November 20th, 2020

Tender for Extension of Bulk gas lines to second floor of CeNSE Building

This is an RFQ (Request for Quote) for **Supply, installation, modification, testing and commissioning of Bulk Gas lines (Argon, Nitrogen & Oxygen) from cleanroom plenum to 2nd Floor CeNSE Building** as part of a limited tender for the Centre for Nano Science and Engineering (CeNSE.) at Indian Institute of science (IISc.) Bengaluru.

CeNSE is a multidisciplinary research department at IISc that houses a 14,000 sq. ft. cleanroom and characterization facility used by 50 faculty members from various disciplines at IISc. CeNSE also runs a nationwide program which has allowed 4200 participants from more than 700 universities and institutes all over India to use the facilities at CeNSE. Consequently, any utility/facility at CeNSE receives significant exposure to scientific community at IISc and beyond. The vendors are kindly 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/

CORRIGENDUM (added on Dec 2nd 2020)

1. On page 4/6, Annexure 2 (Technical requirements), Sl. No. 8 "Testing & Validation", it is mentioned as "Helium leak test and oxygen/moisture/particle tests are not required". This is wrong. **"Helium leak testing" and pressure hold test are required**

CORRIGENDUM 2 (added on Dec 6th 2020)

1. In Annexure 3 (Technical requirements), more manufacturer options have been added.
2. Also, the last date of the tender has been extended to Dec 17th 2020, 5PM.

Facility/Site

National Nano Fabrication Center is a 14,000 sq. ft. cleanroom with class 100 and class 1000 where semiconductor devices and fabricated. The facility has the following equipment, several of which require ultrapure hydrogen.

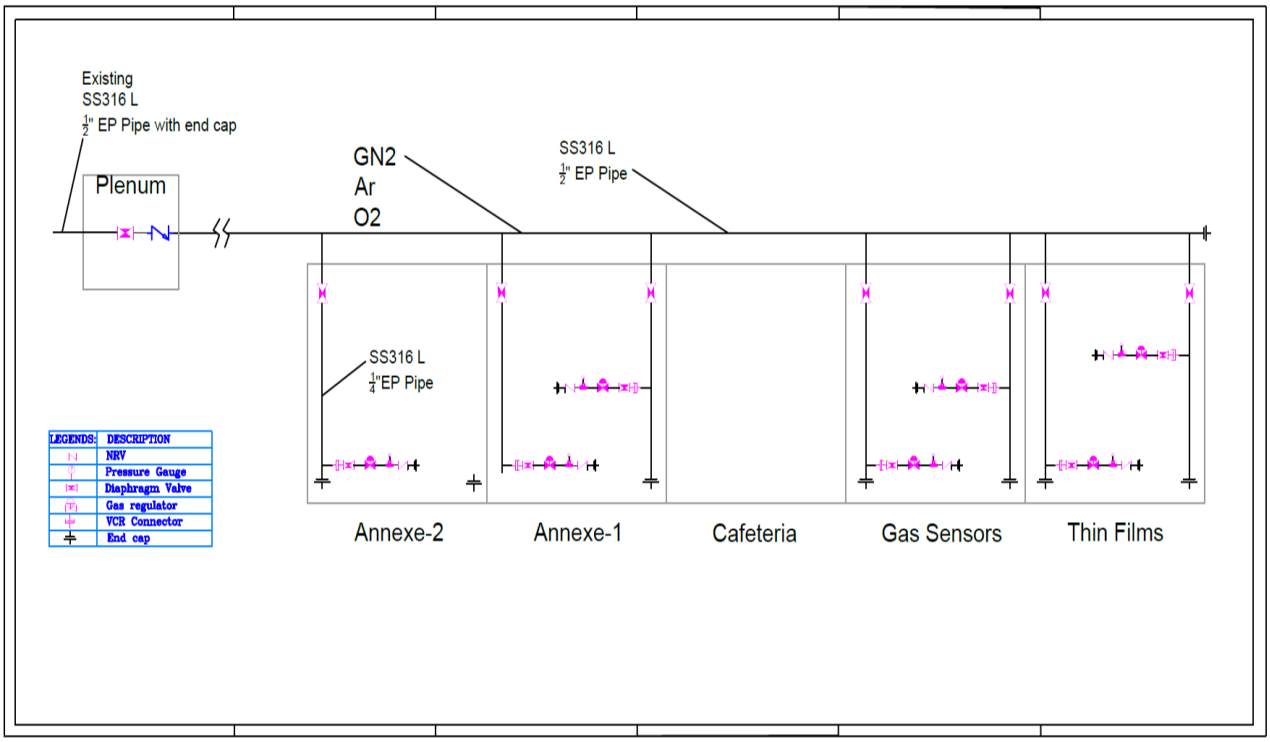
- Furnaces
- CVD equipment
- Sputter equipment
- Rf generators
- Electronic circuit boards (PCBs)
- Wet chemical hoods for concentrated acids and bases use and storage
- Solvent hoods for organic solvents use and storage
- Optical and E-beam lithography
- Characterization tools etc.

Procedure

1. Vendors will be required to submit their technical proposal and their commercial proposal in **two separate sealed envelopes**. Any violation of this will lead to cancellation of the proposal.
2. **The deadline for submission of proposals is the 10th December 2020, 5:30 pm Indian Standard Time [Extended to 17th Dec 2020, 5:30 PM IST].** Proposals should arrive at the Main office, GF-20, Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India, by the above deadline.
3. The decision of purchase committee will be final.
4. Vendors will be required to visit the site for actual measurements and routing of SS tubes. For site visit and verification please contact NNFC office GF-20 CeNSE., IISc.
5. The technical proposal should contain a compliance table. The first column must list the technical requirements, in the order that they are given in the technical configuration below. The second column should describe your compliance in a "Yes" or "No" response. If "yes" the third column should provide the make and type of system. If "No" the fourth column should provide the extent of the deviation (please provide quantitative responses). The fifth column should state the reasons for the deviation. Sixth column can be used for highlighting advantages of the system in third column.
6. Please find the reference P&ID layout and a table showing required number of sticks for each lab, in Annexure-1, Technical requirements in Annexure-2 and BOQ in Annexure-3.
7. Any additional capabilities or technical details, that you would like to bring to the attention of the purchase committee, can be listed at the end of the technical table.
8. Vendors are encouraged to highlight the advantages of their capabilities over the competitors.
9. Only vendors who are compliant with the technical requirements will be considered for commercial comparison. The bid is awarded to the lowest cost vendors (referred as L1)
10. The commercial comparison is done as per Government of India rules, specifically GFR 2017. Note that GFR has recently been amended. We shall follow the GFR rules as they stand on the date the tender has been released.
11. As per recent edits to the GFR, there are three classes of vendors distinguished by their "local content". In the cover letter, vendors must mention which applies to them:
    a. Class 1 supplier: Goods and services have a local content of equal to or more than 50%
    b. Class 2 supplier: Goods and services have a local content more than 20% but less than 50%
    c. Non-local supplier: Goods and services have a local content of equal to or less than 20%
12. In the commercial bid, please provide itemized cost of the system and required accessories, such as Regulators, Tubing, Valves, NRVs, gauges etc. BOQ is provided a the end of this document.
13. Please indicate the warranty provided with the part/material. Warranty of 3 year or more is preferred.
14. GST @5% for supply of items as per concession available to educational institutions and 18% on Transportation/services.
15. The technical proposal must include references of 3 previous installations, preferable in India. Please provide the names and contact addresses of the referees, so that the committee can contact them independently.
16. Any questions can be directed to Dr. Savitha P, GF-20, Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India. (savithap@iisc.ac.in)

Annexure 1

Reference P&ID



Name of Lab	No. of sticks required		
	Argon (Ar)	Nitrogen (N_2)	Oxygen (O_2)
NNFC Annexe-2	1	4	1
NNFC Annexe-1	4	6	3
Gas Sensor	1	4	2
Thin Films	4	4	4
Total	**10**	**18**	**10**

Annexure 2

Technical Requirements

1.	Application	Argon, Nitrogen and oxygen gases for a semiconductor foundry. Project plans to extend existing gas distribution network. The work will involve cutting into exiting lines and extending them. ***Ability to maintain ultra-high purity of the gas lines during this job is crucial and the most important aspect of the order.*** We cannot tolerate any contamination due to operator error or inexperience.
2.	Industry type	Semiconductor research laboratory.
3.	Tubing	Seamless SS-316L electropolished tubes with roughness ≤10 Ra.
4.	Valves & Fittings	1. Internally electropolished with an internal surface roughness of ≤10 Ra. 2. Only metal-to-metal face-seal to be considered from Swagelok® or Parker®, e.g. VCR®
5.	Welding work	Vendor must have at least 10 years of prior experience in SS316L orbital tube welding. Demonstrated ability to maintain purity needed for semiconductor works is crucial. Vendors must demonstrate capability by showcasing prior experience.
6.	End Sticks	All point-of-use (PoU) end-sticks should contain the following: 1. Single stage regulator with inlet & outlet pressure gauge; and check valve. Inlet pressure is maximum 50 bar, outlet pressure is 10 Bar. Gauge reading should be suitable to the range. Regulator-diaphragm must be SS or Hastelloy®. 2. 1/4'' shut-off diaphragm valve 3. Dummy End cap/Blinds for all lines.
7.	Hardware	1. Clamps for tubing support. 2. Unistrut support to be used at standard lengths. 3. All line must be tagged/labelled for identification.
8.	Testing & validation.	1. Pressure hold test at 1.5 times of operating pressure for 24 hours with 0 psi pressure drop. 2. [Amendment added on 2nd Dec 2020] Helium leak test. Must demonstrate a leak rate of less than $9x10^{-9}$ std cm3/s. 3. Oxygen/moisture/particle tests are not required.
9.	Installation & commissioning	1. The Installation should be carried out by trained technicians. 2. The Installation, testing and documentation procedure followed must be compliant to semiconductor standards.
10	Safety	1. The installation technician should follow all site safety terms. 2. Mandatary PPE: Safety helmet with face shield, electrical insulated gloves, electrical insulate Safety shoes.
11	Experience	1. The Vendor must submit references from at least 3 previous installations (must be semiconductor labs/foundries) 2. The names and contact addresses of the referees must be submitted with the proposal, so the purchase committee can contact them independently.

Annexure 3

Bill of Quantities

Sl. No.	Description	Unit	Qty.
1	½ inch, seamless SS-316L-EP-tubes with Roughness 10 Ra Make: Valex/Swagelok/Sandvik/ Dockweiler	Rmt	190
2	¼ inch, seamless SS316L-EP- tubes with Roughness 10 Ra Make: Valex/Swagelok/Sandvik/ Dockweiler	Rmt	220
3	1/2" shut-off Diaphragm Valve Max Pressure: 50 bar Manually operated Material: SS316, Seat: SS or Haste alloy End Connection: 1/2" VCR female Make: Swagelok/Parker/ AP Tech/Rotarex	Nos.	3
4	1/4" shut-off Diaphragm Valve Max Pressure: 50 bar Manually operated Material: SS316, Seat: SS or Haste alloy End Connection: 1/4" VCR female end. Make: Swagelok/Parker/ AP Tech/Rotarex	Nos.	45
5	1/2" VCR male nut and VCR female blind with glands, SS316 (for end cap) Make: Swagelok/Parker/Valex/Hamlet	Nos.	3
6	1/4" VCR male nut and VCR female blind with glands, SS316 (for end cap) Make: Swagelok/Parker/Valex/Hamlet	Nos.	45
7	1/2" Non-Return Valve, MOC: SS316, Working Pressure: 206 Bar, Cracking Pressure: 1/3 PSI, End Connection: 1/2" VCR male end. Make: Swagelok/Parker/Aptech/	Nos.	3
8	1/4" Non-Return Valve, MOC: SS316, Working Pressure: 206 Bar, Cracking Pressure: 1/3 PSI, End Connection: 1/4" VCR male end. Make: Swagelok/Parker/Aptech	Nos.	38
9	1/4" Line Pressure Regulator MOC: SS316, Specially Cleaned, Inlet Pressure: 50 Bar, Outlet Pressure: 0 to 10 Bar, Diaphragm: SS or Haste alloy. Inlet & Outlet Ports = 1/4" VCR male end. Make: Swagelok/Parker/Tescom/Aptech/ Rotarex	Nos.	38
10	Centre mounted Pressure Gauge Pressure range:(0 to 10 Bar) Make: WIKA	Nos.	38
11	SS316L, BW Equal Tee without Shoulder 1/4"	Nos	38

	Make: Swagelok/Parker/Valex/Hamlet		
12	SS316L, BW Equal Tee without Shoulder ½'' Make: Swagelok/Parker/Valex/Hamlet	Nos.	3
13	SS316L, BW Reducing Tee without Shoulder 1/2 x 1/4" x 1/2" Make: Swagelok/Parker/Valex/Hamlet	Nos.	7
14	SS316L 1/4" Equal Tee VCR Connectors. Make: Swagelok/Parker/Valex/Hamlet	Nos.	35
15	MS powder coated mounting plate for Gas sticks with labelling.	Nos.	20
16	Supply of labels, Tube Clamps and Supports for Pipeline	Lot	1

Note:

1. Any type of Civil / Structural works such has wall openings/closing for the passage of pipes, supports, frame-work, etc., will be in vendor/Contractor's scope.
2. Any work-permit/shutdown required for work must be intimated prior 5-6 days before start of work.
3. Any deviation in quantities will be paid extra against actual site measurements. In the Same way, any quantities leftover will be retained by Customer (CeNSE).

Thanking you,
Savitha P,
COO, NNfC