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|  | INDIAN INSTITUTE OF TECHNOLOGY MADRAS Chennai 600 036 Telephone: [044] 2257 9798/9723 E-mail: tender@imail.iitm.ac.in |  |
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The Senior Manager (Project Purchase)

Ref: ASE/SRCH/027/2019
Date: 30.07.2019

Open Tender No: ASE/SRCH/027/2019

Due Date: 19th August 2019, 3PM

Pre-Bid meeting on 7th August 2019, 11:30 AM at Conference Room, NCCRD – Building, IIT-Madras.

Technical Bid opening meeting on 20th August 2019, 4:00 PM at NCCRD – Building, Department of Aerospace Engineering, IIT-Madras.

Dear Sir/Madam,

On behalf of the Indian Institute of Technology Madras, offers are invited for the supply of **“Electrical Air Heater”** 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 addresses mentioned below, either by post or by courier so as to reach our office before the due date and time specified in our schedule. The offer/bid can also be dropped in the tender box on or before the due date and time specified in the schedule.
The tender box is kept in the office of the:

**The Senior Manager,
Project Purchase,
IC & SR Building 2nd floor,
I.I.T. Madras,
Chennai – 600 036.**

- 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 will be examined by a technical committee which will decide the suitability of the bids as per our specifications and requirements. All bidders will be invited for opening of the technical bids. With respect to opening the financial bid, only technically qualified bidders will be called.

- IV. Prices:** - The price should be quoted in net per unit (after breakup) and must include all packing and delivery charges to the **NCCRD - Department of Aerospace Engineering**. The offer/bid should be exclusive of taxes and duties. The percentage of tax & duties should be clearly indicated separately. Kindly note that IIT Madras is eligible for concessional GST and relevant certificate will be issued.

In case of import supply, the price should be quoted without custom duty. IIT Madras is exempted from levy of IGST on Imports and eligible for concessional custom duty (not exceeding 5%) and 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 after receipt of the equipment and its satisfactory installation. Agency Commission will not be paid in foreign currency under any circumstances. The details should be explicitly shown in the tender document 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 the percentage of payment and it should be included in the basic price quoted originally (if any)..
- VI. Terms of Delivery:** - The item should be supplied to the NCCRD – **Department of Aerospace Engineering, IIT Madras** as per the 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 on 20th August, 2019, 4:00 PM at the NCCRD – Building **Department of Aerospace Engineering, IIT-Madras**. 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,

The Senior Manager (Project Purchase)
IC&SR Building, I.I.T. Madras,
Chennai – 600 036.

SCHEDULE

Important Conditions of the tender

1. The due date for the submission of the tender is **19.08.2019, 3 PM.**

The offers / bids should be submitted in two bids systems (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 Open Tender for supply of “**Electrical Air Heater**” should be written on the left side of the Outer bigger cover and sealed.

2. **EMD Rs.2,00,000/- in the form of account payee DD in favor of The Registrar-IIT Madras, payable at Chennai should be enclosed in the cover containing technical 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 (MSE) as defined in MSE Procurement Policy issued by Department of Micro, Small and Medium Enterprises (MSME).

3. **Performance Security:** - The successful bidder should submit Performance Security for an amount of 5% of the value of the contract/supply. The Performance Security may be furnished in the form of an Account Payee DD, FD Receipt from the commercial bank, Bank Guarantee from any nationalized bank in India. **The performance security should be furnished within 21 days from the delivery of the purchase order.**

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

8. **Validity:** Validity of Quotation not less than 90 days from the due date of tender.
9. **Delivery Schedule:** - The tenderer should indicate clearly the time required for delivery of the item (subjected to the executive committee-IITMadras approval). 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.
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 accepted time frame by IITM, the PO would be cancelled and liquidated damages will be enforced.
10. **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.
11. **Payment:-**
 - (i) 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).
 - (ii) **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.
12. **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.
13. **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).
14. **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.
15. **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.
16. **Do not quote the optional items or additional items unless otherwise mentioned in the Tender documents / Specifications.**

17. 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 on arbitrator. The Dean IC&SR will nominate the Presiding Arbitrator of the arbitral tribunal. The arbitration proceeding 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.

18. 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**

Air heater- technical Requirements**Requirement 1**

An electric air heater which can preheat compressed air with a max flow rate of 2.5 Kg/s to the desired temperature range of 50- 350 deg. C. Heater should be able to deliver air at the above temperature range for any flow rates less than the maximum condition.

Requirement 2

An electric air heater which can preheat compressed air with a max flow rate of 2 Kg/s to the desired temperature range of 50- 350 deg. C. Heater should be able to deliver air at the above temperature range for any flow rates less than the maximum condition.

IIT Madras will choose either requirement 1 or requirement 2 based on the final experimental conditions required for the Project. Vendors may quote separately for either one of the requirements or for both according to their capabilities. Detailed technical specifications for both the requirements are listed below.

Specifications for Electric Heater with Thyristor Control Panel

| S.No. | Description | |
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| 1. | Heating Media | Air |
| 2. | Max. Flow rate | 2.5 Kg/s/ 2 Kg/s |
| 3. | Outlet temperature | 350°C |
| 4. | Power required | Vendor to calculate |
| 5. | Voltage | 690 V or 415V, 3 Phase Delta connected |
| 6. | Voltage tolerance | ± 10% |
| 7. | Operating pressure | 1 to 14 Barg |
| 8. | Design pressure | 16 Barg |
| 10. | Max. allowable watt density | 35 W/in ² |
| 11. | Max. allowable pressure drop | 14.7 PSI |
| 12. | MDMT | 0°C |
| 13. | Corrosion allowance | 3 mm |
| 15. | Heating elements diameter | As per Vendor's design |
| 16. | Heating element tube thickness | As per Vendor's design |
| 17. | Resistance wire MOC | Ni-Cr wire packed with MgO |
| 18. | Elements Sheath Material | Alloy 800 |
| 19. | Immersion length | As per Vendor's design |
| 20. | Cold length below flange | As per Vendor's design |
| 21. | Tube sheet material | SS 304 |
| 22. | Tube sheet size | 18 NPS |
| 23. | Flange thickness | 4" including RF |
| 24. | Flange class | 300 lb |
| 25. | No. of circuits | As per Vendor's design |
| 26. | Segmental baffles | As per vendor's design |
| 27. | Distance between flange and terminal enclosure | As per Vendor's design |

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| 28. | Vessel material | SS 304 |
| 29. | Pipe schedule | SCH 40 |
| 30. | Inlet connection size | 4 NPS Class 300 RFWN |
| 31. | Outlet connection size | 4 NPS Class 300 RFWN |
| 32. | Vessel X-Ray | RT-1 |
| 33. | Vent and Drain | 2 NPS RFWN each |
| 34 | Electrical enclosure size | As per Vendor's design |
| 35. | Electrical Enclosure material | SS 304 |
| 36 | Electrical Enclosure type | Moisture resistant |
| 37 | Sensor on the heating element | 2 EA. Type K, Dual Ungrounded Thermocouple with sensor enclosure |
| 38 | Sensor sheath material | Alloy 600 |
| 39 | Max. allowable temperature inside the enclosure | 65°C |
| 40 | Orientation | Horizontal |
| 41 | Minimum operating life | 100,000 operating hours |
| 42 | Design life calculations | Vendor to provide calculations for heater life estimation. |
| 43 | Heater control | 100% Thyristor control |
| 44 | SCCR rating | 100kA |
| 45 | Open heater and shorted SCR alarm | To be generated within the SCR |
| 46 | SCR firing | Burst firing |
| 47 | SCR fuse I ² T value at 500V (tp=10mSec) | 215600 / 294000 |
| 48 | Panel cooling | As per Vendor's design |
| 49 | SCR dimensions | As per Vendor's design |
| 50 | SCR should generate signal to read kW being used | 4-20mA signal to be generated |
| 51 | Safety limit controller | FM approved |
| 52 | PID controller | Should accept Thermocouple, RTD, 4-20mA or 0-10VDC signal as an input Output from PID to SCR should be 4-20mA signal only PID Controller should have adaptive tuning and autotuning feature. |
| 53 | UL listing | Heating elements, Flange, PID Controller, Safety Limit Controller and Thyristor |
| 54 | Critical components like sensor on element sheath, safety limit controller, PID controller and Thyristor | Make of critical component should be same as heater manufacturer. |
| 55 | Heater design and Manufacturing | Should be in accordance with ASME Sec. VIII Div. 1 latest edition. U Stamped |
| 56 | Testing of the heater vessel | Third party certification is required for the pressure vessel testing |

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| 57 | Previous supply | Previous supply details and relevant documents need to be submitted |
| 58 | Available space for the heater installation | 4 m* 2 m*3 m |

General requirements:

OPTIONAL:

1. Please Quote For 1 year and 2 year Extended Warranty
2. Quote for AMC beyond warranty.

Terms and conditions

1. Warranty service must be provided on-site at IIT, Madras for duration of warranty period.
2. Vendors should provide continuous technical support and maintenance of equipment during warranty period.
3. Vendors must have sufficient experience in supplying equipment to reputed organizations for research purpose. Experience of the end users will also be used as a criterion for the selection of bids that meet technical requirements.
4. List of reputed end users inclusive of educational institutions in India (at least 3) to whom supplies made should be furnished.
5. Vendors must provide detailed documentation for the equipment.
6. Vendors must provide training to our technical staff for using the equipment, free of cost.
7. Vendor must have permanent service representative stationed in India.
8. The vendor must have at least 5 years' experience in manufacturing the product.