INDIAN INSTITUTE OF TECHNOLOGY BOMBAY

MATERIALS MANAGEMENT DIVISION

Powai, Mumbai 400076.

Item Description: Custom photonic chip characterization setup spectrometer

PR NO: 1000049423 **RFX NO: 6100002320**

Sr. No	Item description	Technical compliance (YES/NO)	Additional information (if any)
A	**Scope & Intent:** Supply, installation, and commissioning of a high-performance imaging spectrograph and scanning monochromator system with accessories, gratings, EMCCD detector, and acquisition/calibration software. The specification defines capabilities that represent the state-of-the-art in precision spectroscopy. **Mandatory Compliance Statement:** Bidders must provide a point-by-point compliance matrix (Compliant/Not Compliant) with verifiable datasheet/user manual references for each line item.		
B	**Imaging Spectrograph / Scanning Monochromator Core**		
i	Focal length: 500 mm (or more) class with dual entrance ports and dual exit ports supporting operation as both spectrograph and monochromator.		
ii	Optical paths: Simultaneous 90° and 180° optical path configuration with motorized computer-controlled exit-port mirror.		
iii	Integrated grating drive: Auto-initialization drive that identifies turret and installed gratings and performs automatic optical alignment on startup, enhancing accuracy and repeatability.		
iv	Spectral resolution between 0.07 to 0.05nm or lower is desired from the spectrometer		
v	Calibration ecosystem: software and hardware for wavelength & intensity		

	calibration by the user throughout the sensitivity band of EMCCD from 200nm to 1100nm, including Raman calibration.		
vi	Entrance/exit configuration: Dual independent entrance ports (two separate entrance slits/ports) to allow two input channels or flexible coupling.		
vii	At least one side exit slit and one end-array detector port with direct mechanical and optical coupling for array detectors.		
viii	Motorized computer-controlled exit-port selection via flippable mirror allowing 100% of light going either to the EMCCD (180 degrees) or to exit port 2 (90 degrees).		
ix	The entrance & exit slits must be available as motorized, software-controllable versions, allowing adjustment from 10 µm to 2.5 mm (or more) via the acquisition/control software		
x	Fiber coupling accessory for one of the two entrance slits.		
xi	Aperture: f/6.5 astigmatism-corrected optics or better.		
xii	Turret: Interchangeable triple-grating turret or better.		
xiii	Grating format compatibility: Must accept 68 × 68 mm		
xiv	Dual focal planes ≥14 × 30 mm each for mounting and operation of two cameras simultaneously with appropriate focusing lens tube for exit port 2 for future coupling to external free space optics or fiber		
C	**Optical & Wavelength Performance**		
i	The spectrometer should be usable from UV to NIR covering entire sensitivity spectrum of EMCCD		
ii	Scan range from UV-NIR which would cover the entire usable range of required gratings		
iii	Minimum wavelength step size: 0.002 nm per step (or lower).		

iv	Wavelength accuracy: ±0.2 nm standard;		
v	Wavelength reproducibility: ±0.05 nm (or better).		
vi	Grating change repeatability: ±0.02 nm (or better).		
vii	Reciprocal linear dispersion: ~in the range of 1nm/mm to 2nm/mm (500 mm class) or better — bidders to provide exact dispersion curves for each supplied grating.		
viii	Spectral resolution: ≤ 0.05 nm		
ix	Optical coatings: Appropriate optical coating on all optics to best match the sensitivity spectrum of EMCCD.		
D	**Gratings (Initial Set)**		
i	Ruled grating, 150 g/mm with ~800 nm blaze wavelength.		
ii	Ruled grating, 600 g/mm with ~500 nm blaze wavelength.		
iii	Ruled grating, 1200 g/mm with ~500 nm blaze wavelength.		
E	**Accessories**		
i	Both entrance slits shutter controllable directly by the acquisition software and camera.		
ii	Fiber optic coupler/adapter with X-Y micrometer control. including interchangeable ferrule, SMA and FC adapters. Appropriate baffles/adapters to be included compatible with spectrograph. Please include compatible multimode fiber with appropriate connector to cover the wavelengths within the entire sensitivity band of the EMCCD		

F	**Detector (EMCCD)**		
i	Back-illuminated EMCCD detector, 1024 × 1024 pixels, 13 µm pitch.		
ii	Fringe suppression technology for minimized etaloning with high sensitivity across UV–NIR.		
iii	Peak quantum efficiency >95%.		
iv	Thermoelectrically cooled permanent-vacuum camera head, with guaranteed cooling up to or lower than -60 deg C. Appropriate cooling accessory should be provided		
v	High-speed readout: ≥30 MHz (or faster), 16-bit ADC (or more).		
vi	Data interface: USB or Gigabit Ethernet (GigE).		
G	**Acquisition & Control Software**		
i	Single software platform must provide native control of both spectrograph and detector. The software license should have lifetime validity and with free updates.		
ii	Software should be able to perform basic mathematical operations.		
iii	Native scripting interfaces or SDK for MATLAB, Python, and LabVIEW with example codes included.		
iv	Wavelength & intensity calibration routines must be provided.		
v	Support for multiple export formats: TIFF, FITS, ASCII, AVI.		
H	**Mechanical & Compliance**		
i	Computer interface for spectrograph control: USB 2.0 or higher.		
ii	System must be CE certified (EN 55022, EN 61326-1 or equivalent to Indian Standard/Certification).		
I	**Deliverables, Services & Warranty**		
i	Supply, installation, commissioning, and user training at customer site.		

ii	Factory test reports of the supplied equipment and on-site demonstration to reproduce the aforementioned test results of performance		
iii	User manuals for spectrograph, detector, and software to be provided in USB drive		
iv	Warranty: 1 year comprehensive OEM warranty including software updates.		
v	Mandatory compliance: Bidders should provide a point-by-point compliance matrix with suitable justification in case of any mismatch or nearest specification offered.		