

TENDER (E - PROCUREMENT MODE)

FOR

SUPPLY & INSTALLATION OF MODIFIED CHEMICAL VAPOR DEPOSITION

(CVD) SYSTEM



Tender No.: IITMANDI/S&P/PUR-101/2019-20/4796-97

Tender date: 15th July, 2019

Last Date of Submission: 05th August, 2019

**Indian Institute of Technology Mandi (IIT Mandi),
Store & Purchase Section,
2nd Floor, A7 Building, South Campus,
Kamand – 175 005, District – Mandi (H.P), India**

Tel.: 01905-267039/267048

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

Indian Institute of Technology Mandi, Kamand invites online Bids for supply, erection, installation, commissioning, testing, demonstration and training of “**Modified Chemical Vapor Deposition (CVD) 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 CPP Portal (<http://eprocure.gov.in/eprocure/app>) & Institute website <http://iitmandi.ac.in/administration/tenderseoi.php>.

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.

Instruction to bidder:

1. There are various search options built in the CPP Portal, to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, organization name, location, date, value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as organization name, form of contract, location, date, other keywords etc. to search for a tender publishing on the CPP Portal.
2. Bidder should take into account any corrigendum published on the tender document before submitting their bids.
3. Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid. Please note the number of covers in which the bid documents have to be submitted, the number of documents – including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid.
4. The tenders will be received online through portal <http://eprocure.gov.in/eprocure/app>. In the Technical Bids, the bidders are required to upload all the documents in .pdf format. All quotation (**both Technical and Financial should be submitted in the E-procurement portal**).
5. Possession of a Valid Class II/III Digital Signature Certificate (DSC) in the form of smart card/e-token in the company's name is a prerequisite for registration and

participating in the bid submission activities through <http://eprocure.gov.in/eprocure/app>. Digital Signature Certificates can be obtained from the authorized certifying agencies, details of which are available in the web site <https://eprocure.gov.in/eprocure/app> under the link “Information about DSC”.

Instruction for Preparation & Submission of bids:

1. Technical & Financial Bids should be submitted in PDF format.
2. **In case of Financial bids**, a standard BOQ format has been provided in Excel format. Bidders are required to download the BoQ Excel file and fill their financial offer on the same BOQ format. After filling the same, submit it online in Excel format, without changing the financial template format. However, if bidder wants to modify in its financial offer, then bidder can modify.
3. Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document / schedule and generally, they can be in PDF formats. Bid documents may be scanned with 100 dpi with black and white option.
4. The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.
5. The uploaded tender documents become readable only after the tender opening by the authorized bid openers.
6. **Kindly add scanned PDF of all relevant documents in a single PDF file like, compliance sheet, OEM/Principle Certificate etc.**
7. Bidder should log into the site well in advance for bid submission so that he/she upload the bid in time i.e. on or before the bid submission time. Bidder will be responsible for any delay due to other issues.
8. Upon the successful and timely submission of bids, the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date & time of submission of the bid with all other relevant details.
9. The technical and financial bids should be submitted online through portal <http://eprocure.gov.in/eprocure/app> 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.
10. Each bidder should be marked with the following reference on the top bids submitted online: **“IITMANDI/S&P/PUR-101/2019-20/4796-97/Modified Chemical Vapor Deposition (CVD) System, dated 15th July, 2019”**.
11. 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 in .pdf format.

12. 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.
13. **Tender Cost:** The bidder should submit a demand draft of **Rs. 1,180 (Tender Fee inclusive GST) in Words Rupees One Thousand One Hundred & Eighty only** towards non-refundable **tender fee, drawn in favour of “The Registrar, IIT Mandi”** payable at Mandi in a sealed envelope super-scribed as **“Tender fee & NIT No. “IITMANDI/S&P/PUR-101/2019-20/4796-97/Modified Chemical Vapor Deposition (CVD) System, dated 15th July, 2019”**.
14. on or before last date & time of submission of bids. In the absence of tender cost, the tender will not be accepted.
15. **Earnest Money Deposit (EMD):**
16. Bidder should furnish an EMD of a refundable amount of **Rs 32,000/-** in the shape of Demand Draft and FDR from a scheduled bank in India drawn in favour of **“The Registrar, IIT Mandi” payable at Mandi**. This EMD should be submitted in sealed envelop super-scribed as **EMD & NIT No. “IITMANDI/S&P/PUR-101/2019-20/4796-97/Modified Chemical Vapor Deposition (CVD) System, dated 15th July, 2019”**. 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.
- **To return FDR in original, bidder must submit its valid address as an address proof on its letterhead.**
 - **Note: Both (tender fee & EMD) envelops should be placed in another sealed envelope and address to:**

**“Assistant Registrar, Stores and Purchase”
Indian Institute of Technology Mandi (IIT Mandi),
S & P Section, 2nd Floor , A7 Building, South Campus,
Kamand – 175 005, Distt. – Mandi (H.P), India”**

This envelop having tender fee & EMD should reach on or before last date time of submission of bid.

EMD Exemption:

The Institute may accept bids without EMD from those bidders who are registered with the Central Purchase Organization, National Small Industries Corporation (NSIC) or the concern Ministry or Department **as Manufacturer**. To claim the exemption, the bidder must be offering goods manufactured by themselves.

Exemption will not be granted in case the bidder is acting as an agent for some other vendor.

General Terms & Condition:

1. 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 .pdf format.** In case the firms do not give this undertaking, their rates will not be considered.
2. If the supplier/firm is original equipment manufacturer (OEM)/authorized dealer/sole distributor of any item, the certificate to this effect should submit in .pdf format.
3. The quantity shown against the item is approximate and may vary as per demand of the Institute at the time of placing order.
4. Any bids received after **11:00 A.M. on 05th August, 2019** shall not be considered.
5. The Technical Bids will be opened on **06th August, 2019 at 11:00 A.M.** The date & time for opening of Financial Bids will be informed later on to the technically qualified bidders.
6. The tenders will be received online through portal <http://eprocure.gov.in/eprocure/app>. All tender documents received after the specified date and time shall not be considered.

For any correspondence regarding tenders is on below address:

**“Assistant Registrar, Stores and Purchase”
Indian Institute of Technology Mandi (IIT Mandi),
S & P Section, 2nd Floor, A7 Building, South Campus,
Kamand – 175 005, Distt. – Mandi (H.P), India”**

7. **Arbitration Clause:** 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.
 - a) In case of a dispute between the purchaser and a foreign supplier, the dispute shall be settled by arbitration in accordance with provision of sub-clause above. But if this is not acceptable to the supplier then dispute shall

be settled in accordance with provisions of UNCITRAL (United Nations Commission on International Trade Law) Arbitration Rules.

- b) The venue of the arbitration shall be the place from where the order is issued.
 - c) The place of arbitration and the language to be used in arbitral proceedings shall be decided by the arbitrator.
 - d) All disputes shall be subject to Mandi Jurisdiction only.
8. All tenders in which any of the prescribed conditions is not fulfilled or any condition is put forth by the tenderer shall be summarily rejected.
9. 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 only 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.

10. **Clarifications:**

In case the bidders requires any clarification regarding the tender document, they are requested to submit their queries on the e-mail i.e. ankushbag@iitmandi.ac.in, & arsp@iitmandi.ac.in on or **before 31.07.2019**.

11. **Assistance To Bidders:** Any queries relating to the tender document and the terms & conditions contained therein should be addressed to tender Inviting Authority for a tender or relevant contact person indicated in the tender.

12. **Pre – Qualification Criteria:**

- 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.
- 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.
- OEM should be internationally reputed Branded Company.

- 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.
- 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.
- **In the tender, either the Indian agent on behalf of the Principal/OEM or Principal/OEM itself can bid but both cannot bid simultaneously for the same item/product in the same tender.**
- **If an agent submits bid on behalf of the Principal/OEM, the same agent shall not submit a bid on behalf another Principal/OEM in the same tender for the same item/product.**
- **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.**

13. Prices:

- The Prices quoted should be inclusive of basic price of an item, custom 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 case of imports/foreign supplier, the price should be quoted on ex-work price/FOB/FCA basis only. Under special circumstance (e.g. perishable chemicals), when the item is imported on CIP/CIF, please indicate CIF/CIP charges separately upto Delhi indicating the mode of shipment. IIT Mandi will make necessary arrangements for the clearance of imported goods at the Airport/Seaport.**
- In case of imported equipment(s)/item(s), the agency commission, if any, payable in Indian rupees should be mentioned separately. **IAC shall be paid after satisfactory installation & commissioning of the goods at the destination.** 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.
- **In case of indigenous item, the vendor should clearly mention the final FOR IIT Mandi, Kamand Campus Price, as applicable in their bid.**

14. **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.

15. **Delivery:**

The Equipment should be delivered and installed within the period as specified in the purchase order and be ready for use within 4-6 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.

16. **Installation, Training & Demonstration:**

Bidders need to provide adequate training to the nominated persons of IIT Mandi at their cost. IIT Mandi will not bear any training expenditure. The supplier is required to done the installation and demonstration of the equipment within **15 days** of arrival of materials at the IIT Mandi site of installation, otherwise the penalty clause will be the same as per the supply of material.

In case of any mishappening/damage to equipment and suppliers during the carriage of suppliers from the origin of equipment to the installation site, the supplier has to replace to it with new equipment/supplies immediately at his own risk. Supplier will settle his claim with the insurance company as per his convenience. IIT Mandi will not be liable to any type of losses in any form.

17. **Insurance:** For delivery of goods at the purchaser's premises, the Insurance shall be obtained by the supplier on "**All Risk**" basis. The insurance shall be valid for a period of not less than 3 months after installation and commissioning. **In case of order placed on FOB/FCA basis, the purchaser shall arrange insurance. If order placed on CIF/CIP basis, the insurance should be up to New Delhi, the supplier shall arrange insurance.**

18. **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.

- The Purchaser Shall Promptly notify the Supplier in writing of any claims arising under this warranty. Upon receipt of such notice, the Supplier shall immediately within **Two weeks** arrange to repair or replace the defective goods or parts thereof free of cost at the ultimate destination. The Supplier shall take over the replaced parts/goods at the time of their replacement. No claim whatsoever shall lie to the Purchaser for the replacement parts/goods thereafter. The period for correction of defects in the warranty period is **Two week**. If the supplier having been notified fails to remedy the defects within **Two week**, the purchaser may proceed to take such remedial action as may be necessary, at the supplier's risk and expenses without prejudice to any other rights, which the purchase may have against supplier under the contract.
 - The warranty period should be clearly mentioned. The maintenance charges (AMC) under different schemes after the expiry of the warranty should also be mentioned. The comprehensive warranty will commence from the date of the satisfactory installation/commissioning of the equipment against the defect of any manufacturing, workmanship and poor quality of the components.
 - After the warranty period is over, Annual Maintenance Contract (AMC)/Comprehensive Maintenance Contract (CMC) should be started. The AMC/CMC Charges will not be included in computing the total cost of the equipment.
19. **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.
20. **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 scheduled bank in India, valid for 2 months beyond the expiry of the warranty. All the bank charges within India will be borne by the Institute and outside India will be borne by the Supplier.

- In case of required item quoted in INR, 80% payment will be made through E-payment after receipt of material in good condition and Remaining 20% will be released on successful installation of the instrument and on submission of a performance bank guarantee for 10% of the order value from scheduled bank in India, valid for 2 months beyond the expiry of the warranty.

21. **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.

22. **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.

23. **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.

24. **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.

25. The IIT Mandi reserves the right to cancel the tender at any stage (point of time) without assigning any reason.

26. 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 :

< Organization Letter Head >>
DECLARATION SHEET

We, _____ hereby certify that all the information and data furnished by our organization with regard to this tender specification are true and complete to the best of our knowledge. I have gone through the specification, conditions and stipulations in details and agree to comply with the requirements and intent of specification. This is certified that our organization has been authorized (Copy attached) by the OEM to participate in Tender. We further certified that our organization meets all the conditions of eligibility criteria laid down in this tender document. Moreover, OEM has agreed to support on regular basis with technology / product updates and extend support for the warranty.

We, further specifically certify that our organization has not been Black Listed/De Listed or put to any Holiday by any Institutional Agency/ Govt. Department/ Public Sector Undertaking in the last three years.	NAME & ADDRESS OF THE Vendor/ Manufacturer / Agent
1 Phone	
2 Fax	
3 E - mail	
4 Contact Person Name	
5 Mobile Number	
6 TIN Number	
7 PAN Number	
8 GST No.	
9 Kindly provide bank details of the bidder in the following format:	
a) Name of the Bank	
b) Account Number	
c) Kindly attach scanned copy of one Cheque book page to enable us to return the EMD to unsuccessful bidder	

**Ref:-ENQUIRYNO:- IITMANDI/S&P/PUR-101/2019-20/4796-97/Modified
Chemical Vapor Deposition (CVD) System**

Technical Specifications of Modified Chemical Vapor Deposition (CVD) System

Name of Item: **Modified Chemical Vapor Deposition (CVD) system.**

Number of Items: **1 (one)**

Main features of the Modified CVD System:

A. Vacuum/Deposition Chamber

The deposition chamber will be capable of depositing thin films by magnetron sputtering. The proposed system will be based on standard multisource box type model/cylindrical chamber. The chamber dimensions will be **>300mm x 300mm x 300mm** for box type model or diameter **>300mm** and height **>300mm** for cylindrical chamber. The sample loading and unloading and maintenance will be done through a front hinge door. The electrical power distribution, instrumentation panels and all utilities such as water, air & nitrogen etc. will be located on a system frame.

- The chamber will make of **SS 304 L** stainless steel construction. The chamber will be **TIG weld** and **electro-polished** and **mirror shine** inside.
- The chamber has the provision of inserting a **quartz tube** for CVD such that when using **sputtering** it can be removed out of the chamber.
- Provision for **three** two-inch circular magnetron assembly for RF magnetron sputtering and DC sputtering.
- The sputtering will be sputter up with targets and substrate on top on heater assembly.
- At least **two** two-inch **quartz** windows to view through the plasma excited volume and **two additional blank ports** for future upgrade shall be included.
- Base pressure of **<2X10⁻⁶ mbar** at ambient at any load.
- The chamber will have necessary ports to fixed cathode anode plates, heater supply, thermocouple, shutter fixing, vacuum pumping port etc.
- The deposition process shall be carried at **< 5 X 10⁻³ mbar** pressure in Argon or and Oxygen atmosphere for both CVD and sputtering.
- The equipment should be able to provide thickness **uniformity of ≤ 5%** over the **2”x2”** substrate for the sputter deposition of any one or combination of metals/metal alloys/composites/semiconductors/insulators.

Common sub system

1. Vacuum system
2. Vacuum Gauges
3. Gas manifold & Gases
4. Safety Interlock
5. Electrical Control Panel

B. Chemical Vapor Deposition System (CVD)

CVD system is suitable to grow Gallium Oxide and transparent conducting tin oxide materials using suitable precursors, etc. In this case, the precursor is introduced into a process chamber through gas or vapor source and reacted at a certain temperature and pressure. The desired thin film materials are deposited onto a substrate inside the process chamber. The thickness and composition of the deposited materials can be controlled by the vapor concentration, temperature, and pressure.

Specifications:

CVD system

1. Tube Furnace

- Heating zone length: **>100mm**
- Constant temperature zone: **>120 mm (+/-10C) @ 400 - 1200 °C**
- Maximum temperature: **1200 °C**
- PID temperature controller: From reputed make

2. Processing tube

- High purity suitable material
- Tube: OD: **65 mm**

3. Vacuum Pump

The system includes the following pumping arrangement:

(High through Turbo molecular pump valves and along with suitable backing pump from reputed make, e.g. Pfeiffer or Leybold)

- Inlet flange DN 100CF /ISO
- Pumping speed
N₂ ≥ 300 lit./sec
He ≥ 340 lit./sec
- Ultimate pressure with backing pump **<6x10⁻⁸ mbar**
- The turbo pump rotation speed will be **60,000 rpm**
- Controller for turbo and instrument controller

4. Vacuum gauges

Cold cathode gauge for monitoring high vacuum and Pirani gauges two nos for monitoring backing pump performance. All gauges will be CF compatible

- Gauge controller with digital display
- Pirani gauge **<10⁻³ mbar**
- Cold cathode gauge from **10⁻³ to <5x10⁻⁹ mbar** or wide range gauge from **>10³ to < 10⁻⁹ mbar**

5. Gas manifold & Gases

Three-line gas manifold (one spare)

- Ar gas flow **500 SCCM**

- O₂ gas flow **50** SCCM
- The has manifold features all stainless-steel construction SS 316
- Electronic Mass Flow Controller with digital readout or control through software
- The gas manifold mounted on Al plate with high vacuum and high-pressure testing to ensure there is no leak from any points

6. Safety Interlock

7. Electrical Control Panel

C. Magnetron Sputtering System

High vacuum pumping system is based on Turbo pump for neat and clean system for RF Magnetron sputtering system suitable for depositing of Gallium Oxide and transparent conducting tin oxide materials. The system is also suitable to do co-sputtering and sequential sputtering without breaking vacuum and it is also possible to make newer materials by varying dielectric material property by co-sputtering for high grade research and development applications.

1. Magnetron sputtering cathodes:

- **Three confocally** arranged magnetron sputtering targets of 2-inch size dia. each.
- All targets will be water cooled.
- The gap between the targets and substrate will be adjustable.
- The targets thickness variation from 2 mm to 10 mm will be adjustable.
- The magnetron cathodes assembly will be on the top plate of the chamber and should be removable and replaceable as a whole with different set of cathodes.
- Substrate on the bottom.
- The shutter mechanism will be to isolate the substrate from the target
- Appropriate shielding shall be provided to avoid cross contamination.

2. Substrate holder:

- The substrate holder shall be mounted at the center of the chamber and rotation through magnetic coupled with motor externally. The drive arrangement shall be provided for a rotation **>= 15 rpm**. The distance between sputtering target and substrate holder should be changeable.
- Substrate holder shall be able to accommodate **>= four** rectangular samples of size **2 cm X 2 cm** simultaneously. Adopter for mounting the substrate.
- Mechanical shutter to protect the deposition on the substrate during conditioning of the target and the termination of the deposition on the substrate.
- The substrate holder temperature **>= 850 C** and stable under sputtering conditions including high vacuum, reactive oxygen and nitrogen gases.
- PID temperature controller with display and temperature control **> 850 C** should be included

- Phase angle-based thyristor-based power controller will be provided.
- Bellow assembly type arrangement will be provided between the flange and chamber for adjusting the distance between target and substrate.
- Easy mounting facility for substrate loading and removing.

3. Rf power supply with auto matching network: one number

(of reputed make, such as, SEREN/ Advanced energy/ Comdel/ T&C powerconversion or equivalent for both the RF generator and RF Matchbox)

- RF power supply \geq **300 watt** with the following features
- Forward and reflected digital meter
- High Efficiency
- Frequency **13.56 MHz**
- Compact design
- Active front panel
- Input 220 V, 50 Hz

Manual Matching network

To deliver extremely consistent power across a wide range of plasma load conditions.

4. DC Power Supply

- DC power supply \geq **1kW** regulated with low ripple

All parts shall be mounted on angle iron frame:

Electrical control panel consists of digital vacuum gauge power supply, PID temperature controller, Mass flow controller power supply with safety interlock. The system look shall be professional and user friendly.

D. Control & safety:

- The system will design for 220volt \pm 10 V, 50 Hz provision will be made for vacuum and water interlock
- Pneumatic controls: wherever needed shutter for magnetron source, substrate holder gas manifold.
- Main frame & Control Electronics: Epoxy powder coated CRC structure with \geq 19 inch control rack to accommodate all like RF power supply, Mass flow controller power supply, PID temperature controller, turbo power supply vacuum gauges, power supply and various operating electrical switches as and when required for various system operations.

Safety interlocks shall be provided for all especially all imported electronics instruments like; RF power supply, Mass flow controller power supply, turbo power supply vacuum gauges, power supply.

E. Spare parts

- All O rings and copper gaskets

- Fuses

F. Documentation

- One set of documentation in English
- One set of documents consist of
- Operation and maintenance manual including drawings, electrical drawings, maintenance and trouble shootings
- OEM manual

Note: CVD & Sputtering systems are to be a combined/coupled system but there should be provision to operate individually.

F. General technical terms and condition

1. Installation requisites

All the prerequisites for installation have to be quoted. Institute will only provide electricity of single or three-phase 220V/50Hz, normal quality water and space. Vendor also should quote for suitable water chiller and other required accessories separately as required. All the components such as gauges, pumps, power supply should be of reputed and well-known brands to make sure the high quality of deposition with precise control.

The vendor has to submit pre-installation site requirements/guidelines for the modified CVD system along with the technical bid.

2. Warranty and maintenance: The complete instrument should be under warranty for a period of at least one year from the date of installation. Additional cost, if any for extended warranty of three years may be quoted for all the hardware and software (other than the consumables) of the modified CVD system has to be included in the price quotation.

The modified CVD system provider vendor must have service center in India. In case of breakdown during the warranty period, a competent service engineer of the supplier should make as many visits as are necessary to rectify the problem and replace the faulty parts, without any liability of cost. Supplier should ensure to provide all spares required for making the instrument operational.

3. Annual maintenance contract

The vendor should be agreeable to enter into Comprehensive Annual Maintenance Contract with IIT Mandi at a reasonable price, for maintaining the equipment in proper working conditions, after the warranty period is completed. Quote the cost of onsite annual maintenance for two years after warranty period.

4. Installation and training Complete installations

Installations will be done by the supplier and it should be included in the estimated cost. On-site one-week training for operation and application may be given to the users free of cost. IIT Mandi will not bear any training expenditure in this regard.

5. Spare parts

The supplier of the instrument must confirm in writing that the spares for the entire instrument will be available for a period of at least five years after the model of equipment supplied has been phased out. For frequently required spares, there should be adequate inventory with the Indian agency.

6. User list with contacts Vendor should provide us a list of installations in India with all contact details and model details so that IIT Mandi can approach the contact person for any feedback.

7. Compliance Statement

The supplier must submit technical brochures and proper application notes adequately explaining and confirming the availability of the features in the model of the equipment being quoted. The supplier must submit a table indicating the compliance of the features of the model of the equipment being quoted with those given in the indent. Features not matching – must be clearly indicated. Additional features in the quoted equipment which are better than those in the indent – may be clearly explained.

The vendor may certify that the equipment and accessories quoted provide a complete package for use of modified CVD system with all the intended features/accessories.

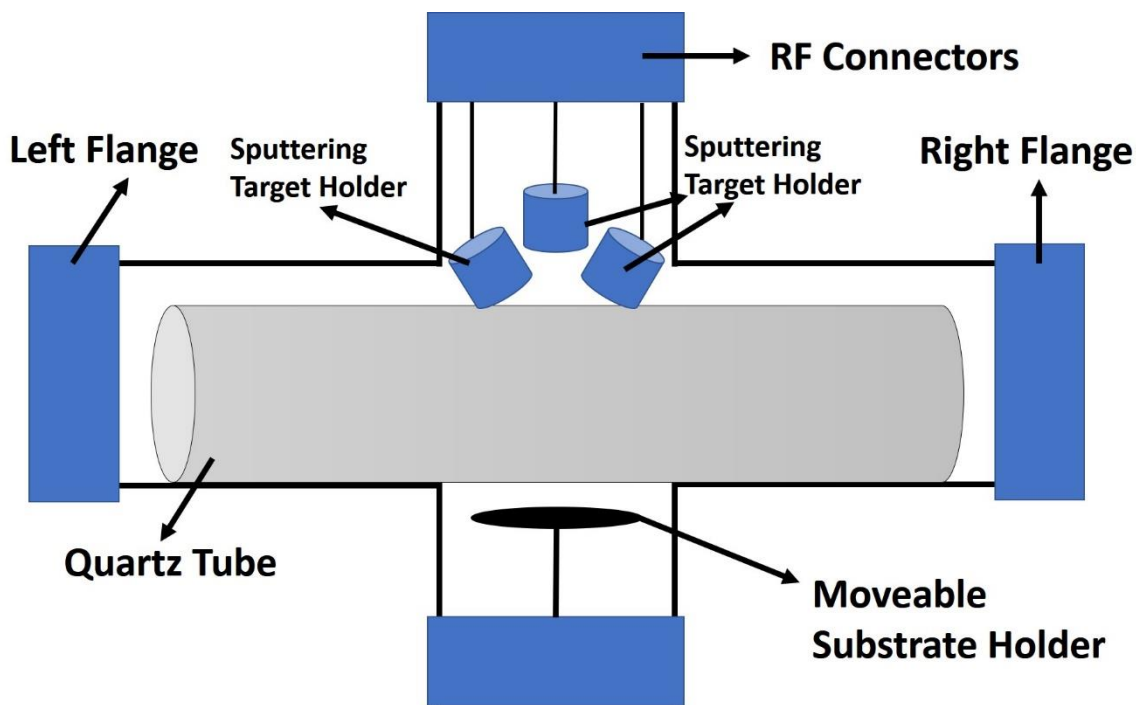


Figure: Tentative design of Modified CVD System (Figure not in scale)

**COMPLIANCE STATEMENT FOR THE TENDER SPECIFICATION
INDIAN INSTITUTE OF TECHNOLOGY MANDI
HIMACHAL PRADESH-175001**

**Ref:- ENQUIRYNO:- IITMANDI/S&P/PUR-101/2019-20/4796-97/Modified
Chemical Vapor Deposition (CVD) System**

Sr. 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 training of operator and research students without any charges offered.		
11	Does the instrument comply with all the required specifications as per annexure 1. IMPORTANT: Attach a separate sheet highlighting compliances with the specifications and explanations thereto if the equipments vary from the requested specifications.		
12	Whether free Installation, Commissioning and Application Training offered.		
13	Whether warranty as per requirement offered		
14	Whether Annual maintenance after expiry of comprehensive onsite warranty quoted separately as optional.		