Indian Institute of Technology Madras

I.I.T.P.O., MADRAS-600 036

STORES & PURCHASE SECTION

Form for Inviting Quotations

Ref.No. **Date:**10 August 2018

CHE	2018	AK	Evaporator

Under Certificate of Posting

Dear Sirs, **DUE DATE: 24 August 2018, 12 PM**

1. Quotations are invited in duplicate for the various items shown below /overleaf/ enclosed list. Quotation should contain two separate parts, a technical offer and a commercial offer, enclosed in a sealed envelopes.
2. The quotations duly sealed and superscribed on the envelope with the reference no. and due date, should be addressed to the undersigned so as to reach him on or before the due date stipulated above.
3. The quotations should be valid for sixty days from the due date and the period of delivery required should also be clearly indicated.
4. If the item is under DGS&D rate contract no. and the price must be mentioned. It may also please be indicated whether the supply can be made direct to us at the rate contract price (please note that we are not Direct Demanding Officers). If so please send copy of the RC.
5. Relevant literature pertaining to the items quoted with full specifications (and drawing, if any) should be sent along with the quotations, wherever applicable. Samples if called for, should be submitted free of charges, and collected back at the supplier's expenses.
6. Local Firms : Quotations should be for free delivery to this Institute. If quotations for Ex-Godown delivery charges should be indicated separately.
7. Firms Outside Chennai: Quotations should be for F.O.R. Chennai. If F.O.R. consignor station, freight charges by passenger train / lorry transport must be indicated. If Ex-Godown, packing, forwarding and freight charges must be indicated.
8. The rate of GST and the percentage of such other taxes legally leviable and intended to be claimed should be distinctly shown along with the price quoted. Where this is not done, no claim for GST will be admitted at any stage and on any ground whatsoever.

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The taxes leviable should take into consideration that we are entitled to have concessional GST applicable to non-Government Educational Institutions run with no profit motive for which a concession. Sales Tax Certificate will be issued at the time of final settlement of the bill.

9. Goods should be supplied carriage paid and insured.
10. Goods shall not be supplied without an official supply order.
11. Payment : Every attempt will be made to make payment within 30 days from the date of receipt of bill / acceptance of goods, whichever is later

Yours faithfully,

10/08/2018

Aravind Kumar Chandiran
Assistant Professor
Department of Chemical Engineering
Indian Institute of Technology
Chennai-36.

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Send the bills to

Aravind Kumar Chandiran
CHL 206A, Department of Chemical Engineering
IIT - Madras, Adyar,
Chennai - 600036.

Technical Specification for Thermal Evaporator (vacuum coating unit) with Turbomolecular pump

IIT MADRAS is looking to procure a thermal evaporator (vacuum coating unit) for the deposition of metals, especially, gold, silver and chromium. On top of the standard fittings and components, the thermal evaporator should satisfy the following basic requirements/specifications. The bidder should be an Indian company who supplied at least one such system to IIT Madras in the last 5 years. The bidding company should have service engineer stationed in Chennai/Bangalore or nearby area.

1. Vacuum Chamber
    a. Vacuum chamber should be made of stainless steel, preferably SS304 or better.
    b. Should be a D type/Box type chamber with front door opening.
    c. Should have provisions to connect
        i. at least 2 evaporation sources and their electrical lines
        ii. a rotary pump/dry scroll pump
        iii. a high vacuum turbo molecular pump
        iv. thickness monitor
        v. viewing port
        vi. vacuum gauges
        vii. substrate rotation system
        viii. source shutters for evaporation sources
        ix. vent valve
    d. Should have capability to hold 5×10^{-7} mbar pressure
    e. Should have a provision to add a 1 to 2 inch sputtering system in future
    f. Should have a provision to upgrade thermal evaporation system to e-beam evaporation system.
2. Evaporation sources and their allied accessories.
    a. Should have two evaporation systems with appropriate electrical feed throughs, independent power supplies, transformers and electrodes.
    b. Both the electrodes should have capability to hold baskets, filaments or boats
    c. Both the electrodes should be capable of carrying 200A current at 10 V or 100 A current at 20 V
    d. Should provide digital meters to monitor the current flowing through the electrodes
    e. Should provide two independent manually operated shutters for both the evaporation sources, to start or stop the evaporation.

    <u>OPTIONAL COMPONENTS</u>

    f. Should provide 6 number of tungsten baskets/boats
    g. Should provide 5 numbers of molybdenum boats
    h. Should provide 2 gaskets/O-rings needed for vacuum chamber
    i. Should provide 2 molybdenum crucibles
    j. Should provide 2 graphite crucibles
    k. Any additional accessories needed can also be quoted.
3. Substrate holder and allied components
    a. Should have capability for substrate rotation of upto 20 RPM
    b. Should hold at least four square (6 cm x 6 cm to 9 cm x 9 cm) substrates. The diameter of the substrates shall be decided based on the positioning and dimensions of 4 square substrates. A reference diagram is given below.

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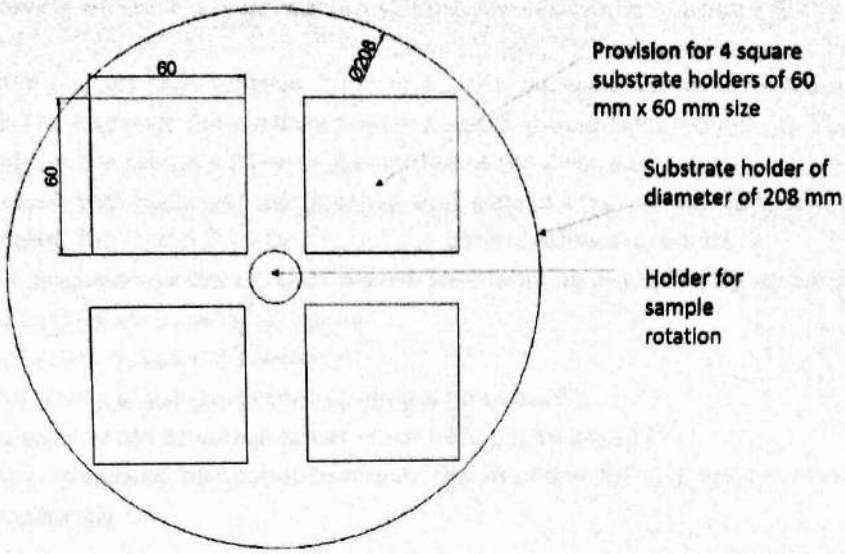

4. Thickness monitor
    a. Quartz crystal microbalance should be installed inside the chamber to monitor the thickness of the deposition
    b. Appropriate digital control to view the thickness and the rate of the deposition directly. Expected precision: 1 angstrom.

    OPTIONAL COMPONENTS
    c. Should provide 10 numbers of crystals as spare.
5. Vacuum system
    a. Should have two stage vacuum system with the rough vacuum being controlled by rotary vacuum pump or dry scroll pump and high vacuum being controlled by turbo molecular pump
    b. The rotary vacuum pump or dry scroll pump should have capability to pump at least 12 m^3 per hour
    c. Turbo molecular pump should be capable of pumping at least 300 litres per second. It is preferred to have Edward/Pfeiffer/Leybold made turbo molecular pump.
    d. Separate vacuum gauges should be provided in the chamber to measure rough vacuum and high vacuum.
    e. Manual control valve for switching over from rough vacuum to high vacuum has to be provided.
    f. Pumping lines should be corrosion resistant preferably made of stainless steel.
    g. Liquid nitrogen trap should be provided for high vacuum pump
    h. Vent valve should be provided to break the vacuum.
6. The entire thermal evaporation unit should be housed in a compact and sturdy cabinet in order to utilize minimal lab space. Any additional plumbing line, electrical circuits, or other necessary components needed for the thermal evaporator for the evaporation of metals (Ag, Au and Cr) shall be added to the system.
7. Safety interlocks need to be provided at appropriate places to avoid vacuum related manual errors, electrical issues and operator safety.
8. Components for the instrument should be leak checked and preferred to have electropolished components to maintain high vacuum.

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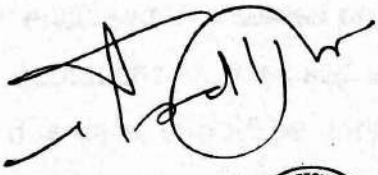
9. Should provide at least 1 year warranty. Cost for additional warranty can be quoted as optional.
10. Vendor/Manufacturer should have supplied a similar vacuum system to IIT-Madras in the last five years. The name of the customer in IIT-Madras should be provided. IIT-Madras reserve right to inquire the bidder's IIT-M customer about the prior experience about their products and service. If the quality of the product and service received by IIT-M customer, found dissatisfactory, the bidder may be disqualified under technical grounds.
11. The service engineer for the product should preferably be available in South India, and most preferably in Chennai or Bangalore area.
12. OTHER OPTIONAL SPECIFICATIONS
    a. Possibility of substrate heating should be quoted
    b. Possibility of vacuum chamber cooling should be quoted
    c. Any additional components/accessories available for the system must be quoted separately.



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