

वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद्  
Council of Scientific & Industrial Research  
राष्ट्रीय वांतरिक्ष प्रयोगशालाएं  
National Aerospace Laboratories



CSIR - NAL Estd. 1959  
ISO 9001 : 2015  
Certified Organization

INVITATION FOR BIDS/NIT

Tender No. NAL/PUR/MSD/590/19-Y

Dated: 16-Mar-2020

CSIR- National Aerospace Laboratories (NAL), Bengaluru, India is one of the premier laboratories under Council of Scientific and Industrial Research (CSIR), an autonomous body under Department of Scientific and Industrial Research, Government of India, New Delhi. CSIR-NAL is a Science and Knowledge based Research, Development and Consulting Organization. It is internationally known for its excellence in Scientific Research in Aerospace Engineering.

The Director, CSIR-NAL invites online quotation for procurement of the following item(s) for day to day research work.

Sl.No.	Description of Items	Unit	Quantity
01	Supply, Installation, testing and commissioning of laboratory gas piping and distribution system. Supply should include Primary regulator for Hydrogen and oxygen, Secondary Regulator (Point of Use) for Hydrogen, Oxygen, Nitrogen and Argon, Genetics regulator with Gauges, Ball valves, Check valves, Relief valves, fitting and accessories required for installation. Please refer Annexure for detailed specification.	No	01

Single / Double Bid	Two Bid
Bid Security (EMD) (in INR)	<b>Bid Security Declaration should be enclosed with quotation</b>
Performance Security	<b>10% of the purchase order value</b>

01. Tender Documents may be downloaded from Central Public Procurement Portal <https://www.etenders.gov.in>. Aspiring Bidders who have not enrolled/ registered in e- procurement should enroll/ register before participating through the website <https://www.etenders.gov.in>. The portal enrolment is free of cost. Bidders are advised to go through instructions provided at 'Instructions for online Bid Submission'.
02. Tenderers can access tender documents on the website (For searching in the NIC site <https://www.etenders.gov.in>, kindly go to Tender Search option, select tender type and select ' Council of Scientific and Industrial Research' in organization tab and select NAL-Bengaluru-CSIR in department type Thereafter, Click on "Search" button to view all CSIR-NAL, Bengaluru tenders). Select the appropriate tender and fill them with all relevant information and submit the completed tender document online on the website <https://www.etenders.gov.in> as per the schedule given in the next page.
03. Either the Indian Agent on behalf of the Foreign principal or the Foreign principal can bid directly in a tender but not both. However, the offer of the Indian Agent should also accompany the authorization letter from their principal. To maintain sanctity of tendering system, one Indian Agent cannot represent two different Foreign principals in one tender.
04. Unsolicited / conditional / unsigned tenders (Quotations) **shall not** be considered. Quotations received after the due date and time **shall be summarily rejected**.
05. The Bidder shall comply the terms and conditions of the tender, failing which, the offer shall be liable for rejection.
06. The Director, CSIR- National Aerospace Laboratories., Bengaluru reserves the right to accept any or all the tenders either in part or in full or to split the order without assigning any reasons there for.

  
Raman Kumar  
(Section Officer S&P)

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**SCHEDULE CUM CRITICAL DATE SHEET**

1	Name of Organization	CSIR-National Aerospace Laboratories, Bengaluru	
2	Tender Reference No	NAL/PUR/MSD/590/19-Y dated: 16-Mar-2020	
3	Tender Type (Open/Limited/EOI/Auction/Single)	Open	
4	Type/Form of Contract (Work / Supply / Auction / Service / Buy / Empanelment / Sell)	Supply	
5	No of Covers (One/Two/Three/Four)	Two	
6	Tender Category (Services/Good/Works)	Goods	
7	Allow Resubmission (Only in online mode within scheduled period)	Yes	
8	Allow Withdrawal (Only in online mode within scheduled period)	Yes	
9	Allow Offline Submission	No	
10	Work Item Title	Supply, Installation, testing and commissioning of laboratory gas piping and distribution system, etc.	
11	Work Description	Supply, Installation, testing and commissioning of laboratory gas piping and distribution system, etc.	
12	Delivery Schedule	90 days from the date of purchase order	
13	Product Category (Civil Works / Electrical Works / Fleet Management / Computer Systems)	R & D Equipment	
14	Is Multi Currency Allowed	Yes	
15	a) Tender Publishing Date -	16-Mar-2020	1800 Hrs
	b) Document Download Start Date-	16-Mar-2020	1800 Hrs
	c) Bid Submission Start Date-	16-Mar-2020	1800Hrs
	d) Bid Submission End Date-	30-Mar-2020	1000 Hrs
	e) Bid Opening Date-	31-Mar-2020	1100 Hrs
16	Bid Validity Days	90 days	
17	Address for communication	Stores and Purchase Officer CSIR-National Aerospace Laboratories, HAL Airport Road, Kodihalli, Bengaluru - 560017	
18	Inviting Officer	Director, CSIR-NAL	
19	Contact No	25086040, 25086041	
20	E-mail Address	<a href="mailto:purchasek@nal.res.in">purchasek@nal.res.in</a>	
21	Detailed specification of item	Refer Invitation for bids / NIT	
22	Tender Terms & Conditions & Instruction for online bid submission	The prospective bidders are requested to refer to the Standard Tender Document available on NAL Internet ( <a href="http://www.nal.res.in">www.nal.res.in</a> ) under the icon Tender-Purchase before formulating and submitting their bids	



**Supply, Installation, testing and commissioning of laboratory gas piping and distribution system**

Supply should include Primary regulator for Hydrogen and Oxygen, Secondary Regulator (Point of use) for Hydrogen, Oxygen, Nitrogen and Argon, Genetics regulator with gauges, Ball valves, Check valves, Relief Valves, fitting and accessories required for installation as per the detailed specifications attached herewith.

**1. Technical Specification for Regulators****Quantity: 19 number**

- Primary Regulator- 4 (for Hydrogen, Oxygen, Nitrogen and Argon) with male connectors at inlet and outlet (Oxygen regulators should have oxy-cleaned connectors)
  - Secondary Regulator (Point of Use)- 5 (for Hydrogen, Oxygen (2), Nitrogen and Argon) with male connectors at inlet and outlet (Oxygen regulators should have oxy-cleaned connectors)
  - Genetic point of use Regulators with Gauges : 10 number
- a) 4 Primary Regulators and 5 secondary Regulators should be of Swagelok make or better than that. Manufacturer should have ISO 9001 certification and as well as product approvals from TUV, ASME, BSI, DNV, Lloyds Registrar of Shipping & PED.
  - b) Every Regulator should be tested using Nitrogen and is performed to a requirement of no detectable leakage with a liquid leak detector.
  - c) The Regulators for Oxygen should be cleaned as governed by ASTM G93 Level C.
  - d) Regulators for Hydrogen should be two stages to reduce supply pressure effect. Regulator body for Hydrogen should be SS 316. It should have an Annealed Alloy X-750 diaphragm to reduce chances of failure due to Hydrogen embrittlement.
  - e) Supply Pressure effect should be less than 1.5% for single stage regulators and less than 0.02% for two stage Hydrogen regulators.
  - f) Regulators for Hydrogen should be two stages where the first stage should reduce the inlet pressure to 500 psig (34.4 bar). The second stage should be adjustable with the handle to achieve the required outlet pressure
  - g) Regulator Range springs should be of 316 SS (0 to 10 through 0 to 100 psig control ranges) or Zinc-plated steel (0 to 250 and 0 to 500 psig control ranges)
  - h) Manufacturer should provide traceability certificates.



- i) Manufacturer must warrant to the purchaser of their Products that the non-electrical components shall be free from defects in material and workmanship for 10 years of life of the Products.
- j) The authorized representative of the manufacturer shall have the ability to conduct Leak Audits

## 2. Technical Specification for Ball Valves

**Quantity: 8+5 number**

- a) The Ball Valve ¼" OD of 8 in numbers for high pressure and anti-corrosive material for hazardous gas.
- b) The Ball Valve ¼" OD of 5 in numbers is made of indigenous SS 304 material for low pressure compressed airlines.
- c) Valve manufacturer should have ISO 9001 certification and as well as product approvals from TUV, ASME, BSI, DNV, Lloyds Registrar of Shipping & PED.
- d) All 316 SS Ball valves body to conform to CF3M A351/ASTM A182/ A479 and ball material should conform to 316 SS/A276.
- e) Every Ball valve should be factory tested with nitrogen at 1000 psig (69 bar) and it should have maximum allowable leak rate of 0.1 std. cm<sup>3</sup>/min. Leak testing need to be performed onsite for no detectable leakage with a liquid leak detector.
- f) Manufacturer should be able to provide Testing certificate for vacuum range of 1X10<sup>-5</sup>torr, Hydro testing at customer specified pressure.
- g) Design pressure should be at least twice the working pressure & Burst pressure may be almost four times the working pressure of the ball valves.
- h) Manufacture should be able to provide ATEX certified, Chlorine service, Steam application, Rapid cycling and Thermal Service ball valves as a part of their ball valves package.
- i) Pneumatic actuator, ISO 5211 compliant Pneumatic actuator, Electrical actuator operated Ball Valves should be a part of the manufacturer's ball valves package offered.

## 3. Technical Specification for Check Valves

**Quantity: 6 number**





**Specifications for the Check valves for Hydrogen, Nitrogen and Argon gas**

- a) Valve manufacturer should have ISO 9001 certification and as well as product approvals from TUV, ASME, BSI, DNV, Lloyds Registrar of Shipping & PED.
- b) All 316 SS Check valves body and poppet to conform to CF3M A351/ASTM A182/ A479 and spring, gasket material should conform to ASTM A313/A 240
- c) Every check valve should be factory tested for crack and reseal performance with a liquid leak detector. Check valves with fixed cracking pressures should be cycled six times prior to testing. Every Check valve should be tested to ensure it seals within 5 seconds at the appropriate reseal pressure. Check valves with adjustable cracking pressures should be tested at two pressure points. Every valve should be tested at a low-pressure setting and at a high-pressure setting. All Check valves must seal within 5 seconds at the appropriate reseal pressure.
- d) Check Valves with adjustable cracking pressure should have adjusting and locking screw made of SS 316 conforming to ASTM A276
- e) Manufacturer should be able to provide certificate of conformity and traceability.
- f) The Check Valves should be field serviceable and the manufacturer should have maintenance kits as a part of their product offering.

**Specifications for the Check Valves Oxy Cleaned for Oxygen gas line**

- a) Valve manufacturer should have ISO 9001 certification and as well as product approvals from TUV, ASME, BSI, DNV, Lloyds Registrar of Shipping & PED.
- b) Every check valve should be factory tested for crack and reseal performance with a liquid leak detector. Every valve is tested to ensure it seals within 5 seconds at the appropriate reseal pressure.
- c) Manufacturer should be able to supply Check valves with specially cleaned and packed to ensure compliance with product cleanliness requirements stated in ASTM G93 Level C for oxygen service.
- d) Design pressure should be at least twice the working pressure & Burst pressure may be almost four times the working pressure of the Check valves.
- e) Manufacturer should be able to provide multiple options for packing materials, O-ring maintenance kits and Handle kits.

**4. Technical Specification for Relief Valves**



**Quantity: 6 number**

- a) Valve manufacturer should have ISO 9001 certification and as well as product approvals from TUV, ASME, BSI, DNV, Lloyds Registrar of Shipping & PED.
- b) All 316 SS Relief valves body to conform to CF3M A351/ASTM A182/ A479 and spring should be made of SS S17700 material and the tensile strength of spring material should conform to AMS5678 spec.
- c) Every proportional relief valve should be factory tested for set and resealing performance with minimum resealing pressures for various set ranges according to the below table.

Test Set Pressure psig (bar)	Minimum Resealing Pressure as a Percentage of Set Pressure, %
10 to 20 (0.7 to 1.3)	50
175 to 225 (12.0 to 15.5)	91
100 to 200 (6.8 to 13.7)	50
850 to 1000 (58.5 to 68.9)	84

- d) Out of 6, 1 Relief valve should be oxy-cleaned for Oxygen gas line
- e) Manufacturer should have a capability to pre-set the relief valves to a specified set pressure. Valves should set, tested, locked, and tagged with the set pressure; certificates of test should be included.
- f) Relief Valve should have a quad seal and O-ring to provide positive shutoff and eliminate leakages
- g) Relief Valve should have a lock nut made of SS material to maintain cap position and ensure pressure adjustment
- h) Relief Valve should be provided with Cap made of SS 316 which enables easy external set-pressure adjustment.
- i) Relief Valve should have lock-wire capability to secure cap to maintain set pressure adjustment
- j) The Relief Valves should be field serviceable and the manufacturer should be able to provide spares for seals and springs.



**5. Technical Specification for SS 316/316L instrumentation tubing**  
**Quantity: 202+24 Meter**

- a) The Tube ¼" OD of 202 meters is the imported Swagelok SS 316 make for high pressure and anti-corrosive material for hazardous gas. Out of which 60 meter is oxy-cleaned.
- b) The Tube ¼" OD of 24 meters is made of indigenous SS 304 material for low pressure compressed airlines.
- c) Tubing manufacturer should have ISO 9001/ 9002 certification and as well as product approvals from TUV and JIS.
- d) Quality System of the Tubing Manufacturer should have approval from ASME quality system certificate as material organization
- e) Tubing should be dual certified as TP 316 / 316L. Also, tubing should be clearly marked with heat code, lot code, outer diameter and wall thickness as in the inspection certificate.
- f) Testing of the tubing should be in accordance with SS 219711, SS219713, DIN 17458 TC1, NFA 49 – 117, ASTM A213, ASTM A269, ASTM A789 AND ASTM B667.
- g) Tubing sizes upto 1" OD should be bright annealed. Tubing with outside diameter larger than 1" OD should be supplied in annealed and pickled condition.
- h) Tubing should have a minimum of 2.5% Molybdenum so as to ensure high resistance to corrosion.
- i) Tubing should have carbon content  $\leq 0.030\%$ .
- j) The tubing should be supplied with plugged ends.
- k) Tubing hardness should be max of HRB 80
- l) Tolerance for 316/316L tubing from 6 to 42mm OD as per DIN/2391/EN 10305-I & Tolerance on wall thickness should be +/- 10%
- m) Tubing supplier should furnish an "INSPECTION CERTIFICATE" indicating:
  - (i) Material description
  - (ii) Steel making process
  - (iii) Heat code
  - (iv) LOT code
  - (v) Leak test: Eddy current test according to ASTM A-450
  - (vi) Test results of chemical composition, tensile test, hardness test, flaring test and flattening test.





6. Primary regulator hoses for H<sub>2</sub>,N<sub>2</sub>,Ar at Primary regulator point
7. Gauges for Regulators: H<sub>2</sub>,N<sub>2</sub>,Ar at Primary Gas line
8. Fitting accessories required for installation of the gas line for Argon, Nitrogen, Oxygen, Hydrogen and compressed air line: To be supplied as per site requirement  
Standard cleaning and packaging as per Swagelok specification (SC-10)
9. The authorized representative of the manufacturer shall have the ability to conduct Installation Training Program
10. The authorized representative of the manufacturer shall have the ability to conduct Leak Audits a record of having completed few audits in the previous 12-month period.

Evaluation service post installation-inclusive of compressed airlines to be done using Ultrasonic Leak Detector and appropriate post completion report to be submitted





**BID-SECURING DECLARATION FORM**

Date: \_\_\_\_\_

Bid No. \_\_\_\_\_

To (insert complete name and address of the purchaser)

I/We. The undersigned, declare that:

I/We understand that, according to your conditions, bids must be supported by a Bid Securing Declaration.

I/We accept that I/We may be disqualified from bidding for any contract with you for a period of one year from the date of notification if I am /We are in a breach of any obligation under the bid conditions, because I/We

(a)	have withdrawn/modified/amended, impairs or derogates from the tender, my/our Bid during the period of bid validity specified in the form of Bid; or
(b)	having been notified of the acceptance of our Bid by the purchaser during the period of bid validity
	(i) fail or refuse to execute the contract, if required, or
	(ii) fail or refuse to furnish the Performance Security, in accordance with the Instructions to Bidders.

I/We understand this Bid Securing Declaration shall cease to be valid if I am/we are not the successful Bidder, upon the earlier of (i) the receipt of your notification of the name of the successful Bidder; or (ii) thirty days after the expiration of the validity of my/our Bid.

Signed: (insert signature of person whose name and capacity are shown)  
in the capacity of (insert legal capacity of person signing the Bid Securing Declaration).

Name: (insert complete name of person signing the Bid Securing Declaration)

Duly authorized to sign the bid for an on behalf of: (insert complete name of Bidder)

Dated on \_\_\_\_\_ day of \_\_\_\_\_ (insert date of signing)

Corporate Seal (where appropriate)

**Note:**

1. In case of a Joint Venture, the Bid Securing Declaration must be in the name of all partners to the Joint Venture that submits the bid.
2. Bid Security declaration must be signed in by the Proprietor/CEO/MD or equivalent level of Officer of the company.