INDIAN INSTITUTE OF TECHNOLOGY MAORAS

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V.Sathyanarayanan

Senior Manager (Project Purchase)

Ref: CIE/KRAG/011/2017

Dated: 29.06.2017

**Open Tender for supply of "Modulated Differential Scanning Calorimeter (MDSC) & Simultaneous Thermal Analyzer (TGA-SDT)" Tender No: CIE/KRAG/011/2017**

**Due Date: 20.07.2017 at 2:30p.m**
Technical bid opening on 20.07.2017 at 3.30p .m

Dear Sir/Madam,

On behalf of the Indian Institute of Technology Madras, offers are invited for the supply of **"Modulated Differential Scanning Calorimeter (MDSC) & Simultaneous Thermal Analyzer (TGA-SDT)"** (CIE/KRAG/011/2017) conforming to the specifications given in (Annexure-I):

**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. In respect of opening the financial bid, those bidders who are technically qualified alone 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.
The price should be quoted without custom duty (and excise duty). IIT Madras is exempt from payment of (excise duty), and eligible for concessional custom duty
In case of import supply, the price should be quoted on **EX-WORKS** 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 explicitly 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). **(vi) Terms of Delivery**: - The item should be supplied to our Department(s) 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). **(vii) Technical Bid Opening:** The technical bid will be opened on 20/07/2017 at 3.30pm at the BSB 106, Department of Civil, IIT Madras and the financial bids of technically qualified tenders will be opened at a later date under intimation to them.

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

Yours sincerely,

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

वी. सत्यनारायणन
V. SATHYANARAYANAN
वरिष्ठ प्रबंक (परियोजना क्रय)
SENIOR MANAGER (PROJECT PURCHASE)
आईआईटी मद्रास/I.I.T. MADRAS-600036

# SCHEDULE

## Important Conditions of the tender

1. The due date for the submission of the tender is **20.07.2017, 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 "**Modulated Differential Scanning Calorimeter (MDSC) & Simultaneous Thermal Analyzer (TGA-SDT)" (**CIE/KRAG/011/2017)" should be written on the left side of the Outer bigger cover and sealed.

2. **EMD:** -EMD should be at 2% (two percent) of the tender value quoted by the bidder. The EMD should be included in the Financial bid which will not be opened for Technical evaluation. Enclosing the EMD in the Technical bid will automatically disqualify the tenderer. EMD should be in the form of DD in favour of "The Registrar, Indian Institute of Technology Madras" and payable at Chennai. The tender without EMD would be considered as UNRESPONSIVE and REJECTED. Photo/FAX copies of the Demand Draft/Banker's pay orders will not be accepted. No interest will be paid for the EMD and the EMD (Bid Security) will be refunded to the successful bidder on receipt of Performance Security.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 IIT Madras 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 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:-** Incase 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 contact 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, and catalogue.

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 should not be 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.

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. Installation should be done by the successful bidder at free of cost.

15. **Warranty/Guarantee**:- The offer should clearly specify the warranty or guarantee period for the machinery/equipment. Any extended warranty offered for the same has to be mentioned separately. (for more details please refer our Technical Specifications). At least one year warranty from the date of installation.

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** and will not be published in newspapers. 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-I

## Technical specifications of Modulated Differential Scanning Calorimeter (MDSC) and Simultaneous Thermal Analyzer (TGA-SDT)

We would like to purchase a modulated differential scanning calorimeter (MDSC) and a simultaneous thermal analyzer (TGA-SDT) with the following technical specifications. As the thermal analysis techniques such as DSC, TGA and SDT are complimentary, we wish to have MDSC and TGA-SDT instruments from single manufacturer. This enables us to interpret the complex phase transitions such as melting and decomposition, by overlapping the data obtained from these instruments.

### *A. Technical Specifications for Modulated Differential Scanning Calorimeter (MDSC)*

1. The equipment must have sinusoidal, isothermal & linear modulation modes.
2. The operating temperature (i.e., sample temperature) range of the instrument should be -180 °C to 700 °C.
3. Temperature range for direct heat capacity measurement should be -180 °C to 700 °C or better.
4. Temperature accuracy must be 0.05 °C or better.
5. Temperature precision must be 0.05 °C or better.
6. The heating rate must be capable of changing from 0.1 to 200 °C/min.
7. The instrument must have provision for inlet of two gases. It must be capable of operating in purging air, oxygen, nitrogen, argon, as well as other corrosive gases, and also have an in-built mass flow controller.
8. Instrument must be capable of measuring heat capacity directly in a single run.
9. The calorimetric precision of the instrument must be 0.05 % or better.
10. The calorimetric reproducibility of the instrument must be 0.05 % or better.
11. The maximum calorimetric sensitivity of the instrument must be 0.2 μW or better.
12. Baseline curvature of the instrument must be 10 μW or better (in the temperature range of -50 °C to 300 °C).
13. Baseline reproducibility of the instrument must be 10 μW or better.
14. The dynamic range of the instrument must be ±500 mW or better.
15. The peak /half width ratio of Indium under $N_2$ environment must be 30 or better, without any mathematical calculation.
16. The instrument must be supplied with mechanical cooling accessory which has capability of reaching temperature up to -90 °C.

17. The instrument must be supplied with standard samples for calibration of DSC in the temperature range of -180 °C to 700 °C.
18. Sapphire standard must be provided for the calibration of specific heat.
19. The instrument must accommodate sample weight in the range of 0.5 to 100 mg.
20. The warranty for the DSC cells must be five years or more.
21. The instrument must be supplied with 500 numbers of sample pans and lids.
22. The instrument must be supplied with sample press and die sets for handling solid, powder, and liquid samples.
23. The instrument must be supplied with all necessary accessories.
24. The instrument must be supplied with the required software.
25. The equipment must be capable of being operated by a computer.
26. The software must be compatible with Microsoft Windows operating system.
27. The heating rate must be programmable through the software and should have provision for multi-step heating and isothermal holding.
28. The data must be available in ASCII as well as CSV formats.
29. The software must analyze the DSC curves and provide characteristic temperature curves and enthalpy change values.
30. The instrument must be capable of working under power supply of 230 V single phase/ 50-60 Hz.
31. A branded computer can be supplied by the local representative.

**Terms and Conditions**

1. The system should be delivered within 4-6 weeks from the opening of the letter of credit or issue of purchase order, whichever is later.
2. The cost should include 12 month warranty of the overall system and CIP up to Chennai.
3. Prices quoted should be valid for at least six months.
4. Individual costs should be indicated for the different items (parts) quoted. IIT Madras reserves the right to exclude some items from the purchase.
5. Costs and related information should be given only in the financial bid.
6. The system should be installed and commissioned with no additional cost. At least two days of training at IIT Madras should be provided with no additional cost. Installation and training shall be done by the suppliers' engineer(s).
7. Two copies of the system manual should be provided in CD form.
8. The list of at least three users of similar installations in India including contact details (name of the person in-charge, email and phone number) is to be provided.
9. There must be a local service agent in India.
10. The payment conditions consist of 90% LC at site and 10% after installation and satisfactory training.
11. The supplier/vendor must be an original equipment manufacturer.

## *B. Technical Specifications for Simultaneous Thermal Analyzer (TGA-SDT)*

The simultaneous thermal analysis (TGA-SDT) is one of the thermal methods in which a specific property (weight) of a material is monitored as a function of temperature. A TGA combined with an infrared spectrometer (TG-IR) is the most common type of evolved gas analysis (EGA) system.

1. The operating temperature (i.e., sample temperature) range of the instrument should be ambient to 1500 °C or higher.
2. The instrument must have five point temperature calibration capability.
3. Temperature repeatability of the instrument must be ±0.1 °C or better, based on the standards.
4. The dynamic temperature precision of the instrument must be ±0.5 °C or better.
5. The instrument must have capability to combine with an infrared spectrometer (FTIR, available in our lab) for evolved gas analysis, without any demand for additional accessories. In view of this, the adapter connecting TGA-SDT with FTIR must be supplied.
6. The instrument must be supplied with platinum/platinum-rhodium (Type R) thermocouple, so that higher accuracy in temperature measurement can be achieved.
7. The instrument must have modulated DSC capability.
8. The instrument must have modulated TGA capability.
9. The instrument must have horizontal dual beam (for sample & reference) balance. This is essential to couple the TGA with an infrared spectrometer (TG-FTIR) for evolved gas analysis without altering the furnace or needing additional accessories.
10. The sensitivity of the balance must be 0.1 microgram or better.
11. The furnace must be made of platinum or better material to achieve the higher heating rates of up to 100 °C/min.
12. The heating rate must be capable of changing from 0.1 to 100 °C/min.
13. The instrument must accommodate sample weight up to 200 mg, excluding the weight of crucible.
14. The instrument must have dual TGA capability so that more number of samples can be analyzed in a given time.
15. The instrument should have built-in high resolution TGA so that overlapping peak can be separated.
16. The instrument must be fitted with mass flow controller so that gas switching can be achieved using computer.
17. The instrument must have built-in reactive gas inlet.
18. Instrument must be vacuum tight to 50 μTorr.

19. The maximum calorimetric sensitivity of the instrument must be 4 μW or better.
20. The calorimetric precision of the instrument must be ± 2 % or better.
21. The calorimetric accuracy of the instrument must be ± 2 % or better.
22. The instrument must have provision for inlet of two gases. It must be capable of operating in purging air, oxygen, nitrogen, argon, and other corrosive gases, and also have an in-built mass flow controller.
23. The warranty for the furnace must be five years or more.
24. The instrument must be supplied with platinum, alumina crucibles and lids.
25. The instrument must be supplied with all necessary accessories.
26. The instrument must be supplied with the required software.
27. The equipment must be capable of being operated by a computer.
28. The software must be compatible with Microsoft Windows operating system.
29. The heating rate must be programmable through the software and should have provision for multi-step heating and isothermal holding.
30. The data must be available in ASCII as well as CSV formats.
31. The software must analyze the TGA/DSC curves and provide characteristic temperature curves and enthalpy change values.
32. The instrument must be capable of working under power supply of 230 V single phase/ 50-60 Hz.

**Terms and Conditions**

1. The system should be delivered within 4-6 weeks from the opening of the letter of credit or issue of purchase order, whichever is later.
2. The cost should include 12 month warranty of the overall system and CIP up to Chennai.
3. Prices quoted should be valid for at least six months.
4. Individual costs should be indicated for the different items (parts) quoted. IIT Madras reserves the right to exclude some items from the purchase.
5. Costs and related information should be given only in the financial bid.
6. The system should be installed and commissioned with no additional cost. At least two days of training at IIT Madras should be provided with no additional cost. Installation and training shall be done by the suppliers' engineer(s).
7. Two copies of the system manual should be provided in CD form.
8. The list of at least three users of similar installations in India including contact details (name of the person in-charge, email and phone number) is to be provided.
9. There must be a local service agent in India.
10. The payment conditions consist of 90% LC at sight and 10% after installation and satisfactory training.
11. The supplier/vendor must be an original equipment manufacturer.