

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/259/19-Y

Dated: 13-Nov-19

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	Qty
1	Vertical tubular split type Furnace operating up to 1600°C Fabrication, supply and installation of High Temperature vacuum/insert atmosphere vertical tubular split type furnace with Molybdenum Disilicide heating element for continues operation at 1600°C and design temperature of 1700°C. Please refer Annexure for detailed specification.	No	1

Single / Double Bid	Two bid
Bid Security (EMD) (in INR)	Nil

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/259/19-Y dated: 13-Nov-19	
3	Tender Type (Open/Limited/EOI/Auction/Single)	Limited	
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	Vertical tubular split type Furnace operating up to 1600°C.	
11	Work Description	Vertical tubular split type Furnace operating up to 1600°C.	
12	Delivery Schedule	60 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 -	15-Nov-19	1800 Hrs
	b) Document Download Start Date-	15-Nov-19	1800 Hrs
	c) Bid Submission Start Date-	15-Nov-19	1800 Hrs
	d) Bid Submission End Date-	05-Dec-19	1000 Hrs
	e) Bid Opening Date-	06-Dec-19	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	

**Note:**

- a) Participation in this tender is by invitation only and is limited to the selected bidders. Unsolicited offers are liable to be ignored. However, bidders who desire to participate in such tenders in future may bring it to the notice of Procuring Entity and apply for registration.
- b) To get registered as an approved bidder with the procuring entity please refer our website [www.nal.res.in](http://www.nal.res.in) and submit.



**Vertical tubular split type Furnace operating up to 1600°C**

Fabrication, supply and installation of High-Temperature vacuum/inert atmosphere vertical tubular split type furnace with Molybdenum Disilicide heating element for continuous operation at 1600°C and design temperature of 1700°C with the following specifications. (Schematic diagram enclosed)

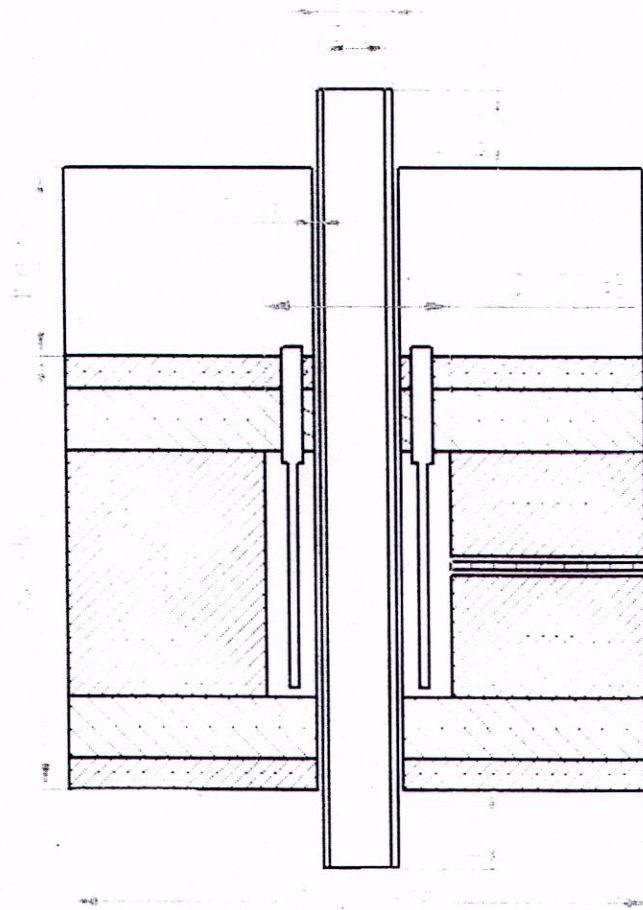
1	Heating zone	150 mm internal diameter × 150 mm height
2	Temperature controller	Programmable Eurotherm/Honeywell/Equivalent make with 4-8 programs and 16 segments in each program.
3	Safety temperature controller	Eurotherm/Honeywell/Equivalent make (digital)
4	Power controller	Euorotherm/Honeywell/Equivalent power controller through thyristor power pack.
5	Power supply	Through the stepdown air cooled transformer
6	Thermocouples	R –type, Platinum-Platinum Rhodium, recrystallized alumina sheath.
7	Furnace casing	Fabricate with stainless steel (304/316L grade) sheets/plates with structural sections duly welded/screw joints, wherever necessary. Skin temperature should be below 50°C at highest operating temperature.
8	Furnace insulation	The complete furnace insulation should be lined with vacuum-formed high-temperature ceramic fibre board to withstand the temperature up to 1800°C.
9	Total dimensions of the furnace	400 ± 25 mm outer diameter × 500 ± 25 mm length, fixed to a stand for adjusting the required height.
10	Heating Elements	Molybdenum Disilicide heating elements should be placed inside the chamber to achieve the necessary temperature and terminals should be taken out to connect the control panel.
11	Control panel	Fabricate using sheet steel to provide the port(s) for connecting the programmable temperature controller, safety temperature controller, thyristor power controller, voltage and current meter, MCB, Fuses, indicating lamps, secondary cables and other connecting/measuring data units.
12	Recrystallized alumina tube	Both ends opening with outer diameter of 60 mm × internal diameter of 50 mm × length is equal to height of the furnace (with an additional extension of 125 mm).



13	Thermocouples placement	Thermocouples placement should be at the centre of the heating element.
14	Water cooling jackets	Necessary water cooling jackets made up of stainless steel with purging inert gas and vacuum compatible to the recrystallized alumina tube.
15	Gas purging systems	Necessary gas purging systems with suitable gas flow meter, pipeline and fittings.
16	Safety devices	Temperature controller should have fail-safe thermocouple and cold junction compensation, HRC fuses for short circuit protection.
<b>Spares</b>		
<ul style="list-style-type: none"><li>• One set of necessary heating elements.</li><li>• One recrystallized alumina tube as mentioned in item 12.</li><li>• One set of necessary thermocouples.</li></ul>		



**Schematic Diagram of the Tubular split type furnace**



*(Handwritten signature)*

All dimensions are in mm