**DEPARTMENT OF APPLIED MECHANICS AND BIOMEDICAL ENGINEERING**

**INDIAN INSTITUTE OF TECHNOLOGY MADRAS, IIT POST,**

**CHENNAI — 600 036, INDIA**

**PHONE: 044 22575057, FAX: 044 22574052**

**Dr. M.S. Sivakumar, Date: 01.03.2024**

**Professor & HoD**

**Ref No: AMBE/2023/MS/004 Magentron Due Date: 11-03-2024**

Dear Sir,

Quotations are invited in duplicate for the various items shown below overleaf/enclosed list.

1. The quotations are to be in two parts as:

Technical Offer and as Commercial offer

The two parts of the offer are to be clearly marked on the envelopes. The two parts of the offer in separate envelopes must be enclosed in one bigger envelope duly sealed and super scribed with reference numb r and due date and must be addressed to the undersigned so as to reach him on o before the due date stipulated above.

2. The quotations duly sealed and subscribed on the envelope with reference no. and due date, should be addressed to the undersigned so as to reach him or before the due date stipulated above.

3. Quotations should be valid for 60 days from the due date and period of delivery indicated.

4. Local firms to quote for free delivery to the Institute. If quoted for Ex-godown delivery charges are indicated separately.

5. Relevant literature pertaining to the items quoted with full specifications.

6. Sales Tax/General Taxes/ED if applicable and such other taxes legally legible and intended to be claimed should be distinctly shown along with the price quoted. If this is not indicated no such claim will be admitted at any stage.

7. Goods should be supplied in carriage paid and insured.

8. Goods shall not be supplied without an official supply order.

9. Every effort will be made to make payment within 30 days from the to of bill/acceptance of goods whichever is later.

10. The Guarantee period of the item may be indicated clearly.

11. In case of LC. Payment 90% of the payment will be made after completion of the supply. The balance 10% of the payment will be made after satisfactory installation of the equipment.

12. IIT Madras is exempt from payment of Excise Duty and is eligible for concessional rate of custom duty. Necessary certificate will be issued on demand IIT Madras will make necessary arrangements for the clearance of imported goods at the Airport/Seaport. Hence the price should not include the above charges.

13. 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 rejects it in full without assigning any reason.

14. Fax and Email quotations are not acceptable.

Yours faithfully,

Head of the Department – AMBE.

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TECHNICAL SPECIFICATION FOR MAGNETRON SPUTTERING SYSTEM

1. VACUUM CHAMBER:

 stainless steel, front-loading, high vacuum, D shaped, water-cooled chamber and having

dimension 400mm (W) x 400mm (D) x 500mm (H) with view port in chamber door. It

should have provision for three targets.

 A set of easily removable stainless-steel chamber liners.

2. MAGNETRON SOURCE:

 Two numbers of 2” flexible sputter sources. Provision for adding one more source.

 High power Nd-Fe-B magnets which needs to be isolated from the water.

 Easy to change target without breaking any internal seals.

 User-adjustable tilt angle (45°) with respect to the plane of the substrate

 The magnetrons to be arranged in “sputter up”, confocal configuration.

 An electro pneumatically operated target shutter to be provided for each source.

3. POWER SUPPLIES:

 Two numbers of 1 kW DC power supply. Provision needs to be provided to add one more AC power supply.

4. SUBSTRATE HOLDER WITH HEATER:

 The rotary substrate work holder and associated fixture to be designed to hold up to

a 4- inch substrate.

 The rotary drive mechanism to be provided for the continuous rotation of the

substrate with adjustable speed up to 30 rpm.

 Resistive substrate heater to be provided to heat 4” substrate from R.T to 500 deg. C.

Provision needs to be provided for 100 deg. C.

 Temperature measurement using ‘K’ type thermocouple.

 Temperature controlled using digital PID controller.

 An electro pneumatically operated substrate shutter should be provided.

5. MASS FLOW CONTROLLER:

 Mass flow controller for Argon and Oxygen gas with necessary fitting is provided - 2No’s. However, provision needs to be provided for one more controller.

6. VACUUM PUMPING SYSTEM:

 A dual stage rotary pump with displacement capacity of 12 m3/hr

 A diffusion pump having a pumping capacity of 600 lit/sec.

 An inbuilt liquid nitrogen trap to be incorporated below the high vacuum valve.

 Stainless steel vacuum pipelines.

 1-inch electro pneumatic right-angle valves for roughing and backing.

 The valves need to be interlocked to avoid accidental opening by operators.

 A vent valve is necessary

 Motorized high vacuum valve(poppet) of suitable size to be

mounted above the high vacuum pump and can be operated in

throttling mode during sputtering.

 A needle valve is necessary.

 A digital gauge with two numbers of high pressure pirani gauge

monitor are necessary to look at the pressure in the range of 1000

mbar to 10-3 mbar.

 A digital inverted magnetron sensor is necessary to monitor the

pressure in the range of 10-2 mbar to 10-7 mbar.

 The ultimate vacuum of better than 1 x 10-6 mbar range needs to

be achieved in clean, cold, degassed, chamber after high vacuum

valve opens and initially back filled with pure and dry nitrogen

gas and liquid nitrogen trap filled with liquid nitrogen.

7. CONTROL CONSOLE:

 A separate control is provided for mounting the gauges display

unit and control for substrate rotation, heating, and magnetron

power supply, etc.

 Manual ON/OFF switches

 All necessary safety interlocks

8. WARRANTY:

 Two years from the date of installation.

Delivery: 1 Week from the date of the confirmed order.

* Installation & Commissioning: The Installation & Commissioning should be provided free of cost at IIT Madras.
* Training : Training to be provided by the supplier for one week.
* Minimum 2-year warranty should be provided.
* Proof of supply of similar equipment to government or academic institutes to be provided.
* Distributers need to provide authorization certificate from the equipment supplier.
* Two-bid system will be followed. Technical compliance statement and price quotation to be submitted in separate envelops.

Yours faithfully,

Head of the Department – AMBE.

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**INFORMATION OF TENDER TO UPLOAD IN CPP PORTAL Date: 01.03.2024**

|  |  |  |
| --- | --- | --- |
| **1** | **Purchase from** | **INSTITUTE** |
| **2** | **Tender Reference No.** | **AMBE/2023/MS/004 Magnetron** |
| **3** | **Name of the item** | **Magnetron Sputtering System**  1. VACUUM CHAMBER:   stainless steel, front-loading, high vacuum, D shaped, water-cooled chamber and having  dimension 400mm (W) x 400mm (D) x 500mm (H) with view port in chamber door. It should have provision for three targets.  A set of easily removable stainless-steel chamber liners.  2. MAGNETRON SOURCE:   Two numbers of 2” flexible sputter sources. Provision for adding one more source. High power Nd-Fe-B magnets which needs to be isolated from the water. Easy to change target without breaking any internal seals. User-adjustable tilt angle (45°) with respect to the plane of the substrate. The magnetrons to be arranged in “sputter up”, confocal configuration. An electro pneumatically operated target shutter to be provided for each source.  3. POWER SUPPLIES:   Two numbers of 1 kW DC power supply. Provision needs to be provided to add one more AC power supply.  4. SUBSTRATE HOLDER WITH HEATER:   The rotary substrate work holder and associated fixture to be designed to hold up toa 4- inch substrate. The rotary drive mechanism to be provided for the continuous rotation of the substrate with adjustable speed up to 30 rpm.  Resistive substrate heater to be provided to heat 4” substrate from R.T to 500 deg.C Provision needs to be provided for 100 deg.C  Temperature measurement using ‘K’ type thermocouple. Temperature controlled using digital PID controller. An electro pneumatically operated substrate shutter should be provided.  5. MASS FLOW CONTROLLER:   Mass flow controller for Argon and Oxygen gas with necessary fitting is provided - 2No’s. However, provision needs to be provided for one more controller.  6. VACUUM PUMPING SYSTEM:   A dual stage rotary pump with displacement capacity of 12 m3/hr  A diffusion pump having a pumping capacity of 600 lit/sec .   An inbuilt liquid nitrogen trap to be incorporated below the high vacuum valve. Stainless steel vacuum pipeline   1-inch electro pneumatic right-angle valves for roughing and backing. The valves needs to be interlocked to avoid accidental opening by operators.   A vent valve is necessary   Motorized high vacuum valve(poppet) of suitable size to be  mounted above the high vacuum pump and can be operated in throttling mode during sputtering. A needle valve is necessary   A digital gauge with two numbers of high pressure pirani gauge monitor are necessary to look at the pressure in the range of 1000mbar to 10-3 mbar.  7. CONTROL CONSOLE:   A separate control is provided for mounting the gauges display unit and control for substrate rotation, heating, and magnetron power supply, etc.   Manual ON/OFF switches   All necessary safety interlocks  8. WARRANTY:  Two years from the date of installation. |
| **4** | **Tender Category**  **(GOODS/WORKS/SERVICE** | Goods |
| **5** | **Type of Tender (Limited)** | Limited |
| **6** | **No. of Bids : ( 1/ 2)** | 2 |
| **7** | **Tender Start Date** | 01.03.2024 |
| **8** | **Tender Due Date & Time** | 11.03.2024 & 3 PM |
| **9** | **Bid Opening Date & Time** | 11.03.2024 & 4 PM |
| **10** | **Bid Opening venue** | Dept of Applied Mechanics& Biomedical Engg, MSB 226 |
| **11** | **Pre-bid meeting Date & Time** | - |
| **12** | **Pre-bid meeting venue** | - |
| **13** | **Quotation Validity Days** | 30 days |
| **14** | **Tender Validity Days** | 60 days |
| **15** | **Completion of work** | - |
| **16** | **Quotation May be Sent to (Inviting officer Name & Address)** | **Dr. M.S. Sivakumar,**  **DEPARTMENT OF APPLIED MECHANICS AND BIOMEDICAL ENGINEERING**  INDIAN INSTITUTE OF TECHNOLOGY MADRAS,  IIT POST,  Chennai – 600036. |
| **17** | **No of documents to be uploaded in CPP portal** | 3 |

Yours faithfully,

Head of the Department – AMBE.