 0.2 nm.
- 12) TEM's maximum magnification up to ≥ 1.5 Mx compatible with above mentioned resolution.
- 13) HAADF, STEM Detectors & Imaging Modes (Maximum Magnification up to ≥ 150 Mx, HAADF Resolution ≤ 0.15 nm).
- 14) X, Y movement Range $\geq \pm 1$ mm.
- 15) Z height adjustment Range $\geq \pm 0.2$ mm.
- 16) At least 5 Axes Eucentric Sample Stage or better.
- 17) Specimen Tilt Angle $\geq \pm 25^\circ$.
- 18) Windowless Silicon Drift detectors without Liquid Nitrogen with total area ≥ 100 mm² for EDS, EDS Controller and additional 24 inch Monitor for EDS Elemental Mapping. Shift in peak position and Resolution < 1 eV up to 100,000 counts per second, FWHM at Manganese: ≤ 129 eV; Capable of elemental analysis from Beryllium (Be) to Uranium (U). EDS interface capable of line scan, elemental analysis, multi-elemental, quantitative mapping etc. Vendors must also provide standard EDS calibration samples and accessories.
- 19) Convergent Beam Electron Diffraction Capability, Convergence Angle from ≥ 1.5 mRad to ≥ 20 mRad.
- 20) Fully Load Locked Sample Loading Chamber with Liquid Nitrogen cold trap.
- 21) Two (1+1) - single tilt specimen holder(s) and Two (1+1) - double tilt specimen holder(s) with all required tips, stubs, accessories and external holder mounts for sample mounting.
- 22) Additional Specimen holders with tilting – a) for heating and b) for cooling stages including all required heating and cooling accessories.
- 23) Vacuum pump based external storage/holder for specimen holders and all required sample mount accessories for sample loading and unloading.

- 24) Calibration Standards: Please also provide standard TEM sample calibration accessories – a) resolution standards, b) magnification standards and c) single and multi-element standards for EDS.
- 25) Main Computer with ≥ 2 GHz Processor, ≥ 8 GB RAM, ≥ 3 TB Hard Drive and ≥ 24 inch Dual Monitors for HRTEM Operation.
- 26) Vibration Isolation Platform for TEM: Auto leveling, active, anti-Vibration system for chamber and electron column isolation is required.
- 27) Electrical Mains supply: All equipment & accessories should be compatible with 220/440 V, 50 Hz power supply as per Indian Standard.
- 28) Safety Devices: All necessary safety devices against power/water/vacuum failures including the most important automated Field Emission filament Safety device should be included. Please mention these items clearly in your quotation.
- 29) Manuals: One set of Operating/User manual, relevant Technical Manuals and Service Manual (Soft Copy in English) should be provided.
- 30) Onsite Installation, Training and Support for a total of ≥ 2 Weeks in the beginning.
- 31) Periodic onsite Technical Trainings within warranty period: Necessary technical trainings should be provided to users from IISER Pune as per IISER requirements and without any additional costs within the warranty years.
- 32) Warranty: Three years of comprehensive warranty including all replacement parts including the Schottky FE Gun, labor & service charges, applicable taxes and duties, shipping costs as required without any additional cost for the whole HRTEM system and all its accessories including ultra-high vacuum pumps, gauges, Electronic Controller(s), DAQ cards and PCs etc. This comprehensive warranty should start from the date of final technical acceptance of by IISER-Pune in fully operational condition after successful installation and commissioning by the vendor.
- 33) Written Certificate must be provided from Principal HRTEM Company guarantying at least 10 years of serviceability and availability of spare parts including HR-TEM hardware and accessories from the Date of Installation of HRTEM.
- 34) Free of cost Upgradation of all Operating Software(s) including portability/upgradation to latest Operating systems for the main computer after 5 years from the Date of Installation of HRTEM should be committed. This should include the free replacement of any additional hardware(s) and/or electronic cards including service.
- 35) Written Guarantee of maximum downtime of not more than two weeks within the Warranty Period.
- 36) At least 3 years of FE Gun Operation must be ensured from the date of installation. Free FE Gun Replacements should be carried out if required within this time frame. This should be based on as & when necessary basis including the sourcing of all required accessories, apertures, labor & service charges, applicable taxes and duties, shipping costs at No Additional cost. Written Guarantee from the Principal HRTEM company must be submitted for this.
- 37) List of Users of Similar Models in India/Abroad with contact information: Vendors must provide the List of most recent installations in India with names, addresses and contact information of the end users in various Indian universities/ institutes / laboratories.
- 38) Technical Certificates: Factory Test certificates and compliance to various national and international standards should be enclosed with the system.
- 39) Furnish All Pre-Installation Requirements on the Receipt of Purchase Order: Complete technical details of pre-installation requirements should be furnished along with Temperature and Humidity Control and placement of AC Units etc. IISER will only provide the installation room as per the design submitted by the vendor. IISER will also provide air conditioning units and required electrical outlets and water connections as per the design submitted by the vendor. 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 isolation of the instrument room and the any requirement of building floor with professional civil and electrical details.
- 40) Vendors must conduct the advanced site survey at no additional cost once before they ship the main HRTEM Unit.
- 41) Installation: Any Heavy Lifting machinery required for Installation must be sourced by the Vendors only.

- 42) Suitable $\geq 10\text{kVA}$ UPS with 60mins Battery Back Up with Maintenance Free Batteries for TEM. The UPS must support each and every module of the TEM including high voltage generator, computers, Main control tower, water chillers and the HRTEM itself.
- 43) De-humidifier, 50 Lt/Day, Tank Capacity ≥ 8 Lt, Recommended Coverage Area ≥ 850 Sq.ft, Minimum Air Flow ≥ 220 m³/Hr.
- 44) Standard Turbo pump backed Plasma Cleaner to clean TEM Grids.
- 45) Onsite HRTEM Operator 9-6pm from Mon-Sat on Contract for 3 Years. Please quote all-inclusive monthly salary in the main quotation itself.
- 46) 100 sets of Vials/pkg for Standard Copper Grids, Center-Marked Grids, 400 mesh, Pitch $< 65\mu\text{m}$, 3.0mm O.D. with Carbon film support.
- 47) 100 sets Vials/pkg of Standard Copper Grids, Center-Marked Grids, 200 mesh, Pitch $< 130\mu\text{m}$, 3.0mm O.D. with Carbon film support.
- 48) 3D TEM Tomography capability with special sample holder for tomography including all accessories and analysis software(s) having Tilt Angle $\geq \pm 60^\circ$.
The corresponding options and costs may be separately indicated because the purchase of this capability or otherwise will depend on the costs and budget.
- 49) (a) In-column Electron energy loss spectroscopy (EELS) with energy-filtered transmission electron microscope (EFTEM) capabilities with ≤ 0.8 eV energy resolution, Capable of Energy Loss imaging including elemental mapping and Energy Loss Spectrum including Elemental Analysis, 100eV EELS range, at ≥ 1000 spectra/s with energy filtered imaging, mapping, and diffraction or better.
OR
(b) Post-column Electron energy loss spectroscopy (EELS) with energy-filtered transmission electron microscope (EFTEM) capabilities with ≤ 0.8 eV energy resolution, Capable of Energy Loss imaging including elemental mapping and Energy Loss Spectrum including Elemental Analysis, 2000eV EELS range, at ≥ 1000 spectra/s with Large field of view energy filtered imaging, mapping, and diffraction, Aberration correction up to the fifth order with 9 mm entrance aperture for EFTEM and 5 mm entrance aperture for EELS, aberration corrected High Resolution STEM EELS with 2.5mm aperture.
- 50) Duplex, Multifunction Color Laser Printer and Scanner and Copier for TEM Image Printing.