



सत्यमेव जयते

भारत सरकार/ GOVERNMENT OF INDIA

अंतरिक्ष विभाग/ DEPARTMENT OF SPACE

भारतीय अंतरिक्ष विज्ञान एवं प्रौद्योगिकी संस्थान/INDIAN INSTITUTE OF SPACE SCIENCE & TECHNOLOGY

क्रय एवं भंडार विभाग / **PURCHASE & STORES DEPARTMENT**

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निविदा आमंत्रण / INVITATION TO TENDER

Date : 19.06.2015

Tender Due on : **11.08.2015 at 14.00 Hrs.**

Tender opening on: **12.08.2015 at 10.30 Hrs**

Dear Sirs,

Separate Sealed TWO PART tenders are invited from accredited / manufacturers / suppliers / agents for the supply of the following equipments:

Sl. No.	Tender No.	Item Description	Qty/ Nos.	Cost of Tender (₹)
1.	2015002538	<p><u>Modular wall clean room for Photolithography</u></p> <p>The facility requires:</p> <p>1) Class 1000 (ISO 6) Modular hard wall clean room for Photolithography.</p> <p>2) Class 100000 (ISO 8) Air lock & Gowning Area.</p> <p>Area for Clean room: (Please refer Annexure –II for lab layout)</p> <p>Class 1000 (ISO 6) Clean room for Photolithography: 3.5 m X 3.5 m</p>	1 No.	500+VAT @5% (525/-)

Technical Details:

Item	Sl. No.	Specification
Wall Panel	1	100 mm thick Wall panels made up of GI powder coated sheets of 0.6 - 0.8mm thick on both sides, filled with PUF of 38 Kg/m ³ density
	2	Thickness of Zinc Coating (Galvanization) should not be less than 180 gm/Sq.m.
	3	The panels shall be manufactured to a minimum width of not less than 1200mm and of any suitable length as required in a continuous length.
	4	Wall Panels should include bottom and top runner, interconnecting profiles made of (1) Aluminium or (2) mirror finished Stainless Steel.
	5	Interconnecting Profiles for connecting wall panels are required in order to facilitate for relocation & dismantling/assembling the panels as and when required. Hence Tongue & Groove type of joints are not acceptable.
Ceiling	1	Ceiling System Shall Comprise of Ceiling panels of double skin type, 50 mm /60 mm thick, sandwiched with self-extinguishing quality PUF of density not less than 38kg / cum.
	2	The inner and outer skin shall be of powder coated steel sheet, the thickness of inner skin and outer skin of the panel shall not less than 0.8mm the powder coated steel sheet shall be hot dip galvanized with zinc coating not less than 180 gm / sq m .
	3	Both side of the panel, along with Aluminum Ceiling Grid system walkable type, having 'T' & 'L' angles etc., to be provided on hanging configuration.
	4	The system shall include aluminum extrusions, aluminum extruded cross connectors with bolts and nuts and other standard accessories.
	5	The ceiling grid shall be suitable for accommodating individual hooded HEPA. Light fixture, blank panels etc., and shall be provided with virgin neoprene or PVC gasket.

Mounting	1	The fan filter units shall be mounted in bays on the ceiling structural grid.
	2	The clean room ceiling shall be supported by a rigid frame structure (2"minimum) of powder coated steel.
	3	The frame structure should be made in such a way that it could be disassembled for possible modification or relocation.
	4	The ceiling grids should accommodate a variety of interchangeable ceiling modules.
	5	The minimum headroom inside the room shall be 2500 mm from floor to the filter face.
	6	The workstation shall be enclosed on all four sides with powder coated GI skin sandwiched PUF wall panels (details as given above) forming an enclosure.
	7	The structural grid work for supporting laminar shall not vibrate or amplify the sound during operation.
	8	The blower/motor assembly shall be mounted with proper suspension and non - corrosive material.
Door and Vision Panels	1	Modular sandwiched doors with both side GI powder coated, GI Sheet construction 0.8mm thickness duly flushed with the walls, with 45mm thick PUF, sandwiched between GI sheets, with door frame, including flushed hinges, view panels, SS 304 handle, push plates and hydraulic door closers
	2	The view panels shall be provided with PVC film of 350nm-380 nm of yellow color to match the required process of photolithography (UV sensitive process)
	3	Emergency (equipment transfer) double leaf door: 1200 x 2100mm
Fan Filter Units (FFUs)	1	The FFUs shall work on 220V/50 Hz AC power source.
	2.	The FFUs shall have low noise, low power requirement, low heat generation.
	3	The impeller blower shall be mounted in powder-coated corrosion resistant steel housing with a plenum design that optimizes uniform air velocity across the entire face of the filler.
	4	Uniform air speed across the filter to be maintained
	5	The filter shall have sufficient percentage of HEPA coverage to give and maintain class 1000 standard.
	6	Each HEPA (high efficiency particulate air) filter installed inside the housing is to be rated 99.99% efficient at 0.3µm particles.

	7	Ductable HEPA Filters with flexible ducts and volume control dampers for each filter, shall be housed in false Ceiling system to deliver filtered air into the ISO 6 (class 1000) & ISO 8 (Class 100000) cleanroom
	8	Provision shall be made to fix the yellow Tear drop/surface mount light fixtures in the false ceiling of Photolithography & surface mounted light fixtures in other Areas. Sealed cut outs for Filters, Diffusers & light fixtures etc., shall be provided
	9	Power to the FFUs is controlled by a master ON/OFF switch located on the cleanroom control panel outside.
	10	The FFUs shall have pre filters to prevent damage to the main HEPA filters.
	11	The filters shall be replaceable independently.
	12	The sound level shall be less than 60 dB measured 30" from filter face at an average flow velocity of 90 ft /min (0.45 m/s).
	13	All FFU modules should be tightly sealed using clean room compatible sealant along the ceiling grid perimeters.
	14	All the FFUs shall be CE certified.
Lighting	1.	Surface mount type/tear drop light fixtures of yellow intensity fluorescent lamp type providing 300- 380 lux at working table level (at a height of 900mm from floor).
	2	Provision shall be made for selected light fixtures to provide the emergency illumination, in the event of Mains power failure
	3	UV filtration film should be applied to lighting: (Yellow lighting)
	4	Ensure emergency illumination in the event of a mains power failure.
Blank Ceiling Panels	1.	All remaining ceiling grids should be covered with blank panels, which can be removed to allow installation of additional fan filter units or illuminator modules.
	2.	Panels should be made of Powder Coated GI with PUF .
	3.	All ceiling modules should be tight sealed using clean room compatible sealant along the ceiling grid perimeters.
Control Panel	1.	The control panel assembly to be installed at the clean room entrance along with LED status indicator

	2.	The control panel assembly shall include all power controls for FFUs, lights and all other connected devices.
	3.	All electrical lines shall terminate in quick- connect fittings for easy installation.
	4.	Magnehelic differential pressure gauge, temperature and humidity meters shall also be installed to monitor pressure, temperature and humidity.
Air shower	1.	The internal air shower unit shall be designed to produce a high velocity air shower for bathing the personnel entering the clean room to minimize the contamination.
	2.	Other features include interlocking of doors to prevent cleanroom cross-contamination, shower time adjustment, panic switch etc.
	3.	The Air shower shall be self-contained system, designed to deliver the required air velocity to ensure efficient scrubbing action to remove particulate matter from adjustable nozzle in the ceiling and opposing walls.
	4	There shall be a microprocessor controlled panel to provide automatic and programmable control of access door operation.
	5	The air to the air shower shall pass through HEPA filters maintaining Class 1000/ISO 6.
	6	The door interlocking arrangements permits opening of only one door at a time.
	7	While the air shower is in operation, neither entrance, nor exit door can be opened.
	8.	Necessary emergency buttons shall be provided inside and outside the air shower for safety.
	9.	In the event of power failure, however, both the doors can be opened manually.
	10	The required illumination level also shall be provided inside the air shower.
Process Extraction Systems		Process Extract Duct Work to be connected to a suitable blower for the solvent bench meant for photo resist processing.
Electrical power points		Electrical Wiring, Control Switches, power points for respective systems shown in the layout

ESD Flooring		<p>The flooring of 600 x 600mm tiles made out of 2mm thick Conductive / antistatic homogeneous vinyl tiles (2.5×10^4 to 10^6 Ohms), to be glued to the concrete floor & the joints to be welded using same vinyl welding material for monolithic construction.</p> <p>Necessary grounding using suitable thick copper strips/shims also to be done.</p>
Temperature		<p>The desired Temperature inside the Cleanrooms are as under-</p> <p>LITHOGRAPHY: $22 \pm 2^\circ\text{C}$</p> <p>AIR LOCK/GOWN: $22 \pm 2^\circ\text{C}$</p> <p>The required temperature to be obtained by suitable HVAC system consisting of Air Cooled DX System, Condensing Units, air handling system.</p> <p><i>Ceiling mounted AHU to be considered for the design after inspecting the site at IIST.</i></p>
Humidity		<p>The required Relative Humidity inside the Cleanrooms are as under-</p> <p>LITHOGRAPHY: $50 \pm 5\%$</p> <p>AIR LOCK/GOWN: $50 \pm 5\%$</p> <p>The required Relative Humidity shall be obtained by suitable HVAC system consisting of DX condensing unit, air handling system, Humidifier and Dehumidifier like Desiccant type Dehumidifier of Suitable capacity. Requirement of Dehumidifier is a needed keeping in mind the challenging humidity Condition in monsoon at Thiruvananthapuram.</p>
Spatial Pressure		<p>The spatial positive Pressure should be</p> <p>LITHOGRAPHY: + 15 Pa</p> <p>Above mentioned spatial pressures shall be maintained in order to reduce ingress of contaminations from adjacent areas. The required amount of air for maintaining spatial pressure to be obtained from fresh air and also by proper return air volume control using volume control dampers in the Return Air Raisers.</p>
Transfer Hatch		<p>600mm x 600mm x 600mm floor mounted for material/chemical movement. Static type, with</p>

		Electromagnetic door Interlock, made of stainless steel SS304
Garment Storage		Garment storage unit to be provided in the Gowning are for the storage of 'in use' garments, complete with stainless steel hanging rail and retained stainless steel hangers. Cleanroom Garments Static Cabinet, made of powder coated GI with UV lamp and fluorescent light. 600 x 600 x 1500 mm, with provision for storing sterile shoes
Validation		Vendor must conduct clean room validation test post installation at As built, At Rest and Operational Condition followed by Primary Validation Test.
Optional items		
1. Clean Room Apparel, Clean Room Disposables, Shoe Covers & Head Covers Etc.		Provide optional list with price list per quantity.
2. Furniture: Chairs (2 Nos)	1.	These shall be designed for use in Class 1000 clean rooms preventing attraction and accumulation of dust.
	2.	The chairs shall have adjustable seat height with polyurethane upholstery.
	3.	The chair frames shall be made of chrome plated steel or stainless steel.
	4.	The castors shall be single wheel with thermoplastic rubber and shall have non-marring ball bearing castors.

Terms and Conditions of Tender No. 2015002538 dated.19.06.2015

Sl. No.	Description
1.	The supplier shall give details of previous cleanrooms they have designed and commissioned in India of similar nature for similar application. They shall provide technical details (Area, Class, application) and photographs of the same along with customer contact details. Vendors experienced in building cleanrooms in India for similar applications only would be entertained.
2.	The site measurement shall be taken before production.
3.	The scope of work includes supply, fabrication, supply, installation and commissioning of the total system.
4.	The clean room cleanliness class, noise level and air velocity shall be measured at multiple locations as per the standard and Class 1000/ISO 6 shall be demonstrated during commissioning.
5.	The party should provide the electrical load requirements, electrical interface details and civil works requirements.
6.	The installation work should be completed within 8-10 weeks from date of PO.
7.	Minor design changes which are considered very essential may be incorporated without any additional cost.
8.	Certificate of conformance and third party certification shall be provided for FFUs and the clean room.
9.	Three years warranty should be provided from the date of commissioning of the clean room.
10.	The party shall also quote separately for the Annual Maintenance Contract (AMC) for the clean room for five years. The AMC shall commence after the warranty period. The details of the AMC shall also be given.
11.	The party should also coordinate with IIST for facilitating the installation of the equipments (Mask Aligner, Solvent wet chemical bench) provided in the layout.
12.	The recommended list of spares shall also be provided and three sets of essential spares shall be supplied during delivery.
13.	IIST shall provide the power to the distribution board in the clean room. The electrical distribution board in the clean room and the necessary wiring shall be within the scope of the supplier. The systems shall work in 220V single phase AC or 415V three phase AC.
14.	Detailed Technical drawings, technical catalogues of all components and clean room shall be provided along with the offer.
15.	An item wise compliance statement indicating clearly any deviations against specifications, make etc. shall be provided along with the offer.
16.	Complete Cleanroom design details (Heat load calculations etc.). shall be provided along with the offer.
17.	Compliance Statement for complete technical specification indicated above should be prepared and enclosed along with Technical & Commercial bid for evaluation.

Commercial Terms and Conditions Tender No. 2015002538 dated.19.06.2015

1.0 General Requirements:

- 1.1 Detailed Catalogue/ Data Sheet of the quoted item.
- 1.2 Clientele List
- 1.3 Performance Letter from the Clients.
- 1.4 Detailed Compliance Sheets are to be attached along with Technical Bids for evaluation.
Without detailed Compliance sheet, your offer shall summarily rejected.

2.0 SPECIAL INSTRUCTIONS TO TENDERERS

- 2.1 **The bidder is required to submit quotation for the entire scope in TWO PART viz, Technical and commercial bid and price bid separately. The first cover shall contain the technical and commercial details along with the format of price quotation without the price superscribing in the cover “Technical and Commercial-Tender No. 2015002538 Due on 11.08.2015. The second cover shall contain the prices superscribing in the cover price bid- Tender No. 2015002538 Due on 11.08.2015. All the covers will be sealed and insert in another cover superscribing the Tender No. 2015002538 Due on 11.08.2015 and submit immediately but not later than the due date mentioned against each tender. If the tender is received after the due date and time, the same shall be summarily rejected.**
- 2.2 The cost of tender stated against each tender shall be submitted ***along with Technical & Commercial bid by Demand Draft*** drawn in favour of the Accounts Officer, IIST and payable at State Bank of India, Valiamala Trivandrum-695 547. ***In case the Demand Draft is not enclosed with the quotation, the bid shall be summarily rejected.***
- 2.3 Complete technical specifications/catalogue/leaflet etc., should be enclosed with quotation.
- 2.4 **Test certificate:** Wherever required, test certificates should be essential.
- 2.5 **Payment:** Our normal payment term shall be E-Transfer / within 30 days after supply/installation and acceptance for imports and indigenous respectively.
- 2.6 The installation and commissioning of equipment will be at our campus, Valiamala, Thiruvananthapuram-695 547. All pre-requisites such as foundation drawing, grouting and any consumables needed for carrying out the installation, if applicable, shall be separately mentioned in the technical bid.

- 2.7 Delivery terms shall be Ex-works/FOB/FCA for imports and FOR, Valiamala for indigenous equipments.
- 2.8 For import cargoes, the purchase order shall be drawn directly to the foreign supplier through agents in India. We have our own freight forwarder and customs clearance at Trivandrum shall be done by us.
- 2.9 All duties and taxes, if applicable shall be quoted separately.
- 2.10 Accreditation documents such as current income tax/sales tax clearance certificate, clientele list with previous experience in the similar lines of supply must be provided with documentary evidence), Performance Certificate, authorization for import, after sales support in India etc. shall be explained in detail with proof.
- 2.11 **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 found to have developed under proper use, arising from faulty stores design or workmanship, 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 part thereof are faulty.
- 2.12 **Earnest Money Deposit (EMD):-** Interest free EMD towards performance of tender to the tune of ₹80,000/- by Demand Draft drawn in favour of the Accounts Officer, IIST, Valiamala, Trivandrum may be enclosed with Technical & Commercial bid sealed cover. The EMD will be refunded to the unsuccessful tenderers within 30 days after placement of Purchase Order.
- 2.13 **Security Deposit:-** Interest free Security Deposit @ 10% of the value of Purchase Order shall be payable by successful vendor for satisfactory execution of the Purchase Order.
- 2.14 Performance Bank Guarantee equivalent to 10% of order value shall be submitted by the Vendor for Warranty obligation.

- 2.15 Liquidated Damages:** The period of completion indicated shall be the essence of the contract. In the event of delayed date of completion, the liquidated damages @ 0.5% per week or part thereof subject to a maximum of 10% of the contract value shall be recovered.
- 2.16 Force Majeure:** During the continuance of the contract, should a part or whole of the items covered by this contract be delayed in delivery due to reasons of force majeure condition which shall include lockouts, strikes, riots, civil commotions, fire, flood, windstorm, explosion, labour disturbance, act of any Govt. or any agency, judicial action, sabotage act of civil disobedience, act of public enemy, technical failure, accidents, acts of God and war, stoppage of deliveries by Govt. etc, each party undertakes to advise the other as soon as it becomes a way of the circumstance of such force majeure, so that action under the provisions of this contract can be mutually reviewed and agreed upon between contractor and IIST. If the force majeure condition extended over a period of six months, both the parties of the contract shall mutually discussed and arrived at an agreement for the continuation/ termination of the contract forthwith.
- 2.17 Arbitration:** Dispute if any shall be settled mutually, failing which, it will be referred to a one-man arbitrator appointed by Director, IIST in accordance with the Arbitration and Conciliation Act, 1996 and any alteration/modifications thereof, whose decision shall be final and binding on both the parties
- 2.18 After Sales Service Support:** The stock availability of spares and consumables for a minimum period of 5 years for up keeping the equipment shall be guaranteed to avoid obsolescence of systems.
- 2.19 AMC:** The charges towards Annual Maintenance Contract (Comprehensive/Non-Comprehensive) beyond the normal warranty period may be quoted separately as option.
- 2.20** IIST reserves the right to either accept/reject any tender/s without assigning any reason/s whatsoever.
- 2.21 Separate quotations shall be submitted for each tender along with the tender fee by demand draft.**
- 3.0 Terms & Conditions of Tender Form No. DOS PM:20, Form No. DOS PM:22 & Form No. DOS PM:23 as per attachment.**

Sd/-
(M.B Subash Chandran)
Sr. Purchase & Stores Officer
For and on behalf of Registrar, IIST