

TENDER

FOR

SUPPLY & INSTALLATION OF CHAMBER FOR ASSEMBLED SPUTTERING
SYSTEM IN SCHOOL OF COMPUTING & ELECTRICAL ENGINEERING,

IIT MANDI



Tender No.: IITMANDI/S&P/PUR-66/2015-16/5091-92

Tender date: 05th September, 2015

Last Date of submission: 28th September, 2015

Indian Institute of Technology, Mandi

Transit Campus: Mandav Hotel, 2nd Floor (Near Bus Stand), Mandi – 175001 (H.P)

Tel.: 01905-237908 & 267039

Email: satinder@iitmandi.ac.in & arsp@iitmandi.ac.in

Indian Institute of Technology Mandi, Mandi invites tender for supply, erection, installation, commissioning, testing, demonstration and training of **Chamber for Assembled Sputtering System**, as per specifications given in the Annexure attached to the Tender form. All offers should be made in English and should be written in both figures and words. Tender forms can be downloaded from the website (<http://iitmandi.ac.in/administration/tenderseoi.html>) of the Institute. Tender document also published on e- tendering (<http://eprocure.gov.in/eprocure/app>). The bidder can also submit bids online.

The bidders are requested to read the tender document carefully and ensure compliance with all specifications/instructions herein. Non-compliance with specifications/instructions in this document may disqualify the bidders from the tender exercise. The Director, IIT Mandi, Kamand reserves the right to select the item (in single or multiple units) or to reject any quotation wholly or partly without assigning any reason. Incomplete tenders, amendments and additions to tender after opening or late tenders are liable to be ignored and rejected.

Terms and Conditions:

1. The technical and financial bids should be quoted separately and put in different sealed envelopes marked "**Technical bid**" or "**Financial bid**" as applicable. These separate bids envelopes are to be put in an outer envelope which should also be sealed.
2. The Vendors who have earlier supplied the equipment to any of the IITs, IISc, IISERs and other Scientific Institute of National Repute may only tender. The details of such institutions and the cost with name of equipment may also be supplied with the bids.
3. The technical and financial bids should be submitted in original. The financial bid should include the cost of main equipment/item and its accessories. If there is any separate cost for installation etc. that should be quoted separately.
4. Each individual sealed envelope as well as the outer envelope should be marked with the following reference on the top left hand corner: "**IITMANDI/S&P/PUR-66/2015-16/5091-92/Item Name. ___ dated 05th September, 2015**"
5. The printed literature and catalogue/brochure giving full technical details should be included with the technical bid to verify the specifications quoted in the tender. The bidders should submit copies of suitable documents in support of their reputation, credentials and past performance.
6. The rates should be quoted in figures (typed or printed) and cutting should be avoided. The final amount should be in figures as well as in words. If there are cuttings, they should be duly initialed, failing which the bids are liable to be rejected.
7. Any bids received after **1:00 P.M. on 28th September, 2015** shall not be considered
8. The Technical Bids will be opened on **28th September, 2015 at 03:00 P.M.** The date & time for opening of Financial Bids will be informed later on to the technically qualified bidders.

9. While sending rates, the firm shall give an undertaking to the effect that *“the terms/conditions mentioned in the enquiry letter/Tender Notice against which the rates are being given are acceptable to the firm.”* In case the firms do not give this undertaking, their rates will not be considered.
10. If the supplier/firm is original equipment manufacturer (OEM)/authorized dealer/sole distributor of any item, the certificate to this effect should be attached.
11. The quantity shown against the item is approximate and may vary as per demand of the Institute at the time of placing order.
12. All tender documents should have to be sent through courier, speed post or registered post only. All tender documents received after the specified date and time shall not be considered.

The postal address for submitting the tenders is:

**“Assistant Registrar, Stores and Purchase”
Indian Institute of Technology Mandi (IIT Mandi),
Administrative Block (Mandav Hotel,
Near Bus Stand), Mandi – 175001 (H.P), India”**

13. In the event of any dispute or difference(s) between the vendee Institute (IIT Mandi) and the vendor(s) arising out of non-supply of material or supplies not found according to specifications or any other cause whatsoever relating to the supply or purchase order before or after the supply has been executed, shall be referred to “The Director, IIT Mandi”, Kamand who may decide the matter himself or may appoint arbitrator(s) under the arbitration and conciliation Act,1996. The decision of the arbitrator shall be final and binding on both the parties.
14. The place of arbitration and the language to be used in arbitral proceedings shall be decided by the arbitrator.
15. All disputes shall be subject to Mandi Jurisdiction only.
16. All tenders in which any of the prescribed conditions is not fulfilled or any condition is putforth by the tenderer shall be summarily rejected.
17. IIT Mandi reserves the right to cancel the tender at any point of time without assigning any reason.
18. The bidders or their authorized representatives may also be present during the opening of the Technical Bid, if they desire so, at their own expenses.

Note: Price bids of only those bidders will be opened whose technical bids are found suitable by the committee appointed for the purpose. Date and time of opening of price bids will be decided after technical bids have been evaluated by the committee. Information in this regard will be intimated to the technically qualified bidders. In exceptional situation, an authorized committee may negotiate price with the qualified bidder quoting the lowest price before awarding the contract.

19. **Clarifications:**

In case the bidders requires any clarification regarding the tender documents, they are requested to contact our office (e-mail: satinder@iitmandi.ac.in & arsp@iitmandi.ac.in on or **before 18/09/2015**.

20. **Tender Cost:**

A Demand draft of **Rs. 1,000/- (Rupees One Thousand only)** towards non-refundable **tender fee, drawn in favour of "The Registrar, IIT Mandi"** payable at Mandi should accompany the Technical bid documents. In the absence of tender cost, the tender will not be accepted.

21. **Earnest Money Deposit (EMD):**

A refundable amount @ of 2% of quoted value as per earnest money deposit (EMD) in the shape of DD from a scheduled bank in India (**valid for a minimum period of 3 months from the date of submission of tender**) should accompany the bid documents. The DD drawn in favour of "The Registrar, IIT Mandi" payable at Mandi should accompany the bid documents. The EMD should be kept in a separate sealed envelope, should be marked clearly and put in the outer envelope that contains the technical and financial bid envelopes. The bidders should enclose a pre-receipted bill for the EMD to enable us to return the EMD of unsuccessful bidders. Failure to deposit **Earnest Money** will lead to rejection of tender. In the event of the awardee bidder backing out, EMD of that bidder will be forfeited.

22. **Pre – Qualification Criteria:**

- a. Bidders should be the manufacturer / authorized dealer. Letter of Authorization from original equipment manufacturer (OEM) on the same and specific to the tender should be enclosed.
- b. The Vendors who have earlier supplied the equipment to any of the IITs, IISc, IISERs and other Scientific Institute of National Repute may only tender. The details of such institutions and the cost with name of equipment may also be supplied with the bids.
- c. An undertaking from the OEM is required stating that they would facilitate the bidder on a regular basis with technology/product updates and extend support for the warranty as well.
- d. OEM should be internationally reputed Branded Company.
- e. Non-compliance of tender terms, non-submission of required documents, lack of clarity of the specifications, contradiction between bidder specification and supporting documents etc. may lead to rejection of the bid.
- f. **Furnishing of wrong/ambiguous information in the compliance statement may lead to rejection of bid and further black listing of the bidder, if prima-facie it appears that the information in the compliance statement was given with a malafide/fraudulent intent.**

23. **Prices:**

- a. The Prices quoted should be inclusive of all taxes or duties, packing, forwarding, freight, insurance, delivery and commissioning etc. at destination site (IIT Mandi, Mandi/Kamand). IIT Mandi is registered with DSIR, Govt. of India and is exempted from Custom / Excise Duty. Exemption Certificate to this effect will be issued by IIT Mandi. **Hence, Customs/Excise Duty exempted price should be quoted.** The rates shall be firm and final. Nothing extra shall be paid on any account. **In the price bid/financial bid, the vendor should clearly mention the final price breakup i.e. ex-work price/FCA price, FOB price, CIP/CIF price & FOR IIT Mandi, Kamand Campus price, as applicable in their bid.**
- b. In case of imported equipment(s)/item(s), the agency commission, if any, payable in Indian rupees should be mentioned separately. For imported equipment, the Letter of Credit will be opened for the amount excluding agency commission in Indian Rupees. The firm should clearly mention the address of foreign bank in the financial bid.

24. **Validity:**

The bid should be valid for acceptance up to a period of 180 Days. The Bidders should be ready to extend the validity, if required without any additional financial implications.

25. **Delivery:**

The Equipment should be delivered and installed within the period as specified in the purchase order and be ready for use within 24 weeks of the issue of purchase order unless otherwise prescribed. If the bidder fails to deliver and place any or all the Equipments or perform the service by the specified date, penalty at the rate of 1% per week of the total order value subject to the maximum of 10% of total order value will be deducted.

26. **Training:**

Bidders need to provide adequate training to the nominated persons of IIT Mandi at their cost. IIT Mandi will not bear any training expenditure.

27. **Warranty Declaration:**

Bidders must give the comprehensive on-site warranty as required from the date of successful installation of Equipment against any manufacturing defects and also give the warranty declaration that *“everything to be supplied by us hereunder shall be free from all defects and faults in material, workmanship and shall be of the highest quality and material of the type ordered, shall be in full conformity with the specification and shall be complete enough to carry out the experiments, as specified in the tender document.*

Any deviation in the material, and the specifications from the accepted terms may liable to be rejected and the bidders need to supply all the goods in the specified form to the satisfaction / specifications specified in the order / contract and demonstrate at their own cost.

28. **Performance Bank Guarantee:** A performance bank guarantee from a scheduled bank in India for an amount equal to 10% of the price for duration of two months beyond the expiry of warranty period will be taken from the supplier or Indian agent.
29. **Terms of Payment:** Payment will generally be made only after delivery and satisfactory installation, testing, commissioning etc. **This must be specified in the tender/quotation.**
- In case of imported supplies, payment (excluding Indian agency commission, if any) will be made through irrecoverable Letter of Credit in two installments. 80 % of the money will be released on submission of shipping of documents. Remaining 20 % will be released after successful installation of the instrument and submission of a performance bank guarantee for 10% of the order value from a nationalized bank, valid for 2 months beyond the expiry of the warranty.
30. **Tender expenses and documents:** All costs incurred by the bidder in the preparation of the tender shall be at the entire expense of the bidder.
31. **Tender Evaluation Criteria:** The technical bids will be opened and evaluated by a duly constituted committee. After evaluation of the technical bid, the financial bid for only those offers which have qualified in the evaluation of technical bid will be opened.
32. **Return of EMD:**
- The earnest money of unsuccessful bidders will be returned to them without any interest within 15 working days after awarding the contract.
 - The earnest money of the successful bidder will be returned to them without any interest within 15 Days after supply of material.
33. **Manual and documentation:** All the manuals necessary for operating and servicing the equipment (including details of electronic circuits) will have to be provided along with the instrument.
34. The IIT Mandi reserves the right to cancel the tender at any stage (point of time) without assigning any reason.
35. Bidders should go through the tender terms, conditions and specifications carefully and fill in the attached compliance statement accurately and unambiguously. They should ensure that all the required documents are furnished along with the bid.

Sd/
Assistant Registrar
Stores & Purchase

BID PARTICULARS

- 1. Name of the Supplier :

- 2. Address of the Supplier :

- 3. Availability of demonstration of equipment : Yes / No

- 4. Tender cost enclosed: : Yes/No if yes

D.D. No. _____ Bank _____ Amount _____

- 5. EMD enclosed : Yes / No if Yes

D.D. No. _____ Bank _____

- 6. Name and address of the Officer/contact person to whom all references shall be made regarding this tender enquiry.

Name :

Address :

Telephone No. :

Fax No. :

Mobile No :

e-Mail :

Web

Ref:-ENQUIRYNO:- **IITMANDI/S&P/PUR-66/2015-16/ Item No.1/Multi Chamber**

Procurement of Multi Chamber System for Assembled Sputtering System

❖ **HIGHLIGHTS**

A. High Vacuum Chamber:

1. Stainless steel chambers
2. Channels must be welded on external side for water circulation.
3. Gas inlet ports at suitable location.
4. Top to be provided with ports for substrate rotation.
5. 6" view port with shutter.
6. High Vacuum throttling Gate Valve.
7. High Vacuum Measuring gauges.

B. Substrate holder specifications

1. Substrate Holder to hold substrate of 2", 4" and 6" dia.
2. Substrate rotation from 2 to 5 rpm
3. Substrate to target distance adjustment must be provided with 80-100 mm distance
4. Substrate heater to be provided with temperature range from LN2 to room temp and room temp to 800°C.
5. Substrate biasing facility should be included.
6. PID programmable temperature controller

C. Magnetron Sources

1. Confocally arranged for one chamber and parallel arrangement for rest (see description below for chamber details).
2. 2" dia of 4 nos magnetron sputtering source capable to operate with RF and Pulse DC.
3. One of them should be capable to sputter magnetic material also.
4. Magnetron sources should be water cooled
5. Magnetron guns should be capable of adjustable distance between substrate and sputtering targets.
6. Manual and automatic or electro-pneumatic shutter should be included in all sputtering sources.

D. Film Thickness Monitor

1. Thickness Monitor with standard Single Sensor, oscillator box, quartz crystals, cables to be provided to measure the deposition rate and thickness.
2. 1 **packet (10 Nos.)** of Quartz crystals to be supplied along with the unit.

❖ **DESCRIPTION OF MULTI CHAMBERS:**

Figure 1 shows the top view and Figure 2 the isometric view of multi chamber system.

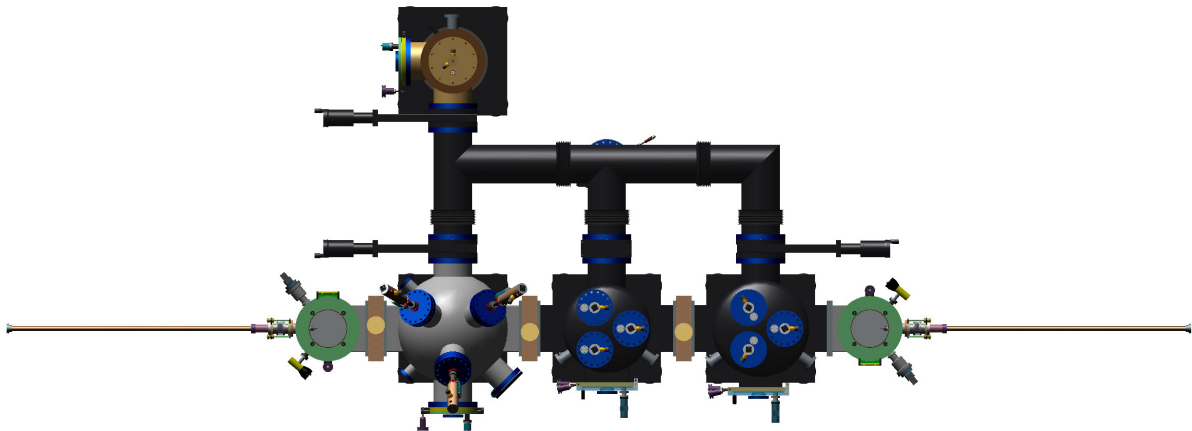


Figure 1 - Top view of Multi Chamber System

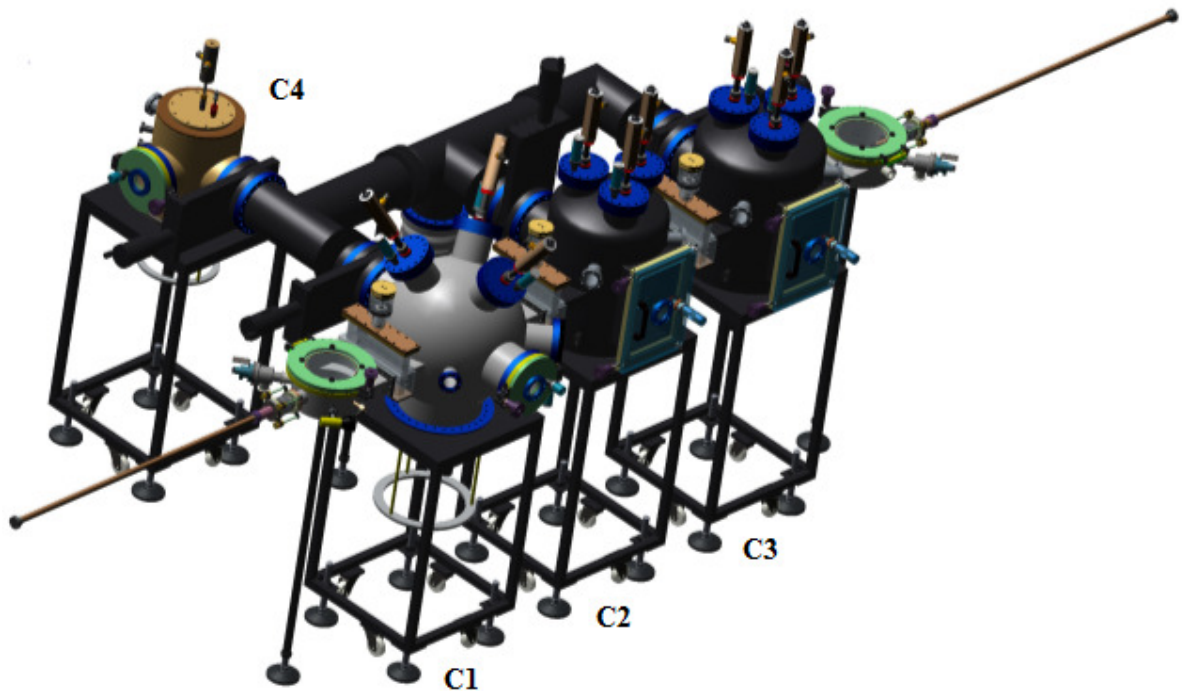


Figure 2 - Isometric view of Multi Chamber System

Chamber C1: (in the schematic shown this chamber is the one on bottom left)

- 1) Appropriate SS spherical chamber (14 to 16" dia) with ports for
 - a) 3 sputter sources in confocal and sputter down configuration. (Preferably CF flange)
 - b) Bottom port to mount heater capable of rotation and heating a sample to 800 °C
 - c) Load Lock port to transfer sample

- d) Quick access door to remove sample in emergency or when load lock is not required.
- e) High vacuum Pumping port
- f) Gauge ports
- g) Gas port
- h) View ports (shuttered)
- g) Port to connect next chamber (C2)

2) Sputter sources mounted on flange with inbuilt shutters and in and out movement to adjust sample target distance. Clamping arrangement for targets, efficient water cooling for high power sputtering, N type female RF connector for connecting power supply. High power magnets. Capability of using 2" or 1" targets. Shutter to be UHV compatible (rotating seal to be bellow sealed or magnetic coupled). **Qty 3 nos**

3) Gate valve to isolate the pump (CF150 flange) as well as throttle to get process pressures. Shaft movement bellow sealed, Motorized operation.

4) Bellow sealed isolation valve for gas entry (electropneumatic)

5) Bellow sealed roughing valve, (electropneumatic)

6) Bellow sealed backing valve (electropneumatic)

7) SS Gate valve for loadlock. Manual operation

8) Loadlock arrangement with transfer arm, port for pumping with isolation valve, port for pirani gauge, view port, air inlet valve/gas inlet valve.

9) Sample holder for heating 6" dia sample to 800 °C, rotation for uniform deposition. All rotations bellow sealed or magnetic coupled. PID programmable temperature controller. Electropneumatic shutter (Magnetic coupled)

10) Quick access port for sample loading and unloading when load lock is not required.

Chamber C2: (the one connected to C1)

1) Appropriate SS cylindrical chamber (14 to 16" dia) with ports for

- a) 3 sputter sources in parallel and sputter down configuration.
- b) Bottom port to mount chuck capable of rotation
- c) Load Lock port to transfer sample from C1 to C2
- d) Quick access door to remove sample in emergency or when load lock is not required.
- e) High vacuum Pumping port
- f) Gauge ports

- g) Gas port
- h) View ports (shuttered)
- g) Port to connect next chamber (C3)

2) Sputter sources mounted on flange with inbuilt shutters and in and out movement to adjust sample target distance. Clamping arrangement for targets, efficient water cooling for high power sputtering, N type female RF connector for connecting power supply. High power magnets. Capability of using 2" or 1" targets. Shutter to be UHV compatible (rotating seal to be bellow sealed or magnetic coupled). **Qty 3 nos.**

3) Gate valve to isolate the pump (CF150 flange) as well as throttle to get process pressures. Shaft movement bellow sealed, Motorized operation.

4) Bellow sealed isolation valve for gas entry (electropneumatic)

5) Bellow sealed roughing valve, (electropneumatic)

6) Bellow sealed backing valve (electropneumatic)

7) SS Gate valve for Loadlock, manual operation

8) Loadlock arrangement with transfer arm, port for pumping with isolation valve, port for pirani gauge, view port, air inlet valve/gas inlet valve.

9) Sample holder for 6" dia wafer with rotation for uniform deposition, indexing to bring sample under different guns. All rotations bellow sealed or magnetic coupled.

10). Sample holder should be provided with capability for low temperature at liquid nitrogen (LN₂) deposition of the thin film/nano powder etc. The sample holder should be attached with heater to raise the temperature from liquid nitrogen to room temperature. PID programmable temperature controller.

11) Quick access port for sample loading and unloading when load lock is not required.

Chamber C3: The chamber on bottom right)

- 1) Appropriate SS spherical chamber (14 to 16" dia) with ports for
 - a) 3 sputter sources in parallel and sputter down configuration.
 - b) Bottom port to mount heater capable of rotation and heating a sample to 800 °C
 - c) Load lock port to transfer sample
 - d) Quick access door to remove sample in emergency or when load lock is not required.
 - e) High vacuum pumping port
 - f) Gauge ports
 - g) Gas port

h) View ports (shuttered)

g) Port to connect adjacent chamber (C2)

2) **Sputter sources** mounted on flange with inbuilt shutters and in and out movement to adjust sample target distance. Clamping arrangement for targets, efficient water cooling for high power sputtering, N type female RF connector for connecting power supply. High power magnets. Capability of using 2" or 1" targets. Shutter to be UHV compatible (rotating seal to be bellow sealed or magnetic coupled). **Qty 3 nos**

3) Gate valve to isolate the pump (CF150 flange) as well as throttle to get process pressures. Shaft movement bellow sealed, Motorised operation.

4) Bellow sealed isolation valve for gas entry, (electropneumatic)

5) Bellow sealed roughing valve, (electropneumatic)

6) Bellow sealed backing valve, (electropneumatic)

7) SS Gate valve for loadlock, manual operation

8) Loadlock arrangement with transfer arm, port for pumping with isolation valve, port for pirani gauge, view port, air inlet valve/gas inlet valve.

9) Sample holder for heating 6" dia sample to 800 °C, indexing to bring sample under different guns. All rotations bellow sealed or magnetic coupled. PID programmable temperature controller

10) Quick access port for sample loading and unloading when load lock is not required.

Chamber C4: (chamber on top). (PECVD chamber)

1) Appropriate SS spherical chamber (14 to 16" dia) with ports for

a) Bottom port to mount heater capable of rotation and heating a sample to 800 °C

b) Quick access door to remove sample

c) Vacuum Pumping port

d) Gauge port

e) Gas port

f) View ports (shuttered)

g) Port to connect next chamber

2) RF electrode for creating plasma mounted from top plate 5 to 6" dia with a gas ring and grounded shield. This will be used to create plasma and the process will be plasma enhanced CVD

3) Gate valve to isolate the pump (CF150 flange) as well as throttle to get process pressures. Shaft movement bellow sealed, Motorized operation.

- 4) Bellow sealed isolation valve for gas entry, (electropneumatic)
- 5) Bellow sealed roughing valve, (electropneumatic)
- 6) Bellow sealed backing valve, (electropneumatic)
- 7) Port for pirani gauge, view port, air inlet valve/gas inlet valve.
- 8) Sample holder for heating 6" dia sample to 800 °C, rotation for uniform deposition. All rotations bellow sealed or magnetic coupled. PID programmable temperature controller.
- 9) Quick access port for sample loading and unloading.
 - **Warranty:** Minimum **One Year**
 - Frame to mount the chambers, instrumentation tack to mount all controls, power supplies pump controls etc
 - System to be integrated with user provided pumps and gauges, power supplies, water chiller, MFC etc.

Ref:-ENQUIRYNO:- **IITMANDI/S&P/PUR-66/2015-16/ Item No.2/Rapid thermal annealing system**

Procurement of Rapid Thermal Annealing for sputtering system

IIT Mandi Looking for

A Rapid Thermal Annealing system which can reach high temperatures, high ramp up/down times, in vacuum environment with gas inlet facility and compatible with the existing turbo molecular pump at the workplace. The following are the specifications required of rapid thermal annealing for sputtering system:

Detailed Specifications of Rapid Thermal Annealing for sputtering system:

- A. Temperature range:** Room temperature to 1200 °C
- B. Ramp rate:** ≥ 60 °C/s on ≥ 2 -inch Si wafer under N₂/O₂/Ar ambient (Higher preferable)
- C. Cooling:** cooling via air/water with fast ramp down times (≥ 90 °C/s) (Higher preferable)
- D. Temperature uniformity:** $\leq \pm 0.5$ % at 1000 °C across the ≥ 2 -inch diameter silicon wafer
- E. Accuracy:** highly accurate, repeatable temperature control $\leq \pm 5$ °C
- F. Heating Element:** Halogen lamp or any other heating element compatible with N₂/O₂/Ar atmosphere.
- G. Process Control:** PID control for setting of parameters
- H. Vacuum:** vacuum capability, vacuum valve and vacuum gauge with capability of process chamber down to 10⁻⁶ torr (preferable) or 10⁻³ torr range.
- I. Purge gas line:** ≥ 1
- J. Process gas lines:** ≥ 3 with digital MFC and full gas mixing facility for N₂/O₂/Ar
- K. Heating Zones:** ≥ 1
- L. Lamp life time:** ≥ 1000 hours
- M. Thermocouple:** Standard thermocouple or n-type sheathed thermocouple for long lifetime for accurate temperature measurement (Optional)
- N. Input mains power:** compatible with Indian power standards, single phase 220V/50Hz
- O. Safety:** Safety interlocks must be provided for dangerous gas mixing, overheating, thermocouple failure, lamp filament failure, temperature control failure.
- P. Interface to vacuum pump:** The system must be equipped with appropriate vacuum fittings and connection to the existing turbo molecular pump with flange size CF150 (preferable) or to existing dry rotary pump with flange size KF25 at workplace (IIT Mandi).
- Q. Warranty:** 1 year warranty mandatory with optional extended warranty

Separate Sheet should be submit for both item
COMPLIANCE STATEMENT FOR THE TENDER
SPECIFICATIONS
INDIAN INSTITUTE OF TECHNOLOGY MANDI
HIMACHAL PRADESH-175001

Ref:-ENQUIRY NO:- **IITMANDI/S&P/PUR-66/2015-16/Annexure 1 & 2**

Instructions

1. You have to fill in all columns and ensure that you furnish all the required information accurately and unambiguously.
2. If our specification contains any values, you have to provide your values against the column in the same unit as we have specified.
3. Deviation in values, materials etc. from our specification may be explained in the remarks column

S. NO	Check list of documents/ Undertakings ?	YES/ NO	Remarks (Give explanation if answer is No)
1	Is Tender fees attached?		
2	Is EMD attached? (if applicable)		
3	Is the bidder original equipment manufacturer (OEM)/authorised dealer?		
4	If authorised dealer, recent dated certificate to this effect from OEM, attached or not?		
5	Undertaking from OEM regarding technical support & extended warranty period		
6	Validity of 180 days or not?		
7	Undertaking from bidder regarding acceptance of tender terms & conditions		
8	Whether list of reputed users (along with telephone numbers of contact persons) for the past three years specific to the instrument attached.		
9	Whether special educational discount for Indian Institute of Technology (IIT) Mandi (H.P) given.		
10	Whether required training of operator and research students without any charges offered.		
11	Does the instrument complies with all the specifications as per annexure 1 & 2. Attach a separate sheet showing compliance with the specifications and explanations thereto if the equipments varies from the requested specifications.		
12	Whether free Installation, Commissioning and Application Training offered.		
13	Whether required comprehensive onsite extended warranty offered.		
14	Whether Annual maintenance after expiry of comprehensive onsite warranty quoted separately as optional.		