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Tender notification for the procurement of a Surface Area and Pore Analyzer based on volumetric gas adsorption principle

Last date of submission: **29.07.2024**

Kindly send your best quotation for a "**Surface Area and Pore Size Analyzer**" with the technical specifications/general compliance mentioned below. The quote should come only from an **Indian Original Equipment Manufacturer (OEM), fabricator, or their Indian authorized distributor**. ***Resellers shall not participate***. The quotations should be on FOR-IISc Bangalore basis in INR. The Bidder should belong to either **Class-1 or Class-2 suppliers** distinguished by their "local content" as defined by recent edits to GFR. They should mention clearly which class they belong to in the cover letter. a) Class-1 supplier: Goods and services should have local content of equal to or more than 50%. b) Class-2 supplier: Goods and services should have local content of equal to or more than 20 % and less than 50%. Bidders offering imported products will fall under the category of non-local suppliers. They cannot claim themselves as Class-1 local suppliers/Class-2 local suppliers by claiming services such as transportation, insurance, installation, commissioning, training, and other sales service support like AMC/CMC, etc., as local value addition. Purchase preference as defined by the recent edits to GFR (within the "margin of purchase preference") will be given to the Class-1 supplier.
MSMEs can seek an exemption to some qualification criteria. IISc follows GFR2017 for such details.

Technical specifications for Surface Area and Pore Analyzer

The Surface Area and Pore Size Analyzer is an essential tool used in various fields to measure the surface area, pore size distribution, and porosity of materials

Procedure:

1. The tenderer should submit the technical and financial bids separately in sealed envelopes superscribing the envelopes as 'Technical bid' and 'Financial bid'. Both these envelopes must be put into a single envelope, superscribed 'TENDER FOR: SURFACE AREA AND PORE ANALYZER USING GAS ADSORPTION". This should reach the following address by **29.07.2024.**

Attn: Dr. Souradeep Gupta,
Room 209
Centre for Sustainable Technologies (Near Maramma Temple Gate)
Indian Institute of Science,
Bengaluru, Karnataka - 560 012

Soft copies are to be mailed to souradeep@iisc.ac.in with the subject line 'TENDER FOR: Surface Area and Pore Size Analyzer using gas adsorption".

2. The technical proposal should contain a technical compliance table with 4 columns.
   a. The first column must list the technical requirements and other requirements, in the order that they are mentioned below.
   b. The second column should provide specifications of the instrument against the requirement (please provide quantitative responses wherever possible).
   c. The third column should describe your compliance with a "Yes" or "No" only. Ensure that the entries in column 2 and column 3 are consistent.
   d. The fourth column can contain additional remarks. You can use this opportunity to highlight technical features, qualify responses of previous columns, or provide additional details.
3. Vendors are encouraged to highlight the advantages of their tools over comparable tools from the competitors.
4. In the commercial bid, please provide an itemized cost of the system and required accessories, such as software, tubes, pumps, power supply, etc.

Terms and conditions:

1. The decision of the purchase committee is final.
2. The tenderer is required to carry out full testing and demonstration of the machine's performance at the Indian Institute of Science, along with training the representative(s) from the institute on the operation and some sample testing for acceptance. 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.
3. Clarify if periodic (preventive) maintenance be done by a trained on-site engineer or requires a specialist from the OEM. The vendor should have qualified technical service personnel for the equipment based in India (preferably in Bangalore or nearby cities) and must ensure a response time of less than 2 business days after receiving a service request.
4. The lead time for the delivery of the equipment should not be more than **2.5 months** from the date of receipt of our purchase order unless otherwise negotiated by IISc. If there is a delay, IISc must be informed at least one month in advance. Approval of any delay in delivery is at the discretion of the purchase committee.
5. The indenter reserves the right to withhold placement of the final order, reject all or any of the quotations and to split up the requirements or relax any or all of the above conditions without assigning any reason.
6. The validity of the quotation shall be at least 12 weeks.
7. The vendor must ensure that all spare parts of the supplied machine and maintenance/troubleshooting support are available for at least 10 years after the machine's delivery.

8. The selected vendor must register with IISc (free registration) if not already registered. As per the purchase policy, purchase orders can be raised only for registered vendors.
9. Payment will be processed once satisfactory on-site testing and demonstration have been conducted. The vendor must furnish a delivery report countersigned by a representative from IISc.

Technical specifications:

1. The instrument shall operate based on the vacuum volumetric gas adsorption principle. The setup should have features to measure the adsorption/desorption of isotherms, *multi-point and single-point* surface area, and pore size distribution of powder and porous materials. Some examples are powder mineral binders, clays, activated carbon, metallic nanoparticles and similar. The machine should function effectively within an operating temperature range of 15 ºC to 35 ºC and relative humidity of 20% to 80% in a non-condensing environment.
2. The gases to be used for adsorption experiments include CO_2, N_2, Ar, and other non-corrosive gases for analysis purposes. Any additional accessory (for example, water bath/circulator, chiller, etc.) required for using all the mentioned gases should be provided along with the instrument. When using CO_2, a temperature range of 10 ◦C to 70 ◦C needs to be ensured. All such accessories must be of reputed make and covered under the same warranty terms as that of the machine.
3. The Dewar volume should be suitable for a service life of at least 15 hours (or better) in one refill.
4. The relative pressure range should be maintained between 10^{-4} to 0.997, with a pressure measurement accuracy of 0.1% of full scale.
5. The machine must make automatic dead volume corrections. Compensation for the dead volume should be made during the computation of surface area/pore parameters.
6. The lowest specific surface area measurement should be 0.02 m^2/g or better. Surface area reproducibility should be within the range of 1% to 2%.
7. The instrument must be capable of measuring pore sizes within a range of 0.7 nm to 500 nm for N_2 and a minimum pore size of 0.35 nm when using CO_2.
8. The minimum pore volume measurement capacity should be 1.2×10^{-8} cm^3.
9. The instrument should include a minimum of 3 integrated or separate degassing ports/stations. Degassing may be conducted at 400 ◦C (or higher). If separate degassing stations are provided, a dedicated rotary vacuum pump of reputed make must be supplied. This should be separate from the one used for analysis. The vacuum pumps, regardless of integrated or separate system, should generate a vacuum pressure in the range of $1 – 3 \times 10^{-3}$ torr (or better). For the samples to be tested, degassing time of 8 – 9 hours is usually practiced.
10. The machine should have **at least** two measurement ports. All the ports will be used simultaneously for surface area and pore size/distribution measurements. Vendors providing more ports at a competitive price and within budget will be given preference.
11. The operating software must be capable of generating reports with tabular or graphical data, or both, which can be printed, saved as .pdf, and exported via common file formats such as .csv or .xlsx.
12. The analysis program should support classical methods such as BET (single and multi-point specific surface area and micro-pore surface area), BJH, t-plot, DH, Harkins-Jura (HK), MP

& Dubinin-Astakhov (DA), as well as simulation methods based on density functional theory such as NLDFT.

13. A branded PC (not assembled) with the following specifications and compatible with the machine software shall be provided: 21-inch LED screen, Windows 10 (or better), 8 GB RAM, 500 GB HDD, UPS, and i5 processor or better. MS Office should be preinstalled. The vendor must check that all the computer parts are authentic and supplied to the specs. Any deviation at a later stage will be considered a violation of the contract/tender specs. PC must be shown as a line item in the quotation.
14. The vendor is required to provide leak-proof and compatible tubing from the gas cylinder to the machine. Any fixture/connectors required for connecting the gas cylinder tube to the machine must be provided. Gas cylinders will be arranged by IISc.
15. The power supply for the instrument should be AC 100~240 V, 50 Hz / 60 Hz/ 10 A. Any change to these must be informed beforehand so that necessary approval and arrangements can be made. It is requested to specify the number of sockets in the technical bid.
16. All necessary consumables, including vacuum pumps (as applicable), sample tubes (1.80 cc and 5 cc volumes), tube stand, O-rings, filters, sample fillers, caps, liquid bottle, etc. need to be provided by the vendor. 10 full sets complete with caps, O-rings etc. of each tube volume shall be provided.
17. Annual maintenance contract (AMC) rates shall be quoted as an optional line item for consideration. AMC will start after a 3-year warranty period.

Other requirements:

1. The vendor must do a due diligence check on all the features of the machine and all the accessories and computers before delivery.
2. The tenderer has a track record of supplying similar equipment to at least four other public academic institutes (IISc/IITs/ IISERs/NIT etc.) in the last three years. Relevant documents including user testimonials on product performance/maintenance shall be furnished.
3. IISc requires at least three (3) years of complete warranty from the installation date for all parts of the machine (including accessories). Vendors providing longer warranties within a competitive price will be given preference.
4. The vendor must arrange at least one site visit each year at no additional cost to IISc by a competitive technical staff during the warranty period for calibration and routine checks for the entire machine. This is in addition to any troubleshooting that may be required.
5. The vendor must make necessary logistical arrangements for shipping, and unloading at the lab premise without any damage at no extra cost to IISc. Commissioning, and installation of the machine and all the parts by competitive technical personnel shall be arranged by the vendor.
6. Demonstration and training must be carried out within **two days of delivery** by competitive personnel. IISc will not pay additional for such training/demonstration.
7. IISc will expect acceptance tests, post installation. These can be recorded in the presence of representatives of the vendor and staff from IISc.

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