

**GOVERNMENT OF INDIA  
DEPARTMENT OF SPACE  
ISRO INERTIAL SYSTEMS UNIT (IISU)  
THIRUVANANTHAPURAM**

**Tender for Atomic layer thin film deposition coating system ( Thermal and Plasma enhanced ALD).**

**Bids to be submitted online**

**Tender No.: IISU/PURCHASE UNIT IX (IISU PURCHASE)/IU202400526501 dated  
05-02-2025**

## A. Tender Details

Tender No :	<b>IISU/PURCHASE UNIT IX (IISU PURCHASE)/IU202400526501</b>
Tender Date :	<b>05-02-2025</b>
Tender Classification:	<b>GOODS</b>
Purchase Entity :	<b>PURCHASE UNIT IX (IISU PURCHASE)</b>
Centre :	<b>ISRO INERTIAL SYSTEMS UNIT (IISU)</b>

### **Atomic layer thin film deposition coating system ( Thermal and Plasma enhanced ALD).**

Only online tenders will be accepted. No manual / Postal / e-mail / fax offers will be entertained. No manual tender document will be issued. Bidders can seek help from help desk 0471-2565454 also as provided in the home page of e-procurement portal in case of any problem for bid submitting and subsequent process.

Important Notice : Tender will be automatically closed on the due date, if at least one offer is received. If the tender could not be opened on the first day due to any technical snag, it will be opened on the subsequent day as per the schedule.

#### **A.1 Tender Schedule**

Bid Submission Start Date :	<b>19-02-2025 15:00</b>
Bid Clarification Due Date :	<b>05-03-2025 10:00</b>
Bid Submission Due Date :	<b>20-03-2025 14:00</b>
Bid Opening Date :	<b>20-03-2025 14:15</b>
Price Bid Opening Date :	<b>07-04-2025 10:00</b>

## B. Tender Attachments

### Technical Write-up/Drawings

Document : [ALD specifications](#)

### Instructions To Vendors

#### **2. PROFORMA FOR INSTRUCTIONS TO TENDERERS AND TERMS & CONDITIONS OF TENDER where the indent value is Rs. 2.00 lakhs & above for FOREIGN SUPPLY items**

1. 10. Instructions / Operation Manual containing all assembly details including wiring diagrams should be sent wherever necessary in duplicate. All documents / correspondence should be in English language only.

2. 10. PORT OF ENTRY:

Thiruvananthapuram International Airport For Air Cargoes And Kochi Sea Port For Ocean Vessel Cargoes

3. 11. CONSIGNEE:

Purchase & Stores Officer(Stores), Composites Entity, Vikram Sarabhai Space Centre, Vattiyookavu, Thiruvananthapuram 695013.. Ph:04712569141

4. 11. The Purchaser reserves the right to accept or reject the lowest or any offer in whole or part without assigning any reason.

5. 12. It is expressly agreed that the acceptance of the Stores Contracted for is subject to final approval in writing by the Purchaser.

6. 12. SHIPPING MARKS.

The mark on the shipping documents such as invoice, bill of lading and on the packages should be as follows:

PURCHASE ORDER NO. ....

DATED .....

GOVERNMENT OF INDIA  
DEPARTMENT OF SPACE  
VIKRAM SARABHAI SPACE CENTRE

## COMPOSITES ENTITY

Destination: VATTIYOORKAVU, THIRUVANANTHAPURAM-695013

Port of Entry: .....

7. 13. a) Part shipment is not allowed unless specifically agreed to by us.

b) As far as possible stores should be despatched by Indian Flag Vessels / Air India through any Agency nominated by us.

### 8. 13. INSURANCE OF THE STORES:

The necessity or otherwise of insurance will be as indicated in the Purchase Order.

### 9. 14. CONTRACTOR'S DEFAULT LIABILITY:

14.1 The purchaser may upon written notice of default to the Contractor terminate the Contract in whole or in part in circumstances detailed hereunder:

a) If in the judgement of the Purchaser the Contractor fails to make delivery of Stores within the time specified in the Contract/agreement or within the period for which extension has been granted by the Purchaser to the Contractor.

b) If in the judgment of the Purchaser the Contractor fails to comply with any of the other provisions of this Contract.

10. 14. Inspection / Test Certificate should be provided for the goods after testing it thoroughly at the Contractor's works. If any Inspection by Lloyds or any other testing agency is considered necessary, it shall be arranged by Contractors.

11. 15. In the event the Purchaser terminates the Contract in whole or in part as provided in Clause 14 the Purchaser reserves the right to Purchase, upon such terms and in such a manner as he may deem appropriate, stores similar to that terminated and the Contractor shall be liable to the Purchaser for any additional costs for such similar stores and/or for liquidated damages for delay as defined in Clause 19 until such reasonable time as may be required for the final supply of stores.

15.1 If this Contract is terminated as provided in Clause 14 the Purchaser in addition to any other rights provided in this Article, may require the Contractor to transfer title and deliver to the Purchaser under any of the following clauses in the manner and as directed by the Purchaser:

a) Any completed stores.

b) Such partially completed stores, drawing, information and Contract rights (hereinafter called manufacturing material) as the Contractor has specifically produced or acquired for the performance of the Contract as terminated. The Purchaser shall pay to the Contractor the Contract price for completed stores delivered to and accepted, by the purchaser and for manufacturing material delivered and accepted.

15.2 In the event the Purchaser does not terminate the Contract as provided in Clause 14, the Contractor shall continue the performance of the Contract in which case he shall be liable to the

purchaser for liquidated damages for delay as set out in Clause 19 until the stores are accepted.

12. 15. Where erection or assembly or commissioning is a part of the Contract, it should be done immediately on notification. The Contractor shall be responsible for any loss/damage sustained due to delay in fulfilling this responsibility.

13. 16. For items having shelf life, those with maximum shelf life should be supplied if order is placed.

14. 16. REPLACEMENT:

If the stores or any portion thereof is damaged or lost during transit, the Purchaser shall give notice to the Contractor setting forth particulars of such stores damaged or lost during transit. The replacement of such stores shall be effected by the Contractor within a reasonable time to avoid unnecessary delay in the intended usage of the Stores. In case the purchaser agrees, the price towards replacement items shall be paid by the purchaser on the basis of original price quoted in the tender or as reasonably worked out from the tender.

15. 17. REJECTION :

In the event that any of the stores supplied by the Contractor is found defective in material or workmanship or otherwise not in conformity with the requirements of the Contract specifications, the purchaser shall either reject the stores or request the Contractor, in writing, to rectify the same. The Contractor, on receipt of such notification, shall either rectify or replace the defective stores free of cost to the purchaser. If the Contractor fails to do so, the purchaser may at his option either .....

a) replace or rectify such defective stores and recover the extra cost so involved from the Contractor, or

b) terminate the Contract for default as provided under clause 14 above, or

c) acquire the defective stores at a reduced price considered equitable under the circumstances. The provision of this article shall not prejudice the Purchaser's rights under clause 19.

16. 18. EXTENSION OF TIME:

If the completion of supply of stores is delayed due to reason of force majeure such as acts of god, acts of public enemy, acts of Government, fires, floods, epidemics, quarantine restriction, strikes, freight embargoes, etc., the Contractor shall give notice within 15 days to the purchaser in writing of his claim for an extension of time. The purchaser on receipt of such notice after verification, if necessary, may agree to extend the Contract delivery date as may be reasonable but without prejudice to other terms and conditions of the Contract.

17. 19. DELAY IN COMPLETION / LIQUIDATED DAMAGES:

If the Contractor fails to deliver the stores within the time specified in the Contract or any extension thereof, the purchaser shall recover from the Contractor as liquidated damages a sum of one-half of one percent (0.5 percent) of the Contract price of the undelivered stores for each calendar week of delay. The total liquidated damages shall not exceed ten percent (10 percent) of the Contract price of

the unit or units so delayed. Stores will be deemed to have been delivered only when all their component parts are also delivered. If certain components are not delivered in time, the stores will be considered as delayed until such time as the missing parts are delivered.

18. 1. Quotation/Open Authorization shall be submitted online [only] complying the specified schedule with technical specifications, including pamphlets and catalogues.

19. 20. GUARANTEE & REPLACEMENT:

a) The Contractor shall guarantee that the stores supplied shall comply fully with the specifications laid down for material, workmanship and performance.

b) For a period of twelve months after the acceptance of the stores, if any defects are discovered therein or any defects therein are found to have developed under proper use arising from faulty materials, design or workmanship, the Contractor shall remedy such defects at his own cost provided he is called upon to do so within a period of 14 months from the date of acceptance thereof by the Purchaser who shall state in writing in what respect the stores or any parts thereof are faulty.

c) If in the opinion of the purchaser it becomes necessary to replace or renew any defective stores, such replacements or renewals shall be made by the Contractor free of all costs to the purchaser provided the notice informing the Contractor of the defect is given by the purchaser in this regard within the said period of 14 months from the date of acceptance thereof.

d) Should the Contractor fail to rectify the defects, the purchaser shall have the right to reject or repair or replace at the cost of the Contractor the whole or any portion of the defective stores.

e) The decision of the Purchaser, notwithstanding any prior approval or acceptance or inspection thereof on behalf of the purchaser, as to whether or not the stores supplied by the Contractor are defective or any defects has developed within the said period of 12 months or as to whether the nature of the defects requires renewal or replacement shall be final, conclusive and binding on the Contractor.

f) To fulfill guarantee conditions outlined in Clause 20 (a) to (e) above, the Contractor shall, at the option of the purchaser, furnish a Bank Guarantee (as prescribed by the purchaser - Bank Guarantee format enclosed) from a Bank approved by the purchaser for an amount equivalent to 3% of the value of the Contract along with first shipment documents. On the performance and completion of the Contract in all respects, the Bank Guarantee will be returned to the Contractor without any interest.

g) All the replacement stores shall also be guaranteed for a period of 12 months from the date of arrival of stores at purchaser's site.

h) Even while the 12 months guarantee applies to all stores, in case where a greater period is called for by our specifications, then such a specification shall apply, and in such cases, the period of 14 months referred to in Clause 20 (b) and (c) shall be asked for guarantee period plus two months.

20. 21. REQUIREMENT OF ADDITIONAL NUMBERS OF THE STORES/SPARE PARTS ORDERED:

The Contractor shall also undertake the supply of additional number of items covered by the order as considered necessary by the purchaser at a later date, the actual price to be paid shall be mutually agreed to after negotiations.

#### 21. 22. PACKING:

- a) The Contractor wherever applicable shall pack and crate all stores for sea / air shipment as applicable in a manner suitable for export to a tropical humid climate, in accordance with internationally accepted export practices and in such a manner so as to protect it from damage and deterioration in transit by road, rail or sea for space qualified stores. The Contractors shall be held responsible for all damages due to improper packing.
- b) The Contractor shall ensure that each box / unit of shipment is legible and properly marked for correct identification. The failure to comply with this requirement shall make the Contractor liable for additional expenses involved.
- c) The Contractor shall notify the purchaser of the date of shipment from the port of embarkation as well as the expected date of arrival of such shipment at the designated port of arrival.
- d) The Contractor shall give complete shipment information concerning the weight, size, content of each packages, etc.
- e) Transshipment of equipment shall not be permitted except with the written permission of the purchaser.
- f) Apart from the despatch documents negotiated through Bank, the following documents shall also be airmailed to the purchaser within 7 days from the date of shipment by sea and within 3 days in case of air-consignments:
  - a) Commercial Bill of Lading / Air Way Bill / Post parcel Receipt. (Two Non-negotiable copies)
  - b) Invoice (3 copies)
  - c) Packing List (3 copies)
  - d) Test Certificate (3 copies)
  - e) Certificate of Origin.

The Contractor shall also ensure that one copy of the packing list is enclosed in each case.

#### 22. 23. ARBITRATION:

If at any time any question, dispute or difference whatsoever shall arise between the purchaser and the Contractor upon or in connection with this Contract, either party may forthwith give to the other notice in writing of the existence of such question, dispute or difference and the same shall be referred to the adjudication of two arbitrators, one to be nominated by purchaser, other by a Contractor and in the event of any difference of opinion, the arbitrators will refer the matter to the umpire. The arbitration shall be conducted in accordance with the rules and procedure for arbitration of the International Chamber of Commerce at Paris. The expenses of the arbitrators and umpire shall be paid as may be determined by them. However, the venue of such arbitration should be in India.

#### 23. 24. LANGUAGE AND MEASURES:

All documents pertaining to the Contract including specification, schedule, notice, correspondence, operating and maintenance instructions, drawings or any other writings shall be written in English language. The metric system of measurement shall be used exclusively in the Contract.

**24. 25. INDEMNITY:**

The Contractor shall warrant and be deemed to have warranted that all Stores supplied against this Contract are free and clean of infringement of any patent, copyright or trade mark and shall at all times indemnify the purchaser against all claims which may be made in respect of stores for infringement of any right protected by Patent, Registration of design or Trade Mark, and shall take all risk of accident or damage which may cause a failure of the supply from whatever cause arising and the entire responsibility for the sufficiency of all the means used by him for the fulfillment of the Contract.

**25. 26. COUNTER TERMS AND CONDITIONS OF SUPPLIERS:**

Where counter terms and conditions/printed or cyclostyled conditions have been offered by the supplier, the same shall not be deemed to have been accepted by the purchaser unless specific written acceptance thereof is obtained.

**26. 27. SECURITY INTEREST:**

On each item to be delivered under this Contract, including an item of work in progress in respect of which payments have been made in accordance with the terms of the Contract, purchaser shall have a security interest in such items which shall be deemed to be released only at the time when the applicable deliverable item is finally accepted and delivered to the purchaser in accordance with the terms of the Contract. Such security interest of the purchaser shall constitute a prior charge as against any other charge or interest created in respect of such items by any entity.

**27. 28. BANK CHARGES:**

While the purchaser shall bear the bank charge payable to his Bankers (State Bank of India), the Contractor shall bear the Bank charges payable to his Bankers including the cheques towards advising amendment commissions.

**28. 29. TRAINING:**

The Contractor shall, if required by the purchaser, provide facilities for the practical training of Purchaser's engineering / technical personnel from India and for their active association on the manufacturing processes throughout the manufacturing period of the Contract / stores, number of such personnel to be mutually agreed upon.

29. 2. A Proforma Invoice may also be given which should contain the following Information:

- a) The FOB/FCA value, the C & F value for import by Sea freight / Air freight up to and for air parcel post up to Trivandrum should be separately indicated.
- b) Agency Commission: The amount of commission included in the price and Payable to the Indian Agent of the Contractor shall be paid directly to the Indian Agent by the Purchaser in equivalent Indian

Rupees on the basis of an Invoice from him applying T.T. buying rate of exchange ruling on the date of placement of the Purchase Order and which shall not be subject to any further exchange variations. This payment will be released to the Indian Agent immediately after Customs clearance of the goods in India.

c) The Contractor shall invoice only for the net amount payable to him, after deducting the amount of Agency Commission included in the invoice which will be paid to the Indian Agent directly by the Purchaser. However, the Contractor's invoice should separately reflect the amount of commission payable to his Indian Agent.

d) The earliest delivery period and country of origin of the Stores.

e) Banker's name, address, telephone/fax Nos. & e-Mail ID of the Contractor.

f) The approximate net and gross weight and dimensions of packages / cases.

g) Recommended spares for satisfactory operation for a minimum period of one year.

h) Details of any technical service, if required for erection, assembly, commissioning and demonstration.

### 30. 2. PRICES:

Tenders offering firm prices will be preferred. Where a price variation clause is insisted upon by a tenderer, quotations with a reasonable ceiling should be submitted. Such offers should invariably be supported by the base price taken into account at the time of tendering and also the formula for any such variations.

### 31. 30. APPLICABLE LAW:

The Contract shall be interpreted, construed and governed by the laws of India.

### 32. 3. TERMS OF PAYMENT:

3.1 Being a Department of the Government of India, the normal terms of payment are by Sight Draft. However other terms of payment like establishment of Letter of Credit may be considered by the Purchaser on such terms and conditions as may be agreed upon.

3.2 The Sight Draft / Letter of Credit will be operative on presentation of the undermentioned documents:

a) Original Bill of Lading / Airway Bill

b) Commercially certified invoices describing the stores delivered, quantity, unit rate and their total value, in triplicate. The invoice should indicate the discounts, if any, and Agency Commission separately.

c) Packing List showing individual dimensions and weight of packages.

d) Country of Origin Certificate in duplicate.

e) Test Certificate.

f) Declaration by the Seller that the contents in each case are not less than those entered in the invoices and the quality of the Stores are guaranteed as per the specifications asked for by the Purchaser.

g) Warrantee and guarantee Certificate/s vide Clause 20 hereinbelow

33. 3. The FOB/FCA and C & F prices quoted should be inclusive of all taxes, levies, duties arising in the tenderer's country.

34. 4. IMPORTANT LICENCE:

Reference to Import License No. & date and Contract number & date shall be prominently indicated in all the documents vide para 3.2

35. 4. The offer should be valid for a minimum period of 90 days (Single Part Tender) / 180 days (Two Part Tender) from the due date of opening of the tender.

36. 5. DEMURRAGE:

Supplier shall bear demurrage charges, if any, incurred by the purchaser due to delayed presentation of shipping documents as prescribed in para 3.2 to the bankers within a reasonable time (say within 10-12 days) from the date of bill of lading for sea consignments and within 3-4 days from the date of Air Way Bill for air consignments.

37. 5. Samples, if called for, should be sent free of all charges.

38. 6. ADDRESS OF INDIAN AGENTS:

39. 6. Late and delayed tenders will not be considered. Quotations by cable must be followed by detailed offers.

40. 7. GUARANTEED TIME DELIVERY:

The time for and the date of delivery stipulated in the Purchase Order shall be deemed to be the essence of the Contract. Delivery must be completed within the date specified therein.

41. 7. Offers made by Indian Agents on behalf of their Principals, should be supported by the proforma invoice of their Principals.

42. 8. INSPECTION AND ACCEPTANCE TEST:

8.1 The Purchaser's representatives shall also be entitled at all reasonable times during manufacture to inspect, examine and test on the Contractor's premises the material and workmanship of all stores to be supplied under this Contract and if part of the said stores is being manufactured on other premises, the Contractor shall obtain for the purchaser's representative permission to inspect, examine and test as if the equipment were being manufactured on the Contractor's premises. Such inspection, examination and testing shall not release the Contractor from the obligations under this Contract.

8.2 For tests on the premises of the Contractor or of any of his sub-Contractors, the Contractor shall provide free of cost assistance, labour, material, electricity, fuel and instruments as may be required or as may be reasonably needed by the purchaser's representative to carry out the tests efficiently.

8.3 When the stores have passed the specified test, the purchaser's representative shall furnish a

certificate to the effect in writing to the Contractor. The Contractor shall provide copies of the test/s certificates to the purchaser as may be required.

43. 8. The details of Import Licence will be furnished in the Purchase Order.

44. 9. MODE OF DESPATCH:

Generally, stores should be despatched through Indian Flagged Vessel / Air India or through any other Agency nominated by the purchaser. A copy of the invoice and packing list should invariably be kept inside each of the packages.

45. 9. The authority of person signing the tender, if called for, shall be produced.

46. DEPARTMENT OF SPACE

VIKRAM SARABHAI SPACE CENTRE

CMSE, VATTIYOORKAVU P.O.,

THIRUVANANTHAPURAM- 695 013

47. FORM 22 FOR FOREIGN CASE

48. II. TERMS AND CONDITIONS

1. DEFINITIONS:

(a) The term 'Purchaser' shall mean the President of India or his successors or assignees.

(b) The term 'Contractor' shall mean, the person, firm or company with whom or with which the order for the supply of stores is placed and shall be deemed to include the Contractor's Successors, representatives, heirs, executors and administrators unless excluded by the Contract.

(c) The term 'Purchase Order' shall mean the communication signed on behalf of the Purchaser by an officer duly authorised intimating the acceptance on behalf of the Purchaser on the terms and conditions mentioned or referred to in the said communication accepting the Tender or offer of the Contractor for supply of stores of plant, machinery or equipment of part thereof.

(d) The term 'Stores' shall mean what the Contractor agrees to supply under the Contract as specified in the Purchase Order.

### **3. Conditions for BIDDER FROM A COUNTRY WHICH SHARES LAND BORDER WITH INDIA**

1. Any bidder from a country which shares a land border with India will be eligible to bid in this tender, only if the bidder is registered with the Competent Authority.

Competent Authority for the purpose of registration shall be the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade (DPIIT).

2. Any false declaration and non-compliance of the above would be a ground for immediate

rejection of offer or termination of the contract and further legal action in accordance with the laws.

3. Validity of Registration: Registration should be valid at the time of submission of bids and should be valid at the time of placement of order.

#### **4. PPP Make in India(Non- Divisible Items-All Classes of Suppliers)**

1. A committee (with an external expert from a practicing cost accountant or practicing chartered accountant, if required) constituted for independent verification shall verify the self-declarations & auditor's / accountant's certificates on random basis, as per the requirements.

2. a) The subject item falls under Non-divisible category. b) The offers are sought from all classes of suppliers.

3. Definitions: A supplier or service provider, whose goods, services or works offered for procurement, has local content: i. Equal to or more than 50%: Class-I local supplier. ii. More than 20% but less than 50%: Class-II local supplier. iii. Less than or equal to 20%: Non-local supplier.

4. False declarations will be in breach of code of the integrity for which a bidder or its successor's will not be eligible/debarred for purchase preference from further tenders / pending tenders for two years along with other actions as may be applicable.

5. In case of a complaint received from any local supplier indicating a need for review / verification of Local content of successful vendor / awarded vendor, for accepting a complaint from such complainant (w.r.t the false declaration given by the successful vendor on the local content), a complaint fee of Rs.2Lakhs or 1% of the locally manufactured items being procured (subject to a maximum Rs. 5Lakhs), whichever was higher, to be paid by demand draft by the complainant. In case, the complaint is found to be incorrect, the complaint fee shall be forfeited. In case, the complaint is upheld and found to be substantially correct, deposited fee of the complainant would be refunded without any interest.

6. In cases the quoted price is in excess of Rs.1000 Lakhs (including duties, taxes and freight & Insurance) the 'Class-I & II local supplier shall provide a certificate from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in case of suppliers other than companies) giving the percentage of local content.

7. In line with Public Procurement (Preference to Make in India), Order 2017 & its amendments issued by Govt. of India from time to time with a view to support the Indian industries, ISRO has implemented "Purchase Preference Policy". The "Purchase Preference" is applicable for the "Class-I Local Supplier" for the goods/ services/ works covered in this tender, subject to the following terms & conditions:-

8. 'L1' means the lowest technically accepted tender / bid / quotation (i.e. lowest landed cost including duties, taxes and freight & Insurance).
9. 'Local content' means the amount of value added in India (i.e. indigenous items/services added in the offered products/ services/ works) be the total value of the item offered (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties/IGST) as a proportion of the total value (excluding net domestic indirect taxes), in percent.
10. 'Margin of purchase preference' means the maximum extent to which the price quoted by the "Class-I local supplier" above the L1 (landed cost).
11. Purchase Preference Policy:- Goods/Works which are not divisible (ie., required quantity is 1 or as a package) and Services:
- a) If L1 is from a 'Class-I local supplier', the contract will be awarded to L1 bidder.
  - b) If L1 is not from a 'Class-I local supplier', the lowest bidder among the 'Class-I local supplier' will be invited to match the L1 price subject to local supplier's quoted price falling within the margin of purchase preference (i.e. 20%) and the contract shall be awarded to such 'Class-I local supplier' subject to matching the L1 price (inclusive of duties, taxes and freight & insurance).
  - c) In case such lowest eligible 'Class-I local supplier' fails to match the L1 price, the 'Class-I local supplier' with the next higher bid within the margin of purchase preference shall be invited to match the L1 price and so on, and order/contract shall be awarded accordingly. In case where none of the 'Class-I local supplier' within the margin of purchase preference agree to match the L1 price, then the order/contract shall be awarded to the original L1 Bidder.
12. The 'Class-I & II local supplier' should provide a "Self Certification" along with technical offer indicating that the item offered meets the minimum local content [as per Sl. No.(3)] as called for in the tender and provide the percentage of local content along with details of the location(s) at which the local value addition is made. In case of two bid tenders, it is mandatory to indicate compliance to MLC(minimum Local Content) in technical bid zone.
13. The ink-signed certificate shall be provided on vendors letter head along with the offer (in case of online tender, copy of ink-signed certificate shall be uploaded along with your offer under concerned tab. Original in Hard copy shall be produced on request). In case of non-submission of certificate, the purchase preference shall not apply.
14. The margin of Purchase Preference shall be up to 20%.
15. The Public Procurement (Preference to Make in India), Order 2017 issued by Govt. of India indicates that if there are any general or specific restrictive clauses to restrict participation of Indian companies in those countries procurement tenders, reciprocity clause need to be invoked as per the order. Hence, if ISRO or Govt. of India come across that Indian suppliers of an item are not allowed to

participate and / or compete in procurement by your government, the bid submitted by you will be not be considered and excluded from eligibility for procurement. Please note this point.

16. Works means all works as per Rule 130 of GFR- 2017, and will also include 'turnkey works'. Works includes Engineering, Procurement and Construction (EPC) contracts and services include System Integrator (SI) contracts.

## C. Bid Templates

### C.1 Technical Bid - Atomic layer thin film deposition coating system ( Thermal and Plasma enhanced ALD).

#### 1. COATING-Atomic layer thin film deposition coating system ( Thermal and Plasma enhanced ALD).

#### Item specifications for COATING-Atomic layer thin film deposition coating system ( Thermal and Plasma enhanced ALD).

SI No	Specification	Value	Compliance	Offered Specification	Remark
1	Major equipment	(1)Thermal and Plasma enhanced Atomic Layer Deposition System suitable and capable for deposition of Carbides, Sulfides and Di sulfides, Nitrides, Oxides of Non Metallic and Metallic coating.	Yes / No / Explain		

2	Substrates and Temperature	<p>(2a)Substrate Material: The substrate materials are stainless steel, Ceramic, Permendur, Quartz, glass, silicon and etc.</p> <p>(2b) Substrate / samples size, Type and holder: The size of the planar substrates is dia 200 mm (8 inch) (Max). Other samples are Multiple number of spherical balls (Dia 7 mm), irregular 3D objects (Dia 20mm). Suitable substrate holder capable of holding above said all materials to ensure the conformal coating and uniformity such as mesh basket and cartridges should be provided. Substrate holder need to be Ultrasonicated or agitated for end to end operation. The substrates need to be cleaned by plasma cleaning method, inside the chamber, prior to coating and provision is to be made accordingly.</p> <p>(2c) Sample / Substrate loading should be Manual mode.</p> <p>(2d)Substrate Temperature Range and Temperature Uniformity: Compatible substrate heater (preferably Resistive heating assembly) shall be provided for heating up to 500 °C with an accuracy <math>\pm 1</math> °C. Temperature</p>	Yes / No / Explain		
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		<p>uniformity: <math>\pm 1</math> °C. The heater element should be compatible with high vacuum, plasma, reactive gas (O<sub>2</sub>, N<sub>2</sub>) and corrosive coating materials.</p> <p>(2e) Suitable Temperature controller (Reputed make Eurotherm, Thermo) using PID type, thyristor power controller, thermocouple or better with redundancy shall be provided. Heating ramp rate shall be provided and the ramp rate shall be user defined.</p>			
3	Coating materials	<p>(3a) Coating deposition materials: The materials to be coated are Titanium carbide, Molybdenum Disulfide, Tungsten Disulfide, Titanium Nitride, Aluminum Oxide (Carbides, Sulfides, Disulfides, Nitrides and Oxides).</p> <p>(3b) Party should specify coating conformity, aspect ratio, uniformity and repeatability.</p>	Yes / No / Explain		

4	Vacuum Chamber	<p>(4a) Chamber material is of High quality vacuum compatible, non magnetic, non corrosive material. Party should certify the chamber material for usage in corrosive coating. Chamber shape shall be cylindrical for above coating.</p> <p>(4b) Suitable Reactor head (Preferably Shower head) is to supplied by party for above surface coatings.</p> <p>(4c) O rings /gasket should be suitable for high temperature and corrosive material (Sulfides and disulfides) coatings. O rings /gasket should be reputed make (Preferably Aflaz / Chemraz) for high vacuum sealing</p> <p>(4d) Suitable chamber size is to be specified for coating 8 inch (200mm) dia substrates. Approximate chamber size is 300mm (dia) and Height is 100mm.</p> <p>(4e) Process chamber and all sub assemblies should withstand corrosive material coatings, high temperature and can be of electro polished for low out gassing during operation.</p> <p>(4f) Inside the vacuum chamber there should not be any outgassing material , which will affect the vacuum</p>	Yes / No / Explain		
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<p>performance and cause cross contamination over continuous operation.</p> <p>(4g) Chamber should be designed to carry out sequential of multi-layers using Thermal and Plasma ALD. Should be able to operate between the thermal and plasma modes without any hardware changes.</p> <p>(4h) The chamber structure should be capable of maintaining pressure <math>&lt;5 \times 10^{-2}</math> mbar.</p> <p>(4i) View port of 2" dia or larger made of Quartz with RF shield for direct view of deposition process shall be provided on the door and it shall be provided with externally operated shutter to reduce the deposition on view port.</p> <p>(4j) The chamber door should be configured and designed taking into account of easy accessibility of all the internal systems for operation such as substrates, gas, plasma lines and cleaning activities.</p> <p>(4k) Chamber door shall be of double hinge type (to ensure uniform compression on the O ring) with locking mechanism.</p> <p>(4l) Chamber should be leak tested through MSLD for leak rates better than <math>1 \times 10^{-9}</math> mbar l / s (Helium)</p> <p>(4m) Ports on the chamber body for</p>			
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		<p>the following components to be provided. (4m1) Substrate holder, substrate heater, control valve, source, shutter. (4m2) Ports for vacuum pumps, gauges, other essential items. (4m3) Ports for Process /reactive gas inlet ports. (4m4) Ports should be provided for all optional items.</p>			
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5	Vacuum pumps and gauges	<p>(5a) Vendor should supply suitable Dry pump for corrosive materials such as Sulfides, Disulfides and Carbides coating.</p> <p>(5b) Pumping system: The vacuum system is equipped with a Dry pump (Reputed Make: Pfeiffer / Edwards / Leybold / Varian / Agilent), chemical series and resistant against corrosive gases.</p> <p>Suitable Dry Pumping capacity: <math>\geq 90 \text{ m}^3/\text{hr}</math>, Noise level :&lt; 65 Db.</p> <p>(5c) Vapor &amp; Poise trap and Filters should be provided. (5d) Dry Scrubber should be provided.</p> <p>(5e) Vacuum level: Base pressure &lt;5 x 10-2 mbar.</p> <p>(5f) Vacuum valves: Suitable Gate valve, slit valve and Butterfly valve should be provided. ( Reputed make: VAT / MKS )</p> <p>(5g) Vacuum measuring gauges:</p> <p>(5g1) Pirani gauge: Two no's. Of active Pirani gauge having a measuring range from atmosphere to 10-3mbar for backing and roughing pressure monitoring with controller (Reputed Make: Pfeiffer/ Edwards /MKS/ Agilent / Inficon)</p> <p>(5g2) All the supplied gauges to be provided with calibration certificate for the period of validity from one year after installation</p>	Yes / No / Explain		
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		at IISU. (5g3) OEM Maintenance and calibration procedure of vacuum gauges needs to be specified by the supplier.			
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6	RF ICP ( RF-Inductive coupled remote Plasma Source )	<p>(6a) Plasma source: RF-ICP Remote plasma by inductive coupled. ICP type: helical, RFICP power: 600W, Tunable and Ability to run plasma down to 10 mTorr.</p> <p>(6b) Generator with directly coupled automatic matching. Auto matching network as process parameters should be provided.</p> <p>(6c) ICP Power supply: The system should include an Inductively coupled plasma (ICP) source driven by a frequency as per international standard , generator that is attached as a remote source (Remote Plasma) to the upper flange of the reactor. An external matching box matches the plasma load to the output impedance of the RF generator.</p> <p>(6d) The ICP is to be generated inside the quartz tube. Auto matching network for plasma generation. The top flange with suitable Reactor head should be attached with ICP source (Remote plasma) for Plasma ALD. Plasma source isolation valve should be provided.</p> <p>(6e) One 600 watts, RF ICP Remote plasma power supply package (Reputed make: SEREN, Advanced energy, Huttinger) including generator, Auto tuning (AT ),</p>	Yes / No / Explain		
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		auto-matching network, control panel ,power supply along with all cables and interlock connectors shall be provided. Party should explicitly provide details on RF-ICP configuration, drawings, power, frequency, operation and geometry of RF ICP along with Quotation.			
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7	Precursors lines and precursors containers	<p>(7a) Six numbers of precursors with precursor lines should be provided. Heater jackets should be provided for all the six number precursor lines. Precursors material purity: 99.999 %.</p> <p>Suitable Bubblers should be provided along with precursor.</p> <p>(7b) Precursor lines are required to be heated up to 200° C ± 0.5° C using molded heater jackets. Precursor temp 30 - 200° C for all 6.</p> <p>(7c) Precursor cabinet must handle up to total 6 (liquid and solid precursors).</p> <p>(7d) Precursor size = Precursor size is ≥ 200 ml for all 6.</p> <p>(7e) Substrate heater, Chamber heater, Individual heater for precursors, Gas manifold lines, precursor lines and Pumping lines should be provided.</p> <p>(7f) Precursor material container: 6 Nos of DOT certified standard precursor container- Cylinders / canisters / bottles filled with precursor's chemicals by Reputed make: STREM / EPI valence / Dockwell / Sigma Aldrich -Merck.</p>	Yes / No / Explain		
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8	ALD Valves	<p>(8a) Suitable ALD valves with three port (Reputed make: Swagelok) should be Provided.</p> <p>(8b) ALD valves response time, controlled should be &lt;10ms and process control 100 ms (open to close time) rapid automatic pressure controller. ALD valves need to be temperature controlled up to 200°C. ALD valves should be provided for all six precursors, plasma gas lines and purging lines.(8C) ALD valves for above requirement is 13.</p>	Yes / No / Explain		
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9	Gas Lines and Piping	<p>(9a) Plasma gas lines such as four numbers of reactive gas lines I Nitrogen for Nitrides, Oxygen for Oxides ,Hydrogen for Reduction, Ammonia ,Hydrogen Sulfide ,spare lines for carbides ] and one number of purging gas lines [Argon gas] with three port ALD valve should be provided.</p> <p>(9b) Plasma gas lines for above requirement are 7.</p> <p>(9c)Gas purging lines should be of electro polished SS 310/ Material compatible for Corrosive gases, fabricated with , preferably swage lock compatible fittings.</p> <p>(9d) Gas lines should be fabricated in electro polished SS 316 materials/ Material compatible for Corrosive gases, from cylinder to gas pod / gas cabinet to MFC to chamber.</p> <p>(9e) PID(Piping, Instrumentation and Drawings / Diagrams) consists of Exhaust backing pump pipe lines, Exhaust of gas box pipe lines, un reacted gas pipe lines, dry scrubber lines, precursor pipe lines, gas pipe lines, purging pipe lines along with safety alarm, Chemical and Gas leak sensors should be provided. Detailed plan of</p>	Yes / No / Explain		
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		assembly and Integration of PID for the above should be mentioned in Quotation.			
10	Mass flow controllers (MFCs)	<p>(10a) Gas manifold housing with electronically controlled high precision mass flow controllers (MFC) for Nitrogen, oxygen, argon, Hydrogen, Ammonia ,Hydrogen disulfide, process gas (Reputed Make: MKS / Swagelok preferably )</p> <p>(10b) MFC Controller with digital read out having controllability better than 0.1 sccm is essential (10-100 % Range), Full scale range: 200 sccm (Max) (Ar, O2, N2).</p> <p>(10c)All the gases shall be purged individually using separate valve systems. Reactive process gases (nitrogen and oxygen) shall be injected via gas ring or better kind of mechanism.(10d) Suitable Mass flow controllers (MFCs) for above requirements are <math>\geq 13</math> and should be provided.</p>	Yes / No / Explain		

11	Safety Interlocks and system Safety	<p>(11a) All necessary safety interlocks for RF- ICP, Cooling water, poor vacuum and high voltage shall be provided. Supplier shall provide details of all built-in safety features including those features to take care of power failures during ALD operation and other emergencies. Interlock shall be provided to shut off RF plasma before opening of vacuum chamber door.(11b) System design shall take care of all interlocks and safety aspects With respect to equipment, human and application safety. Proper electrical wiring for earthing connection should be provided. Mushroom headed Emergency stop button shall be provided in the control panel with necessary alarm / display in HMI on its activation. Appropriate Warning symbols shall be pasted on the Equipment.</p> <p>(11c) All valves, plumbing lines shall marked and tagged. General P&amp; ID of the ALD coating system shall be Given. Safety interlock shall be provided to precursor cabinet, gas pod / gas cabinet, ALD valves, chamber pressure, chamber bottom cabinet including all</p>	Yes / No / Explain		
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		<p>accessories and utilities. (11d) Vendors should meet, comply and supply CE and SEMI standard procedures / certificate for RF-ICP power supply.(11e) Safety Features :Built in safety features - H2 / O2 safety interlock,- Software safety interlocks - Overpressure abort,- Over temp abort,- Faulty recipe entry warnings - Continuous USB communication monitoring, For protection of the pump and the environment, the system will include a high surface area ALD trap in the exhaust path, integrated within the system to minimize footprint, and heated under closed loop recipe control.</p>		
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12	Electrical power Supply	<p>(12a) System should function with 220 V ± 10 % single phase or 415 V ± 10 % three phase 50 Hz + 5 % power supply.</p> <p>(12b) Main Power supply indication and isolation switches should be Provided. Exact electric load for full system operation and required UPS rating need to be specified. In case of sudden power failures, suitable protective devices should be provided in all electrical/electronic systems to prevent damages to the critical / sensitive systems of the sputtering unit.</p> <p>(12c) All power cables used for wiring shall be FRLS (Fire retardant low smoke cables). All motor shall be provided with two independent earths. All electric motors to be protected with over load relay. Necessary electrical overload protection, Phase reversal / phase failure protection relay should be provided.</p> <p>(12d) All electrical items like circuit breakers, relays, power contactors should be from reputed manufactures with ISI certified (Reputed make Legrand/Havels/Siemens/ABB /Schneider/ L &amp; T etc).</p>	Yes / No / Explain		
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13	Instrumentation and HMI Interface	<p>(13a) Instrumentation and HMI Interface, Process Control, PLC based automation for system operation and process with 7 " HMI control interface (Make: Siemens/GE/Allen Bradley) shall be provided. HMI should have main menu for overall functions and separate sub menus for the vacuum pumping system, Power supply, Vacuum gauges, Mass flow controller, Substrate holder controls Thickness controller etc. Better service support and spares availability.</p> <p>(13b) Graphical user interface with system mimic showing status indication of each subsystem. Manual / Auto operation control panel with on/off switches for ICP RF power supply, Dry pump, turbo molecular pump –optional item, roughing, backing, high vacuum, Substrate heater, Substrate rotary drive, vacuum valves, mass flow controller etc. shall be provided.(13c) Recipe programming, storage and recall facility. The system users will have free access to the supplier's recipe Database on demand. Standard recipes for Titanium</p>	Yes / No / Explain		
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carbide, Molybdenum di sulfide , Tungsten di sulfide, Aluminum oxide and Titanium Nitride should be provided along with machine.

(13d) Display /data logs for trends for all major process parameters. Alarm management with continuous alarm logging function and failure indication. Visual Alarm indication should appear in the HMI when required conditions are not met. Alarm indication with appropriate narration for fault identification.

(13e) The control panel to have audio-visual alarm for indicating any failure in safety systems, auxiliaries, power and control systems etc. Acknowledgement provision should be given for all kinds of alarm indications.

(13f) Multi-colored tower lamp shall be provided over the control panel, each color programmed to indicate the status of the equipment.

(13g) The system should be able to operate in auto mode with programmed process recipe , manual mode with safety interlocks, service mode operations .Different level of security access (User, supervisor, service) with additional user

		<p>settings and security protection through password.(13h) Software and PLC backup should be provided.</p> <p>(13i) Laptop or computer with printer should be provided.</p> <p>(13j) All safety interlocks should be provided for the above end to end coating operation.</p>			
14	Utilities requirements	<p>(14a) Utilities of required suitable capacity such as recirculation chiller (Reputed Make: Thermo Fischer / Julaboo / Werner Finely ), Air compressor /CDA-Clean dry air (Reputed Make: ELGI/ Atlas Copco) and Nitrogen Generator (Reputed make: Sarlin / Thermo Fischer ) required for system operation shall be supplied along with equipment.</p> <p>(14b) All external utilities shall be interlocked for system performance and safety.</p> <p>(14c) Tubing's, distribution lines and its connections for recirculation chiller, Air compressor (CDA-Clean dry air) and Nitrogen Generator should be provided.</p>	Yes / No / Explain		

15	Pre dispatch Inspection (PDI) , Training and Acceptance criteria / Performance specifications	<p>(15a) Pre dispatch Inspection (PDI) will be carried out at the Manufactures site/supplier's site before dispatch.</p> <p>(15b) Training must be given to IISU Personnel's during Pre dispatch Inspection (PDI).</p> <p>(15c) During Pre dispatch Inspection (PDI), the following Acceptance criteria / Performance specifications should be demonstrated.</p> <p>(15c1) operation, maintenance and Trouble shooting of the system.</p> <p>(15c2) The system would be leak tested to the required level.</p> <p>(15c3) All the components, sub assemblies and final unit to be leak tested using MSLD to an individual leak rate of <math>3 \times 10^{-9}</math> mbar litres / sec to be demonstrated.</p> <p>(15c4) Base pressure <math>&lt; 5 \times 10^{-2}</math> mbar to be demonstrated with Dry Pump.</p> <p>(15c5) Coating conformity, High aspect ratio, uniformity and repeatability to be demonstrated.</p> <p>(15c6) Thermal ALD coating of Aluminum oxide (<math>Al_2O_3</math>) and Plasma ALD coating of Titanium Nitride (TiN) on spherical balls and planar substrate should be demonstrated.</p> <p>(15 c7) Thermal ALD coating of Molybdenum di</p>	Yes / No / Explain		
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		<p>sulfide (MoS<sub>2</sub>) and Thermal ALD coating of Tungsten Disulfide (WS<sub>2</sub>) on spherical balls and planar substrate should be demonstrated if feasible.  (15 c8) Party should coat and demonstrate the above  (S.I.No.15c6 &amp; 15c7) with using their own precursors.</p>			
16	Installation and commissioning	<p>Installation and commissioning of the equipment is to be carried at ISRO Inertial System Unit (IISU). Acceptance criteria / Performance specifications must be met during installation and commissioning at IISU.</p>	Yes / No / Explain		
17	Documentation /Manual	<p>One set of instruction manual ( hard copy and soft copy) for operation ,maintenance of the system, Trouble shooting , service manual, spare list, part lists, mechanical and drawings and air, water and electrical diagrams (English) to be provided along with system.</p>	Yes / No / Explain		
18	Warranty	<p>Warranty of all the total system is to be provided for TWO YEAR from the date of installation. Warranty and Test certificates for all the components from OEM to be provided. OEM certificate should be attached from reputed manufacturer.</p>	Yes / No / Explain		

19	AMC/Maintenance	<p>(19a) Party should provide separately quote for the AMC support for a period of 3 years beyond the warranty period.</p> <p>(19b) Scope of AMC should cover the servicing and maintenance of all the subsystem including original equipment manufacturers (OEM) as a turnkey basis.</p> <p>(19c) Vendor should commit to provide service support and spare/ consumables for a period of not less than 10 years.</p> <p>(19d) This system is required to function with highest uptime hence minimum down time preferred would be less than 96 hours from the date of intimation.</p>	Yes / No / Explain		
20	Price bid cost break up	<p>Sub system wise cost break up details should be provided for System, Chamber, Vacuum pumps, vacuum Gauges, vacuum valves ,Precursors, ALD Valves, Mass flow controllers, Gas lines, Purging lines, Exhaust lines , Pipe lines, , RF-ICP power supply, generator, Auto Matching network , Utilities ,PID etc should be provided.</p>	Yes / No / Explain		
21	Equipment layout	<p>Equipment layout, drawings with actual dimensions, utilities, gas pipe and exhaust lines shall be provided to customer.</p>	Yes / No / Explain		

22	Compliance Statement	All technical compliances shall be supported by technical leaflet or statement from manufacturer. Any blank left shall be taken as non compliance.	Yes / No / Explain		
23	Realization time frame	Total time frame for the realization of the item at IISU site shall be provided.	Yes / No / Explain		
24	User list with contacts	User list with contacts email address, phone number and full address should be provided.	Yes / No / Explain		

25	General Terms and conditions.	<p>(25a) Sample loading: Manual mode must be given.</p> <p>(25b) Material purity certificate for all precursors, DOT certificate for precursor container, material certificate for chamber material and heating element, calibration certificate for vacuum gauges such as Pirani and Penning and CE &amp; SEMI standard certificates for RF –ICP power supply, generator and its controller should be provided along with supplied items.</p> <p>(25c) Original equipment manufacturer (OEM) certificates for all imported items such as vacuum pumps, vacuum gauges, vacuum valves, RF-ICP power supply, Generator and its controller, ALD valves and etc should be provided along with supplied items.</p> <p>(25d) Gas lines, Purging line and precursor lines should be fabricated in electro polished SS316 /corrosion resistance material, Exhaust lines, dry scrubber and utilities to be installed by vendor / party in lab. Detailed plan of assembly and Integration of PID (Piping, Instrumentation and Drawings / Diagrams) for the above should be mentioned in Quotation.(25e)</p>	Yes / No / Explain		
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Manufactures should have minimum Three customers in the field supply of both Thermal and Plasma enhanced Atomic Layer Deposition System for Non metallic and Metallic coating. Customer End user Details must be provided along with quotation.

(25f) Machine should have Clean room compatible class 10000.

(25g) Mechanical dimensions and utility requirements should be provided.

(25h) The complete layout, drawing and actual dimensions for the system should be sent to indenter.

(25i) Footprint should be attached.

(25j) Complete detailed technical specifications along with leaflets, product catalogues for each imported items should be included with the quotation.

(25k) Break up cost for the individual items must be given along with quotation.

(25l) Third party inspection is required for materials used in the chamber and components and leak testing for qualification of welding.

(25m) The required accessories must be quoted as option, separately for minimum period of three year for trouble free operation.

(25n)The main

		supply voltage at IISU is 415V AC 50HZ three phase power supply.			
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26	Optional Items	<p>The following items shall be quoted as optional items.</p> <p>(26a) Suitable precursors  (26a1) For Titanium carbide (TiC), Precursor is Titanium tetra chloride( TiCl<sub>4</sub>) and Trimethyl aluminium (TMA),  (26a2) For Molybdenum Disulfide (MoS<sub>2</sub>), Precursor is Molybdenum Penta carbonyl Mo(CO)<sub>5</sub> and Hydrogen di sulfide (H<sub>2</sub>S) ,  (26a3) For Tungsten Disulfide (WS<sub>2</sub>), Precursor is Tungsten hexa carbonyl (WCO<sub>6</sub>) and Hydrogen di sulfide (H<sub>2</sub>S) ,  (26a4) For Aluminum oxide, Precursor is Trimethyl aluminum &amp; Water,  (26a5) For Titanium Nitride (TiN), Precursor is Titanium Tetrachloride and Tetrakis dimethyl amino titanium (TDMAT) shall be quoted as optional items.(26a6) In addition to the above precursors, Preferably organo-metallic precursors also for the above shall be quoted as optional items.</p> <p>(26b) Turbo molecular pump (Reputed Make: Leybold / Varian / Pfeiffer/ Edwards / Agilent) should suitable pumping capacity &amp; chemical series and resistant against corrosive gases, Preferably</p>	Yes / No / Explain		
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Magnetic levitated coupled Turbo Molecular Pump (TMP).It is water-cooled or Air cooled, Pumping capacity:  $\geq 500$  litres /sec  
 .TMP, Turbo controller and its cables should be quoted as optional items. If optional item Turbo molecular pump is selected, then Ultimate vacuum better than  $5 \times 10^{-7}$  mbar to be demonstrated during initial evacuation and  $1 \times 10^{-6}$  mbar within 30 minutes inside the chamber for repeated operations.  
 (26c) Penning gauge: Active penning gauge having a measuring range from  $1 \times 10^{-2}$  mbar to about  $1 \times 10^{-9}$  mbar for chamber pressure monitoring with controller.  
 (Reputed Make: Pfeiffer/ Edwards /MKS /Agilent)  
 (26d)Capacitance manometer type gauge for precise measurement and closed loop pressure control during sputtering operation with controller.  
 (Reputed Make: Pfeiffer/ Edwards /MKS/ Agilent / Inficon)  
 (26e) Ellipsometry  
 (26f) Optical Emission Spectrometer (OES )  
 (26g) Glove box for handling precursor materials.  
 (26h) Ozone Generator  
 (26i) Ports should be provided for such as Ellipsometer, Optical

		emission spectrometer (OES) and Turbo pumps connection to process chamber should be provided (26j) Necessary tools-1 set (26k) Any other consumable/spares which are essential for smooth functioning of the system shall be recommended by the supplier.			
27	Vendor Offer details	S.No - Description 27a - Technical bid, 27b- Price bid with cost split up for sub system wise, 27c- Compliance statement, 27d -Warranty, 27e -AMC quote, 27f- List of spares , consumables with cost quote, 27g -List of optional accessories, 27h- List of customers and details.	Yes / No / Explain		

**Document : ALD specifications**

**Common Specifications (Applicable for all items)**

SI No	Specification	Value	Compliance	Offered Specification	Remark
1	Major equipment	(1)Thermal and Plasma enhanced Atomic Layer Deposition System suitable and capable for deposition of Carbides, Sulfides and Di sulfides, Nitrides, Oxides of Non Metallic and Metallic coating.	Yes / No / Explain		

2	Substrates and Temperature	<p>(2a) Substrate Material: The substrate materials are stainless steel, Ceramic, Permendur, Quartz, glass, silicon and etc.</p> <p>(2b) Substrate / samples size, Type and holder: The size of the planar substrates is dia 200 mm (8 inch) (Max). Other samples are Multiple number of spherical balls (Dia 7 mm), irregular 3D objects (Dia 20mm). Suitable substrate holder capable of holding above said all materials to ensure the conformal coating and uniformity such as mesh basket and cartridges should be provided. Substrate holder need to be Ultrasonicated or agitated for end to end operation. The substrates need to be cleaned by plasma cleaning method, inside the chamber, prior to coating and provision is to be made accordingly.</p> <p>(2c) Sample / Substrate loading should be Manual mode.</p> <p>(2d) Substrate Temperature Range and Temperature Uniformity: Compatible substrate heater (preferably Resistive heating assembly) shall be provided for heating up to 500 °C with an accuracy <math>\pm 1</math> °C. Temperature uniformity: <math>\pm 1</math> °C. The heater element should be compatible with high vacuum, plasma, reactive gas (O<sub>2</sub>, N<sub>2</sub>) and corrosive coating materials.</p> <p>(2e) Suitable Temperature controller</p>	Yes / No / Explain		
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		(Reputed make Eurotherm, Thermo) using PID type, thyristor power controller, thermocouple or better with redundancy shall be provided. Heating ramp rate shall be provided and the ramp rate shall be user defined.			
3	Coating materials	(3a) Coating deposition materials: The materials to be coated are Titanium carbide, Molybdenum Disulfide, Tungsten Disulfide, Titanium Nitride, Aluminum Oxide (Carbides, Sulfides, Disulfides, Nitrides and Oxides). (3b) Party should specify coating conformity, aspect ratio, uniformity and repeatability.	Yes / No / Explain		

4	Vacuum Chamber	<p>(4a) Chamber material is of High quality vacuum compatible, non magnetic, non corrosive material. Party should certify the chamber material for usage in corrosive coating. Chamber shape shall be cylindrical for above coating.</p> <p>(4b) Suitable Reactor head (Preferably Shower head) is to supplied by party for above surface coatings.</p> <p>(4c) O rings /gasket should be suitable for high temperature and corrosive material (Sulfides and disulfides) coatings. O rings /gasket should be reputed make (Preferably Aflaz / Chemraz) for high vacuum sealing</p> <p>(4d) Suitable chamber size is to be specified for coating 8 inch (200mm) dia substrates. Approximate chamber size is 300mm (dia) and Height is 100mm.</p> <p>(4e) Process chamber and all sub assemblies should withstand corrosive material coatings, high temperature and can be of electro polished for low out gassing during operation.</p> <p>(4f) Inside the vacuum chamber there should not be any out-gassing material , which will affect the vacuum performance and cause cross contamination over continuous operation.</p> <p>(4g) Chamber should be designed to carry out sequential of multi-layers using Thermal and Plasma ALD. Should be able to operate between the</p>	Yes / No / Explain		
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thermal and plasma modes without any hardware changes.

(4h) The chamber structure should be capable of maintaining pressure  $<5 \times 10^{-2}$  mbar.

(4i) View port of 2" dia or larger made of Quartz with RF shield for direct view of deposition process shall be provided on the door and it shall be provided with externally operated shutter to reduce the deposition on view port.

(4j) The chamber door should be configured and designed taking into account of easy accessibility of all the internal systems for operation such as substrates, gas, plasma lines and cleaning activities.

(4k) Chamber door shall be of double hinge type (to ensure uniform compression on the O ring) with locking mechanism.

(4l) Chamber should be leak tested through MSLD for leak rates better than  $1 \times 10^{-9}$  mbar l / s (Helium)

(4m) Ports on the chamber body for the following components to be provided.

(4m1) Substrate holder, substrate heater, control valve, source, shutter.

(4m2) Ports for vacuum pumps, gauges, other essential items.

(4m3) Ports for Process /reactive gas inlet ports.

(4m4) Ports should be provided for all optional items.

5	Vacuum pumps and gauges	<p>(5a) Vendor should supply suitable Dry pump for corrosive materials such as Sulfides, Disulfides and Carbides coating. Pumping system: The vacuum system is equipped with a Dry pump (Reputed Make: Pfeiffer / Edwards / Leybold / Varian / Agilent), chemical series and resistant against corrosive gases. Suitable Dry Pumping capacity: <math>\geq 90 \text{ m}^3/\text{hr}</math>, Noise level: <math>&lt; 65 \text{ Db}</math>.</p> <p>(5c) Vapor &amp; Poise trap and Filters should be provided.</p> <p>(5d) Dry Scrubber should be provided.</p> <p>(5e) Vacuum level: Base pressure <math>&lt; 5 \times 10^{-2} \text{ mbar}</math>.</p> <p>(5f) Vacuum valves: Suitable Gate valve, slit valve and Butterfly valve should be provided. ( Reputed make: VAT / MKS )</p> <p>(5g) Vacuum measuring gauges:</p> <p>(5g1) Pirani gauge: Two no's. Of active Pirani gauge having a measuring range from atmosphere to <math>10^{-3} \text{ mbar}</math> for backing and roughing pressure monitoring with controller (Reputed Make: Pfeiffer/ Edwards /MKS/ Agilent / Inficon)</p> <p>(5g2) All the supplied gauges to be provided with calibration certificate for the period of validity from one year after installation at IISU.</p> <p>(5g3) OEM Maintenance and calibration procedure of vacuum gauges needs to be specified by the supplier.</p>	Yes / No / Explain		
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6	RF ICP ( RF-Inductive coupled remote Plasma Source )	<p>(6a) Plasma source: RF-ICP Remote plasma by inductive coupled. ICP type: helical, RF ICP power: 600 W, Tunable and Ability to run plasma down to 10 mTorr.</p> <p>(6b) Generator with directly coupled automatic matching. Auto matching network as process parameters should be provided.</p> <p>(6c) ICP Power supply: The system should include an Inductively coupled plasma (ICP) source driven by a frequency as per international standard , generator that is attached as a remote source (Remote Plasma) to the upper flange of the reactor. An external matching box matches the plasma load to the output impedance of the RF generator.</p> <p>(6d) The ICP is to be generated inside the quartz tube. Auto matching network for plasma generation. The top flange with suitable Reactor head should be attached with ICP source (Remote plasma) for Plasma ALD. Plasma source isolation valve should be provided.</p> <p>(6e) One 600 watts, RF ICP Remote plasma power supply package (Reputed make: SEREN, Advanced energy, Huttinger) including generator, Auto tuning (AT ), auto-matching network, control panel ,power supply along with all cables and interlock connectors shall be provided. Party should explicitly provide details on RF-ICP configuration, drawings, power,</p>	Yes / No / Explain		
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		frequency, operation and geometry of RF ICP along with Quotation.			
7	Precursors lines and precursors containers	<p>(7a) Six numbers of precursors with precursor lines should be provided. Heater jackets should be provided for all the six number precursor lines. Precursors material purity: 99.999%. Suitable Bubblers should be provided along with precursor.</p> <p>(7b) Precursor lines are required to be heated up to 200°C ± 0.5°C using molded heater jackets. Precursor temp 30 - 200° C for all 6.</p> <p>(7c) Precursor cabinet must handle up to total 6 (liquid and solid precursors).</p> <p>(7d) Precursor size = Precursor size is ≥200 ml for all 6.</p> <p>(7e) Substrate heater, Chamber heater, Individual heater for precursors, Gas manifold lines, precursor lines and Pumping lines should be provided.</p> <p>(7f) Precursor material container: 6 Nos of DOT certified standard precursor container– Cylinders / canisters / bottles filled with precursor's chemicals by Reputed make: STREM / EPI valence / Dockwell / Sigma Aldrich -Merck.</p>	Yes / No / Explain		

8	ALD Valves	<p>(8a) Suitable ALD valves with three port (Reputed make: Swagelok) should be Provided.</p> <p>(8b) ALD valves response time, controlled should be &lt;10ms and process control 100ms (open to close time) rapid automatic pressure controller. ALD valves need to be temperature controlled up to 200°C. ALD valves should be provided for all six precursors, plasma gas lines and purging lines.</p> <p>(8c) ALD valves for above requirement is 13</p>	Yes / No / Explain		
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9	Gas Lines and Piping	<p>(9a) Plasma gas lines such as four numbers of reactive gas lines [ Nitrogen for Nitrides, Oxygen for Oxides ,Hydrogen for Reduction, Ammonia ,Hydrogen Sulfide ,spare lines for carbides ] and one number of purging gas lines [Argon gas] with three port ALD valve should be provided.</p> <p>(9b) Plasma gas lines for above requirement are 7.</p> <p>(9c)Gas purging lines should be of electro polished SS 316/ Material compatible for Corrosive gases, fabricated with preferably swage lock compatible fittings.</p> <p>(9d) Gas lines should be fabricated in electro polished SS 316 materials/ Material compatible for Corrosive gases, from cylinder to gas pod / gas cabinet to MFC to chamber.</p> <p>(9e) PID(Piping, Instrumentation and Drawings / Diagrams) consists of Exhaust backing pump pipe lines, Exhaust of gas box pipe lines, un reacted gas pipe lines, dry scrubber lines, precursor pipe lines, gas pipe lines, purging pipe lines along with safety alarm, Chemical and Gas leak sensors should be provided. Detailed plan of assembly and Integration of PID for the above should be mentioned in Quotation.</p>	Yes / No / Explain		
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10	Mass flow controllers (MFCs)	<p>(10a) Gas manifold housing with electronically controlled high precision mass flow controllers (MFC) for Nitrogen, oxygen, argon, Hydrogen, Ammonia, Hydrogen disulfide, process gas (Reputed Make: MKS / Swagelok preferably )</p> <p>(10b) MFC Controller with digital read out having controllability better than 0.1 sccm is essential (10-100 % Range), Full scale range: 200 sccm (Max) (Ar, O2, N2).</p> <p>(10c) All the gases shall be purged individually using separate valve systems. Reactive process gases (nitrogen and oxygen) shall be injected via gas ring or better kind of mechanism.</p> <p>(10d) Suitable Mass flow controllers (MFCs) for above requirements are <math>\geq 13</math> and should be provided.</p>	Yes / No / Explain		
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11	Safety Interlocks and system Safety	<p>(11a) All necessary safety interlocks for RF- ICP, Cooling water, poor vacuum and high voltage shall be provided. Supplier shall provide details of all built-in safety features including those features to take care of power failures during ALD operation and other emergencies. Interlock shall be provided to shut off RF plasma before opening of vacuum chamber door.</p> <p>(11b) System design shall take care of all inter locks and safety aspects With respect to equipment, human and application safety. Proper electrical wiring for earthing connection should be provided. Mushroom headed Emergency stop button shall be provided in the control panel with necessary alarm / display in HMI on its activation. Appropriate Warning symbols shall be pasted on the Equipment.</p> <p>(11c) All valves, plumbing lines shall be marked and tagged. General P&amp; ID of the ALD coating system shall be Given. Safety interlock shall be provided to precursor cabinet, gas pod / gas cabinet, ALD valves, chamber pressure, chamber bottom cabinet including all accessories and utilities.</p> <p>(11d) Vendors should meet, comply and supply CE and SEMI standard procedures / certificate for RF-ICP power supply.</p> <p>(11e) Safety Features :Built in safety features</p>	Yes / No / Explain		
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		<ul style="list-style-type: none"><li>- H2 / O2 safety interlock,- Software safety interlocks</li><li>- Overpressure abort,- Over temp abort,- Faulty recipe entry warnings</li><li>- Continuous USB communication monitoring, For protection of the pump and the environment, the system will include a high surface area ALD trap in the exhaust path, integrated within the system to minimize footprint, and heated under closed loop recipe control.</li></ul>			
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12	Electrical power Supply	<p>(12a) System should function with 220 V ± 10 % single phase or 415 V ± 10 % three phase 50 Hz + 5 % power supply.</p> <p>(12b) Exact electric load for full system operation and required UPS rating need to be specified. In case of sudden power failures, suitable protective devices should be provided in all electrical/electronic systems to prevent damages to the critical / sensitive systems of the sputtering unit.</p> <p>(12c) All power cables used for wiring shall be FRLS (Fire retardant low smoke cables). All motor shall be provided with two independent earths. All electric motors to be protected with over load relay. Necessary electrical overload protection, Phase reversal / phase failure protection relay should be provided.</p> <p>(12d) All electrical items like circuit breakers, relays, power contactors should be from reputed manufactures with ISI certified (Reputed make Legrand/Havels/Siemens/ABB /Schneider/ L &amp;T etc).</p>	Yes / No / Explain		
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13	Instrumentation and HMI Interface	<p>(13a) Instrumentation and HMI Interface, Process Control, PLC based automation for system operation and process with 7 " HMI control interface (Make: Siemens/GE/Allen Bradley) shall be provided. HMI should have main menu for overall functions and separate sub menus for the vacuum pumping system, Power supply, Vacuum gauges, Mass flow controller, Substrate holder controls, Thickness controller etc. Better service support and spares availability to be ensured.</p> <p>(13b) Graphical user interface with system mimic showing status indication of each subsystem to be provided. Manual / Auto operation control panel with on/off switches for ICP RF power supply, Dry pump, turbo molecular pump –optional item, roughing, backing, high vacuum, Substrate heater, Substrate rotary drive, vacuum valves, mass flow controller etc. shall be provided.</p> <p>(13c) Recipe programming, storage and recall facility. The system users will have free access to the supplier's recipe Database on demand. Standard recipes for Titanium carbide, Molybdenum disulfide, Tungsten disulfide, Aluminum oxide and Titanium Nitride should be provided along with machine.</p> <p>(13d) Display /data logs for trends for all</p>	Yes / No / Explain		
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		<p>major process parameters.</p> <ul style="list-style-type: none"> <li>•Alarm management with continuous alarm logging function and failure indication.</li> <li>•Visual Alarm indication should appear in the HMI when required conditions are not met.</li> <li>•Alarm indication with appropriate narration for fault identification.</li> </ul> <p>(13e) The control panel to have audio-visual alarm for indicating any failure in safety systems, auxiliaries, power and control systems etc. Acknowledgement provision should be given for all kinds of alarm indications.</p> <p>(13f) Multi-colored tower lamp shall be provided over the control panel, each color programmed to indicate the status of the equipment.</p> <p>(13g) The system should be able to operate in auto mode with programmed process recipe , manual mode with safety interlocks, service mode operations .Different level of security access (User, supervisor, service) with additional user settings and security protection through password.</p> <p>(13h) Software and PLC backup should be provided.</p> <p>(13i) Laptop or computer with printer should be provided.</p> <p>(13j) All safety interlocks should be provided for the above end to end coating operation.</p>			
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14	Utilities requirements	<p>(14a) Utilities such as recirculation chiller (Reputed Make: Thermo Fischer / Julaboo / Werner Finely ), Air compressor /CDA-Clean dry air (Reputed Make: ELGI/ Atlas Copco) and Nitrogen Generator (Reputed make: Sarlin / Thermo Fischer ) required for system operation shall be supplied along with equipment.</p> <p>(14b) All external utilities shall be interlocked for system performance and safety.</p> <p>(14c) Tubing's, distribution lines and its connections for recirculation chiller, Air compressor (CDA-Clean dry air) and Nitrogen Generator should be provided.</p>	Yes / No / Explain		
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15	Pre dispatch Inspection (PDI) ,Training and Acceptance criteria / Performance specifications	<p>(15a) Pre dispatch Inspection (PDI) will be carried out at the Manufactures site/supplier's site before dispatch.</p> <p>(15b) Training must be given to IISU Personnel's during Pre dispatch Inspection (PDI).</p> <p>(15c) During Pre dispatch Inspection (PDI), the following Acceptance criteria / Performance specifications should be demonstrated.</p> <p>(15c1) operation, maintenance and Trouble shooting of the system.</p> <p>(15c2) The system would be leak tested to the required level.</p> <p>(15c3) All the components, sub assemblies and final unit to be leak tested using MSLD to an individual leak rate of <math>3 \times 10^{-9}</math> mbar litres / sec to be demonstrated.</p> <p>(15c4) Base pressure <math>&lt; 5 \times 10^{-2}</math> mbar to be demonstrated with Dry Pump.</p> <p>(15c5) Coating conformity, aspect ratio, uniformity and repeatability to be demonstrated.</p> <p>(15c6) Thermal ALD coating of Aluminum oxide (<math>Al_2O_3</math>) and Plasma ALD coating of Titanium Nitride (TiN) on spherical balls and planar substrate respectively should be demonstrated.</p> <p>(15 c7) Thermal ALD coating of Molybdenum di sulfide (<math>MoS_2</math>) and Thermal ALD coating of Tungsten Disulfide (<math>WS_2</math>) on spherical balls and planar substrate should be demonstrated if</p>	Yes / No / Explain		
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		feasible. (15 c8) Party should coat and demonstrate the above (S.I.No.15c6 & 15c7) with using their own precursors.			
16	Installation and commissioning	Installation and commissioning of the equipment along with all utilities and Piping & Instrumentation is to be carried out at ISRO Inertial System Unit (IISU). Acceptance criteria / Performance specifications (Ref: S.No 15C 1 to 15 C7) must be met during installation and commissioning at IISU.	Yes / No / Explain		
17	Documentation /Manual	One set of instruction manual ( hard copy and soft copy) for operation ,maintenance of the system, Trouble shooting , service manual, spare list, part lists, mechanical and drawings and air, water and electrical diagrams (English) to be provided along with system.	Yes / No / Explain		
18	Warranty	Warranty of all the total system is to be provided for TWO YEAR from the date of installation. Warranty and Test certificates for all the components from OEM to be provided. OEM certificate should be attached from reputed manufacturer.	Yes / No / Explain		

19	AMC/Maintenance	<p>(19a) Party should provide separately quote for the AMC support for a period of 3 years beyond the warranty period.</p> <p>(19b) Scope of AMC should cover the servicing and maintenance of all the subsystem including original equipment manufacturers (OEM) as a turnkey basis.</p> <p>(19c) Vendor should provide service support and spare/ consumables for a period of not less than 10 years.</p> <p>(19d) This system is required to function with highest uptime hence minimum down time preferred would be less than 96 hours from the date of intimation.</p>	Yes / No / Explain		
20	Price bid cost break up	<p>Sub system wise cost break up details should be provided for System, Chamber, Vacuum pumps, vacuum Gauges, vacuum valves ,Precursors, ALD Valves, Mass flow controllers, Gas lines, Purging lines, Exhaust lines , Pipe lines, , RF-ICP power supply, generator, Auto Matching network , Utilities, PID etc .</p>	Yes / No / Explain		
21	Equipment layout	<p>Equipment layout, drawings with actual dimensions, utilities, gas pipe and exhaust lines shall be provided to customer.</p>	Yes / No / Explain		
22	Compliance Statement	<p>All technical compliances shall be supported by technical leaflet or statement from manufacturer. Any blank left shall be taken as non compliance.</p>	Yes / No / Explain		

23	Realization time frame	Total time frame for the realization of the item at IISU site shall be provided.	Yes / No / Explain		
24	User list with contacts	User list with contacts email address, phone number and full address should be provided.	Yes / No / Explain		

25	General Terms and conditions.	<p>(25a) Sample loading: Manual mode must be given.</p> <p>(25b) Material purity certificate for all precursors, DOT certificate for precursor container, material certificate for chamber material and heating element, calibration certificate for vacuum gauges such as Pirani and Penning and CE &amp; SEMI standard certificates for RF –ICP power supply, generator and its controller should be provided along with supplied items.</p> <p>(25c) Original equipment manufacturer (OEM) certificates for all imported items such as vacuum pumps, vacuum gauges, vacuum valves, RF-ICP power supply, Generator and its controller, ALD valves and etc should be provided along with supplied items.</p> <p>(25d) Gas lines, Purging line and precursor lines should be fabricated in electro polished SS316 /corrosion resistance material, Exhaust lines, dry scrubber and utilities to be installed by vendor / party in lab. Detailed plan of assembly and Integration of PID (Piping, Instrumentation and Drawings / Diagrams) for the above should be mentioned in Quotation. (25e) Manufactures should have minimum Three customers in the field supply of both Thermal and Plasma enhanced Atomic Layer Deposition System for</p>	Yes / No / Explain		
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		<p>Non metallic and Metallic coating. Customer End user Details must be provided along with quotation. (25f) Machine should have Clean room compatible class 10000. (25g) Mechanical dimensions and utility requirements should be provided. (25h) The complete layout, drawing and actual dimensions for the system should be sent to indenter. (25i) Footprint should be attached. (25j) Complete technical specifications along with leaflets, product catalogues for each imported items should be included with the quotation. (25k) Break up cost for the individual items must be given along with quotation. (25l) Third party inspection is required for materials used in the chamber and components and leak testing for qualification of welding. (25m) The required accessories must be quoted as optional, separately for minimum period of three year for trouble free operation. (25n) The main supply voltage at IISU is 415V AC 50HZ three phase power supply.</p>			
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26	Optional Items	<p>The following items shall be quoted as optional items.</p> <p>(26a) Suitable precursors</p> <p>(26a1) For Titanium carbide (TiC), Precursor is Titanium tetra chloride( TiCl4) and Trimethyl aluminium (TMA),</p> <p>(26a2) For Molybdenum Disulfide (MoS2), Precursor is Molybdenum Penta carbonyl Mo(CO)5 and Hydrogen di sulfide (H2S) ,</p> <p>(26a3) For Tungsten Disulfide (WS2), Precursor is Tungsten hexa carbonyl (WCO6) and Hydrogen di sulfide (H2S) ,</p> <p>(26a4) For Aluminum oxide, Precursor is Trimethyl aluminum &amp; Water,</p> <p>(26a5) For Titanium Nitride (TiN), Precursor is Titanium Tetrachloride and Tetrakis dimethyl amino titanium (TDMAT) shall be quoted as optional items.</p> <p>(26a6) In addition to the above precursors, Preferably organo-metallic precursors also for the above shall be quoted as optional items.</p> <p>(26b) Turbo molecular pump (Reputed Make: Leybold / Varian / Pfeiffer/ Edwards / Agilent) should suitable pumping capacity &amp; chemical series and resistant against corrosive gases, Preferably Magnetic levitated coupled Turbo Molecular Pump (TMP).It is water-cooled or Air cooled, Pumping capacity: ≥500 litres /sec .TMP,</p>	Yes / No / Explain	
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<p>Turbo controller and its cables should be quoted as optional items. If optional item Turbo molecular pump is selected, then Ultimate vacuum better than <math>5 \times 10^{-7}</math> mbar to be demonstrated during initial evacuation and <math>1 \times 10^{-6}</math> mbar within 30 minutes inside the chamber for repeated operations.</p> <p>(26c) Penning gauge: Active penning gauge having a measuring range from <math>1 \times 10^{-2}</math> mbar to about <math>1 \times 10^{-9}</math> mbar for chamber pressure monitoring with controller. (Reputed Make: Pfeiffer/ Edwards /MKS /Agilent)</p> <p>(26d) Capacitance manometer type gauge for precise measurement and closed loop pressure control during sputtering operation with controller. (Reputed Make: Pfeiffer/ Edwards /MKS/ Agilent / Inficon)</p> <p>(26e) Ellipsometry</p> <p>(26f) Optical Emission Spectrometer (OES )</p> <p>(26g) Glove box for handling precursor materials.</p> <p>(26h) Ozone Generator</p> <p>(26i) Ports should be provided for such as Ellipsometer, Optical emission spectrometer (OES) and Turbo pumps connection to process chamber should be provided</p> <p>(26j) Necessary tools- 1 set</p> <p>(26k) Any other consumable/spares which are essential for smooth functioning of the system shall be</p>			
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		recommended by the supplier.			
27	Vendor Offer details	S.NoDescription 27aTechnical bid 27bPrice bid with cost split up for sub system wise 27cCompliance statement 27dWarranty 27eAMC quote 27fList of spares , consumables with cost quote 27gList of optional accessories 27hList of customers and details	Yes / No / Explain		

### Supporting Documents required from Vendor

#### 1. Detailed data sheets and catalogues

2. upload cost related documents ,if any ( will be opened along with price bid only) (Price Bid Related)

3. 11. The complete layout, drawing and actual dimensions for the system should be sent to indenter.

4. 10. Mechanical dimensions and utility requirements should be provided

5. . 9. Complete technical specifications along with leaflets, product catalogues for each imported items should be included with the quotation

6. 8 .Break up cost for the individual items must be given along with quotation.

7. 7. Third party inspection is required for materials used in the chamber and components and leak testing for qualification of welding

8. 6. The required accessories must be quoted as optional, separately for minimum period of three year for trouble free operation

9. 5 .Detailed plan of assembly and Integration of PID (Piping, Instrumentation and Drawings / Diagrams) for the above should be mentioned in Quotation

10. 4. Original equipment manufacturer (OEM) certificates for all imported items such as

**vacuum pumps, vacuum gauges, vacuum valves, RF-ICP power supply, Generator and its controller, ALD valves and etc should be provided along with supplied items**

**11. 3. Material purity certificate for all precursors, DOT certificate for precursor container, material certificate for chamber material and heating element**

**12. . 2. calibration certificate for vacuum gauges such as Pirani and Penning and CE & SEMI standard certificates for RF –ICP power supply, generator and its controller should be provided along with supplied items.**

**13. 1. Footprint should be attached.**

5 additional documents can be uploaded by the vendor

## C.2 Commercial Terms / Bid

Sl. No.	Description	Compliance	Vendor Terms
1	1 . Supply voltage is 415V AC 50HZ three phase power supply. 2. Manufactures should have minimum Three customers in the field supply of both Thermal and Plasma ALD .3 Break up cost for the individual items must be given .	Yes / No / Explain	
2	Department of Expenditure Order (Public Procurement No 01) OM No.F.No.6/18/2019-PPF dated 23.07.2020 and subsequent Amendment dt 11.09.2023 implies restrictions under Rule 144 (xi) of General Financial Rules, 2017. The Department of Expenditure order dated 23.07.2020 & 11.09.2023 stipulates necessity of registration of bidders, from a country which shares a land boarder with India, with the competent Authority I.e Department of Promotion of Industry and Internal trade (DPIIT).	Yes / No / Explain	
3	Payment term: 100% within 30 days after receipt and acceptance of item for indigenous/Sight Draft for import cases.	Yes / No / Explain	
4	Delivery period	Yes / No / Explain	
5	Installation period	Yes / No / Explain	
6	Delivery Term: FOR IISU. In case of Ex Works, please indicate Air worthy packing, forwarding & freight charges up to IISU separately.	Yes / No / Explain	
7	Warranty: Two years from the date of receipt, installation and acceptance of item at our site. Warranty certificate required.	Yes / No / Explain	
8	Performance Bank Guarantee: 3% of the Purchase Order value shall be given by you in the form of Bank Guarantee in Rs. 200/- non-judicial stamp paper from a Nationalized/Scheduled bank towards ensuring satisfactory performance of the item during warranty period (Two years) and claim period beyond 60 days of warranty period.	Yes / No / Explain	
9	Mode of despatch	Yes / No / Explain	

10	No insurance is required at our cost.	Yes / No / Explain	
11	Authorization certificate from the manufacturer is required	Yes / No / Explain	
12	PO ordering address in full with Contact Person Name, E-mail id, Phone No. [also attach your Quotation in PDF format]	Yes / No / Explain	
13	Please furnish your Bank details, Account No., SWIFT code, IFSC code etc for PFMS verification for payment, in case of PO.	Yes / No / Explain	
14	Any other points	Yes / No / Explain	
15	This is a Public Tender (Two part). Techno commercial bid and price bid shall not be submitted together. No price details should be mentioned in the Techno-commercial bid.	Yes / No / Explain	
16	We do not open PART-II (Price Bid), if PART-I (Technical & commercial Offer) does not meet with our technical specification requirements.	Yes / No / Explain	
17	The technical documents need to be attached online as a single pdf file without any price information, technical bid containing price details will be treated as rejected.	Yes / No / Explain	
18	Price bid opening date indicated in the schedule is tentative only. Actual date will determine after evaluation of techno commercial bid.	Yes / No / Explain	
19	Security deposit: In the event of placement of order (above 5.0L), you should submit Security Deposit at 3% of the order value of the P.O. The Security Deposit shall valid for a period of 60 days beyond the date of completion and acceptance of P.O/Contract. The Security Deposit will be discharged without any interest after completion and acceptance of the Contractual obligations.	Yes / No / Explain	

20	Liquidated damages: The delivery date stipulated in the purchase order shall be deemed to be the essence of order and delivery must be completed not later than the date specified therein otherwise a sum not exceeding 0.5% of the value of the order will be realized by way of liquidated damages for each calendar week or part of the week during which the delivery of such stores may be in arrears subject to a maximum ceiling of 10% of the order value.	Yes / No / Explain	
21	Quotation validity - Minimum 180 days	Yes / No / Explain	

### C.3 Price Bid

Sl. No.	Item	Quantity	Unit Price	Currency	Total Price	Remark
1	COATING-Atomic layer thin film deposition coating system ( Thermal and Plasma enhanced ALD).	1.00 Nos.		-		

### Common charges (Applicable for all items)

<b>Freight charge</b>	
<b>P&amp;F Charges</b>	