Request for Quote (India based vendors only) for the procurement of FT-IR spectrophotometer with variable angle specular reflectance measurement capability (Last date: 14 May 2021)

This is a Request for Quote (RFQ) from **Class I and Class II local suppliers/ manufacturers** only for the procurement of Fourier Transform Infrared spectrophotometer with variable angle specular reflectance measurement capability, for the Department of Inorganic and Physical Chemistry (IPC) of the Indian Institute of Science, Bengaluru.

Only the **Indian Original Equipment Manufacturer (OEM) or** their distributor shall submit a response demonstrating their capabilities to produce the requested equipment to the primary point of contact listed below. With respect to this tender, the rules laid out by the Government of India in order No. P45021/2/2017-pp-BE-II issued by the Public Procurement Section, Department or Promotion of Industry and Internal Trade, Ministry of Commerce and Industry, dated 4th June 2020 will be followed. The bidders must go through the Government of India order stated above and follow all the rules and regulations therein.

Relevant definitions as per Government of India order:

- **Class-I local supplier** - A supplier or service provider, whose goods, services or works offered for procurement, has local content equal to or more than 50%.
- **Class-II local supplier** - A supplier or service provider, whose goods, services or works offered for procurement, has local content more than 20% but less than 50%.
- **Local content** – The amount of value added in India which shall, unless otherwise prescribed by the Nodal Ministry, be the total value of the item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all custom duties) as a proportion of the total value, in percent.

Procedure:

1. Vendors will be required to submit a technical proposal and a commercial proposal in **two separate sealed envelopes**. The technical bid should contain all commercial terms and conditions, except the price. **Only vendors who meet the technical requirement will be considered for the commercial negotiation**.
2. The covering letter should clearly state that whether the vendor is a Class-I or Class-II local supplier distinguished by their "local content". Failing this the bid will be automatically rejected.
3. The vendor to state the percentage of the local content and provide self-certification that the item offered meets the minimum local content requirement. They should also give details of the location(s) at which the local value addition is made.
4. Sperate detailed justification needs to be given to substantiate the qualification as Class 1 and Class 2 suppliers and the intender reserves the right to cross-check the factual validity of the same and one if some foreign parts or equipment is being put forward then please submit the "*bill of material*" details for the same for evaluation.

5. The technical bid must contain a point-by-point technical compliance document. The technical proposal should contain a compliance table with 5 columns.
    a. First column must list the technical requirements, in the order that they are given in the technical requirements below.
    b. The second column must provide specification of the instrument against the requirement (please provide quantitative responses wherever possible)
    c. The third column should describe the compliance with a "YES" or "NO" only. Ensure that the entries in the column 2 and column 3 are consistent.
    d. The fourth column should clearly state the **reasons/explanations/context** for deviations if any. Without clear explanation, just stating YES" or "NO" will not be considered.
    e. The fifth column may contain additional remarks. It can be used to highlight the technical features, qualify response of previous columns, or provide additional details.
6. Items in addition to that listed in the technical table that the vendor would like to bring to the attention of the committee, such as data sheets, technical plots etc. can be listed at the end of the compliance table. Vendors are also encouraged to highlight the advantage of their tools over comparable tools from the competitors.
7. If multiple systems can fulfil the requirements, vendors can submit multiple bids.
8. The commercial bid must include the price of the item in Indian currency, inclusive of all discounts. All accessories needed for the instrument to function as per the technical specification must be listed. Please provide the itemized quotes for the instrument and any other attachment/accessory.
9. 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.
10. Provide itemized cost for required spares for 3 years of operation. For sake of calculation the vendor may assume the active instrument usage of 35 hours/week. The system will remain powered on continuously. This number will be used to estimate the lifecycle cost of the instrument.
11. The commercial bid should indicate the following separately: (a) equipment price (b) optional items (c) Freight and insurance cost (d) Shipping cost and (e) the Total cost.
12. List of customers and references: The Bidder should have supplied similar equipment in in **Govt. of India funded institutes (IITs, IISc, IISERs and NITs) and central universities**. Please provide the details and contact information.
13. **The quotations should be on FOR-IISc Bangalore basis in INR only. Please quote the price of each optional line item, separately.**

The deadline for submission of the bids is **14 May 2021, 5:30 pm Indian Standard Time.** Proposals should arrive at the office of Dr. Anoop Thomas, Department of Inorganic and Physical Chemistry, Indian Institute of Science, Bengaluru, Karnataka – 560 012, India. Direct all questions concerning the acquisition to addresses to Dr. Anoop Thomas at: athomas@iisc.ac.in

II. General terms and conditions:

1. The decision of the purchase committee will be final. The Institute reserves the right to accept or reject any bid, or to annul the bidding process and reject all bids, at any time prior to the award of contract without thereby incurring any liability of the affected bidder or bidders.

2. The quote must also include references of 5 previous installations of the similar equipment in India. Please provide the names and contact addresses of the referees, so that the committee can contact then independently. Details of such systems with model numbers and users should be provided. The references can be used to disqualify vendors with poor track record of service, build quality, system performance or poor availability of spares.

3. The bidder must also submit another list of 50 customers where similar systems have been installed.

4. 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 should be provided.

5. The vendor should be able to repair and maintain the equipment once it is installed. Clarify if periodic (preventive) maintenance can be done by a trained on-site engineer (i.e. IISc employee) or requires a specialist from the OEM. The bidder should have qualified technical service personnel for the equipment based in India and must assure a response time if <24 hours after receiving a service request.

6. If maintenance must be done by OEM, as an additional option, provide cost of an annual maintenance contract (AMC) for 3 years, post warranty. The AMC must cover one scheduled and one emergency visit per year. The AMC cost must also include an itemized list of spares that are essential for the scheduled visits.

7. All the quotations must be valid for at least 90 days at the time of submission.

8. The quotations should clearly indicate the terms of delivery, delivery schedule, tax, and payment terms.

9. After the award of purchase order, the vendor must provide an Order Acknowledgement within 30 days from the receipt of the Purchase Order.

10. The lead-time for the delivery of the equipment should not be more than 3 months from the date of receipt of our purchase order.

11. 100% payments will be released after the completion of delivery and satisfactory installation subject to TDS as per rules. As per GFR no advance payment can be made to domestic vendors, unless an equal amount of bank guarantee is provided.

12. The bidder is responsible for the installation of the equipment in the IISc campus.

13. Necessary training to operate the procured setup and required literature support (in English language) should be provided without additional cost.

14. Bidders should undertake to support the system with spares and software bugfixes, if any, for the next 5 years.

15. Please indicate the warranty provided with the tool. No travel claims must be made by the vendor for servicing during the guarantee/warranty period.

16. Wherever requested in this specification sheet, data must be supplied along with the technical compliance documents. Technical bids without supporting data will be deemed as technically non-compliant.

17. All guaranteed specifications will have to be demonstrated, upon request, in an active installation. Failure to demonstrate any promised specifications will be deemed as technical non-compliance.

18. Printed literature and published papers in support of all compliance to the prescribed specifications may be provided.

19. Technical evaluation by the institute must include demonstration to verify functionalities and capabilities of the system quoted. Any discrepancy between the promised specifications and demonstrated specifications will be deemed as technical non-compliance. If need arises, the vendor must be ready to physically visit IISc for a techno commercial discussion.

20. The intender reserves the right to withhold the placement of the final order. The right to reject all or any of the quotations and to split up the requirements or relax any or all the above conditions without assigning any reason.

III. Technical requirements for Fourier Transform Infrared (FT-IR) spectrophotometer with variable angle reflectance measurement capability.

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) There should be an additional transmittance channel available allowing for MIR transmittance measurements independent from the spectrometers main sample compartment.

    d) The FT-IR should have at least 2 input beam ports and output beam ports for upgrade.

2. **Spectral range:** 450 cm^{-1} to 7000 cm^{-1} using a single source, single beam splitter and single detector.

    Additional requirements:
    a) The spectrometer should be upgradable to analyze samples in the far-IR (up to 20 cm^{-1}) and NIR (up to 26000 cm^{-1}) region without increasing the footprint of the spectrometer.

    b) The spectrometer should have the option to measure the transmittance in the range from 80 cm^{-1} to 5000 cm^{-1} using single source, single beam splitter and single detector.

3. **Spectral resolution:** Should be better than 0.18 cm^{-1} under standard mid infrared (MIR) measurement conditions using KBr beamsplitter.

4. **Signal to noise ratio:** 50,000:1 peak to peak in 60 seconds and 13000:1 peak to peak in 5 seconds scan or better.

5. **Wavenumber accuracy:** Better than 0.01 cm^{-1} at 1500 cm^{-1}

6. **Photometric accuracy:** Better than 0.1% in transmission mode

7. **Sources required:** (1) Mid-IR and (2) NIR source. The spectrometer should be equipped with slots for placing a far-IR source for extension in future. Source must be electronically stabilized for highest precision and long lifetime, air cooled. Software controlled interchange of sources should be possible.

8. **Detectors:** The following MIR detectors are needed,
    a) Deuterated triglycine sulfate (DTGS) detector with high sensitivity in the spectral range of 450 cm^{-1} to 7000 cm^{-1}.

    b) Broad band mercury cadmium telluride (MCT) detector in the spectral range of 450 cm^{-1} to 7000 cm^{-1}.

    Additional requirements:

c) Extra slots for placing a solid-state silicon Far-IR detector. Software controlled interchange of detectors must be possible.

d) Software controlled interchange of detectors should be possible.

9. **Beamsplitter:**

   a) Broadband KBr with range of 380 to 10000 cm^{-1}.

   b) Glass beamsplitter for alignment.

   Changing the beam splitters should be straight forward and there should be dedicated sections, preferably in the optics bench of the spectrometer to keep the unused beamsplitters.

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:** Transmission, reflection, absorption, and emission. 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^{-1} spectral resolution.

12. **Sample chamber and transmission measurement platform:** Transmission platform must be suitable for using solid pellets and liquid IR cells from *Specac.* It should also have the following features:

    a) The transmission sample holder should be compatible with the demountable and heatable liquid cells and the variable temperature measurement accessory from third party providers such as *Specac* (accessories with part Nos. GS21525, GS20582, GS20592 and GS20730) and *Harrick.*

    b) An additional optical bread board (with metric scale mounting holes) that fits inside the sample compartment.

    c) All the transmission platforms including the optical bread board should be automatically recognized by the instrument upon connection.

13. **Reflectance measurement:** The spectrometer must have a specular reflectance measurement capability with the following technical features.

    a) **Reflectance mode should support 15º to 80º variable angle specular reflectance measurement**.

    b) Manual and computer assisted angle adjustment should be possible.

    c) The sample platform should contain a demountable solid sample holder and a fixed mount to place the mid-IR polarizer.

    d) A mid-IR polarizer is required.

    e) Additional normal incidence ($\theta = 0$) reflectance measurement accessory if available should be quoted.

f) Other available variable or fixed angle specular reflectance measurement accessory in the range of 0-15^{o} should also be quoted as optional accessories.

14. **IR emission measurement:** The spectrometer should be equipped for IR emission studies. The main requirements are:
    a) **An input port** for the emitted light from the sample placed outside the spectrometer (ideally on the right side) to enter to the spectrometer.
    b) **The mirrors suitably aligned** with the optical bench such that the emitted light from the sample placed outside the spectrometer is directed towards the interferometer and to the optical bench of the spectrometer for detection.
    c) IR emission sample housing and the blackbody source could be quoted as optional accessories.

15. **Interface and software:** The full process of data acquisition, data processing, data evaluation and data visualization/reporting must be manageable by single workstation software appropriately interfaced to a PC using Windows Operating system. The data acquisition software should be included for all the measurement modes. A library of common polymers and solvents must be included.

    A branded computer with latest hardware configuration and all the required accessories should be included.

16. **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.

17. **Accessories:** Must include basic accessories, such as KBr pellet holder and liquid cell.

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

19. **Warranty:** A minimum of 2 (two) years warranty is required. Annual Maintenance Contract (AMC) for additional 3 (three) years must be included. (Quote separately).

20. **Upgrade possibility:** The spectrometer should be capable of upgrading with other accessories such as IR-microscope and Far-IR measurement setup.

21. **Installation and training:** Installation and training should be provided at the customer site. Installation requirement should be intimated in advance.

22. **Optional items to be included, with a separate quote.**
    a) Far-IR source (450 - 20 cm^{-1})
    b) Far-IR detector
    c) Solid state Silicon Far-IR beam splitter.
    d) Variable or fixed angle specular reflectance accessories in the range of 0^{o}-15^{o}.
    e) IR emission sample housing and blackbody source.
    f) ATR measurement accessory.
    g) ATR accessory that can be used along with the variable angle specular reflectance measurement unit including a ZnSe and CaF_2 hemispheres and prisms.