



Date: 17th January 2022

Local Tender (India based vendors only)

To Whom It May Concern

This is an RFQ (Request for Quote) for setting up a chemical fume-hood facility as part of a limited tender for the Centre for Nano Science and Engineering (CeNSE) at IISc, Bangalore.

CeNSE is a multidisciplinary research department at IISc that houses a 14,000 sq. ft. cleanroom and characterization facility used by over 50 faculty members from various disciplines at IISc. CeNSE also runs a program called Indian Nanoelectronics Users Program (INUP) which has allowed 4200 participants from more than 700 universities and institutes all over India to use the facilities at CeNSE. Consequently, any tool in CeNSE receives significant exposure to scientific community at IISc and beyond. The vendors are requested to factor in the value of this exposure into their quotes. Details of existing facilities and INUP program can be gleaned from:

<http://nnfc.cense.iisc.ac.in/>

<http://www.mncf.cense.iisc.ac.in/>

A. Procedure:

- Vendors must undertake a mandatory site visit at the CeNSE department before submitting their proposals to get/measure details regarding the floor plan and physical infrastructure requirements as per the technical requirements stated below.**
- To schedule a site visit, please make a prior appointment by contacting via email to sadhanala@iisc.ac.in with a copy to office.cense@iisc.ac.in
- Vendors who have undertaken the mandatory site visit will then be required to submit a technical proposal and a commercial proposal in **two separate sealed envelopes**. Only vendors who meet the technical requirement will be considered for the commercial negotiation.
- Proposals from vendors who have not undertaken the mandatory site visit will not be considered.
- The Bidder should belong to either class 1 or class 2 suppliers distinguished by their “local content” as defined by recent edits to GFR. They should mention clearly which class they belong to in the cover letter.
 - Class 1 supplier: Goods and services should have local content of equal to or more than 50%.
 - Class 2 supplier: Goods and services should have local content of equal to or more than 20 % and less than 50%.



6. Purchase preference as defined by the recent edits to GFR (within the “margin of purchase preference”) will be given to Class-1 supplier.
7. MSME can seek exemption to some qualification criteria. IISc follows GFR2017 for such details
8. Separate detailed justification needs to be given to substantiate the qualification as Class 1 and Class 2 suppliers and the intender reserves the right to cross-check the factual validity of the same.
9. Quote should come only from Indian Original Equipment Manufacturer (OEM) or their Indian authorized distributor.
10. The deadline for submission of proposals is **7th February 2022, 5:30 pm** Indian Standard Time. Bids should arrive at the office of **Prof. Aditya Sadhanala, TF-12, Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012**, India, by the above deadline.
11. The technical proposal should contain a technical compliance table with 5 columns.
 - a. The first column must list the technical requirements, in the order that they are given in the technical requirement below.
 - b. The second column should provide specifications of the instrument against the requirement (please provide quantitative responses wherever possible).
 - c. The third column should describe your compliance with a “Yes” or “No” only. Ensure that the entries in column 2 and column 3 are consistent.
 - d. The fourth column should state the reasons/explanations/context for deviations, if any.
 - e. The fifth column can contain additional remarks from the OEM. You can use this opportunity to highlight technical features, qualify response of previous columns.
12. Vendors are encouraged to highlight the advantages of their tools over comparable tools from the competitors
13. If multiple systems can fulfil the requirements, vendors can submit multiple bids.
14. In the commercial bid, please provide the itemized cost of the system and required accessories, etc.
15. As an option, please provide itemized cost for any suggested accessories/add-ons that may enhance the usability, capability, accuracy or reliability of the tool. Vendors are encouraged to quote for as many add-ons as their tool portfolio permits.
16. In the quote, you are requested to provide itemized cost for spares expected over 2 years of use.
17. Please indicate the warranty provided with the tool.
18. Any questions or clarifications can be directed to:
Prof. Aditya Sadhanala,
TF-12, Centre for Nano Science and Engineering,
Indian Institute of Science, Bangalore 560012
sadhanala@iisc.ac.in



B. Terms and Conditions

1. The decision of the purchase committee will be final
2. The vendor is responsible for the installation of the system at the IISc campus.
3. The RFQ must include references of 5 previous installations, preferable in India. Please provide the names and contact addresses of the referees, so that the committee can contact them independently. Details of such systems with model numbers and users should be provided. The reference letters can be used to disqualify vendors with poor track record of service, build quality, system performance, or poor availability of spares.
4. The vendor must also submit a list of 50 customers where similar systems have been installed.
5. Clarify if periodic (preventive) maintenance be done by a trained on-site engineer or requires a specialist from the OEM. The vendor should have qualified technical service personnel for the equipment based in India and must assure a response time of <2 business days after receiving a service request.
6. The lead-time for the delivery of the equipment should not be more than 2 months from the date of receipt of our purchase order.
7. The indenter reserves the right to withhold placement of final order. The right to reject all or any of the quotations and to split up the requirements or relax any or all of the above conditions without assigning any reason.
8. Wherever requested in this specifications sheet, data must be supplied along with technical compliance documents. Technical bids without supporting data will be deemed as technically non-compliant.
9. All guaranteed specifications will have to be demonstrated, upon request, in an active installation. Failure to demonstrate any promised specifications will be deemed as technical non-compliance.
10. Printed literature and published papers in support of all compliance to the prescribed specifications may be provided.
11. Technical evaluation by the institute may include a demonstration to verify functionalities and capabilities of the system quoted. Any discrepancy between the promised specifications and demonstrated specifications will be deemed as technical non-compliance. If need arises, the vendor must be ready to physically visit IISc for a techno commercial discussion.
12. The **validity of commercial quotation should be at least 60 days** from the last date for the submission of tender documents.
13. The quotations should be on FOR-IISc Bangalore basis in INR only.
14. 100% payments will be released after completion of delivery and satisfactory installation subject to TDS as per rules. As per GFR no advance payment can be made to domestic vendors, unless an equal amount of bank guarantee is provided.

Technical Requirements:

Laboratory Furniture for Fume Hood Facility	
A.Polypropylene Fume Hood Specifications	
Quantity	6
Construction	<p>Construction a) Material of construction is 10mm thick natural Polypropylene, should be laminated on both the sides. b) Double wall construction. c) Non corrosive adjustable levelling feet's to the floor level. c) All the free ends of the Fumehood must be reinforced with Polypropylene C-Channels for improving strength & rigidity.</p>
	<p>Design Standard American Design Standard: ASHRAE11-1995. All the construction should be Aerodynamic type.</p>
	<p>Dimensions: Overall dimensions (1800 mm L X 950D x 2400 mm H) Working dimensions (1600mm L x 750 mm D x 1700 mm H) – 1 nos.</p>
	<p>Visor/Sash An operator safety visor/sash made of 6 mm thick clear acrylic/polycarbonate sheet with PP frame, which is fixed in front of the bench and can be opened/closed based on the operator's requirement. Mechanism for vertical sliding visor should be counter weighted type.</p>
	<p>Worktop Worktop should be made of 10mm thick polypropylene sheet with perforation. Appropriate supporting ribs shall be given at the bottom of worktop to avoid deflection. Worktop spills, chemical spills and spent DI water should drain to the plenum below and from there to a dedicated main spigot to station rear.</p>
	<p>Material Selection All materials selected for application should be suitable for a cleanroom and corrosive application.</p>
	Utilities
<p>Raw water: 1 nos. off Gooseneck made of Polypropylene with control valve for sink for Acid usage Wet chemical Station.</p>	

	<p>Drain Polypropylene drain of size 40mm(1 ½”) with union connection at the bottom of the sink base for draining Raw/DI water spent.</p> <p>Nitrogen Gun: N2 spray guns are to be constructed of virgin PTFE material, can deliver maximum anti-corrosion protection wherever extreme chemical environments are used in the vicinity of nitrogen dispensing or drying. Nitrogen gun should be manufactured of the durable materials to resist acid attacks. Standard nitrogen hand spray gun with 1/4”FNPT Inlet thread, filter housing with disposable filter. (Max. operating pressure 5 Bar,Media Temperature Range: 10°C - 50°C)</p> <p>Valves: Valves for CDA, Ar and Vacuum</p> <p>Lights: 2 normal light 36W will be supplied for adequate illumination, material of construction should be PVC/polycarbonate.</p> <p>Power Points: For circuit protection, miniature circuit breakers (MCB) should be provided. There should be 6 nos. of 15amps socket and switches provided on front of the station on either side.</p> <p>Magnehelic gauge A magnehelic gauge of 50mm of water column capacity should be provided to measure the differential pressure across the fume hood</p>
Exhaust grills	Exhaust grills should be provided at above the work top. All the fumes generated at the work area will be exhausted through exhaust box.
Exhaust Port	Exhaust port design should ensure that the fumes will be exhausted smoothly without any turbulence and has to avoid the condensation droplets on to the worktop.
Bottom storage cabinet/chemical trolley	The station needs 2 nos. of storage cabinets with a partition for storing chemicals under the sink base. Both the cabinets should be interconnected to the Fumehood exhaust
Requirements	
Exhaust Capacity	900 cfm @ 50 mm static
Raw water	5-10 LPM @ 2 bar pressure
N2, Ar & CDA	5-10 SLPM @ 2-3 bar Pressure
Power	Fume Hood: 1Ph , 32 A
Installation, Commissioning & validation.	SITC will be done at IISC premises as per ASHRAE standards.

<p>C. Arm Exhaust 3 Nos. Exhaust Arm: Arm exhaust pipe shall be Polypropylene 72 mm dia. Reach of arm exhaust: 1370mm.</p>
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Dome: Transparent Dia. 385mm.
Damper : Inbuilt damper
Ceiling column: Polypropylene
Exhaust capacity: 80-110 cfm

C. Laboratory Tables

Laboratory table have to be made of Polypropylene 10 mm thick
Each table should have 2 drawers and 2 shelves
Work top: 18-20 mm thick jet black granite
Load bearing capacity: 150-200 Kg

D. Safety Shower cum Eye Wash (Hand/Foot Operated)

Material of construction:

Pipe : Stainless steel pipe 304 grade confirming to Schedule 40
Self-closing valve: Stainless steel 304 grade IC
Bowl for eyewash: Stainless steel 304 grade IC
Eye wash nozzles: Stainless steel 304 grade IC
Shower head: Stainless steel 304 grade IC
Foot Pedal: Stainless steel 304 grade IC
Spring: Stainless steel 304 grade IC
Pull chain: Stainless steel 304 grade IC

Safety Shower must have two types of showers i.e. one for Face protection at lower level and Second for Full Body protection. Both the showers can either be operated simultaneously or singularly as per the requirements.
Showers need to be fitted with both - pull chain for Body Shower and Foot operated for Face wash.

Exhausted Acid and Solvent Bins

MOC: Non metal
Volume: 60-80 litres
Lid : Required

HVAC

A. AHU Specifications

Air Handling Unit(AHU)

Total Supply air= 2.337 M3/sec
Return air=0.0 m3/sec
Fresh air=2.337 m3/sec
Total fan Static=125mm

Cooling Coil Capacity=20.5 Tr.

Air Handling Unit:

AHU CASING

- 1) AHU should be of modular construction and of draw through type comprising of pre-filter section, fine filter section, cooling coil section and fan section. The framework has to be of extruded Al sections joined by moulded high tensile reinforced plastic and be assembled to provide a sturdy, strong and self-supporting framework for various sections. Each section should be complete with its own independent base and mounted on 14G galvanized sheet steel and aluminium die-cast channels. Zinc deposition on the GI sheets should be of a minimum 120 gsm
- 2) AHU should be of double skin, with 45+5 mm thick PUF insulation sand-witched panel, 0.8 mm thick percolated GSS outer skin and 0.8 mm thick plain GSS sheet inside. The density of PUF insulation should be minimum 38 Kg/m³.
- 3) The framework for each section should be joined together with soft rubber gasket in between to make joints air tight.
- 4) Suitable air tight access doors with Aluminium die cast heavy duty hinges and locks should be provided for various sections.
- 5) The casing should incorporate thermal break profile and all other necessary design features to ensure that condensate does not occur during all seasons.
- 6) The AHUs should be having Sound attenuators at Suction and delivery of AHUs to reduce the sound to 70+2 dB (A).

CIRCULATION FANS:

- 1) Fan Type: Direct driven, Plug type high efficiency centrifugal fan.
- 2) Noise level should be reduced to 70+10 dB (A) or less by suitable sound attenuators on supply and return air path.
- 3) Total static pressure: 125 mm WG.
- 4) Fans shall have backward curved blades.
- 5) Fan blades should be made of Aluminum alloy.
- 6) Motor and fan assembly should be floor mounted and placed on Extruded aluminium sections and on vibration isolators to reduce amplitude to less than 25-50 microns.
- 7) Motor: Adequately sized, TEFC Squirrel cage induction motor with VFD drive and suitable for 415V + 10%, 3 phase, 50 Hz+ 5% AC power supply.
- 8) The motor should be of high Efficiency IE3 class as per IS 12615 - 2011.- Non FLP.
- 9) Motor should be compatible for VFD operation.
- 10) Flexible connection fabricated of neoprene coated flame proof fabric attached by screws or bolts at 6" interval will have to be provided. Flexible connection would need to be provided with sufficient material width to prevent interference with the free operation of the fan vibration system.
- 11) Fan should be factory statically and dynamically balanced as required to achieve field balance levels.

12) Vibration measurement should be made in three orthogonal areas at each bearing location. Where equipment configuration precludes measurement at bearing, measurement should be made on adjacent routine structure.

13) Peak to peak displacement at the rotational frequency should be measured. Governing displacement should be at the rotational frequency of fan.

COOLING COILS

1) Cooling medium: Chilled water

2) The velocity across the cooling coils should not exceed 2.25 m/s. accordingly, cooling coil area is to be selected.

3) Coils should be of seamless copper tubes with Al fins, 6 rows deep, with 12-13 fins/inch, with copper header, flange connection and SS 304 enclosure.

4) Copper tubes should be 26 SWG and hydrostatically tested for 21 kg per sq. cm.

5) Cooling coil condensate tray should be of 14 SWG SS 304 material.

6) Vertically stacked Cooling coils should have SS 304 drip trays between them and SS pipe drain connection left at the drain tray and finally connected to drain point with suitable trap to check ingress of outside air.

7) Fouling factor: 0.0002 hr. m² 0 C/K cal

8) Accessories: Frame, support, inlet and outlet header, vent connection and drain connection with valves, pressure gauges with valves at inlet and outlet and their associated fittings.

FILTERS

AHU should have 2 stages of filtration.

Specifications:

- Filters face velocity should not exceed 2.25 m/sec. 1st stage filters and 2nd stage filters
- Filter mounting frame should be made out of extruded aluminium material. The frame should be strong enough to withstand the weight of two persons which may climb the frame during the filters replacement.
- Between Filter sections, minimum spacing of 600 mm should be maintained.
- Filters should be having a quick release mechanism and sealing gasket.
- All the filters should have Al frame (flange type) with a module size of 600mm x 600mm (preferably).

1) **1st Stage Pre-filters:** Should be of G4 grade as per EN 779, non-woven synthetic material sandwiched between HDPE mesh on both sides with minimum thickness of 150mm flange type with an initial pressure drop of 5 mm WG or less, suitable for cleaning with dry air or water jet.

2) **2nd Stage Fine filters:** Should be of F7 grade as per EN779, non-woven synthetic material sandwiched between HDPE mesh on both sides and suitable for minimum thickness of 300mm initial pressure drop of 6-8 mm WG or less, suitable for cleaning with dry air or water jet.

DAMPERS

Aluminium volume control dampers for fresh air and Supply air

B. Chilled Water Line

Chilled water line should be Schedule 10 seamless SS304

Valves and fittings should be SS304

Insulation: Insulation should be 50 mm thick EPS/PUFF clad with 0.2 mm thick aluminium sheet.

C.HVAC Ducting

Supply, installation, testing & commissioning of pre-fabricated GI sheet metal ducting (Prefabricating Ducting means duct fabrication on CNC machines) complete with GI / MS supports (complete supporting structure to install ducts at site) with fully threaded GI rods, GI nuts and bolts (With check nuts wherever applicable), vanes, splitters, thermal isolation blocks, etc. as per drawings and SMACNA standards for 4 inch and 2 inch pressure class. Ducting should have duct mate flanges with Food Grade Rubber Gasket between the flanges. All duct supports should have minimum 3 mm thk. Insulated tape between support and duct. All Ducting seam have to be sealed with RTV Sealant. The zinc coating thickness should not be less than 120 grams/sq,mtr (GSM). All duct joints should be inspected for leakage. Ducting should be 22 G

D. Insulation

Supply, installation of 19 mm thick nitrile rubber insulation with one side Aluminum faced. The Insulation Material should be FM Approved. The insulation should have fire performance such that it passes Class 'O' as per BS 476 Part 6 for Fire Propagation and Class 1 as per BS 476 Part 7 for surface spread of flame. All insulation joints (including Flange joints) should be sealed with 3" width Self Adhesive tape.

Insulation thickness should be 19 mm thick.

Electrical Panel

Complete Electrical system to be designed and executed meeting the Bureau of Indian standards (BIS), Indian electricity rules 1956 and International Standards codes.(IEC)

Electrical Control Panel suitable for 4 wire, 3 phase, 415v, 50Hz AC system with dust & vermin proof, free standing / floor mounted switch board fabricated out of 14 Swg sheet steel for load bearing members, gland plates and front doors.

Electrical panel should be comprise of the following.

- 1) VFD for AHU Blower
- 2) Temperature controller
- 3) 3-Way modulating valve controller

- 4) Emergency switch off
- 5) Interlock to fire damper
- 6) BMS features like ON/OFF, status, regulating flow.
- 7) Interlock to limit switch.

Gypsum Board partitions:

100 mm thick 2 side Gypsum board partition
Non-Combustibility: Standard 476 Part 4 – Pass
Fire Rating: Standard 476 Part 20 – 4 Hours
Sound Insulation: 38 db to 45 db
Joint Treatment: Jointing Compound is applied between abutting panels
Fastener Types: Anchors, Plastic Plugs
Flexibility: Can be removed and replaced easily.
Door : 900x2100 m – 2nos

Regular Maintenance: The system should require minimal maintenance. Any regular maintenance (calibration, cleaning, etc.) needed to keep this fume hood facility in good working conditions should be clearly mentioned. The cost of this regular maintenance (if requiring additional consumables or spare parts) for 2 years should be quoted separately as “maintenance contract”.

Operating Conditions: The system must function year-round in Bangalore conditions, i.e. the ambient temperature of 10-40 °C and relative humidity of 30-95%.

Local Support: Please mention if the system will be supported by a local distributor. A Bangalore based vendor who can quickly respond to issues will be preferred.

References: Please provide a list of at least 3 references from facilities or users in India where similar fume hood facility has been installed.

Thank you,



Aditya Sadhanala