

**Notice Inviting Open Tender for Procurement of FT-IR spectrophotometer at the Indian Institute of Science, Bangalore**

(Last date of Submission 12<sup>th</sup> August 2022)

Date: 20<sup>th</sup> July 2022

Dear Sir/Madam:

Please send your tender documents valid for 90 days from the actual date of opening the technical bid, for the supply of equipment described below. Your documents/quotation should clearly indicate the terms and conditions of the quotations, delivery schedule, entry tax, payment terms, warranty coverage etc. The tender 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 12<sup>th</sup> August 2022.

The Chairman  
Civil Engineering Department  
Indian Institute of Science,  
Bangalore 560012,  
Karnataka, India.  
Attn: D Nagesh Kumar

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## **SECTION 2 – Technical Specifications**

FT-IR (Fourier Transform – InfraRed) spectrophotometer covering the 8000 cm<sup>-1</sup> – 350 cm<sup>-1</sup> Spectral Range for rapid and accurate testing of soil properties in laboratory.

A. Main Instrument Specifications (the specifications stated are minimum required, a better specification is desirable).

<b>SI No</b>	<b>Description</b>	<b>Specification (Minimum)</b>
1	Optics	a) The optical bench should be sealed and desiccated. It should also be purgeable with inert gas. b) An internal attenuator wheel with minimum 4 positions must be available to prevent the saturation of detectors. c) The FT-IR should have at least 2 input beam ports and 3 output beam ports for upgrade.
2	Spectral Range	8000 cm <sup>-1</sup> – 350 cm <sup>-1</sup> The spectral range must be in future optionally expandable to Far IR range till 30 cm <sup>-1</sup> and visible region till 25000 cm <sup>-1</sup>
3	Spectral Resolution	Better than 0.2 cm <sup>-1</sup> under standard measurement conditions
4	Wavenumber Accuracy	Better than 0.005 cm <sup>-1</sup>
5	Photometric Accuracy	Better than 0.1 % in transmission mode
6	Signal to Noise ratio	60,000:1 peak to peak in 60 seconds or better
7	Sources Required	Suitable IR sources of high quality, high performance and longer life should be supplied to cover the 8000 cm <sup>-1</sup> – 350 cm <sup>-1</sup> spectral range. Source must be electronically stabilized for highest precision and long lifetime, air cooled.
8	Detectors	Deuterated TriGlycine Sulphate (DTGS) detector with high sensitivity in the spectral range of 8000 cm <sup>-1</sup> to 350 cm <sup>-1</sup>
9	Beam splitter	KBr beamsplitter
10	Interferometer	Permanently aligned, wear-free and stable interferometer with velocities ranging from 1.6 - 80 kHz for the movable mirror. Interferometer types creating abrasion or dust (graphite or ball bearings) are not acceptable since they will get stuck and/or misalign over time.
11	Measurement modes	Diffuse reflectance measurements. Software controlled repeated scans should be possible. The basic spectrometer should also allow for time resolved measurements with a rate of at least 15 spectra/second at 8 cm <sup>-1</sup> spectral resolution and should have in future possibility to upgrade rapid scan option of 50 spectra/second at 8 cm <sup>-1</sup> .

12	Microplate Reader	<p>Microplate reader for automated IR spectroscopic analysis of large sample numbers of minimum 96 well plate should be provided. Microplate reader should be compatible to the supplied FTIR Spectrometer. Its optical design should allow sample measurements in diffuse reflectance mode utilizing the mid infrared spectral range of <math>8000\text{ cm}^{-1} - 350\text{ cm}^{-1}</math> and in future must be upgradable to transmission mode.</p> <p>The drawer of the IR microplate reader must be motorized. After placing the microplate in the drawer, the plate must be located automatically in the correct measurement position when the drawer moves into the module. The positioning of the well must be software controlled.</p> <p>Dedicated liquid nitrogen cooled mercury cadmium telluride (MCT) detector must be provided for Microplate reader.</p>
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Standard Items accompanying the Main Instrument: Must include basic accessories as:

1. Stainless steel micro spatula
2. Mortar and pestle
3. At least 5 dedicated Aluminium microplates (minimum of 96 no. of wells in a plate) for powder sample measurement.
4. Supporting frame for the well-plates

**B. Interface and software:**

1. The full process of data acquisition, data processing, data evaluation and visualization/documentation must be manageable by a workstation software appropriately interfaced to a PC using Windows Operating system. The software should also provide a range of pre-processing and validation options for multivariate analysis
2. A library of common materials, polymers and solvents must be included.
3. The software controlling the IR-microplate reader must perform the data acquisition, data control, data evaluation and documentation in a fully automated manner.
4. The software shall allow to set the positions for background and sample measurement according to user definition.
5. The software shall provide an option for interactive selection of individual positions and arrays on the microplate.
6. A branded computer with latest hardware configuration, all the required accessories and laser printer should be included.

**C. Electrical connectivity and UPS:** The instrument and all the accessories should be operational based on Indian standard electrical connectivity. Suitable UPS (at least 30 minutes power backup) be given as an optional item with a separate quote.

**D. Purging unit:** A Liquid Nitrogen Cryocan with at least 100L capacity to generate dry nitrogen by evaporation and compatible tubing to connect the spectrometer.

- E. Warranty: The complete system is to be under manufacturer's warranty for a minimum of 2 (two) years from the date of installation including any accessories and parts. Annual Maintenance Contract (AMC) for additional 3 (three) years must be included. (Quote separately).
- F. Upgrade possibility: The Instrument must have at least 2 input beam ports and 3 output beam ports for future upgradation with other accessories like TGA, FT-RAMAN, IR - Microscope, photoluminescence model and step scan option for time resolved spectroscopy down to 6 microseconds or better.
- G. Installation and training: Installation and training should be provided at the customer site. Installation requirement should be intimated in advance.

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### **Section 3–Terms and Conditions:**

1. The tender document should be in English and be submitted in two bid system, i.e., Techno-Commercial Bid and Financial Bid separately in two sealed envelopes with Techno-commercial or Financial bid clearly indicated on the envelope. These two sealed envelopes should be placed in a larger envelope super-scribing “FT-IR spectrophotometer Bid - D Nagesh Kumar, Civil Engineering. Department”.
2. The Techno-Commercial Bid must include all details of technical specifications of the instrument along with commercial terms and conditions masking only the price component. Bill of materials, brochures, technical datasheets, and any other document may be enclosed to help the evaluation of the technical bid. Please also include warranty terms and any other information on upgradation terms/extra accessories in the technical bid.
3. The technical bid must clearly state the specifications of the main instrument (A) along with the accompanying standard items and all other details including the warranty terms (B-G) as specified in section 2 of this document.
4. The Financial Bid must include the base price of the instrument delivered in place and all components including accessories plus any additional GST component.
5. The Financial Bid must indicate detailed component-wise and itemized price breakup and must include optional items/accessories.
6. Bidder should have well established own establishment. Enclose Company Registration Certificate, PAN, 3 years of audited balance sheets and turnover.
7. The vendor should have a good track record of having previously supplied similar equipment in India or elsewhere in the world (Please furnish complete details including names and contact addresses). Reference letters may be sought by the committee to arrive at the decision.
8. The vendor should have qualified technical service personnel for the instrument based in Bengaluru.
9. Bidder should have executed at least three orders of similar instrument in India in the last 2 years. (Please provide copy of purchase orders and details).
10. The bidder should provide a list of national and international publication resulting from the data of the instrument.
11. The Bidder should not be currently blacklisted by any institution, bank in India or abroad (Please provide self-declaration).
12. Mode of Payment: The payment shall be through a Letter of Credit.
13. Agency commission (not encouraged) if any should be clearly mentioned and detailed in the Financial Bid.
14. The lead time for the delivery of the equipment should not be more than two months from the date of receipt of purchase order and must be mentioned in the Techno-Commercial Bid.
15. If the equipment or any parts/accessories are found to be defective during warranty period, they have to be replaced or rectified at the cost of the supplier within 30 days from the date of receipt of written communication from us. If there is any delay in replacement or rectification, the warranty period needs to be extended by a year and/or face a penalty equal to the valuation of the equipment.
16. The Techno-Commercial Bid shall be opened first and evaluated.

17. Bidders meeting the required criteria as stated in Section 2 of these documents as well as the terms and conditions shall only be considered for opening of Financial Bid. Further, agencies not furnishing the documentary evidence as required shall not be considered.
18. Following the opening of Techno-Commercial Bid, a presentation may be sought from the bidder, if found necessary.
19. Mode of Shipment: The equipment must be shipped via air only, insured and transported to the installation site at IISc by the supplier.
20. Customs Clearance: The department will furnish the necessary papers for the import of items into India, necessary custom duty exemption certificate and other supporting documents to facilitate the import of the items.
21. The Engineers of the parent manufacturer or bidding firm must install, demonstrate and provide the training on FT-IR spectrophotometer for two days at IISc, Bangalore without additional cost.
22. The bids should be valid for at least 90 days from the last date of submission of the quotation.
23. The price should be quoted in INR only. The cost should be inclusive of delivery till the CIF Bangalore Airport. Price offer must be on FOR-IISc Bangalore basis. Please note that IISc is a DSIR Recognized Research Institution, applicable rate of GST is required to be quoted separately in accordance with the provisions of Notification No.47/2017 read with Notification No.11/2022 and as applicable to such Institutions for the time being in force.
24. The decision of the Purchase Committee on suitability / meeting the criteria of vendors shall be final.
25. IISc, Bangalore reserves the right to accept or reject any bid and to annul the bidding process and reject all bids at any time period to award of construct without thereby incurring any liability of the affected bidder or bidders.
26. Tender documents that do not satisfy the “Terms and Conditions” listed herein will be disqualified.
27. Governing Laws and Jurisdiction
  - 27.1 This Contract, its meaning and interpretation, and the relation between the Parties shall be governed by the Laws of India for the time being in force.
  - 27.2 In case of any claim, dispute or difference arising in respect of a contract, the cause of action thereof shall be deemed to have arisen in Bangalore and all legal proceedings in respect of any claim, dispute or difference shall be instituted in a competent court in the City of Bangalore only.
- 28 The tender documents should be sent to the following address no later than 17:00 hours 12<sup>th</sup> August 2022.

The Chairman  
Civil Engineering Department  
Indian Institute of Science,  
Bangalore 560012  
Karnataka, India.  
Attn: D Nagesh Kumar