NATIONAL INSTITUTE OF TECHNOLOGY ROURKELA

TEQIP –II CELL

No. NITR/TQ/CoE-OTER/NCB/2013/L/01 Date:02/01/2014

Addendum

The Pre-bid meeting was held on 1st January, 2013 to discuss the supply of following of **Environmental SEM, Package No. 147** under TEQIP-II (Tender reference no. NITR/TQ/CoE-OTER /NCB/2013/L/719 dated. 25.11.2013).

On request of the representatives of suppliers participated in the meeting, the last date for submission of bids is changed as follows.

- **Last Date for submission of Revised Technical & Price bids - 10/01/2013, Time 12.00A.M.**
- **Techno – commercial presentation – 10/01/2013, 3.00 P.M.**

Technical Specifications for High Resolution Environmental SEM

The Field Emission Gun Scanning Electron Microscope (FE-SEM) should be a state-of-the art design with latest configuration and configuration towards better ease of use and data output capability.

Applications:

For mainly hardcore biological and bio-materials samples, and for Materials samples analysis also.

For high resolution topographical, morphological, highly illuminated sample surface imaging. This must be capable of excellent microanalysis capability with EDS attachment.

The system must be capable to be upgraded with cooling stage with peltier (<-20˚C) and LN_2 cooled stage (,-165˚C) for biological applications. It is desirable the system is capable of imaging samples in liquid at its real state without freezing.

Electron Gun:

High Resolution Schottky Field Emission Gun electron source with life ≥ 12 months.

Resolution:

≤ 1nm @ 30kV using SED in high-vac

≤ 1.4nm @ 30kV using SED in low-vac/ extended low vac.

≤ 2.5nm @ 30kV using BSED

Accelerating Voltage:

200V - 30kV – continuously variable.

Probe Current:

Upto 200 nA or more - continuously adjustable

Specimen Stage:

Specimen stage should be eucentric motorized and should have facility to load single and multiple samples.

Stage movements are: X = 50 mm; Y = 50 mm; Z = 50 mm & R = 360˚ –continuous. Tilt= -15˚ to +75°.

Specimen Chamber:
Should have sufficient number of ports (at least 6 nos.) for retrofitting accessories and future upgradation.
Sample size: 100 mm dia maximum, 50 mm thickness.

Detectors:
- Dedicated Secondary Electron Detectors (SED) throughout the high vacuum range.
- Annular type chamber mounted Back Scattered Electron Detector (BSED)
- IR-CCD for Sample viewing in Chamber

Vacuum System:
- The instrument must have sufficient safety & arrangement to maintain the vacuum properly.
- Should have sufficient vacuum range to analyze all kinds of samples including biological samples.
- Desired vacuum range is: from high vacuum level ($6x10^{-4}$ Pa) to low vacuum range (200 Pa). For hydrated biological sample analysis the chamber vacuum should be extended up to 500 Pa or more.
- The electron column & chamber must be equipped suitable pumping design technology for keeping the column / specimen chamber free from contamination at all the times as biological samples will be used.
- The pumping must be done by Turbo Molecular Pump (TMP) and sufficient no. of Turbo Molecular Pump (TMP), PVP pump for attaining required vacuum and hassle free operations, along with at least two nos. Ion Getter Pump (IGP) for stable & better vacuum.

Imaging and Processing:
Secondary and backscattered electron imaging with various images enhancements & processing controls, pseudo- coloring facility, Image storage in JPEG, TIFF or BMP mode and also in video data recording in .avi mode.
Image processing resolution approx 4096 x 3536 pixels or better.

Tool kits:
Suitable & essential Tool Kit is to be supplied with the system for the required maintenance. The equipment should give provision for Remote diagnostics and remote operation facilities.

System Control & Integrated Computer Peripheral:
Suitable State-of-the-art Windows XP or Windows 7 Operating System and factory preloaded SEM operating software, compatible computers with latest configuration, keyboard, Mouse, at least 19" LCD Monitor, Essential software (licensed) etc.

Power Supply:
The system must be capable of running with Indian standard: 230V AC, 50 Hz.

Documentation:
Necessary documents, operational & system manual in form of CD and hardcopy must be supplied with the system.

Warranty:
2 year standard for the complete system after system installation and commissioning.
All the technical specification claimed by the vendor/manufacturer should be mentioned in the original technical brochure or in the official company website.

Standard Installation:

Vendor should have installed at least 10 Environmental FESEM all over India.
EDS should be quoted as optional. The minimum specifications should be as below:
Integrated EDS system with 30 mm^2 detector active area SDD type EDS system detector with a resolution of 127eV or better @ MnKα.
The EDS detector should be LN_2 cool free & peltier-cooled.
Elemental Analysis and Elemental Mapping with Imaging Facility for all types of samples.
The system should guarantee the peak stability at high-count rates. The resolution and peak shift should be less than 1ev at high count rate.
The system software should allow elemental analysis and mapping. The software should also allow correction for coating element and Quant optimization for accurate analysis without need for measuring probe current. The necessary software required for the FESEM system with above essential accessories should be quoted.

Any other accessories which is required but not mentioned above may be quoted under optional items.

Yours sincerely,

Nodal Officer (Procurement)