



**INSTITUTE OF NANO SCIENCE AND TECHNOLOGY,  
MOHALI**

(An autonomous Research Institute of Department of Science and Technology,  
Government of India)

**Habitat Centre, Sec-64, Phase X, Mohali – 160062, PUNJAB**

**Phone No: 0172 – 2210075/74/73, Fax No: 0172 – 2211074**

**Website: [www.inst.ac.in](http://www.inst.ac.in)**

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**INSTITUTE OF NANO SCIENCE AND TECHNOLOGY (INST), MOHALI.  
Habitat Centre, Phase 10, Sector 64, SAS Nagar, Mohali – 160062 PHONE: 0172 –  
2210075/74/53**

**REF. NO. INST/12(184)/2019-PUR**

**TENDER FOR THE SUPPLY, INSTALLATION AND  
COMMISSIONING OF CLEAN ROOM AT INST, MAIN  
CAMPUS, SECTOR – 81, KNOWLEDGE CITY, MOHALI**

**SIGNATURE & SEAL OF TENDERER**



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**Habitat Centre, Phase 10, Sector 64, SAS Nagar, Mohali – 160062 PHONE: 0172 –**  
**2210075/74/53**

**TENDER NOTICE**

- Bid reference : REF. NO. INST/12(184)/2019-PUR
- Name of work : Supply, installation and commissioning of Clean Room at INST Main Campus Lab, Located at Knowledge City, Sector 81, Mohali
- Estimated value : Rs. 2,05,00,000/-
- EMD : Rs. 5,12,500/-
- Tender Fee : Rs. 590/-
- Tender download : From [www.inst.ac.in](http://www.inst.ac.in) or CPPP Website: [www.eprocure.gov.in](http://www.eprocure.gov.in)**

| <b>IMPORTANT DATES AND TIME</b>  |  |
|----------------------------------|--|
| Date and Time of Pre-bid Meeting | 23 <sup>rd</sup> March, 2020 (1400 HRS)                      |
| Last Date & Time For Submission  | 23 <sup>rd</sup> April, 2020 (1400 HRS)                      |
| Date / Time of Opening of Bids   | 23 <sup>rd</sup> April, 2020 (1500 HRS)                      |
| Venue of Bid Opening at INST     | INST, Habitat Centre, Phase 10, SAS Nagar, Sector 64, Mohali |
| Tenders to be submitted at       | INST, Habitat Centre, Phase 10, SAS Nagar, Sector 64, Mohali |

Head of Office

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**Habitat Centre, Phase 10, Sector 64, SAS Nagar, Mohali – 160062 PHONE: 0172 –  
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**TENDER NOTICE**

Director, Institute of Nano Science and Technology, Mohali invites tenders for supply, installation and commissioning of clean room at its main campus located at sector 81, Knowledge city, Sector – 81, Mohali.

1. Interested eligible Bidders may obtain further information from the office of Store and Purchase Officer, INST.

2. The bid shall be submitted in two cover system consisting price bid. The price bid of those who qualify in the technical bid only will be opened.

3. Detailed terms and conditions, scope of work etc. as indicated in the invitation to bid are contained in the bidding document of the above work.

|  |   |  |
|--|---|--|
| Time of completion                                 | : | 90 days  |
| Address for communication and place of bid opening | : | INST, Habitat Centre, Phase 10, SAS Nagar, Sector 64, Mohali - 160062. |
| Bid Validity                                       | : | 180 days   |

All bids must be accompanied by Bid security (EMD) and tender fee as specified in the tender notice.

**Head of Office**

Place: Mohali Date: 02/03/2020.

**SIGNATURE & SEAL OF TENDERER**



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## **General Tender Terms & Conditions for tender**

This tender is Opened tender and published on INST Website: [www.inst.ac.in](http://www.inst.ac.in) and CPPP Website: [www.eprocure.gov.in](http://www.eprocure.gov.in) and also published in national newspapers for supply, installation and commissioning of Clean Room at INST Main Campus Lab, Located at Knowledge City, Sector 81, Mohali. The tender is invited in two cover system from the registered and eligible firms in sealed tenders form. Prospective bidders willing to participate in this tender shall submit personally or send their sealed bid through speed post / registered post / courier to INST at Habitat Centre, Phase 10, Sector 64, SAS Nagar, Mohali – 160062, Phone: 0172 – 2210075/74/53.

1. **Due date:** The tender has to be submitted before the due date. The offers received after the due date and time will not be considered.
2. **Preparation Bids:** The offer/bid should be submitted in two bid systems (i.e.) Technical bid and financial bid. The technical bid should consist of all technical details along with commercial terms and conditions. Financial bid should indicate item wise price for the items mentioned in the technical bid. The Technical bid and the financial bid should be put in separate covers and sealed. Both the sealed covers should be put into a bigger cover along with letter of EMD and to be sealed. The tender number and details should be superscripted on the left side of the outer cover. The Quotations should be valid for 120 days from the date of opening of tender. The Quotations duly sealed and super scribed on the envelope with the reference No. and due date, should be addressed to “**The Director, Institute of Nano Science and Technology, Habitat Centre, Sector 64, Phase –X, Mohali, 160062, Punjab, India**” so as to reach on or before the due date.
3. **Delivery of the tender:** The tender shall be sent to the below mentioned addressee either by post or by courier so as to reach our office before the due date specified in our Schedule. The offer/bid can also be dropped in the tender box on or before the due date specified in the schedule. The tender box is kept in Foyer area of INST.
4. **Tender Preparation Expenses:** The tenderer shall solely bear all the costs associated with the preparation and submission of the bid. The Institute shall in no case be responsible or liable for such costs, regardless of the conduct or outcome of the tender process. In no case, such costs shall be reimbursed by the Institute.
5. **Opening of the tender:** The offer/bid will be opened by a committee duly constituted for this purpose. The technical bid will be opened first and it will be examined by a technical committee which will decide the suitability as per our specification and requirement. The financial offer/bid will be opened only for the offer/bid which technically meets all our requirements as per the specification. The bidders if interested may participate on the tender opening Date and Time. The bidder should produce authorization letter from their company to participate in the tender opening. Only one representative will be allowed to participate in the tender opening.
6. **Opening of Financial Bids:** Bids of the technically qualified bidder’s shall only be considered for opening and evaluation of the financial bid on the date and time mentioned in critical date’s section.

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7. **Acceptance/Rejection of bids:** The Committee reserves the right to reject any or all offers without assigning any reason.
8. **Tender Fee/EMD:** Tender fee/EMD is to be obtained from the bidders except those who are registered with the Central Purchase Organisation, National Small Industries Corporation (NSIC) or the concerned Ministry or Department. The tenderer should submit Tender Fee/EMD amount as per tender ref. no. through NEFT/RTGS in INST Account. Account Details are as follows: **a.** Name of Beneficiary: Institute of Nano Science and Technology (INST)
- b.** Account No. 2452201001102
- c.** Name of Bank: Canara Bank, Sector 34, Chandigarh
- d.** IFS Code: CNRB0002452
- e.** MICR Code: 160015003
- f.** Swift Code: CNRBINBBFFC

The details of transaction for Tender Fee/EMD viz. Name of bidder firm, Tender Description, Transaction ID/No. of Transfer, Transaction date, Amount of Transaction, Name of Bank, Address of Bank shall be furnished by the tenderer on their letterhead separately along with their tender.

9. **Refund of EMD:** The EMD will be returned to unsuccessful Tenderer only after the Tenders are finalized. In case of successful Tenderer, it will be retained till the successful and complete installation of the equipment.

SIGNATURE & SEAL OF TENDERER

**GENERAL TERMS & CONDITIONS (INSTRUCTION TO BIDDERS)**

Tender for the supply, installation and commissioning of Clean Room at INST Main Campus Lab, Located at Knowledge City, Sector 81, Mohali subject to the following terms and conditions.

**1. Eligibility and qualification requirements.**

- 1.1 To be eligible for the award of Contract, bidders shall provide satisfactory evidence to the INST regarding their eligibility, capacity and adequacy of resources to carry out the Contract effectively. To this end, all bids submitted shall include the following information.
- a. Copies of original document defining the constitution or legal status, place of registration and principal place of business of the company or firm or partnership or if a joint venture, of each party there to constituting the bidder.
- b. Details of the experience and past performance of the bidder (or of each party to a joint venture) on works of similar nature within the last three years, and details of

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current work in hand and other Contractual commitments shall be submitted as per Annexure II Schedule 1 and Schedule II of this bidding document.

1.2 For the purpose of this particular contract, bidder should meet the following qualifying criteria as minimum

- a. The bidder should be in business for a minimum period of 3 years at the time of bid opening in the same name and style.
- b. The bidder should have completed a minimum of 2 similar work of the estimated value of the Contract, for which this Invitation to Bid is issued, during the last three years

Or

Four similar work for 50% of contact value or above during the last three years in govt. organisations.

- c. At least 2 Nos of Successful Installation list shall be provided.
- d. **The bidder shall furnish a copy of the Income tax Returns for the previous year in original or certified true copies.**

**2. Scope of work.** Provide a Clean Room with standard features like cabinet, doors, brower, filters, lighting etc complete.

**3. Schedule of Quantities and rates**

- i. The specification for each item of work and schedule of quantities are given in the enclosed Annexures.
- ii. The rate quoted shall be inclusive of all applicable taxes and duties, ESI Contribution, material cost, labour cost, transportation of materials to site, loading and unloading charges and nothing extra will be paid on any account iii. While quoting the rates, the bidder should quote the rates for supply (material cost) and erection (labour cost) separately in the offer.

**4. Tender Fee & Earnest Money Deposit**

The tender fee and EMD will be Rs. 590/- (Rs. Five Hundred Ninety Only) and Rs. 5,12,500/- (Rupees Five Lakh Twelve Thousand Five Hundred Only) respectively and the same shall be accepted through online NEFT transaction through the site [www.inst.ac.in](http://www.inst.ac.in).

5. The EMD of the successful bidder will be released after signing of the agreement and submission of performance security.

6. EMD will be returned through online NEFT/RTGS transaction only.

7. No interest will be paid for the EMD for the period for which it lies with the INST.

**8. Period of Validity**

The offers submitted by the bidder shall remain valid for acceptance for a period of 180 days from the date of opening.

**9. Period of Completion**

All the works specified in the scope of work should be completed in all respects within 90 days from the date of receipt of order. However, the tenderer after examining the scope of work and site conditions can specify in the offer, the shortest period by which he can complete the above works in all respects.

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## 10. Award of Work

The successful bidder will be awarded work order for completion of work of clean room as per tender specs.

## 11. Performance Security

Within 7 days of the receipt of the work order the successful bidder shall furnish a performance security 10% of the contract value. The performance security in the form of Demand Draft or Bank Guarantee in favour of Director, INST Mohali. The Bank guarantee shall be valid for the entire period of contract including guarantee period plus 60 days.

## 12. Submission of bills

- i. Bills shall be prepared in duplicate in the name of Director INST, Mohali and shall be submitted to the Office of HOO at INST, Mohali for releasing the payment. ii. Payment shall be released against supply/erection on submission of bills. However, the value of each bill shall not be less than Rs.2, 00,000/- (Two Lakh only).
- iii. After completion of the above work in all respects, the Contractor should submit the final bill along with the details for all the works.
- iv. While setting the bills, statutory deductions such as income Tax, sales tax on works contract, and ESI, etc. will be deducted from the payment due to the contractor.

## 13. Payment Terms

### a. Supply components

- 80% payment against safe receipt of the goods at site.□
- 20% payment on completion of erection, testing and commissioning of the item□
- b. Erection components
- 80% payment on erection of the equipment on group basis.□
- 20% payment on completion of erection, testing and commissioning of the item□

### • 14. Guarantee

The entire work executed should be guaranteed for a period of one year from the date of completion of the work for quality and workmanship. In case any work or part thereof, is found defective due to substandard material, bad workmanship, the same shall be repaired/replaced by the contractor without any extra cost during the guarantee period and the entire expenditure towards such repair/replacement shall be borne by the contractor.

## 15. Liquidated Damages

In case the work is not completed within the stipulated period of completion, liquidated damage will be levied @ 0.5% per week for the value of the portion of work so delayed subject to a maximum of 10% of the work order value. However, if the works are delayed due to genuine reasons beyond the control of the contractor due consideration will be given while operating the liquidated damages clause provided the contractor furnishes the documentary evidence for the same and the same is found to be acceptable.



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**16. General**

- The work should be carried out in consultation with the Clean Room Coordinator or the authorized representative of the INST and should be strictly as per the
- specification, approved drawings and directions.□
- The undersigned reserves the right to accept or reject any or all quotations without assigning any reason whatsoever and no explanation can be sought on this account.□

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### TECHNICAL SPECIFICATION FOR CLEAN ROOM (As per Layout attached below)

## Supply Installation and Commissioning of Cleanroom (10K class) along with gas lines, scrubbers and liquid nitrogen tank

### CLASS 10000 CLEAN ROOM FACILITY

Class 10000 Clean Room Facility shall comply clean room requirements including negative/ positive pressure, HVAC system and air compressor, supply and exhaust HEPA filter system, PUF/ Sandwiched specialized partitions, PUF sandwiched walk-able ceiling, epoxy joint less floors with radius coving round corners.

The bidder shall be responsible to construct Class 10000 Facility in line with design lay out enclosed, its fabrication and technical support at site, supervision of other construction, air balancing, testing and commissioning.

Technical and operation documentation should be provided by the bidder and the bidder will be responsible for performance tests for the room by demonstrating –

- i) Wall panels check according to the clean air specifications
- ii) HEPA filter leak test according to the US Federal Standard 209E.
- iii) Room differential pressure test verification,
- iv) Particle test for cleanliness, according to US Federation 209E;
- v) Air pattern smoke test.
- vi) Air velocity test;

### TECHNICAL SPECIFICATIONS:

#### **Heating, Ventilation and Air Conditioning (HVAC) system**

- i. Combined type air handling unit (Tonnage according to lab design) with temperature control from **24- 26oC** and relative humidity value control from **50%~55 (Independent for each room)**
- ii. Independent supply & exhaust blower
- iii. Unidirectional inward air flow with 90% recirculation and 10 % exhaust

#### **Supply & Exhaust High Efficiency Particulate Air (HEPA)**

- i. Supply & exhaust HEPA filters (Qty-dependng on air quality and lab design, kindly specify in tender) having particle size 0.3 µm particle size with efficiency of 99.99%
- ii. All air supply and exhaust should be fine filtered
- iii. All fresh air ducts and their outer inlets should be installed with insect proof barrier
- iv. 3 stages Pre-filter with ASHRAE specifications -1st stage at 5-8%, 2nd stage at 30% and 3rd stage at 90-95% efficiency
- v. Supply & exhaust GI fixture

#### **Air Duct:**

Entire supply and exhaust ducting as well as HEPA housing should be made from G.I. 24 gauge, sealed and air tight



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### **Air change:**

Air changes should be as per guide lines to obtain the desired air quality standard for Class 10000 (50-60 air changes).

### **Pass box:**

Dynamic Pass box (**Qty 2 Nos.**) shall be installed for easy and safe transfer of material with following features. The pass box should have following features

- Made of 304 stainless steel
- Magnetic Door interlocking
- Internal Dimension shall be 600x600x600 mm
- Equipped with short wave UV light for decontamination

**Static Pass Box:** 1 No. of Static pass box made of 304 stainless steel, magnetic Door interlocking, Internal Dimension shall be 450x450x450 mm

### **Sterile Garment Cabinet**

Cabinets shall be equipped with a blower and a HEPA filter in a fully contained enclosure constructed of powder-coated steel sheets. They shall store clean room garments in a visible and organized manner, while at the same time removing particulate contamination from garments as they are stored and removed. Dimensions Clean air storage space L x W x H (900 x 600 x 1200 mm)

### **Air-Tight Damper:**

Air tight dampers should be GI and permit airtight criterion for decontamination. The system should be equipped with airtight damper to control the positive pressure stable

### **Air Duct Insulation:**

For insulation purposes of air, G.I. ducting to be clad with insulation min. 12 mm thickness. The outer exposed supply insulated ducts to be further clad with Aluminum sheet (0.25 mm thickness) for durability

### **Smoke Alarm:**

The Clean Room facility shall also be equipped with smoke alarms (Qty: Distance and numbers as per Govt. safety guidelines) towards Fire safety. Equal no. of smoke alarms should be installed on false ceiling as well as the concrete ceiling above the false ceiling. Separate smoke alarms should be installed for service area. The fire panel should be addressable and compatible with building information system. Addressable Fire alarm to be integrated with the existing fire alarm system.

Layout of smoke alarm system should be provided after completion of work.

2 Nos. of Foam based fire extinguishers should be provided for each room.

### **Differential Pressure Gauge:**

The Clean Room facility must have provision of differential pressure gauge (Qty: As per design)

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### **Walls and Partitions:**

- i. A specialized wall panel system for the inner perimeter of lab made up of PUF panel (sealed from all 6 sides) not less than 80-90 mm thick with wall (PUF Insulation density: 40+2kg/m<sup>3</sup> Both Side Skin: minimum 0.60 mm thick Permanently Color coated Galvanized mild steel as per IS:277, Galvanized Grade 120 GSM / M3. Yield Strength is 240 MPA.) The panels shall be specifically for clean room and shall not be affixed utilizing cam lock arrangement between them
- ii. The gaps in between panels to be filled by suitable color matching room temperature vulcanizing (RTV) sealant
- iii. The modular panel should be suitable for negative pressure and must be airtight and chemical resistant
- iv. The wall panel thickness should vary between 80-90 mm and should have a stronger bearing and a mass anti-bending capacity
- v. The modular panel must have capacity of anti-negative pressure around -2000 Pa, and should not be deformed in the negative pressure environment
- vi. There must be provision of cut-outs on the walls to accommodate double fixture viewing glasses, electrical outlets, monitoring devices, emergency warning systems, pass-thru cabinets

### **Ceiling:**

- i. The specialized ceiling should be of PUF sandwiched paneled **60 mm** thick walk able type
- ii. The solid ceiling panels shall be specifically for clean room and shall not be affixed utilizing cam lock arrangement between them
- iii. Ceiling panels must be constructed with either upside or room side, finishing with GI panel as same as the wall panel materials

### **Covings:**

Covings, used to link wall-wall, wall-ceiling, wall-floor, etc., should be made of industrial plastic and shaped by Mould manufacture Smooth radius arc should be installed at all inner, outer of wall-to-wall, wall to floor and wall-to-ceiling joints to form a smooth and continuous round surface for easy cleaning purpose.

### **Specialized Flooring (Epoxy- Joint Less)**

- i. The containment must have waterproof and chemical resist epoxy flooring 2+1 mm thick (as per guidelines laid down by WHO) above the base, the floor (for entire Area ) should be first covered by epoxy material for waterproof and leveling purpose.
- ii. Around the inner perimeter of the walls should be carefully sealed with RTV sealant and all covered wall corner joints should be carefully formed and sealed
- iii. Installing an earthing system is a prerequisite for lab floors. The material used for the earthing system can be brass, copper or stainless steel.

### **Customized Door:**

Specialized doors (**2100x2100mm double door and 2100x1000mm single door**) to be installed in the controlled area should be powder coated GI sheet PUF sandwiched with observing window, self-closer and handle, lockable, airtight and self-closing type with drop seals

- i. Doors should be of Galvanized Sheet, 0.6 - 0.8mm thick, powder coated finish, having viewing window SS Handles, SS hinges and door closers
- ii. Doors inside the controlled area (Air lock) should be interlocked



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### Air Shower:

- The Air Shower shall be a high velocity, low pressure type system in accordance with Federal Standard 209E
- The Air Shower will provide normal entrance to and exit from a contamination controlled area.
- The Air Shower shall be a completely self contained unit, equipped with air filtration systems, blowers, motors, controls, solid-state programmable microprocessor, interlocking doors, lighting, and pre-wired electrical panel.

### Air Shower Features:

Designed for 1-2 persons w/ two sides blowing

Rust free construction for longer life

Nozzles 12-16 Two Sides

HEPA Filter - Two Pieces

Air Shower Time 0 ~ 120 seconds Adjustable

Spurt Wind Speed 18~25 m/s

Power 440V AC, 3 Phase, 50 Hz

Filter Efficiency 99.99 %

Cleanliness Level Class 100

Noise level Less than 60 db

Shower jet velocity More than 20±2 meter/second

Door Aluminum fabricated with safety glass and electromagnetic locks

Construction Aluminum / Powder coated MS / 304 - 316 Stainless steel

Standard fittings

- Fluorescent light
- Pre-filter (washable)
- HEPA filter
- Nozzle (Fixed or Adjustable)
- Emergency stop buttons (both sides)
- Blower motor assembly
- Anti slip floor
- Door bell
- Door closers
- Door handles
- DQ / OQ / IQ / PQ

### Electrical System:

**The electrical connections should be fitted in such as way that there will be barrier between PUF and electrical connections. Any spark or any other fault should not come in direct contact with PUF.**

The Clean Room Facility must be supplied with Electrical system having following features:

- i. Electrical wires (Havells/ Finolex/ Anchor/ Plaza/ Equivalent) lightings, Philips/Havells electrical boxes
- ii. Sockets Brand: Legrand/ Havells/Equivalent
- iii. LED Lightings: Philips/Havells to give 600-1000LUX



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- iv. Electrical box should be customized according to the actual situation, the modules should be of Schneider/ Havells or equivalent, the breaker and switch should be made of Havells/Anchor or equivalent
  - v. There will be 15.0-5.0 amp (dual) Sockets (12-14 Nos. each room) to be connected with instrument tables. Location of the same will be decided at the time of construction
  - vi. There will be 20 KVA 3 Phase connections (1 No.), 20 KVA 1 Phase connections (1 No.) and 10 KVA 3 Phase connections (2Nos.) for each room to be connected with instrument tables. Location of the same will be decided at the time of construction

### **CCTV and Biometric Access:**

The security system would comprise of Biometric access control at the main entrance doors and round the clock CCTV monitoring of both the entrance doors/ corridor and the specimen storage area. The scheme of CCTV camera shall comprise of 16 numbers IP based, 2 megapixel indoor dome cameras, one number 16 channel NVR, 8TB HDD with network switch and LED display complete in all respects

### **Networking/ Internet:**

There should be at least 4 Input — output sockets in the each Lab. The required cabling to be completed for Networking with the Institute HIS. These points are to be integrated with the nearest junction box of HIS.

### **Validation:**

The validation, DQ, IQ, OQ, PQ, DRAWINGS TEST etc. shall be done and all CERTIFICATES to be provided

**Specifications are basic essence of the product. It must be ensured that the offers must be strictly as per our specifications. At the same time it must be kept in mind that merely copying our specifications in the quotation shall not make the parties eligible for consideration of the quotation. The tendering company must have completed atleast 2 orders of equivalent amount or 4 orders of 50% amount or 6 orders of 40% amount in last 5 years. The technical bid shall be evaluated for acceptability by the technical committee and may call the tenderer for discussion & previous site visit (manufactured by tenderer in past).**

### **Gas system for Lab: [for N2, CDA, Ar, O2 and one spare gas]**

Scope of Supply :

- Gas Manifold for 05 Gases
- Total 15 Point for Each Gases in Three Rooms (05 Each in each Gas Room).
- 20 x 25 ft room considered.
- Gas System Suitable for 99.999% Pure Gases used for R&D Purpose.

Stainless Steel Gas Manifold for 5 Gases : Make : Gas-Arc, UK / GCE-GmbH / Rotarex-France or any other Imported Make

Suitable for 99.999% Pure Gases.

Material of Construction : Stainless Steel AISI 316L

Diaphragm : Hastelloy C-276

Inbuilt Safety Relief Valve, Purging Facility.

With Diaphragm Process and Purge Valve.

Suitably mounted on Stainless Steel Plate.

Qty : 05 Nos.



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Stainless Steel Point of Use Regulator with Shut off Valve : Make : Gas-Arc, UK / GCE-GmbH / Rotarex-France  
or any other Imported Make

Suitable for 99.999% Pure Gases.

Material of Construction : Stainless Steel AISI 316L

Diaphragm : Hastelloy C-276

With Diaphragm Process Valve.

Suitably mounted on Stainless Steel Plate.

Qty : 60 Nos. (05 Nos. of Gases x 03 No. of Room x 03 Nos. Point of Use in Each Room on Each 03 Valve)

Electro-polished Stainless Steel Tubing : Make - Valex- USA / Dockweiler - Germany / Crest - Korea / Other  
Imported Make

Size : 1/4" OD x 0.89 mm Thk.

Suitable for 99.999% Pure Gases with 10 Ra finish from Inside.

Material of Construction : Stainless Steel AISI 316L

Inside Surface Finish : 10 Ra.

Suitably for Orbital Welding at both Ends.

Qty : 650 Mtrs.

Electro-polished Stainless Steel Branching Tee : Make - Valex- USA / Dockweiler - Germany / Crest - Korea /  
Other Imported Make

Size : 1/4" OD x 0.89 mm Thk.

Suitable for 99.999% Pure Gases with 10 Ra finish from Inside.

Material of Construction : Stainless Steel AISI 316L

Inside Surface Finish : 10 Ra.

Suitably for Orbital Welding at both Ends.

Qty : 60 Nos.

Stainless Steel Tube Fittings for Gas Manifold / Point of Use Regulator Etc. : Make Swagelok-USA or Parkar - UK  
or Unilok-Korea or Other Imported Make

Size : 1/4" OD x 0.89 mm Thk.

Suitable for 99.999% Pure Gases with 10 Ra finish from Inside.

Material of Construction : Stainless Steel AISI 316L

Qty : 170 Nos.

Flash-back Arrestor for Flammable Gases : Make - Gas-Arc, UK / Witt, Germany / GCE-GmbH or other Imported  
Make

Size : 1/4"

Material of Construction : Stainless Steel AISI 316

Qty : 05 Nos.

Installation Material : such as Tube Support Clamps Etc.

Installation, Orbital Welding, Helium Leak Testing and Commissioning of Gas System



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### **5000 Ltrs LN2 tank should be provided with complete installation, inspection and approvals:**

#### DESIGN & WORKING PARAMETERS :

5000 Ltrs.

Capacity (net) 5000 Ltrs.

Capacity (gross) 5250 Ltrs.

Design Pressure 16 Kg/Cm<sup>2</sup>g

Design Temperature . (-)196oC

Strengthening Test Pressure 24 Kg/Cm<sup>2</sup>g

Service LIQUID NITROGEN

Design Code - EN-13458 Annexure 'C' (Cold Stretching) + SMPV(U) Rules 1981 with all amendments.

Type - Double walled – Vertical Vessel supported on legs.

#### Material of Construction :

Inner Vessel - Austenitic stainless steel (SS-304)

Outer Vessel - Carbon Steel

Supports - Carbon Steel

Insulation - High Vacuum with perlite filled in annular space.

Pipe Work - Stainless steel pipe work, detachable assembly through flanged or union joints and pressure building coil should be manufactured of star finned aluminium construction.

Valve (inlet, outlet) - Cryogenic valves on liquid lines extended spindle type of Bestobell Valves, U.K./ Mack Cryo/ HEROSE, Germany.

Pressuring & full try cock - 20NB/ 15NB extended spindle type.

Safety Relief Valves - 2 No. with Divertor Ball Valves, Make – FAINGER LESER/ BRIGHTTECH

Bursting Disc - 1 No. Safety Bursting disc for inner vessel. Make – BS&B Safety System(FMC Sanmar Group)

#### THE TANK SHOULD BE FITTED WITH THE FOLLOWING :-

- \* Tank inlet, outlet with cryogenic valves for liquid service.
- \* Connection to Vaporizer.
- \* Pressurizing coil with pressure build-up valve
- \* Full try cock valve.
- \* Liquid level indicator (D.P. Type) of General Instruments.
- \* Pressure gauge
- \* Safety relief valves – 2 Nos.
- \* Rupture disc for inner vessel and safety disc for jacket.
- \* Vacuum valve

**Inspection :** Party will be responsible for inspection from CCOE approved 3rd Party Inspection Agency

Following documents shall be provided by the tendering company:

- a) Control Certificate of manufacturing the tank from inspection agency.
- b) CCE approved copy of fabrication drawing.
- c) Inspection dossier comprising of material test certificates and inspection reports.
- d) Operational Manual

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e) Safety Valve manufacturing certificates from CCE approved 3rd party inspection agency.

The tendering company will be responsible for Site Approval & Licensing from CCOE, Nagpur

**ATMOSPHERIC VAPORIZER :**

Type : Ambient Air Heated.

Configuration : Vertical

Fluid : LIQUID NITROGEN

Design Temperature : (-)196o to (+) 65oC.

Outlet Temperature : 10oC below ambient.

Capacity : 200 M<sup>3</sup>/hr.

Duty Cycle : 8 hrs. of continuous operation.

Max. Op. Pressure : 24 Kg/Cm<sup>2</sup>g

Design Pressure : 30 Kg/Cm<sup>2</sup>g

Hydraulic Test Pressure : 40 Kg/Cm<sup>2</sup>g

Design Code : ASME Section VIII Div.-1 Edition 2004.

MOC : Aluminium Fins.

**PRESSURE REDUCING STATION (COMPLETE SYSTEM)**

Pressure reducing valve should be self operated spring loaded diaphragm type construction.

Make - REGPORT/ TECNIK

Constant outlet pressure irrespective of fluctuating upstream pressure.

Low maintenance cost and no auxillary energy requirement.

Wide range of pressure setting and easy adjustment of set valve.

Metal bellows & springs of stainless steel construction.

The pressure reducing station should be provided with valves before and after PRV, Y type

strainer bye-pass valve pressure indicators in 'in' and 'out' points with all flanges pipes

etc. of SS-304 make construction size – 1”NB.

**The tendering company will also be responsible for construction of concrete platform for LN2 tank installation. Interested companies can visit the site before submitting the tender.**

**Vertical Flow Fume Scrubbers for 3 fume hoods:**

- Low-energy wet scrubbers with spray tower design to treat the air stream to remove acid fumes. There should be provision of addition of fresh water to purge contaminants and replace evaporation losses
- Complete Scrubber tower including all mist eliminator, water spray nozzles, scrubber water tank and ladder.
- The scrubber should be fabricated from PP-FRP with suitable thickness based on the size & volume.
- All scrubber internals necessary to provide adequate process capture and to achieve the designed performance.
- Flanged connections for all external water fill, water makeup and drain, overflow piping as required.
- Self-contained recirculation pump system.
- Piping for recirculation water, make up fresh water & drain connection.
- All manual valve wherever requires within scrubber.

- Scrubber pump.
- The Scrubber shall be provided with access ports / doors to allow limited access to the internals of the unit.
- The fan and motor should be designed for system static pressure for 6 feet fume hood.
- Sound levels shall not exceed 75 dBA-weighted
- Civil Foundation for scrubber

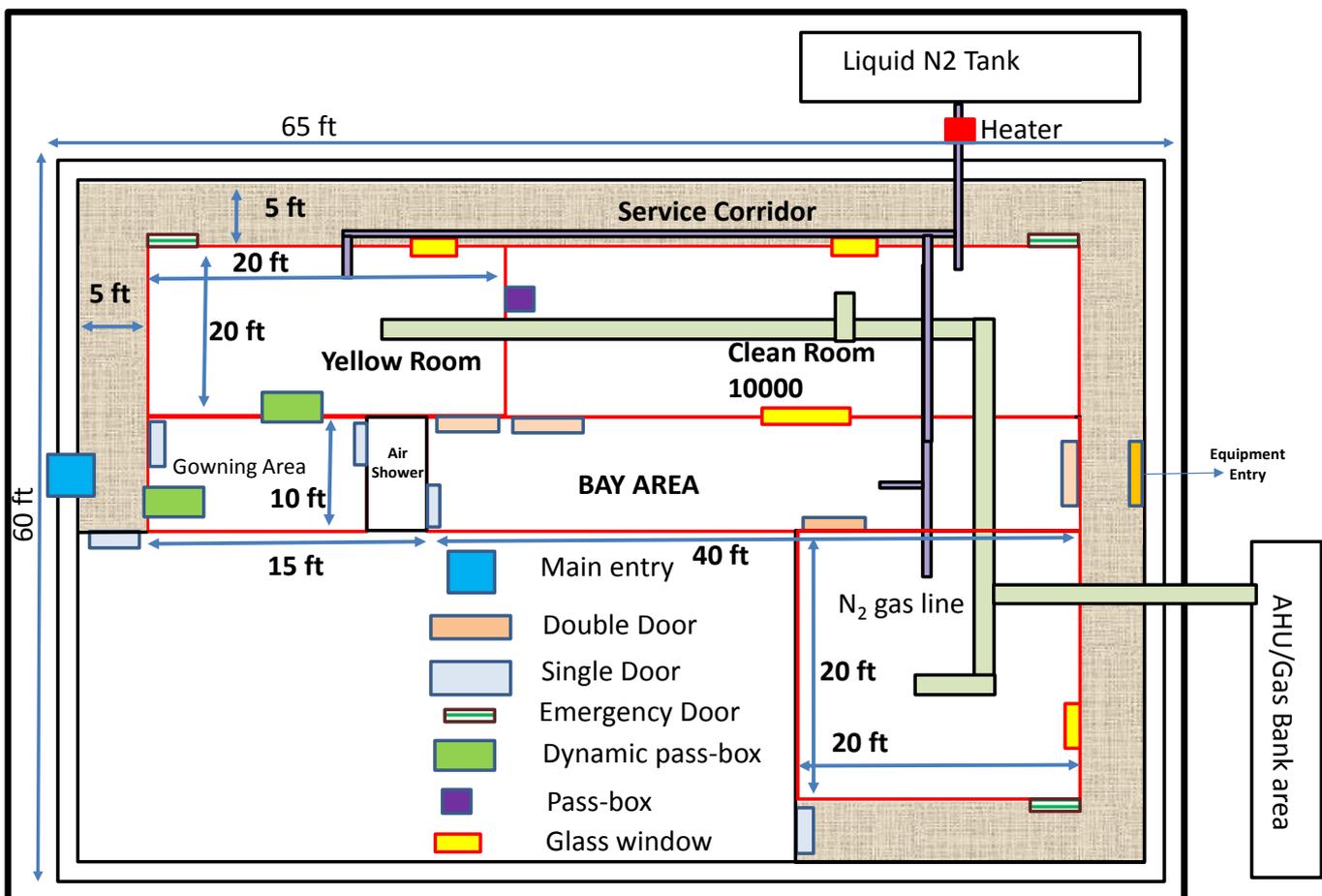
**Following will be provided:**

Fresh water for Scrubber

Required Drain connection near to the Scrubber

**Tentative design of the Clean room:**

**LAYOUT OF CLEAN ROOM**



SIGNATURE & SEAL OF TENDERER

**ANNEXURE - II**

***SCHEDULE 1***

**Major works successfully completed during last five years**

| Sl. No | Name of work | Place | Contract Reference | Name of Client | Value of work | Completion period | Completion date |
|--------|--------------|-------|--------------------|----------------|---------------|-------------------|-----------------|
|        |              |       |                    |                |               |                   |                 |
|        |              |       |                    |                |               |                   |                 |
|        |              |       |                    |                |               |                   |                 |

**ANNEXURE - II**

***SCHEDULE II***

**WORK IN HAND**

| Sl. No | Name of work | Contract Reference | Name of Client | Place of contract | Value of contract | Completion period | Completion date |
|--------|--------------|--------------------|----------------|-------------------|-------------------|-------------------|-----------------|
|        |              |                    |                |                   |                   |                   |                 |
|        |              |                    |                |                   |                   |                   |                 |
|        |              |                    |                |                   |                   |                   |                 |

SIGNATURE & SEAL OF TENDERER



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**(Form of Performance Guarantee)**  
(ON NON-JUDICIAL STAMP PAPER OF RS. 100/-)

Bank Guarantee No.

Date:

This deed of performance guarantee made this..... day of  
20..... (Two

thousand and .....) by (Name and address of the Bank) (hereinafter referred to as the Bank) which expression shall unless repugnant to the context or meaning thereof includes its legal representatives, successors and assigns and the Institute of Nano Science and Technology (hereinafter referred to as the INST) which expression shall unless repugnant to the context or meaning thereof include its legal representative, successors and assignees.

Whereas INST has awarded an order bearing No..... (name and address of the party) (hereinafter referred to as the 'Contractor') for the supply and installation of..... And whereas, the Contractor has agreed to submit a performance guarantee in the form of a Bank Guarantee to the INST in terms and conditions of the order which will be kept valid up to 12 calendar months from the date of Bank Guarantee (the period should be till end of guarantee period). And whereas, the Bank and its duly constituted agent and officer has already read and understood the contract made between the INST and the Contractor.

In consideration of the INST having agreed to award the contract on the Contractor, we .....(name of the Bank), do hereby guarantee, undertake, promise and agree to with the INST, its legal representatives, successors and assignees that the within named.....(name of the Contractor) their legal representatives and assignees will faithfully perform and fulfill everything within the Contract on their part to be performed or fulfilled, at the time (time being the essence of the contract)and in the manner therein provided, do all obligations there under and we further undertake and guarantee to make payment to the INST of Rs. \_\_\_\_\_/- (Rupees \_\_\_\_\_ Only) being the 10% of the contract value in case the contractor, their legal representatives and assignees do not faithfully perform and fulfill everything within the Order and the Contract on their part to be performed or fulfilled, at the time and in the manner therein provided and do not willfully and promptly do all obligations there under.

In case, the Contractor fails to perform or fulfill the Order as per the terms and conditions agreed upon, the INST is entitled to demand an amount equal to 10% of the order value from the Contractor and the demand made by the INST by itself will be conclusive evidence and proof that the Contractor has failed to perform or fulfill his obligations and neither the Contractor nor the Bank will be entitled to raise any dispute regarding the reasons for the failure of performance or fulfillment, on any ground.



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We, (name of the Bank), do hereby undertake to pay an amount equal to 10% of the order value, being the amount due and payable under this guarantee without any demur, merely on a demand from the INST stating that the amount claimed is due by way of non-performance of the contractual obligations as aforesaid by the Contractor or by reason of the Contractor's failure to perform the said Order, any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this Guarantee Shall be restricted to an amount not exceeding Rs. \_\_\_\_\_/- (Rupees \_\_\_\_\_) being the amount equal to 10% fo the total order value.

We, (name of the Bank), further, agree that the performance guarantee herein contained shall remain in full force and effect for a period of 12 calendar months from the date of Bank guarantee (the period should be till end of guarantee period) and till the INST certifies that the terms and conditions of the said order have been fully and properly carried out by the said Contractor and accordingly discharge the guarantee, unless a demand or claim under this guarantee is made on us in writing by the INST on or before ....., we shall be discharged from all liabilities under this performance guarantee thereafter We, (name of the Bank), further agree with the INST that the INST shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said order or to extend the time of performance by the said Contractor from time to time or postpone for any time or from time to time and any of the power exercisable by the INST against the Contractor and to forebear or enforce any of the terms and conditions relating to the said Order and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor, or for any forbearance, act or omission on the part of the INST to the said Contractor by any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving us.

This guarantee shall be in addition to and without prejudice to any other securities or remedies which the INST may have or hereafter possess in respect of the goods supplied or intended to be supplied and the INST shall be under no obligation to marshal in favour of the Bank any such securities or funds or asset that the INST may be entitled to receiving or have a claim upon and the INST at its absolute discretion may vary, exchange, renew, modify or refuse to complete to enforce or assign any security or instrument.

The Bank agrees that the amount hereby guaranteed shall be due and payable to the INST on serving us with a notice, requiring the payment of the amount and such notice shall be deemed to have been served on the Bank either by actual delivery thereof to the Bank or by despatch thereof to the Bank by Registered Post at the address of the Bank.

Any notice sent to the Bank at its address by registered post shall be deemed to have been duly served on the Bank notwithstanding that the notice may not in fact has been delivered to the Bank.



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In order to give full effect to the provisions of this guarantee the Bank hereby waives all rights inconsistent with the above provisions and which the Bank might otherwise as a guarantor be entitled to claim and enforce.

We,..... lastly undertake not to revoke this guarantee during its currency except with the previous consent of the INST in writing and the guarantee shall be a continuous and irrevocable guarantee upto a sum of Rs..... (Rupees .....only). The guarantee shall remain in force until ... ..20..... and unless the guarantee is renewed or a claim is preferred against the Bank within three months from the said date all rights of the INST under the guarantee shall cease and the bank shall be released and discharged from all liabilities hereunder.

(SIGNATURE)

Place: **SEAL** Date:

CODE NO.

**NOTE: 1 CONTRACTORS SHOULD ENSURE THAT SEAL AND CODE NO.OF THE SIGNATORY IS PUT BY THE BANKERS, BEFORE SUBMISSION OF THE BANK GUARANTEES.**