



CENTRE FOR INDUSTRIAL CONSULTANCY AND SPONSORED RESEARCH
INDIAN INSTITUTE OF TECHNOLOGY MADRAS
Chennai 600 036
Telephone: [044] 2257 9798/9761 FAX: [044] 22570545/8366
E-mail: arpp@iitm.ac.in



V.Sathyanarayanan
Senior Manager (Project Purchase)

Ref:
CIE/DALI/055/2017
Date: 22nd Feb, 2018

Open Tender for supply of "**High Pressure Adsorption Analyser**"

Tender No: CIE/DALI/055/2017

Due Date: 15.03.2018, 2:30pm

Technical Bid opening on 15.03.2018 at 4.00pm

Dear Sir/Madam,

On behalf of the Indian Institute of Technology Madras, tenders are invited for the supply of "**High Pressure Adsorption Analyser**. (CIE/DALI/055/2017)" conforming to the specifications given in Annexure.

Instructions to the Bidder

i Preparation of Bids: - The tenders should be submitted under two-bid system (i.e.) Technical bid and Financial bid.

ii. Delivery of the tender: - The tender shall be sent to the below-mentioned address either by post or by courier so as to reach the following address before the due date and time specified in the Schedule: **Senior Manager, Project Purchase, 2nd floor, IC & SR Building, I.I.T. Madras -600036.**

iii. Opening of the tender: - The offer/Bids will be opened by a committee duly constituted for this purpose. The technical bids will be opened first and it will be examined by a technical committee which will decide the suitability of the bid as per our specifications and requirements. The bidders will be invited for opening of Technical bids. In respect of opening of financial bid, those bidders who are technically qualified only will be called for.

iv. **Prices:** - The price should be quoted in nett per unit (after breakup) and must include all packing and delivery charges to various Departments/Centres/Institutions. The offer/bid should be exclusive of taxes and duties. The percentage of tax & duties should be clearly indicated separately. IIT Madras is eligible for concessional GST and relevant certificate will be issued.

In case of Imports, the price should be quoted without custom duty. I.I.T. Madras is exempted from levy of IGST on Imports and eligible for concessional custom duty. In case of import supply, the price should be quoted on **EX-WORXS** and **CIP** basis indicating the mode of shipment.

v **Agency Commission:** - Agency commission, if any, will be paid to the Indian agents in Rupees on receipt of the equipment and after satisfactory installation. Agency Commission will not be paid in foreign currency under any circumstances. The details should be shown in Tender even in the case of 'Nil' commission. The tenderer should indicate the percentage of agency commission to be paid to the Indian agent. The foreign Principal should indicate about the percentage of payment and it should be included in the originally quoted basic price, if any.

vi **Terms of Delivery** - The item should be supplied to our various Departments/Institutions as per Purchase Order. In case of import supply, the item should be delivered at the cost of the supplier to our Institution. The Installation/Commissioning should be completed as specified in our important conditions.

vii **Technical Bid Opening:** The technical bid will be opened on **15.03.2018 at 4.00 pm** In Department of Civil Engineering, IIT Madras and the financial bids of those tenders who are technically qualified will be opened at a later date under intimation to them.

viii. **IIT Madras reserves the full right to accept / reject any tender at any stage without assigning any reason.**

Yours sincerely,



Senior Manager (Project Purchase)
IC&SR, I.I.T. Madras

SCHEDULE

Important Conditions of the tender

1. The due date for the submission of the tender is **15.03.2018, 2:30pm**. The offers / bids should be submitted in two bids system (i.e.) Technical bid and Financial bid. The Technical bid should consist of all technical details / specifications only. The Financial bid should indicate item-wise price for each item and it should contain all Commercial Terms and Conditions including Taxes, transportation, packing & forwarding, installation, guarantee, payment terms, pricing terms etc. The Technical bid and Financial bid should be put in separate covers and sealed. Both the sealed covers should be put in a bigger cover. The Tender for supply of "**High Pressure Adsorption Analyser** Tender No: CIE/DALI/055/2017" should be written on the left side of the Outer bigger cover and sealed.

2.EMD: The EMD in the form of account payee DD for 2% value of the item in favor of Registrar IIT Madras Which should be enclosed in the cover containing financial Bid. Any offer not accompanied with the EMD shall be rejected summarily as non-responsive. The EMD of the unsuccessful bidders shall be returned within 30 days of the end of the bid validity period. The same shall be forfeited, if the tenderers withdraw their offer after the opening during the bid validity period. The Institute shall not be liable for payment of any interest on EMD.

EMD is exempted for Micro and Small Enterprises (MSEs) as defined in MSE Procurement Policy issued by Department of Micro, Small and Medium Enterprises (MSME) or registered with the Central Purchase Organisation or with IITMadras as on the date of submission of bids..

3. Performance Security:- The successful bidder should submit Performance Security for an amount of 5% of the value of the contract/supply within 21 days from the date of issue of work/purchase order. The Performance Security should be furnished in the form of an Account Payee DD / FD Receipt from the commercial bank (or) Bank Guarantee from any nationalized bank in India.

Performance Security in the form of Bank Guarantee:- In case the successful bidder wishes to submit Performance Security in the form of Bank Guarantee, the Bank Guarantee should be routed through the Beneficiary Bank to the end user bank. Otherwise, the Indian Agent of the foreign vendor has to submit a Bank Guarantee from a Nationalized Bank of India.

The Bank Guarantee should remain valid for a period of sixty days beyond the date of completion of all contractual obligations of the supplier including the warranty obligations.

4. Indian agent:- If an Indian agent is involved, the following documents must be enclosed: Foreign principal's proforma invoice indicating the commission payable to the Indian Agent and nature of after-sales service to be rendered by the Indian Agent. Copy of the agency agreement with the foreign principal and the precise relationship between them and their mutual interest in the business. The enlistment of the Indian agent with Director General of Supplies & Disposals under the Compulsory Registration Scheme of Ministry of Finance.

5.The offer/bids should be sent only for a machine that is available in the market and supplied to a number of customers. A list of customers in India and abroad with details must accompany the quotations. Quotations for a prototype machine will not be accepted.

6.**Original catalogue** (not any photocopy) of the quoted model duly signed by the principals must accompany the quotation in the Technical bid. No prices should ever be included in the Technical bid.

7.Documentary proof for the claimed position and repetition accuracies must be obtained from the principals and submitted along with the relevant pages of the standards.

8.Compliance or Confirmation report with reference to the specifications and other terms & conditions should also be obtained from the principal.

9.Validity: Validity of Quotation not less than 90 days from the due date of tender.

10.Delivery Schedule:- The tenderer should indicate clearly the time required for delivery of the item. In case there is any deviation in the delivery schedule, liquidated damages clause will be enforced or penalty for the delayed supply period will be levied.

Normally the delivery should be in 8 weeks from date of PO. If there is delay, the penalty will be @1 % per week of delay subject to a max of 10% of the value of purchase order and if the delay is more than 10 weeks, the PO would be cancelled and liquidated damages will be enforced.

11.Risk Purchase Clause:- In the event of failure of supply of the item/equipment within the stipulated delivery schedule, the purchaser has all the right to purchase the item/equipment from other sources on the total risk of the supplier under risk purchase clause.

12.Payment:- No Advance payment will be made for Indigenous purchase. However 90% Payment against Delivery and 10% after installation are agreed to wherever the installation is involved. In case of import supplies the payment will be made only through 100% Letter of Credit i.e. (90% payment will be released against shipping documents and 10% after successful installation wherever the installation is being done).

13.Advance Payment:- No advance payment is generally admissible. In case of specific percentage of advance payment is required, the Foreign Vendor has to submit a Bank Guarantee equal to the amount of advance payment and it should be routed through the Beneficiary Bank to the end user Bank. Otherwise, the Indian Agent of the foreign vendor has to submit a Bank Guarantee through a Nationalized Bank of India.

14.On-site Installation: - The equipment or machinery has to be installed or commissioned by the successful bidder within 15 to 20 days from the date of receipt of the item at site of IIT Madras.

15.Warranty/Guarantee: - The offer should clearly specify the warranty or guarantee period for the machinery/equipment. The warranty should be for three years from the date of commissioning of the equipment.

16.Late offer: - The offers received after the due date and time will not be considered. The Institute shall not be responsible for the late receipt of Tender on account of Postal, Courier or any other delay.

17.Acceptance and Rejection: - I.I.T. Madras has the right to accept the whole or any part of the Tender or portion of the quantity offered or reject it in full without assigning any reason.

18.Do not quote the optional items or additional items unless otherwise mentioned in the Tender documents / Specifications.

19.Disputes and Jurisdiction: -

Settlement of Disputes: Any dispute, controversy or claim arising out of or in connection with this PO including any question regarding its existence, validity, breach or termination, shall in the first instance be attempted to be resolved amicably by both the Parties. If attempts for such amicable resolution fails or no decision is reached within 30 days whichever is earlier, then such disputes shall be settled by arbitration in accordance with the Arbitration and Conciliation Act, 1996. Unless the Parties agree on a sole arbitrator, within 30 days from the receipt of a written request by one Party from the other Party to so agree, the arbitral panel shall comprise of three arbitrators. In that event, the supplier will nominate one arbitrator and the Project Coordinator of IITM shall nominate one arbitrator. The Dean IC&SR will nominate the Presiding Arbitrator of the arbitral tribunal. The arbitration proceedings shall be carried out in English language. The cost of arbitration and fees of the arbitrator(s) shall be shared equally by the Parties. The seat of arbitration shall be at IC&SR IIT Madras, Chennai..

- a. **The Applicable Law:** This Purchase Order shall be construed, interpreted and governed by the Laws of India, Court at Chennai shall have exclusive jurisdiction subject to the arbitration clause.
- b. Any legal disputes arising out of any breach of contract pertaining to this tender shall be settled in the court of competent jurisdiction located within the city of Chennai in Tamil Nadu.

20. All Amendments, time extension, clarifications etc., will be uploaded on the website only. Bidders should regularly visit the above website to keep themselves updated. No extension in the bid due date/ time shall be considered on account of delay in receipt of any document by mail.

Acknowledgement:- It is hereby acknowledged that the tenderer has gone through all the conditions mentioned above and agrees to abide by them.

**SIGNATURE OF TENDERER
ALONG WITH SEAL OF THE
COMPANY WITH DATE**

**Annexure
SPECIFICATION**

Technical Specifications of High Pressure Adsorption Analyser

The High Pressure Adsorption Analyser is to measure the adsorption characteristics of geomaterial/porous materials for various gases over a range of temperature and pressures. The equipment shall have the following technical & general specifications.

A. Technical Specifications of High Pressure Adsorption Analyser

1. The equipment must be capable of measuring adsorption and desorption isotherms for the estimation of sorption characteristics using gas adsorption phenomena over a pressure range of 0.5 milli bar to 200 bar.
2. The equipment must be capable of measuring the adsorption isotherms over temperatures range of -20 °C to 500 °C or better.
3. The equipment must have one or more sample ports.
4. It should have features to measure the adsorption/desorption isotherms of wide range of porous materials such as sedimentary rock, soils and coals.
5. The equipment must be fully automated, supplied with all the accessories and features for sample preparation as well as sample treatment.
6. It should be able to measure adsorption isotherms for gases, including gases that are corrosive in nature, such as carbon dioxide, methane, hydrogen, nitrogen, oxygen, argon etc.
7. The equipment shall have at least one dedicated gas inlet ports for the adsorbate and independent additional gas inlet port for helium gas. The equipment with four dedicated gas inlets for different adsorbates must be quoted optional.
8. The equipment must be upgradable to four dedicated adsorbate gas inlet ports, in future, by the service engineer on-site. This enable the user to obtain the gas adsorption isotherm of porous materials using multi-gas adsorbates.
9. The equipment manifold shall have a 200 bar high precision pressure transducer as well as 1 bar pressure transducer. Sample analysis station of the equipment should also have dedicated transducers of 1 bar as well as 200 bar capacity to measure the equilibrium pressure.
10. The equipment must have equipped with at least four pressure transducers, in case of single station and with six pressure transducer for two station equipment.
11. There must be a valve to protect the 1 bar pressure transducer when pressure goes beyond 0.5 bar.
12. The switch over of pressure transducers must be automatic when the pressure is changing from 200 bar to 1 bar and vice versa.
13. In addition to the manual mode of operation, the equipment should have automatic and programmable features that enables sample degassing up to a temperature of 500 °C.

14. The analyser should be equipped with an inbuilt rotary vacuum pump which has the ability of attaining the pressure value 0.5 milli bar or lower for sample degassing.
15. The vacuum pump should be internal integrated and automatic. The operation of the rotary vacuum pump must be achieved using a software that is employed for controlling high pressure gas sorption analyser, in an integrated manner. The rotary vacuum pump must be efficient to degas the samples that are equilibrated over a temperature range of -20 °C to 400 °C.
16. The pressure transducer should have at least an accuracy of $\pm 0.05\%$ on full scale. The high accuracy of 0.01% must be quoted optional. The pressure transducer should have high resolution and accuracy with high stability.
17. The equipment must be capable of real time free space measurement using manual as well as automatic modes.
18. The design of equipment should ensure perfect isothermal conditions during the analysis.
19. Reference materials (standards) must be provided to ensure the accuracy of the instrument for adsorption studies.
20. The system should be provided with an in-built temperature sensor that can measure the temperature of the sample cell in real time with an accuracy of $\pm 0.1^\circ\text{C}$ or better.
21. A constant temperature water circulating device should be supplied for measuring the adsorption isotherms in the temperature range of -20 °C to 100 °C. The water circulating bath must be quoted optional.
22. For ensuring isotherms measurement at elevated working temperatures of 100 °C and up to 500 °C, the facility must be equipped with an in-built heating mantle.
23. The water circulating device/heating mantle must be able to maintain the specified sample temperature with an accuracy of $\pm 0.1^\circ\text{C}$. The software should be able to control the temperature of water circulation device/heating mantle.
24. The system should be supplied with gas booster to assure the constant supply of high gas pressure. The gas booster facility must be integrated with software that controls the equipment. The gas booster may be quoted optional.
25. The system should be equipped with gas-tight pneumatic valves to avoid the leakage.
26. The equipment must be supplied with a large number of sample analysis bulbs, filler rods, and o-rings for continuous operation of 2 years.
27. The equipment should implement various user selectable Equation of States (EOS) that are widely accepted by National Institute of Standards and Technology (NIST) or any equivalent measurement standards laboratory for assessing the adsorption-desorption isotherms.
28. The software should enable the user to select an available state of the equation to represent the sorption isotherms. Further, the software should allow the user to

incorporate additional user-defined EoS for measuring the material specific adsorption-desorption isotherms.

29. The instrument operation and data management must be done by windows based software.
30. The calibration procedures must be controlled by the software. The software should facilitate the creation of a method for measuring the adsorption-desorption isotherm.
31. The software should have in-built features for automatic start and shut down procedures, real-time display of the sample analysis progress.
32. The software should have all the data handling features like user-defined report generation, data/figure export to spreadsheets, offline data processing etc.
33. The software should monitor the pressure during the analysis in real time and display warnings and cautions if necessary.
34. It should have a user interface that displays the current status of the valves, current pressures of the manifold and sample cell(s), and status of all available accessories.
35. The equipment should have the battery-backed pressure display system to avoid accidental opening of the cell which may be at high pressure.
36. The equipment must have safety shields on all gas inlets to inhibit removal of the cell at high pressure.
37. The equipment should have safety features which are integrated with the software to prevent the user from performing potentially dangerous actions.
38. A branded computer with the following specifications must be supplied
 - a) Processor : Intel Core i3 or better
 - b) Installed Memory(RAM) : 4 GB or better
 - c) Install Storage : 1TB
 - d) Preinstalled Operating System : Windows 7 or higher (should be compatible with equipment software)
 - e) Monitor : 21" High Definition Display
39. The system should have an efficient gas source and outgassing.
40. Materials used both for internal gas lines and sample cell should assure safe operation.

B. General Specifications of High-Pressure Adsorption Analyser

1. The equipment must be installed by the technical persons of the vendors/principles.
2. Proper demonstration and 2-day training should be given to the users after successful installation.
3. All the necessary accessories should be provided.
4. The equipment should have a minimum of 2 years warranty.
5. The list of at least five users of quoted model installations in India including contact details (name of the person-in-charge, email and phone number) is to be provided.
6. The cost should include 24-month warranty and CIF/CIP up to Chennai.
7. There must be a local service agent in Chennai or nearby cities in India. The downtime should not be more than 36 hours. Detail of service persons to be provided during bid submission.
8. Payment conditions: 90% LC at sight and 10% after installation and training.
9. The vendor must be an OEM.
10. Optional items must be quoted separately.
11. The system should be delivered within 12 weeks from the opening of the letter of credit or issue of the purchase order, whichever is later.
12. Individual costs should be indicated for the different items (parts) quoted. IIT Madras reserves the right to exclude some items from the purchase items must be quoted separately.
13. Costs and related information should be given only in the financial bid.