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Dr. Panchanana Khuntia  
Project Coordinator

**Ref.: PHY/2017/007/Stores**  
Dated: 07.12.2018

**Limited Tender No.: PHY/2018/007/Stores**

**Due Date: 31.12.2018, 5:00 PM**

Dear Sir/Madam,

On behalf of the Indian Institute of Technology Madras, offers are invited for the supply of “**High Temperature Chamber Furnace**” confirming to the specifications given in (Annexure-I):

### **Instructions to the Bidder**

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

**(ii) Delivery of the tender:** - The tender shall be sent to the below-mentioned addresses either by speed post/registered post or by courier so as to reach the following address before the due date and time specified in our Schedule:

**Dr. Panchanana Khuntia, Department of Physics  
Indian Institute of Technology Madras  
Chennai-600036, India**

**(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 of financial bid, those bidders who are technically qualified only will be called for.

**(iv) Prices:** - The price should be quoted in net per unit (after breakup) and must include all packing and delivery charges to Physics Department of IIT Madras. The offer/bid should be exclusive of taxes and duties, which will be paid by the purchaser as applicable. However the percentage of tax & duties should be clearly indicated separately. IIT Madras is eligible for concessional GST and relevant certificate will be issued. The price should be quoted without custom duty and excise duty, since IIT Madras is exempt from payment of excise duty, and the custom duty will be paid at concessional rate against duty exemption certificate.

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 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) Terms of Delivery:** - The item should be supplied to the Physics Departments 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 **2<sup>nd</sup> January 2019** and the financial bids of those tenders who are technically qualified will be opened at a later date.

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

Sincerely,

Dr. Panchanana Khuntia  
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## **TERMS AND CONDITIONS**

### **Important Conditions of the tender**

1. The due date for the submission of the tender is **31.12.2018, 5:00 P.M.**

2. The offers / bids should be submitted in two bids systems (i.e.) Technical bid and Financial bid separately. 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 Limited Tender for supply of one “**High Temperature Chamber Furnace**” should be written on the left side of the Outer bigger cover and sealed. Mark reference no. on the top of the envelopes.

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 of India will be acceptable.

**Only after submission of Performance Security, Purchase Order/Work Order will be released / L.C will be opened.**

**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. 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 (renowned research/academic institutes in India and abroad). A list of customers in India and abroad with details must accompany the quotations. The bidder should have supplied at least one renowned research/academic institute in India. 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.

**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 highly qualified engineer of the successful bidder in free of cost. Free installation and local service is mandatory

**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. Clear warranty statement required.

**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: -** IIT 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: -

(a) **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 IIT Madras 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.

**(b) 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.

(c) 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

## **Corrigendum for limited tender: PHY/2018/007/Stores**

**Ref.: PHY/2017/007/Stores**

Dated: 07.12.2018

This refers to minor modifications (highlighted) regarding the technical specifications (volume) of high temperature chamber furnace. All other terms and conditions remain the same as in the original tender.

### **Annexure-I**

#### **SPECIFICATIONS FOR HIGH TEMPERATURE CHAMBER FURNACE**

We aim at synthesizing a variety of materials with different annealing temperature stages ranging from 300° C to 1700° C. We need to have two chambers for this purpose. (1) The bench-top high temperature muffle furnace consists of high-quality alumina fiber bricks with housing made of sheets of textured stainless steel and MoSi<sub>2</sub> heating elements with a chamber size of 15x30x16 cm<sup>3</sup> with 8 liters capacity. It is proposed to use for annealing and sintering of all types of new material samples. The max. heating temperature is 1750°C. The temperature controller should be programmable with high precision digital controller with an accuracy of +/-1 °C and temp. ramp rate 1deg. C/min. or less. (2) For better temperature control at low temperature and to avoid contamination of sample results from the oxidation of heating element of the high temperature chamber (1 as above), we need another chamber with 3 liters capacity with max. heating temperature (1200°C) with inner dimensions 16x14x12 cm<sup>3</sup> is desired. The temperature controller should be programmable with high precision digital controller with an accuracy of +/-1 °C and temp. ramp rate 1deg. C/min. or less. Further details can be found as follows:

#### **INSTRUMENT SPECIFICATIONS:**

##### **First Chamber with inner dimensions: 15x30x17 cm<sup>3</sup>**

Continuous working Temperature	✓ 1700°C with max. (rated) temperature 1750°C
Heating Elements	High quality MoSi <sub>2</sub> heating elements
Dimension	✓ Chamber: 15x 30 x 16 cm <sup>3</sup> (W x D x H cm), ✓ Volume: 8 Liters ✓ Overall: 47 x 85 x 112 cm <sup>3</sup>
Structure of the Furnace	

	<ul style="list-style-type: none"> <li>✓ Furnace chamber lined with first-class, durable fiber material</li> <li>✓ Housing made of sheets of textured stainless steel</li> <li>✓ Dual shell housing with additional fan cooling for low surface temperature</li> <li>✓ Compact design with lift door, opening upwards</li> <li>✓ Adjustable air inlet</li> <li>✓ Exhaust air opening in the roof</li> <li>✓ Type B thermocouple</li> <li>✓ Switching system with phase-angle firing thyristors (SCRs)</li> <li>✓ Defined application within the constraints of the operating instructions</li> </ul>
Power Consumption	Max. 8 kW (3 phase)
Input Voltage	AC 230V, 50 Hz
Temperature Uniformity	<ul style="list-style-type: none"> <li>✓ Outstanding temperature uniformity in all temp. range of operation.</li> <li>✓ +/- 5°C over 120 mm (5") @ 1700°C</li> <li>✓ +/- 2°C over 80 mm (3") @ 1700°C</li> <li>✓ Minutes to reach max. temp.=40 min.</li> </ul>
Temperature Accuracy	+/- 1° C
Heating Elements	Super 1800 grade MoSi <sub>2</sub> Heating Elements
Thermocouple	High quality B Type (Pt-Rh to Pt-Rh) with Alumina tube
Temperature Controller	<p><b>Type: P470</b>  Include very High quality temperature controller</p> <ul style="list-style-type: none"> <li>✓ Proportional–integral–derivative control (PID control) and auto-tune function</li> <li>✓ 50 programs</li> <li>✓ 40 segments programmed with ramping, cooling and dwelling steps.</li> <li>✓ Heating rate (ramping rate): 1 deg. C/min. or less</li> <li>✓ Built-in over-temperature controller alarm and thermocouple failure alarm</li> <li>✓ +/- 1 °C temperature control accuracy</li> <li>✓ PC communication port</li> <li>✓ MET Certified</li> </ul>

**Additional specifications for temp. controller:**

Max. no. of control zones: 3

Extra functions: 2-6

Status message: yes

Entering prog. names: yes

Real-time clock: yes

Drive of manual zone regulation: yes

Operating hour counter: yes

**Second Chamber with inner dimensions: 16x14x12 cm<sup>3</sup>**

Continuous working Temperature	✓ 1150°C with max. (rated) temperature 1200°C
Heating Elements	High quality integrated heating elements
Dimension	✓ Inner dimension: 16x 14 x 12 cm <sup>3</sup> (W x D x H cm), ✓ Volume: 3 Liters ✓ Outer dimension: 39 x 37 x 44 cm <sup>3</sup>
Structure of the Furnace	✓ Ceramic heating plates with integral heating element which is safeguarded against fumes and splashing, and easy to replace ✓ Highly durable cured vacuum fiber module lining ✓ Housing made of sheets of textured stainless steel ✓ Dual shell housing for low external temperatures and high stability ✓ Optional flap door (L) which can be used as work platform or lift door (LT) with hot surface facing away from the operator ✓ Adjustable air inlet integrated in door ✓ Exhaust air outlet in rear wall of furnace ✓ Solid state relays provide for low-noise operation ✓ Several heating rate (temperature ramp) : 1°C/min or less ✓ Multi steps temperature programming with option to store several program for future access ✓ Minutes to reach max. temp.=75 min.
Power Consumption	Max. 1.2 kW (single phase); 230 V and 50 Hz
Temperature Accuracy	+/- 1° C
Heating Elements	High quality Integrated Heating Elements
Thermocouple	High quality S-type
Temperature Controller	<b>Type: B410</b> Include very High quality temperature controller Proportional–integral–derivative control (PID control) and auto-tune function : Microprocessor based programmable PID temperature controller with LCD display  ✓ 5 programs ✓ 4 segments programmed with ramping, cooling and dwelling steps ✓ Heating rate (ramping rate): 1 deg. C/min. or less



	<ul style="list-style-type: none"><li>✓ Built-in over-temperature controller alarm and thermocouple failure alarm</li><li>✓ +/- 1 °C temperature control accuracy</li><li>✓ PC communication port</li><li>✓ MET Certified</li></ul>
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**Additional specifications for temp. controller:**

Max. no. of control zones: 1

Extra functions: 2

Status message: yes

Entering prog. names: yes

Real-time clock: yes

Operating hour counter: yes

**N.B.: The successful bidder/vendor should be able to provide excellent life time technical support/service to the furnace.**

Sincerely,

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