

To Whom It May Concern

# Global Tender Notification to supply UV-VIS NIR Spectrophotometer MNCF, CeNSE, IISc Bangalore

(Last date of submission of tenders: 19<sup>th</sup> September 2022)

This is an RFQ (Request for Quote) for procurement of a UV-VIS NIR Spectrophotometers as part of a global tender for the Centre for Nano Science and Engineering (CeNSE) at IISc, Bangalore.

CeNSE is a multidisciplinary research department at IISc that houses a 14,000 sq. ft. cleanroom and 5000 Sq. ft characterization facility used by more than 100 faculty members from various disciplines at IISc. CeNSE also runs a program called Indian Nanoelectronics Users Program (INUP) which has allowed 4200 participants from more than 700 universities and institutes all over India to use the facilities at CeNSE. Consequently, any tool in CeNSE receives significant exposure to scientific community at IISc and beyond. The vendors are requested to factor in the value of this exposure in to their quotes. Details of existing facilities and INUP program can be found from:

<http://www.mnfc.cense.iisc.ac.in/>

<http://nnfc.cense.iisc.ac.in/>

<https://www.inup.cense.iisc.ac.in/>

Also, CeNSE hosts equipment on behalf of vendors, as a national standard or 'model' system. If the vendor is interested, CeNSE can consider working out a similar arrangement for the UV-Vis NIR Spectrophotometer system.

Bids should be submitted in two separate sealed envelopes –one containing the "Technical bid" and other containing the "Commercial bid", both of which should be duly signed and must reach the undersigned on or before 17:00 hours 19<sup>th</sup> September 2022. C.I.P. Bangalore basis (by Air Freight only).

**The bids should be addressed to:**

The Chairperson,

Centre for Nano Science and Engineering

Indian Institute of Science

Bangalore – 560012, India

With attention to: Dr. Suresha S J

Please enclose a compliance statement along with the technical bid.

# 1 Procedure

1. The decision of purchase committee will be final.
2. Each bid should be submitted in two separate sealed envelopes –one containing the "Technical bid" and other containing the "Commercial bid".
3. We are seeking bids for the UV-VIS NIR Spectrophotometer with specific wavelength range (See Technical Details for Description).
4. If multiple systems can fulfil the requirements, vendors can submit multiple bids.
5. Vendors must submit a complete bid which includes both the technical and commercial bid with supporting documents.
6. Incomplete bids will be summarily rejected.
7. Only vendors who meet the technical requirement will be considered for the commercial negotiation.
8. The technical proposal should contain a compliance table with 5 columns. The first column must list the technical requirements, in the order that they are given in the technical configuration below. The second column should describe your compliance in a "Yes" or "No" response. If "No" the third column should provide the extent of the deviation (please provide quantitative responses). The fourth column should state the reasons for the deviation, if any. The fourth column can be used to compare your tool with that of your competitors or provide details as requested in the technical requirements table below.
9. Any additional capabilities or technical details, that you would like to bring to the attention of the purchase committee, can be listed at the end of the technical table.
10. Vendors are encouraged to highlight the advantages of their tools over comparable tools from the competitors
11. In the commercial bid, please provide itemized cost of the system and required accessories, such as software, power supply, etc.
12. As an option, please provide itemized cost for any suggested accessories/add-ons that may enhance the usability, capability, accuracy or reliability of the tool. Vendors are encouraged to quote for as many add-ons as their tool portfolio permits.
13. Commercial bids must be valid for 120 days.
14. Commercial bids should indicate the terms and conditions of delivery, delivery schedule, entry tax, payment terms, warranty coverage, etc.
15. The technical and price bids should each be placed in separate sealed covers, superscribing the tender no. and the due date on both the envelopes. Both these sealed covers are to be placed in a bigger cover, which should also be sealed and duly superscripted with the Tender No, Tender Description & Due Date.
16. The SEALED COVER superscribing tender number / due date & should reach CeNSE Main Office, GF-15, Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India on or before the due date mentioned in the tender notice. If the due date happens to be a holiday, the tender will be accepted and opened on the next working day. If the quotation cover is not sealed, it will be rejected.
17. The Bidder's firm should have existed for a minimum of 5 years. (Enclosed Company Registration Certificate)
18. The Bidder should have qualified technical service personnel for the instrument(s) based in India.
19. If the Bidder is a local distributor/dealer/Agent, attaching an authorization certificate with the technical bid from the original equipment manufacturer is mandatory.

20. The bidder should sign and submit the declaration for Acceptance of Terms and Conditions as per -Annexure 1.
21. The Bidder must not be blacklisted/banned/suspended or have a record of any service-related dispute with any organization in India or elsewhere. A declaration to this effect has to be given as per Annexure 2.
22. The Institute reserves the right to accept or reject any bid and to annul the bidding process and reject all bids at any time prior to the award of the contract, without thereby incurring any liability to the affected bidder or bidders or any obligation to inform the affected bidder or bidders.
23. Any questions can be directed to Dr. Suresha S J, GF-12, Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India. ([sureshasj@iisc.ac.in](mailto:sureshasj@iisc.ac.in)).

## 2 Technical Specifications

We invite bid for dual-beam ratio-measuring UV-Vis-NIR spectrophotometer system with wavelength range 175-3300 nm. The technical requirement should be strictly met and supporting documentation and proof must be enclosed along with the Technical Bid.

1. Wavelength range
  - a. 175-2500 nm for direct transmission.
  - b. 175-2500 nm for specular reflectance.
2. Detector:
  - a. A 2 or 3 detector system with low noise and zero stitching error. PMT+PbS or PMT + PbS/InGaAs configuration to cover 175-3300 nm range
3. Light sources:
  - a. Any, as long as the wavelength and noise criteria are met.
4. Beam splitting system:
  - a. Chopper which measures a sample, dark and reference signals per cycle.
5. Wavelength accuracy
  - a. UV-Visible within  $\pm 0.1$  nm
  - b. IR- within  $\pm 0.5$  nm
6. Wavelength reproducibility:
  - a. Std. deviation of peak separation in repetitive scanning  $< 0.05$  nm in UV-Vis
  - b. Std. deviation of peak separation in repetitive scanning  $< 0.1$  nm in NIR
7. Wavelength Resolution:
  - a. 0.05 nm in UV-vis, or better
  - b. 0.2 nm in NIR range or better
8. Photometric range:
  - a. 8 Abs for UV- visible
  - b. 8 Abs for NIR till 2500 nm
  - c. 6 Abs for NIR beyond 2500 nm
9. Photometric accuracy: Using Filter. Any wavelength in the range.
  - a. UV-Vis and NIR 1 A  $< 0.003$  Abs
10. Photometric linearity: Tested using 2 nm slit and  $< 1$  second integration time. Any wavelength in the range.
  - a. UV-Vis at 2 A  $< 0.0200$  A
  - b. NIR at 2 A  $< 0.0010$  A
11. Photometric noise: Tested at  $< 1$  second integration time. Any wavelength in the range
  - a. 4A UV-Vis  $< 0.0010$  A

- b. 3A NIR <0.0001 A
- 12. Baseline flatness: Measured over the working range of 200 nm to 3000 nm. Measured with 2 nm slit and 2 second integration time. No smoothing.
  - a. < 0.0010 A
  - b. Stitching error should be absent/effectively nullified when detectors and/or filter changes happen. Especially at ~800 nm.
- 13. Stray light: in % Transmittance
  - a. 0.00007 or better (At 220 nm, NaI ASTM method)
  - b. 0.0004 or better (At 1420 nm, H<sub>2</sub>O, 1 cm pathlength)

## 2.1 Operational Specifications

1. Spectral Bandwidth:
  - a. UV-Vis: 0.05–5.00 nm in 0.05 nm increments
  - b. IR: 0.4–20 nm in 0.05 nm increments
2. Signal averaging: in seconds
  - a. .05 – 60
3. Scan rate: in nm/min
  - a. Up to 2000 nm/min
  - b. Must have ability for averaging by repetitive scanning up to 100 times.
4. Instrument operation:
  - a. 10 to 30 °C, 50 to 80% relative humidity, non-condensing.
  - b. 240 VAC at 50Hz
5. Life of optics:
  - a. The system must have ruggedized optics that will not degrade in the 10 years of “normal” use. Normal usage is ~ 20 hours/week
  - b. Please highlight strategies to achieve the ruggedization, like protective coatings or ozone abatement.
6. Nitrogen purging:
  - a. We need a system with can be purged with N<sub>2</sub> for both optics and sample compartment.
  - b. The purging loops for optics and sample compartment must be separate.
  - c. The purging must only be needed during active use. No purging should be required in standby or power-off mode.
7. Digital I/O:
  - a. Must communicate with external computer through USB or ethernet.
  - b. The control software must be fully functional for automated measurement and digitization of data.
8. Control software should be compatible with a standard Windows desktop. We will not accept a customized computer that must be purchased from OEM.
  - a. Software must run on Windows 10 or 11.
  - b. OEM must provide a copy of the software for posterity
  - c. OEM must assure forward compatibility. Control software must run on an a “supported” version of Windows for the next 10 years. If this requires updates, then those must be free.
9. Sample size:
  - a. 10 mm to 25 mm diameter
  - b. The primary issue with measuring small samples, without degradation in SNR, is control on the illuminated spot-size. The system must be designed in a way that apertures can

inserted in the optical path, so that the spot-size is reduced. If this requires a mandatory accessory (not including the apertures themselves), please include it in the cost.

- c. As optional items, include a set of apertures needed to measure small samples
10. Form-factor:
- a. Seeking a table-top system
  - b. Volume < 0.4 m<sup>3</sup>
  - c. Weight < 120 kg

## 2.2 Other Requirements

1. Training: The quote should include cost of installation, acceptance tests, demonstrating performance, and operational training of 5 people.
2. Documentation: Complete product manual must be provided that covers the operation, basic troubleshooting, calibration procedure, and maintenance.
3. Warranty: Please indicate the warranty provided with the tool.
  - a. Warranty of 1 year is mandatory. Warranty of 3 years or more is preferred.
  - b. If the warranty is less than 3 years, then please provide the itemized cost for required spares for 3 years of operation from the point of sale. For sake of this calculation, the vendor may assume active tool usage of 20 hours/ week. This number will be used to estimate the life cycle cost of the tool and compare quotes if warranty length is different.
4. Periodic maintenance
  - a. Clarify if periodic (preventive) maintenance be done by a trained IISc engineer or requires a specialist from the OEM.
  - b. If the maintenance can be done by a trained IISc engineer, then mention the cost, tenure, and venue of this training.
  - c. If maintenance requires OEM specialist, then as an option, provide cost of an annual maintenance contract (AMC) for total operation of 3 years. The AMC must cover 1 scheduled and 1 emergency visit per year. The AMC cost must also include an itemized list of spares that are essential for the scheduled visits.
5. References: The RFQ must include references of 3 previous installations, in a centralized characterization facility of similar size or bigger, preferable in India. Please provide the names and contact addresses of the referees, so that the committee can contact them independently.

## 3.4 Preferred Accessories

These must be listed as optional items in the commercial bid.

1. Powder cell holder
2. Cuvette holder
3. Low-cost Integration sphere
  - a. Dual-beam mode with reference
  - b. Wavelength: 250-2500 nm
  - c. Support reflectance with specular included, reflectance with specular excluded, and transmission measurement
  - d. Provide separate cost for multiple versions
  - e. Sample size: 5 mm to 25 mm diameter
4. High-performance Integration sphere
  - a. Dual-beam mode with reference
  - b. Wavelength: 200-2500 nm.

- c. Support reflectance with specular included, reflectance with specular excluded, and transmission measurement
  - d. With baffle
  - e. Provide separate cost for multiple versions
  - f. 5 mm to 25 mm diameter
- 5. Set of beam apertures
- 6. General-purpose optical breadboard (GPOB) for customized beam handling
- 7. GPOB that supports an external detector.
- 8. Polarizer and depolarizer
- 9. Holder for mounting samples as small as 5 mm diameter.
- 10. Any other specialized accessory that provides advanced information for solid samples and films.
- 11. Calibration standard for
  - a. Wavelength accuracy for Vis and NIR
  - b. Photometric accuracy
  - c. Wavelength resolution for Vis and NIR
  - d. Stray light for Vis and NIR
  - e. Diffused reflectance
  - f. Diffused transmission

### 3 Acceptance tests

The system performance will be verified with standard test/reference samples. The specification must be successfully demonstrated at our site.

1. Wavelength accuracy and repeatability of the instrument should be performed by NIST traceable standards and by measuring the emission from a mercury lamp and deuterium lamp
2. Photometric accuracy of the instrument should be performed by NIST traceable standards
3. Photometric Noise should be performed by NIST traceable standards
4. Stray light of the instrument needs to be measured and should come within the limits of the instrument specification
5. Baseline flatness of the instrument has to be demonstrated
6. Absorbance zero stability needs to be demonstrated
7. Demonstrate the step/stair values which occur during detectors changeover, source changeover and source changeover are within the limits of the instrument specification. Preferably 0.1T% in the UV VIS region
8. Reflectance data accuracy should be demonstrated using the NIST traceable standards
9. NIR region wavelength accuracy test needs to be performed by NIST traceable standards and by measuring the emission from a mercury lamp and deuterium lamp
10. Spectral bandwidth accuracy demonstration

## 4 Technical Bid

The technical bid should furnish all requirements of the tender along with all annexures in this section and submitted to

The Chairperson,

**Attn:** Dr. Suresha S J

Centre for Nano Science and Engineering

Indian Institute of Science

Bangalore – 560012, India

## 5 Commercial Bid

The commercial bid should be furnished with all requirements of the tender with supporting documents as mentioned under:

S.No	Description	Cat. Number	Quantity	Unit Price	Sub total
1.	Essential items noted in the technical specification				
1.a	... (details of essential items)				
1.b	...				
2.	Optional items noted in the technical specification				
2.a	... (details of optional items)				
2.b	...				
3.	Accessories for operation and installation				
4.	All Consumables, spares and software to be supplied locally				
5.	Warranty (3 years)				
6.	AMC 2 years beyond warranty				
7.	Cost of Insurance and Airfreight				
8.	CIP/CIF IISc, Bengaluru				

Any additional items

S.No	Description	Cat. Number	Quantity	Unit Price	Sub total

Addressed to

The Chairperson,

Attn: **Dr. Suresha** SJ

Centre for Nano Science and Engineering

Indian Institute of Science

Bangalore – 560012, India



## Annexure – 1:

Declaration for acceptance of terms and conditions

To,

The Chairperson,

Centre for Nano Science and Engineering

Indian Institute of Science,

Bangalore – 560012, India

Ref: Tender No: XXXXXX

Dated: XXXX

Supply and installation of UV-VIS NIR at MNCF, CeNSE, IISc Bangalore

Sir,

I've carefully gone through the Terms & Conditions as mentioned in the above referred tender document. I declare that all the provisions of this tender document are acceptable to my company. I further certify that I'm an authorized signatory of my company and am, therefore, competent to make this declaration.

Yours faithfully,

(Signature of the Bidder)

Name

Designation, Seal

Date:

## Annexure – 2:

Details of items quoted:

14. Company Name
15. Product Name
16. Part / Catalogue number
17. Product description / main features
18. Detailed technical specifications
19. Remarks

Instructions to bidders:

Bidder should provide technical specifications of the quoted product/s in detail.

Bidder should attach product brochures along with technical bid.

Bidders should clearly indicate compliance or non-compliance of the technical specifications provided in the tender document.

## 8 Checklist

**(This should be enclosed with technical bid- Part A)**

**The following items must be checked before the Bid is submitted:**

### 1. Separate Sealed Envelope “A” : Technical Bid

**Section 2 and Section 3- Technical Bid (each page signed by the authorized signatory and sealed) with the annexures below:**

- a. **Annexure 1: Declaration for acceptance of terms and conditions**
- b. **Annexure 2: Details of items quoted**

**Copy of this tender document duly signed by the authorized signatory on every page and sealed.**

### 2. Separate Sealed Envelope “B”: Commercial Bid

#### **Section 5: Commercial Bid**

Your Bids should be submitted in two separate sealed envelopes –one containing the "Technical bid" (**Envelope A**) and other containing the "Commercial bid" (**Envelope B**), super scribing on both the envelopes with Tender No. and due date and both of these in sealed covers and put in a bigger cover which should also be sealed and duly super scribed with Tender No., Tender description & Due Date

The SEALED COVERS should be duly signed and must reach CeNSE Main Office, GF-15, Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India on or before the due date mentioned in the tender notice.