



सीएसआईआर - केन्द्रीय काँच एवं सिरामिक अनुसंधान संस्थान

196, राजा एस सी मल्लिक रोड, कोलकाता - 700 032, भारत

CSIR - CENTRAL GLASS & CERAMIC RESEARCH INSTITUTE

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CORRIGENDUM

REFERENCE NO.: - P/NC/06/SB/DB/GTE/24-25/RE

DATE: 28/11/2024

NAME OF EQUIPMENT: "SUPPLY, INSTALLATION, COMMISSIONING & TRAINING OF "HIGH RESOLUTION TRANSMISSION ELECTRON MICROSCOPE WITH FIELD EMISSION GUN (FEG-HRTEM) AND STEM EDS"

NOTE: The Bids must be submitted in the Central Public Procurement Portal (URL: <https://etenders.gov.in/eprocure/app>) only. Manual/Offline bids shall not be accepted under any circumstances. Bidders should quote in INR only.

CONSEQUENT TO THE PRE-BID MEETING HELD ON 18/11/2024, THE REVISED SPECIFICATION IS GIVEN BELOW:-

Technical Specifications:-

Sl. No.	Features	Specifications
1.	Accelerating Voltage	Selectable range: 80kV or lower to 200 kV or higher
2.	Electron Source / Gun	Cold Field-Emission Gun (CFEG)
3.	Vacuum System	Oil free/dry Ion Getter Pumps/Sputter Ion pumps for creating ultra-high vacuum in the HRTEM system with high vacuum pumps and backing pumps. CFEG Gun vacuum: $< 10^{-6}$ Pa Column Vacuum: $< 10^{-5}$ Pa
4.	Operation Modes	HRTEM, TEM, BF, DF, HAADF, Diffraction, CBED, NBD, SAED, STEM, EDS. Fully digital microprocessor controlled TEM.
5.	Image Resolution	HRTEM image resolution: <ul style="list-style-type: none">• ≤ 0.25 nm (point resolution),• ≤ 0.12 nm (lattice / line resolution) STEM-HAADF Image resolution: ≤ 0.16 nm
6.	TEM Magnification	500x to 1,000,000x or, wider range (variable in steps)


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7.	Apertures of different selectable sizes	<ul style="list-style-type: none"> • Condenser apertures of at least 4 different selectable sizes including those suitable for CBED, micro- and nano-diffraction • Objective apertures of at least 4 different selectable sizes for high-contrast BF and HREM images • Diffraction apertures of at least 4 different selectable sizes
8.	Image recording / Camera system	<p>i) Bottom mounted retractable High resolution CMOS camera of at least 16 megapixel (4K x 4K) with detector active area of at least 36mm x 36mm, or larger with Live Drift correction with at least 20 frames per second (fps) at 4k x 4k full-CCD readout and capable of recording both image and diffraction pattern.</p> <p>ii) Digital imaging system usable over the entire voltage range (80KV to 200kV or higher)</p> <p>iii) Automated tomography data collection and analysis for TEM, STEM and EDS.</p>
9.	STEM Magnification	Up to 1,500,000x or, more (variable in steps)
10.	STEM imaging detectors	<p>i) High-Angle Annular Dark-Field (HAADF)</p> <p>ii) Bright-Field (BF)</p> <p>iii) Dark-Field (DF)</p>
11.	Goniometer Specimen Stage	<ul style="list-style-type: none"> • Side-entry eucentric specimen stage with liquid-Nitrogen cooled anti-contamination device • Piezo-driven / motorized goniometer specimen stage • Specimen stage movement range : -1mm to +1mm (or, wider range) along both the X- & Y- axes, and -0.2mm to + 0.2m (or, wider range) along Z axis. Goniometer specimen tilt-angle range: -70° to +70° or more
12.	EDS Spectrometer	<ul style="list-style-type: none"> • Liquid N₂-free window-less Silicon Drift Detector (SDD). • The detector active area should be at least 100 mm² or larger • Spectrum Resolution <130 eV at Mn-Kα. • Acquisition and analysis software with the following features: <ul style="list-style-type: none"> ○ Quantitative elemental composition through EDS point analysis ○ Quantitative colour mapping of area, line-scan profile of elements ○ Drift correction for prolonged acquisition of map and line-scan
13.	Specimen Holders	<ul style="list-style-type: none"> • Two (02) numbers of low-background double-tilt specimen holders with tilt-angle ('γ-tilt' or, 'β-tilt) range: -30° to +30° or, more and compatible with EDS analysis • One (01) number of tomography holder, EDS compatible along with complete data-collection, image reconstruction and analysis software.


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14.	<i>System Control</i>	i. Windows-based complete software (licensed) package for TEM control, data acquisition for HRTEM, STEM and Tomography analysis and display PC Control System: electron-optical system, evacuation system, electron gun, goniometer stage, etc.
15.	<i>Computer hardware and software</i>	<ul style="list-style-type: none"> • Branded (HP/IBM/DELL or, equivalent) PC /server with the latest hardware and software Configuration. • RAM: 64 GB; • SDD 8.0 TB of minimum storage capacity • Suitable Server/computer for EDS spectroscopy and analysis • All softwares used for operation of the instrument, acquire and process the data should be based on 64-bit Windows platform or, compatible. • 24" (or larger) display monitor. • 2 nos. of Separate PC similar to the above configuration for image, diffraction pattern and EDX data analysis • All control, data acquisition, analysis and diagnostics software must be loaded and tested on the computer. • 3D image data collection, reconstruction and analysis software coupled with EDS must be provided for tomography • Printer: 1 no. Laser Color Printer • Two off-line Licences for 3D data reconstruction for tomography. • Software should be capable of image processing, EDX analysis, electron based imaging and analysis of SAED with two off-line licenses of lifetime validity with provision for future up-gradation. • Diffraction simulation and analysis software with two off-line licenses of lifetime validity with provision for future up-gradation
16.	EMI Shielding	The complete system, including accessories and control units, must be properly shielded from EMI interference.
17.	Oil-free Silent Air Compressor	The compressor, which is used for operating the pneumatic valves, should be noise-free and oil-free
18.	Water Recirculating Chiller	The water chiller for circulating cold water should be able to maintain the desired water temperature within $\pm 0.5^{\circ}\text{C}$ /hr or less on full load.
19.	Uninterrupted Power Supply (UPS): 2 Nos.	<ul style="list-style-type: none"> • 1no. Branded online UPS systems (3phase-Input, 1phase-Output) of adequate rating to support the HRTEM and all its accessories and supporting systems, with batteries of reputed brand with One Hour back-up. • 1no. Branded online UPS systems (3phase-Input, 1phase-Output) of adequate rating for supporting the Chillers and Compressor for at least One Hour back-up.


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20.	Power Supply available at purchaser's site	<ul style="list-style-type: none"> • 3phase, 50Hz, 400V \pm8% • 1phase, 50Hz • All power supplies must comply with Indian standard i.e. 230-250 volts, 50 Hz.
21.	Gas system	<ol style="list-style-type: none"> 1. Must include SF₆ gas Cylinder and regulator with pipeline and manifold 2. Must include Regulator for N₂ gas cylinder with pipeline and manifold
22.	Consumables	<ul style="list-style-type: none"> • Standard Copper Grids, Center-Marked, 300 mesh, 3.0mm O.D with Carbon film support.: 500 Nos. • Standard Copper Grids, Center-Marked, 300 mesh, 3.0mm O.D. with Ultra-thin Carbon film support: 500 Nos • 5-post FIB M-Grids: 200 Nos. • Vacuum tweezer – 1 no. and titanium tweezers: 5 Nos. • Calibration Standards for Magnification, Rotation and Camera Length are to be supplied along with TEM
23.	Spare-parts Kit	<ul style="list-style-type: none"> • All essential Spares required for maintaining the equipment for three years after warranty must be supplied along with the main equipment. List of all essential spares must be included in the technical bid.
24.	Resolution and Magnification calibration Standard Sample	<p>The following TEM sample calibration standard should be given:</p> <ol style="list-style-type: none"> a) Nanocrystalline gold standard grating replica sample for TEM Resolution and magnification calibration b) STEM resolution standard
25.	Warranty	<ul style="list-style-type: none"> ➤ One-year standard comprehensive replacement warranty including all parts and accessories ➤ Three years extended comprehensive replacement warranty including all parts and accessories (after one-year standard Company warranty)
26.	Date of Manufacture	<ul style="list-style-type: none"> ➤ The date of manufacture of the equipment and accessories should be after the placement of Purchase Order.
27.	AMC Requirement	<ul style="list-style-type: none"> ➤ The total AMC Charges for 3-years period after completion of the Four-year extended warranty must be quoted.
28.	Utilities and installation Environment	<ul style="list-style-type: none"> ➤ Pre-installation requirements such as room size, tolerable limits of EM field and vibration (mechanical), required power-rating, utility requirements are to be stated clearly, and to be verified / surveyed by the supplier at the installation site. ➤ Environmental requirements such as temperature, humidity etc., for smooth operation of the FEG-HRTEM-EDS system should be clearly provided.


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29.	Installation, commissioning & Demonstration	<ul style="list-style-type: none"> ➤ Installation, complete interfacing of the system with its sub-systems, and commissioning to be carried out by the vendor's factory trained engineers, followed by a demonstration of the system's performance fully in accordance with the specifications and equipment capabilities.
30.	Acceptance and Performance Criteria	<ul style="list-style-type: none"> ➤ Demonstration of resolution values of HRTEM and STEM-HAADF images with standard sample ➤ Demonstration of EDS resolution
31.	Training	<ul style="list-style-type: none"> ➤ Comprehensive training by experienced and qualified engineers on the operation, basic maintenance of the system (for both the hardware and software) and trouble-shooting must be provided on-site for 3-4 persons at CSIR-CGCRI.
32.	Documents to be submitted in the Technical Bid	<ul style="list-style-type: none"> ➤ Written Certificate from the Principals must be provided guarantying at least 10 years of service, support and availability of spare parts including TEM hardware and accessories from the date of Installation & commissioning. ➤ The supplier must submit technical brochures and proper application notes adequately explaining and confirming the availability of the features in the <u>offered</u> model of the equipment. All necessary Technical documents for supporting specifications given in the offer must be included in the Technical Bid. ➤ The supplier must submit the detailed Technical bid along with compliance statement in tabular form indicating the compliance of the technical specification of the bid against each technical specification provided in the tender. ➤ Additional features offered which are better than the indented specification must be clearly mentioned.
33.	User List & After Sales Service	<ul style="list-style-type: none"> ➤ The supplier must submit a comprehensive list of users of similar instruments in India for the last five years along with contact details.
34.	Vibration proof structure	The FEG-HRTEM equipment should have vibration proof structure.

The dates for submission of bids and other relevant dates has been revised and may be read as follows instead of the existing:

Last date and time of submission of Bid /Quotation in CPP Portal (Bid Submission closing date)	02.01.2025 up to 03:30 PM (IST)
Bid Opening Date	03.01.2025 at 03.30PM (IST) onwards

The above amendments shall amount to amendments of the relevant terms of our Bid Document for CGCRI Tender No. **P/NC/06/SB/DB/GTE/24-25/RE** dated **07/11/2024**.

All other Tender terms and conditions remain unchanged.


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 Stores & Purchase Officer

भण्डार एवं क्रय अधिकारी/Stores & Purchase Officer
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