



**INDIAN INSTITUTE OF SCIENCE EDUCATION AND
RESEARCH THIRUVANANTHAPURAM [IISERTVM]**

PH.-0471 2778019,

EMAIL: purchasestores@iisertvm.ac.in

MARUTHAMALA, VITHURA
THIRUVANANTHAPURAM 695551,
KERALA, INDIA

IISER/PUR/EOI/0001/MT/21-22

22 Apr 2021

NOTICE INVITING EXPRESSION OF INTEREST (EOI)

1. **ATOMIC LAYER DEPOSITION SYSTEM (DETAILS IN ANNEXURE 2)**
2. **CRYOGEN-FREE DILUTION REFRIGERATOR (DETAILS IN ANNEXURE 3)**

TERMS & CONDITIONS:

1. EOI shall contain profile of the manufacturer and supplier (agent or dealer if any), Technical details of the product, HSN Code and other necessary inputs such as list of installations in India and abroad (with contact details of end users) where similar equipment is supplied.
2. Category of Suppliers: Suppliers/Manufacturers should provide documents mentioning the category under which they fall, with the percentage in local content and provide a self-certification that the item offered meets the local content requirement for Class-I local supplier / Class-II local supplier as the case may be. Supplier should give the details of the location at which the local value addition is made. In case of procurement for a value in excess of Rs 10 Crores the class 1 local supplier / class 2 local supplier shall be required to 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 respect of suppliers other than companies) giving the percentage of local content. The supplier /manufacturer who has failed to provide the category & documents will be treated as Non-local supplier. False declarations will be in breach of code of integrity under Rule 175(1)(i)(h) of the General Financial Rules for which the bidder or its successors can be debarred for up to two years as per Rule 151(iii) of the GFR along with such other actions as may be permissible under law.

The categories are:


- a. Class I local Supplier – has local content equal to more than 50%



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- b. Class II local Supplier – has local content more than 20% but less than 50%
- c. Non –Local Supplier – has local content less than or equal to 20%
3. Shortlisted sources may be invited for presentation/ discussion.
4. EOI shall be uploaded in CPPP portal mandatorily. Physical / Hard copy of the EOI will not be accepted by the Institute.
5. **Due date for submission of EOI is 06 May 2021 up to 3.00 PM.**




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Deputy Registrar
[Purchase & Stores]
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Thiruvananthapuram - 695 551

ANNEXUE: 1
Instructions To Bidder for Online Bid Submission

The bidders are required to submit soft copies of their bids electronically on the CPP Portal, using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the CPP Portal, prepare their bids in accordance with the requirements and submitting their bids online on the CPP Portal.

More information useful for submitting online bids on the CPP Portal may be obtained at: <https://eprocure.gov.in/eprocure/app>.

REGISTRATION

- 1) Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal (URL: <https://eprocure.gov.in/eprocure/app>) by clicking on the link "Online bidder Enrollment" on the CPP Portal which is free of charge.
- 2) As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts.
- 3) Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the CPP Portal.
- 4) Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify / nCode / eMudhra etc.), with their profile.
- 5) Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSC's to others which may lead to misuse.
- 6) Bidder then logs in to the site through the secured log-in by entering their user ID / password and the password of the DSC / e-Token.

SEARCHING FOR TENDER DOCUMENTS

- 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 published on the CPP Portal.
- 2) Once the bidders have selected the tenders they are interested in, they may download the required documents / tender schedules. These tenders can be moved to the respective 'My Tenders' folder. This would enable the CPP Portal to intimate the bidders through SMS / email in case there is any corrigendum issued to the tender document.
- 3) The bidder should make a note of the unique Tender ID assigned to each tender, in case they want to obtain any clarification / help from the Helpdesk.

PREPARATION OF BIDS

- 1) Bidder should take into account any corrigendum published on the tender document before submitting their bids.
- 2) 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.
- 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 / XLS / RAR / DWF/JPG formats. Bid documents may be scanned with 100 dpi with black and white option which helps in reducing size of the scanned document.
- 4) To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, annual reports, auditor certificates etc.) has been provided to the bidders. Bidders can use "My Space" or "Other Important Documents" area available to them to upload such documents. These documents may be directly submitted from the "My Space" area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.

Note: My Documents space is only a repository given to the Bidders to ease the uploading process. If Bidder has uploaded his Documents in My Documents space, this does not automatically ensure these Documents being part of Technical Bid.

SUBMISSION OF BIDS

- 1) Bidder should log into the site well in advance for bid submission so that they can 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.
- 2) The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.
- 3) Bidder has to select the payment option as "offline" to pay the tender fee / EMD as applicable and enter details of the instrument.
- 4) Bidder should prepare the EMD as per the instructions specified in the tender document. The original should be posted/couriered/given in person to the concerned official, latest by the last date of bid submission or as specified in the tender documents. The details of the DD/any other accepted instrument, physically sent, should tally with the

details available in the scanned copy and the data entered during bid submission time. Otherwise the uploaded bid will be rejected.

- 5) Bidders are requested to note that they should necessarily submit their technical & financial bids in PDF format only and no other format is acceptable. If the price bid has been given as a standard BoQ format with the tender document, then the same is to be downloaded and to be filled by all the bidders. Bidders are required to download the BoQ file, open it and complete the white coloured (unprotected) cells with their respective financial quotes and other details (such as name of the bidder). No other cells should be changed. Once the details have been completed, the bidder should save it and submit it online, without changing the filename. If the BoQ file is found to be modified by the bidder, the bid will be rejected.
- 6) The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission.
- 7) All the documents being submitted by the bidders would be encrypted using PKI encryption techniques to ensure the secrecy of the data. The data entered cannot be viewed by unauthorized persons until the time of bid opening. The confidentiality of the bids is maintained using the secured Socket Layer 128 bit encryption technology. Data storage encryption of sensitive fields is done. Any bid document that is uploaded to the server is subjected to symmetric encryption using a system generated symmetric key. Further this key is subjected to asymmetric encryption using buyers/bid opener's public keys. Overall, the uploaded tender documents become readable only after the tender opening by the authorized bid openers.
- 8) The uploaded tender documents become readable only after the tender opening by the authorized bid openers.
- 9) Upon the successful and timely submission of bids (i.e. after Clicking "Freeze Bid Submission" in the portal), 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.
- 10) The bid summary has to be printed and kept as an acknowledgement of the submission of the bid. This acknowledgement may be used as an entry pass for any bid opening meetings.

ASSISTANCE TO BIDDERS

- 1) Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender.
 - 2) Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk.
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Annexure 2

The enquiry is for an atomic layer deposition system capable of depositing oxide materials, Al₂O₃ and HfO₂ on standard semiconducting wafers such as Silicon and GaAs.

S/N	Description	Technical Specification
1	Reaction Chamber & wafer size	Should be able to handle wafers of diameter ≥ 150 mm
2	Deposition modes	(i) Thermal mode with heating up to 300 degree with temperature uniformity of ± 1 degree-Celsius across the substrate. (ii) The System should be plasma ready or field upgradable to plasma enhanced mode without any changes to the thermal mode.
3	Plasma enhanced mode (Optional)	All the components required to configure the system into the plasma enhanced mode should be quoted optional. Should be able to change between the thermal and plasma modes without any hardware change. Should be able to deposit uniform oxide layers in the temperature range 50-degrees to 300 degrees (i) 300 Watts plasma generator (ii) Number of plasma lines: 04 configured with suitable mass-flow controllers and valves.
4	Deposition uniformity	~ 1 -2% or better.
5	Conformal deposition	Should be able to maintain the uniformity over aspect ratios 1: 50
6	Precursor manifold and valves	(i) Should contain all the required tubing and fittings to install the system. (ii) 1 no. of controllable precursor-many-fold equipped with 4 nos. of high-speed valve-controlled precursor ports. Precursor temperature controllable up to 200 degree-Celsius. <u>Optional:</u> (i) 1 additional precursor many-fold equipped with high-speed valve-controlled precursor ports. (ii) Heating jacket for the precursor bottles.
7	Materials bottle	2 Nos. of DOT certified standard material bottles
8	Vacuum Pumps & Gauges	Should quote for compatible dry pumping system and vacuum gauges.
9	Process control	(i) Should be able to control the process via computer with latest operating system. Free future upgrades for the control software. (ii) Standard recipe for uniform deposition of Al ₂ O ₃ and HfO ₂ should be provided (iii) Real-time display of process status (iv) Should be able to abort the process during the deposition cycle.
10	Metrology (Optional)	Quartz crystal thickness sensor and monitor



22/07/17
SUDIN. B. BABU
Deputy Registrar
[Purchase & Stores]
Education and Research Thiruvananthapuram
Maruthamala P.O., Vithura
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11	Power	Should operate standard power outlets in the country
12	Safety	Emergency off button on front panel and normally closed pneumatic valves.
13	Experience	The OEM should have supplied at least 3 similar system in the country. Please provide the contact information of existing customers. The vendor should have proven track-record in installing and maintaining the system.
14	Installation & training	Should provide adequate training to the users after installation.
15	Spares, tools & Accessories	(i) Essential spares and tool for routine maintenance for the system should be provided. (ii) Any other accessories required for running the system with the mentioned specifications should be quoted separately.
16	Warranty & support	One-year standard warranty for the system and all the components and one -year process development support, if any.
17	Extended warranty (optional)	Three years of extended warranty for the system except for the third-party components.



(Handwritten signature)

SUDIN. B. BABU
Deputy Registrar
[Purchase & Stores]
Indian Institute of Science Education and Research Thiruvananthapuram
Maruthamala P.O., Vithura
Thiruvananthapuram - 695 551

Annexure 3

Cryogen-free dilution refrigerator with superconducting magnet and accessories

S/N	Item description	Specifications
I Cryogen-free dilution refrigerator with superconducting magnet		
1	Base Temperature & Temperature stability	< 10 mK, with factory installed wires and cables, On-site demonstration is mandatory. Temperature stability: $\pm 1 \text{ mK} < 100\text{mK}$, $\pm 1\% < 100\text{m}$.
2	Cooling power @ 100 mK or below	> 300 uW, with factory installed wires and cables, measured away from the mixing chamber. On-site demonstration is mandatory.
3	Cooling power @ 20 mK	> 12 uW. On-site demonstration is mandatory.
4	Cooldown time from RT to the Base temperature without magnet	< 30 Hrs, with factory installed wires and cables. This should include any pre-cool down time to reach any inter mediate temperature range. On-site demonstration is mandatory.
5	Cooldown time from Room Temperature to the Base temperature with 8T magnet	< 48 Hrs, with factory installed wires and cables. This should include any pre-cool down time to reach any inter mediate temperature range. On-site demonstration is mandatory.
6	Temperature control	BT to 20 K with magnet at full field. On-site demonstration is mandatory.
7	3-He volume	Adequate amount of 3-He/4-He mixture should be included. Optional: 10 % of the 3-He gas should be quoted
8	Operation and cool-down procedure,	Valves should be controllable either automatically in a pre-programmed way, or individually via manually/via computer interface. Safety interlocks allowing unattended operation, remote control operation, continuous monitoring and logging of the system parameters. Control software should be based on the latest version operating system and architecture. Free upgrades of software should be provided. Warmup heaters should be quoted optional if not included as standard items
9	Cryostat	Should consist of single vacuum space with all hermetic seals such as O-ring seal at room temperature. Should not require exchange gas, indium seal and Kapton seal. All the vacuum jackets and radiations shields should be light-weight enabling one-person manual assembly.
10	Gas handling system & pumps	All pumps used should be dry pumps. Mixture circulation using turbo and dry backing pumps. Separate dry pump for pumping the vacuum can. Optional: Integrated turbo pump or standalone pumping station with adequate pumping speed for pumping the vacuum can and sample space.
11	Experimentally accessible ports for the user.	(i) KF-40 or larger: 5. Nos or more. A minimum of 2 should be line-of-sight ports (ii) KF- 25 or KF-16: 2 Nos. or more. A minimum of two should be line-of-sight ports. List all the non-line-of-sight ports provided on the system
12	Pulse-tube cryo-cooler with compressor	Single PTR, 1.5 W or higher at 4.2 K
13	Mechanical Vibration levels	< 1um both vertically and horizontally at 100Hz, at the mixing chamber plate while the fridge is in operation Pulse tube should have mechanical vibration isolation from the rest of the cryostat. Pulse tube and compressor should be electrically isolated from the cryostat.
14	Faster cooldown mechanism to meet the specified cool down time.	Any cryogen-free faster cool down options should be included in the quote to meet the cooldown times specified.



Sudhakar B. Babu
SUDHAKAR B. BABU
Deputy Registrar
[Purchase & Stores]

Indian Institute of Science Education and Research Thiruvananthapuram
Manthamala P.O., Vithura
Thiruvananthapuram - 695 551

15	Cold trap	Appropriate cold traps to operate the fridge for long durations (> 6 months) without any blockage issues in the mixture circulation loop.
16	Thermometry	The system should be equipped with suitable temperature sensors necessary for the operation and diagnostics. Suitable resistance thermometers should be provided for the top and bottom of the magnet. RuOx sensors calibrated down to the mK range on the still, cold plate and mixing chamber stages. Optional: One calibrated RuOx sensor calibrated down to 10 mK for measuring the sample stage temperature.
17	Temperature controller	Fully automated temperature controller capable of controlling all the heaters, heat switches and, monitoring all the temperature sensors.
18	Magnet	Field strength > 8T at 4.2 K Field Homogeneity +/- 1% over 1cm Should be equipped with quench protection mechanism Cold-bore: > 75 mm cold bore Experimentally accessible space diameter > 65 mm Should be equipped with persistent mode switch Compatible bi-polar power supply computer interfacing via GPIB should be provided Should include all the cables and current leads required to run the magnet. Manual or automatic Magnetic lowering mechanism during sample exchange.
19	Experimental wirings-DC	2 X 24-way twisted pair down to the mixing chamber thermalized at all the temperature stages and terminated with micro-D connectors
20	Experimental high-frequency wiring-RF	10 nos of x 0.86mm SCuNi-CuNi (centre conductor is silver plated) coaxial cables capable of supporting signals up to 18 GHz in frequency thermalized using in-line attenuators and feedthrough thermalization flanges at all temperature stages, down to the mixing chamber. Optional: 4 Nos of 4x 0.86mm NbTi-NbTi semirigid superconducting SMA (18GHz) co-axial line from 4K flange to mixing chamber
21	Sample exchange	Bottom loading by lowering or raising the magnet
22	Quick sample exchange mechanisms	Optional: Quote any quick sample exchange mechanism while the cryostat is cold optional
23	Mounting	Floor mounting supporting frames for the cryostat, gas handling systems and pumps.
24	Warranty from the date of Installation	3-Years of comprehensive warranty for the system including all components except the superconducting magnet
25	Maintenance/Service	All costs related to service and maintenance for 5-years from the date of installation should be included. Please specify the service plan like whether the local distributor will address the issue or the parent company.
26	Other terms & Conditions	(i) Factory test reports of Base-temperature, cooling power and cooldown times of the system should be communicated before shipping the item. (ii) Should have supplied and installed similar cryogen-free systems in the Country. Please provide a list of existing customers in the Country. (iii) The lead time for the delivery of the equipment should not be more than 10 months from the date of receipt of our purchase order.
II	Water Chiller	5 TR capacity water chiller with proven service support in the region. Standard warranty



Sudin B. Babu
SUDIN. B. BABU
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III	Air compressor	Air compressor for providing compressed air to operate pneumatic valves. Standard warranty
IV	He-Leak detector	A Helium leak detector system, capable of operating in vacuum and sniffing leak detection modes, with minimum leak detection rates of 5×10^{-12} mbar l/s and 5×10^{-9} mbar l/s, respectively, supported by oil free pumping system, must be included in the quote. Standard warranty



Deputy Registrar (P&S)

SUDIN. B. BASU
Deputy Registrar
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Maruthamala P.O., Vithura
Thiruvananthapuram - 695 551

