INVITATION FOR TENDERS

Tender No. NAL/PUR/SED/144/22-Y **Dated: 08/08/2022**

CSIR - National Aerospace Laboratories (NAL), Bengaluru, Republic of India, is one of the premier research laboratories under aegis of Council of Scientific and Industrial Research (CSIR), an autonomous body under the Department of Scientific and Industrial Research, Government of India, New Delhi. CSIR-NAL is a Science and Knowledge based Research, Development and Consulting Organisation. 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 Item(s)	Unit	Quantity
1	Ice Adhesion Test Rig with Integrated Data Acquisition System and Deep Freezer. (Please refer annexure for detailed specification)	No	1

Single / Double Bid Only	Single	Tender Type	Open
Bid Security (EMD) (in INR)	Bid Security Declaration should be enclosed with quotation	Bid submission end date	29-Aug-2022 10.00 Hrs
Performance Security	**3% of the purchase order value**	Bid opening date	30-Aug-2022 11.00 Hrs

01. Tender Documents may be downloaded from Central Public Procurement Portal https://www.etenders.gov.in. Aspiring Bidders' who have not registered in e- procurement can register free of cost before participating through the website https://www.etenders.gov.in. 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 organisation 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. a. Global Tender Enquiry: 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 authorisation letter from their principal. To maintain sanctity of tendering system, one Indian Agent ***cannot*** represent two different Foreign principals in one tender

b. Open Tender enquiry: Only Local suppliers with prescribed local content as detailed in DIPPT Order No. P-45021/2/2017-PP (BE-II) dated 16th Sep, 2020 and subsequent orders issued by Ministry of Finance (GoI) from time to time, are eligible for bidding. Bidders must enclose the certificate declaring the local content of supplies as per our standard form.

Note: Kindly refer to the first page (NIT) for tender type (i.e. Open Tender Enquiry / Global Tender Enquiry) and submit your bid accordingly.

04. Unsolicited / conditional / unsigned Quotations/Quotations received after the due date and time shall be summarily rejected. The Bidder shall comply the terms and conditions of the tender, failing which, the offer shall be liable for rejection.

05. The bids' failing to comply with the following clauses will be summarily rejected.

a. The Bidders' proposing to supply finished products directly/indirectly from vendors' of countries sharing the land border with India should submit a copy of registration done with DPIIT.

b. If the products supplied are not from vendors of countries sharing land border with India, the Bidders' have to enclose a declaration to that effect.

06. As per Govt. of India procurement policies,

a. The purchaser intends to give purchase preference to local supplies (Preference to Make in India) in case the cost of procurement is up to Rs. 50.00 lakhs.

b. The procuring entity intends to give purchase preference to products/goods manufactured by micro, small and medium enterprises.

07. Bidders' are requested to refer to the instructions regarding Procurement Policies for "Make in India", issued by Ministry of Commerce and Industry, Department of Industrial Policy and Promotion dated. 28-May-2018, and 4-Jun-2020 and guidelines as and when issued.

08. Kindly, note CSIR-NAL **GST No. 29AAATC2716R1ZB.** And the bidders' are requested to furnish their GST No. in their invoice failing which we will ***not*** be able to make timely payment.

09. Printed conditions, if any, submitted along with your quotation shall not be binding on us.

10. The prospective bidders' are requested to refer to the Standard Terms and Conditions available on NAL Internet (www.nal.res.in) under the icon Tender-Purchase before formulating and submitting their bids'.

11. 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.

Thanking you,

Yours faithfully

08/08/2022

Stores & Purchase Officer
For and on behalf of CSIR-NAL

ICE ADHESION TEST RIG WITH INTEGRATED DATA ACQUISITION SYSTEM

ICE ADHESION TEST RIG for measuring the adhesion of ice on different surfaces. The test surface will be in the form of a cylinder and ice will be formed in an annular space between the test surface and a standard surface. The test cylinder should be moved at slow speed and the breakage strength has to be measured as the adhesion strength of the ice on the test surface. Care should be taken such that the ice does not break but shears on the test surface. This experiment has to be conducted at sub-freezing temperature and the sample has to be cooled. To a prescribed time, cooling jacket has to be provided that can control the sample temperature within 1°C from up to -40°C. A deep freezer for sample preparation should be provided.

The ICE ADHESION TEST RIG should be provided with Linear servo actuator system with load cell, LVDT, and PC based data acquisition system. The frame has to be designed to withstand stiffness better than 10^6 N/M with double column configuration.

Uses:

- Evaluate and compare the relative performance of materials and surface coatings basedon their ability to aid in ice removal.
- Test the effectiveness of de-icing methods.
- Repeated testing to measure durability.

Technical specifications for ICE ADHESION TEST RIG

Annexure-I

- Displacement - Max range 4000 micrometer
  Resolution –10 micron
- Normal Load - 10 KN linearity 0.1 % FSO
- Progressive Loading - 2 N to 10 kN
- Sample Dimension - diameter 25mm, length 75mm
- Ice Thickness - 1mm to 2.5mm
- Strain rate - 0.4 sec $^{-1}$ to 6 sec $^{-1}$
- Test Cylinders - 25.4mm dia 75mm length
- Crosshead speed (Compression) - 1 micron/sec to 10 micron/sec Variable.
- Temperature Controller - for sample cooling jacket up to -40°C
- Accuracy - ± 1^{0} C
- Deep freezer - for accommodating 10 samples at a time
- High speed real time DAQ - Load against displacement
- Warranty: - free replacement of mechanical parts against any manufacturing defects for 2 year from the date of installation.

Technical specifications for Deep Freezer

Annexure-II

Deep freezer having chambers with independent cooling and temperature monitoring systems is required to make ice column over the coating and also putting the test specimens required for ice adhesion test RIG to determine the ice (shear) adhesion strength.

The technical specification for Deep freezer is as given below:

1. Material of construction

a) External body: Powder Coated CRCA Steel / Stainless Steel -304 grade for GMP Model.

b) Internal body: Stainless Steel -304 grade / Stainless Steel -316 grade for GMP model.

c) Insulation: 80 mm minimum for body and 80 mm for Door, CFC free polyurethane foam.

2. External dimensions (W x D x H) of freezer, mm ± 20 mm: 800 x 975 x 1800

3. Internal dimensions (W x D x H), mm ± 10 mm: 500 x 500 x 500

4. Deep freezer should have chamber with cooling and temperature monitoring systems

5. Temperatures of chamber: Ambient to -40 °C Variable.

6. Temperature control: Microprocessors with PT-100 sensors should be provided to control the inside temperature in chamber.

7. Power supply: 220-240 Volts, 50 Hz Single Phase 8. Noise level: Less than 65 dB 9A

8. Warranty: free replacement of mechanical parts against any manufacturing defects for 2 year from the date of installation.

9. **The freezer should have following features:**

a) Hermetically sealed compressor with CFC free refrigerant
b) Alarms for high / low set parameters
c) Electrical circuit breaker
d) Inner chambers for easy cleaning
e) Microprocessor controllers with LED display of temperature
f) Unique design of thermal barrier for better energy efficiency
g) Machine filled CFC free PUF insulation to eliminate void pockets

Technical specifications for Data acquisition system with relevant software

Annexure- III

	Item Description	Specification
1.	Form Factor	SFF
2.	Processor	Intel Core i7 11th Gen with Turbo Boost or Latest
3.	Processor Speed	Minimum 3.4 Ghz (Base Memory) or higher
4.	Cache	12MB or higher
5.	Mother Board	Intel / OEM
6.	Chipset	Intel Q370 or equivalent / better
7.	Memory	16GB (1*16GB) DDR4 (2666 MHz) SDRAM Expandable upto 32GB
8.	Graphics	Integrated HD Graphics or better
9.	Hard Disk Drive	1TB (7200 RPM), SSD
10.	Optical Drive	Internal Min. 8x DVD-RW of OEM make
11.	Keyboard	Standard (104 keys) Keyboard of same make of offered PC
12.	Mouse	Two button scrolling Optical Mouse of same make of offered PCalong with good quality of mouse pad
13.	External Ports	USB3.0/3.1, USB Type C (Out of these Min. 4 USB port on front foreasy access), Headphone, Microphone, Display Port/HDMI, RJ45, Audio Line Out, GPIB-communication board, GPIB to USB converter cable
14.	Network Interface	1. Integrated 100/1000 Mbps Ethernet with RJ-45 connector 2. Bluetooth 3.0 or higher & IEEE 802.11 b/g/n wi-fi
15.	Display	27" or higher Color LED display of same OEM make of CPU with Height & Tilt Adjustable
16.	Power	220 ±10% VAC, 50 Hz, pf corrected or better.
17.	OS	Windows 10 or higher
18.	MS office	Licensed version
19.	Printer	Laser jet B/W
20.	Data acquisition relevant software	S/W to operate/control the instrument along with data acquisition
21.	SMPS	400/450 W

Scope of Supply

1. Ice Adhesion Test Rig **(As per annexure-I)**
2. Deep freezer for sample preparation **(As per annexure-II)**
3. Data acquisition system (**As per Annexure-III)** with relevant software
4. Tool Kit
5. Operation & Maintains Manual

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 he 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.