Sophisticated Test and Instrumentation Centre (STIC)

Cochin University of Science and Technology (CUSAT) Campus

Cochin 682022, Kerala.

Field Emission Scanning Electron Microscope (FE-SEM) + EDS,STEM and its Accessories

SR NO	DESCRIPTION	DETAILED SPECIFICATION
1	Resolution in High vacuum mode	- 0.7nm or better @ 15-20kV. - 1.3nm or better @ 1kV. - All the above claimed resolution should be supported by OEM website or OEM catalogue. - High resolution at lower kV should be achieved with or without beam deceleration or any other functions.
2	Accelerating Voltage	It should be variable from 10V – 30kV or higher.
3	Probe Current	In adjustable range from 1pA to 300nA or higher.
4	Magnification	Magnification should be 10,00,000X or higher.
5	Electron Gun	- Schottky type Field Emission Gun with five years standard warranty. - There should be a necessary protection mechanism to protect the Schottky type field emission gun during the long time power failure conditions. - FE Gun should be replaced free of cost within in five years warranty period if it get failed whatever the reasons.
6	Electron Optics	High Resolution imaging should be possible at lower kV with beam deceleration or any other function.
		High resolution imaging of magnetic materials should be possible.
		The final objective lens must be combination of Electrostatic/ magnetic lens or compound lens or Hybrid lens. There should not be any sample restriction from conductive sample to non conductive sample. It should be easily possible with any type of magnetic samples as well.
7	User Interface	Keyboard, Mouse, Touch screen monitor, Control Panel with multifunctions for the control and adjustment of frequently used FESEM parameters.
8	Specimen Stage and Chamber	It should be 5 axis motorized fully Eucentric stage with all motorized stage movements. - X= 100mm or higher -Fully motorized. - Y= 100mm or higher -Fully motorized. - Z=50 mm or higher -Fully motorized. - Rotation: 360° – Fully motorized. - Tilt: -3° or less to +70° or higher – fully motorized. - Specimen chamber should be capable to accommodate larger size upto 200mm diameter and 50mm Height. - Specimen chabmber should be capable to upgrade all future possible detectors like STEM, EBSD, WDS, CL, Etc., - Atleast 6 or more ports shoudle be available for future expansion. - Specimen chamber viewing camera should be included.
9	Specimen Exchange & Vacuum System	- Specimen exchange should be possible through Airlock/loadlock mechanism for easy and faster sample exchange.

		- Suitable vacuum systems having Ion Getter Pump/ Sputter Ion Pump/Turbo molecular Pump/Rotary Pump/Dry Scroll Pump should be provided.
10	Sample Holder	Multisampling specimen holder with 7 position or more should be provided.
		Suitable Specimen stubs to be provided – 50 Numbers
		Carbon Tape – 2 Nos should be supplied.
11	Auto Functions	All auto functions like Gun alignment, Focus, Stigmation, Brightness, Contrast, Wobble and Beam alignment should be automatic.
12	Five Imaging Detectors should be offered	1. Dedicated chamber mounted SE Everhart Thornley Detector.
		2. Dedicated retractable type Back scattered electron detector.
		3. Dedicated inlens type/ through the lens type SE detector for HR imaging.
		4. Dedicated In lens type / through the lens type BSE detector for HR imaging.
		5. STEM Detector should be included for bright field and Dark field imaging.
13	One analysis Detector - EDS Detector	5. EDS system should be state of art system. - The offered EDS detector should be LN2 free type. - The offered EDS sensor should be Silicon Drift Detector type - Detector element area should be minimum 30mm2 or higher. - Capable of quantifying elements ranging from Berrilyum to Uranium. - Energy resolution should be < 129eV or better. - The offered EDS software should have capable of Live spectrum, Live imaging.
14	Computer/ workstation for Microscope	Compatible computers with latest configuration, keyboard, mouse, monitor, latest Windows licensed Operating system preferably Windows 11.
		23-inch monitor square type, bezel less or better size should be included, One separately for EDS
		Image Size:5120 X3840 pixel or better
		Image depth: up to 16 bits or better.
		Image format: BMP, TIFF, JPEG,JPEG2000, GIF, PNG etc.
15	Spares and Consumables	Essential required spares and consumables for trouble free operation of the instrument should be supplied along with instrument. Eg.Stubs, and Carbon tape.
16	Power Supply	Over all Power requirement of the instrument should be provided. (Including Peripherals like chiller and air compressor).
		Instrument should be compatible with Indian power standard conditions i.e, Single phase (230V) / Three phase (415V)@50Hz
		Power supply connectors of the Instrument should be compatible with Indian standards.
17	Installation	After installation and commission, 1-week training has to be provided on the operation, Maintenance and application of the instrument at our site.
18	Training	Should be provided separately by the competent factory trained Engineer.
19	Essential Maintenance Tools	One set of essential Maintenance tools must be supplied along with an instrument for regular operations and Preventive Maintenance work.
20	Water chiller	Operating voltage- Single Phase 230VAC, 50Hz.
		Ambient Temperature- At least 32ºC
		Acoustic Noise level- Less than 65dBA @1m
		Protection- Over Temperature & Low water level.
		Note :- Water chiller should be compatible with supplied instrument and should be capable of working regular and continuous operation i.e. 24 x 7 operation.
21	Air compressor (Optional)	Acoustic Noise level: : Less than 65dBA.
		Ambient Temperature: At least 35ºC
		Operating Voltage- Single Phase 230VAC, 50Hz
		Size- W400mm X D400mm x H750mm
		Protections- High Pressure and Low Pressure trip

		Note: - Air compressor should be compatible with supplied instrument and should be capable of working regular and continuous operation i.e. 24 x 7 operation
22	Other Installaion accessories	- 12kVA UPS with atleast 30min battery back up should be supplied. - Regular N2 cylider with all necessary regulator – 1Nos should be included.
23	Site Inspection	Bidders must conduct site survey after placement of PO at no additional cost and all operation and installation related requirements should also be submitted.
24	Onsite Warranty	Three-years comprehensive on site warranty should be provided for all tendered item and Five years FEGUN warranty should be included.
SAMPLE PREPERATION EQUIPMENTS.		
25	Gold Coater	A fully automated Gold coater with necessary vacuum pump should be included.
		Target type - Au target diameter 57mm and 0.1mm thickness
		Additional Target – 2 Nos should be included.
		Power requirement- Single Phase 230VAC, 50Hz.
		Should accommodate seven samples. No tilt/rotation required.
		Timer- With 15 sec resolution up to 180 sec or better.
		Sputter current- Variable from 10mA,20mA,30mA,40 mA or better.
		Working pressure- 20 Pascal or less.

Director

STIC