INVITATION FOR TENDERS

Tender No. NAL/CCFP/PUR/2K22/034 **Dated: 05/12/2022**

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	Revamping of the process exhaust extractor, thermal and air conditioning units for fiber processing areas. (Please refer annexure for detailed specification)	No	1

Single / Double Bid Only	Two	Tender Type	Open
Bid Security (EMD) (in INR)	Bid Security Declaration should be enclosed with quotation	Bid submission end date	29-Dec-2022 10.00 Hrs
Performance Security	**3% of the Purchase Order Value.**	Bid opening date	30-Dec-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,

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

Revamping of the Process Exhaust Extractor & Thermal and air conditioning units for fiber processing areas

1.0 SUMMARY

This enquiry is for the revamping of 1 no. process exhaust extractor unit and 2 no. thermal and air conditioning units along with refurbishments in associated process areas to enable fiber processing in cleaner ambiences with micron-level filtered ambient air and also to avoid dust settling on the exposed surfaces of the above mentioned units.

2.0 BRIEF DESCRIPTION OF THE PROCESS AREAS

The process areas/facilities concerned, wherein the effluent handling and process exhaust units are required, are located in two adjacent buildings at Centre for Carbon fibers and Prepregs division in CSIR-NAL Belur Campus. These two areas are termed a) "Fiber Spinning area and b) "Heat treatment area". These process areas comprise of various process equipment with associated process and utilities piping and these both areas are at normal operational condition.

The fiber spinning facility consist of fiber treatment baths, bath liquid circulation tanks, fiber forwarding rollers (driven rollers and idlers), air circulation dryers and winders. The fiber spinning area has wet as well as dry process area. The chemicals dimethyl acetamide or dimethyl sulfoxide used for the fiber manufacturing. Fibers pass through aqueous solutions of these chemicals during the process.

The heat treatment area comprises of process equipment such as ovens, furnaces, water baths, unwinders and winders. The equipment used for the heat treatment/drying have maximum skin temperature of about 60°C.

The Process areas have multiple levels at 0.5 meter, 5 meter and 9.0-meter elevation from the road level. The heat treatment area located on 0.5-meter elevation. Its ceiling height is 7.5 meter. The fiber spinning area is located at 5.0-meter elevation. Its ceiling height is 4.5 meter. Packaged HVAC units are located at 7.5 and 9.0-meter elevation for fiber spinning process and heat treatment areas respectively.

These facilities are required to be revamped with refurbishment of exhaust extractor unit and other air conditioning system in order to establish a clean room-like ambience for process operation. The further details are provided in the following sections.

3.0 SCOPE OF THE WORK

The scope of the vendor is design, fabrication, supply, modification, installation and commissioning of the upgradations in the process exhaust extractor and thermal and air conditioning units. The work elements involved are listed area-wise for clarity.

3.1 Fiber spinning area

- Refurbishment of 1 no. thermal conditioning (HVAC) unit
- Supply and installation of sliding window meshes to existing 11 no's windows on the side walls
- Supply and installation of 10 no's air conditioning units for fiber processing areas and control rooms

3.2 Heat treatment area

- Refurbishment of 1 no. thermal conditioning (HVAC) unit
- Refurbishment of 1 no. process exhaust extractor unit
- Replacement of 10 no. exhaust fans on the side walls at about 7 m elevation along with enclosures for these fans for preventing entry of particles from outside.

4.0 TECHNICAL SPECIFICATIONS

The technical requirements of the work elements mentioned in the previous section are listed below.

4.1 Fiber-spinning area – Refurbishment of thermal conditioning unit (HVAC)

The fiber spinning area has a packaged HVAC system for continuous supply of fresh and cleaned air supply to the process area. Some photographic images of the HVAC package are depicted in Annexire-1. The HVAC contains a primary air filer, secondary air filters, micro filters, cooling pads, water spray system, and water collection tank, blower with capacity 15000 CFM. The technical details of the refurbishment required for various components of the HVAC units are tabulated below:

S. No.	Item	Jobs to be done
1	Package HVAC	The inner (metallic) surface area of HVAC package of around 300 square feet is to be painted with epoxy. For all painting work, first surface has to be prepared with proper emery work and then a single coat of epoxy primer is to be applied

		on cleaned surface. After sufficient time of drying it, two coat of epoxy paint is to be applied on the surface.
2	Outer grill for HVAC enclosure	The outer grill of HVAC is to be painted with epoxy paint. Approximate size of grill is 15 x 15 x 15 feet.
3	Pre-filters for HVAC	Supply and installation of one complete set of pre-filters i.e., 3 no's of pre-filter (size 305 x 610 x 50 mm) with 10-15-micron rating 6 no's of pre filter (size 305 x 610 x 305 mm) with 10-15-micron rating. The material of construction for filters has to be stainless steel only. Apart from fixing all the 9 no's of pre filters at HVAC , a spare set of 9 numbers pre filters (one complete set) is to be supplied also.
4	Micro filters for HVAC	Supply and installation of 3 no's of pre filter (size 305 x 610 x 50 mm) with < 1-micron rating and 6 Nos of pre filter (size 305 x 610 x 305 mm) with < 1-micron rating. The material of construction for filters will be stainless steel only. A spare set of 9 no's pre-filters (one complete set of spares) is to be supplied also.
5	Blower	Overhauling/repairing of the 15000 CFM blower and ensuring smooth operation.
6	Water supply to HVAC	Supply and installation of a new 1000-liter overhead tank with necessary CPVC fittings for HVAC unit for efficient water circulation inside air washer. The water supply line is available near to the HVAC unit. Overhead tank is to be mounted on existing concrete slab (5 feet above the HVAC) with metal frame/cement slab for tank support. A float valve in the water tank supply line is to be installed to maintain the water level in tank. Repairing/overhauling water circulation system (pump, piping, valves etc.) for smooth and satisfactory operation.

7	Painting of ducts [2 segments of HVAC duct lines]	Painting of the HVAC duct (galvanized iron) exterior with Aluminum paint. The steps are listed below 1) Surface preparation by removing old rusting on duct, frames etc. 2) Apply of aluminum paint primer on the duct outer surface, frames and support rods 3) Apply 2 coat of aluminum paint on duct external surface area. a. Total external surface area for first HAVC duct including the bends, reducers, supports, and blower is approx. 1400 sq. feet b. Total external surface area for second HAVC duct including the bends, reducers, supports, and blower is approx. 700 sq. feet So, total HAVC duct area which has to be painted is 2100 square feet.
8	Interconnection of two HVAC duct segments	The distance between the two segments of HVAC duct is 19-20 feet at the closest point. This inter-connection can be done with ducting of appropriate size and space available at site. The max duct internal dimension may be 2.5 x 1.5 feet approx. Ducts to be join is shown in Annexure 1.

4.2 Fiber spinning area – Supply and installation of sliding window meshes

In the fiber spinning area, there are 11 no's of glass windows fixed on the side walls. These windows are hinged and open outwards. These windows are required to be in fully closed position during normal operation. However, in case of any emergency it has to be opened. The scope of the work involved is listed below.

- At the inside sill area of these window, a double channel frame made with aluminum is to be fixed.
- On this double channel two sliding windows made with aluminum frame is to be installed.

- On the sliding window mosquito mesh made with either aluminum or stainless steel (SS 304/316) is to be installed.
- The mesh should be made with optimum wire diameter and opening to keep balance between strength and maximum open area (more than 80 %) for light and air . In case of larger size of sliding window, an additional stiffener of frame should be provided on sliding window frame.
- The dimension for windows are as given below.

a) 10 numbers of window with size 47 inch x 98 inch

b) 1 numbers of window with size 47 inch x 152 inch

4.3 Fiber processing areas & control rooms – Supply and installation of 10 no's air conditioning units

In the fiber processing areas and control rooms, air conditioning units are required to be installed. The specification for air conditioner system is given below as

- Quantity: 10 Nos.
- Type: Split AC with inverter compressor (variable speed compressor)
- Refrigeration capacity: 2 Ton of refrigeration
- Copper condenser coils
- 10-year warranty for the compressor and one year for the product.
- Make of air conditioning unit: Voltas/Carrier/Mitsubishi electric

4.4 Heat treatment area - Refurbishment of 1 no. thermal conditioning (HVAC) unit

The heat treatment area has a HVAC unit for supplying fresh and cleaned air to the process area on continuous operation. The HVAC contains a primary air filer, secondary air filters, micro filters, cooling pads, water spray system, and water collection tank, blower (capacity 38000 CFM), and a blower room. Some photographic images of the HVAC unit are depicted in Annexure – 2. This HVAC unit needs to be refurbished and the relevant specifications are as given below.

S. No.	Item	Jobs to be done
1	Blower room • Floor area • Wall and ceiling area	Epoxy coating of 1 mm thickness for floor which is about 650 sq. ft Epoxy paint for wall and ceiling which is about 1800 sq. ft Epoxy coating for water tank which has area about 260 sq. ft

	• Water collection tank • Blower	Epoxy paint for blower and its accessories
2	Air inlet mesh	Supply and installation of a new SS/Al mesh (2 sq.mm) for air inlet. The frame size for inlet mesh is of size 8 feet x 5 feet. Existing frame is to be used for fixing the air inlet mesh.
3	Pre filters for HVAC	Supply and installation of 20 no's pre filters for HVAC unit. The dimension for pre filters are 547 mm x 550 mm. The material of construction for pre filters is stainless steel/aluminum. The filter screen size is 10-15 micron. An additional set of 20 no's of pre filters as spares is to be supplied.
4	Micro-filters for HVAC	Supply and installation of 20 nos of micro filters for HVAC unit. The dimension for micro- filters are 549 mm x 552 mm. The material of construction for micro-filters are either stainless steel/aluminum. The filter screen size is to be less than 1 micron. An additional set of 20 no's of micro-filters as spares is to be supplied.
5	SS frame for water spray on cooling pads and CPVC pipeline	A stainless steel frame with 50 mm x 50 mm x 5mm thickness L angle is to be fabricated and supplied for water spray on cooling pads. The dimension of frame is as 12 feet width and 6 feet height. The frame would be made with stainless steel angles (50 x 50 mm, 5 mm thickness) The cooling pad thickness is 1.5 feet. And this is to be mounted on the new stainless steel frame, so frame would be more than 1.5 feet width to accommodate it properly. A CPVC pipe (40 mm diameter) is to be fixed for this water spray system along with pipe fittings as bends/tee etc. Approximate length of pipe 6 meter.
6	Water circulation to HAVC	Repairing/overhauling of water circulation system (pump, piping, valves etc.) for smooth and satisfactory operation.
7	Door sealing gaskets	The HVAC unit has 5 doors for which a sealing gasket is to be fixed to arrest air leakages in to blower room.

8	Painting of ducts	The HVAC duct is spread over the heat treatment area. It starts with 7.6-meter elevation and comes down to the height of 3.5 meter above the ground through bends. The duct is make of GI sheets and rested on support hanging from ceiling height. This entire duct area needs to be painted with aluminum paint. The steps involve in paint would be as, a. Surface preparation by removing old rusting on sheet and frame b. Application of aluminum paint primer c. Application of aluminum paint on duct external surface area. **Note**: Total external surface area for duct including the bends, reducers, supports, and blower is approx. 3800 sq. feet
9	5 Nos of louvers/diffusor	Supply and installation of new 5 numbers of adjustable louvres/diffusor in the place of the existing un-adjustable louvres in the HVAC ducting. Approximate dimensions of each louvre: 2.75 feet x 1.1 feet
10	Blower	Overhauling of the 38000 CFM capacity blower and to ensure smooth operation.

4.5 Heat treatment area - Refurbishment of 1 no process exhaust extractor unit

The purpose of this unit is to extract gas fumes emanating from the furnace ends and to dilute with air and subsequently released into the atmosphere at 9.0 m elevation above the building. This unit comprises of a suction blower at the roof top and an exhaust header just beneath the ceiling with suction points, with connections to feeders from the top of various equipment, through out the length of the line (40m approx.). The ducting is supported by mild steel frames which in turn are resting on steel rods anchored in the ceiling. Presently, the process exhaust duct system is made of GI sheets. The suction blower located at the roof top are to refurbished as well. The list of the work involved in this section are as below:

The work involved here are

- Painting of the process exhaust ducting, frames and support rods. with Aluminum paint. The painting procedure is described below
    a) Cleaning of the duct: The duct surface and MS L Channel surface is to be prepared by using appropriate emery paper. All the rusted part from this area is to be removed and cleaned for better application of Aluminum paint primer.
    b) Primer application: After surface preparation of the duct and frame, one coat of aluminum paint primer is to be applied on that and leave for sufficient time to dry.
    c) Two coat of Aluminum paint: After the aluminum paint primer application, one coat of aluminum paint is to be applied and allow it for sufficient time to dry. After drying of the first coat of aluminum paint, another coat of aluminum paint is to applied on the duct and frame area.
- Overhauling of the exhaust extractor blower and to ensure smooth operation.
- Supply and installation of 2 no's inline axial blowers (12 inches OD) just beneath the exhaust duct header. Also a damper valve is to be fixed along with suction blower to control the flow. The appropriate cable with length approx. 25 meters would be required to connect this to power supply. A local ON/OFF switch is also to be provided to switch ON/OFF this blower.

Note to Vendor:

- ❖ Header extract duct is located at 7.5 m
- ❖ Approximate duct area is 4200 sq.ft
- ❖ The exhaust duct header exits the building at a height of 7.6 m and connects to the inlet of the suction blower at the roof top.
- ❖ Aluminum paint primer brands : Any standard brands of paint like Asian paints, Nerolac, Berger etc.
- ❖ Aluminum paint brands : Any standard brand of paint like Asian paints, Nerolac, Berger etc.
- ❖ Some pictures are represented in annexure-3.

4.6 Heat treatment area – Supply and installation of 10 no. exhaust fans

Heat treatment area is approx. 76-meter-long and 12-meter-wide with a ceiling height of 7.5 meter. In this area, 10 no's of process exhaust fan (spread over length of 76 meter) is to be supplied and installed at ceiling height for better ventilation during process operation. The exhaust fan installation is

inside the building and its exhaust is passing through a louvers and air thrown out of the building through this louver. The exhaust fan specification is as given below.

- Sweep diameter: 600-620 mm
- Revolution per minute: 800-1000
- Vibration free balanced impeller
- Pre lubricated double ball bearing for maintenance free operation

These exhaust fans are to be enclosed with aluminum frame partition from its suction side and in those aluminum frame a stainless steel/aluminum wire mesh (1 mm square) is to be fixed. All the 5 face of the aluminum partition frame will have mesh installed. The aluminum firms should be sturdy enough to hold the mesh properly and under suction of air it should not come out of frame.

5.0 INFORMATION TO VENDORS

a) Before submitting their techno-commercial offers, vendors need to visit with prior permission to CCFP-NAL Belur campus for complete assessment of work.

b) The equipment is already placed in both fiber spinning and heat treatment area and the fabrication work is to be done without affecting that equipment. For any supporting structure needed, it has to be done either through ground or ceiling support and not through the equipment.

c) A minor temporary support/structural civil work may be required in order to install/repair/modify the existing EHU, process exhaust, clean air room system and air conditioning units. This civil work has to be included in the scope of the work.

d) Vendors need to submit the details about their scheme, material and any other bought out items along with quotation.

e) Vendors have to specify the work duration in their offer

f) Vendor need to submit the details about the Epoxy coating formulation (Resin, Hardener, grades, ratio, make etc.) which is going to be used for flooring/coating.

g) Vendors need to provide warranty of atleast one year for the painting/coating. It has to be specified on quotation.

h) Vendor to check and ensure the completeness of the work and also the satisfactory operations of the units specified in this document for revamping. The operational guarantee for the equipment/material supplied shall be provided by the vendor

Annexure -1

Fiber spinning area – Refurbishment of HVAC unit

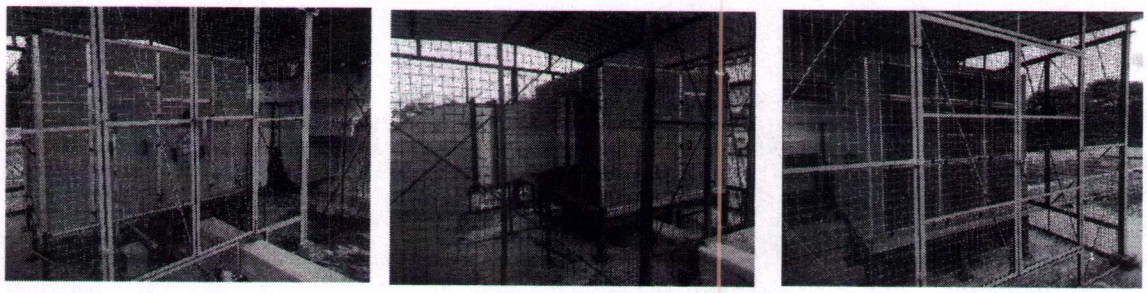

Fig.1 Pictures of package HVAC the fiber spinning area

Fig. 2 Pictures of ducting in the fiber spinning area

Annexure – 2

Heat treatment area – Refurbishment of HVAC unit

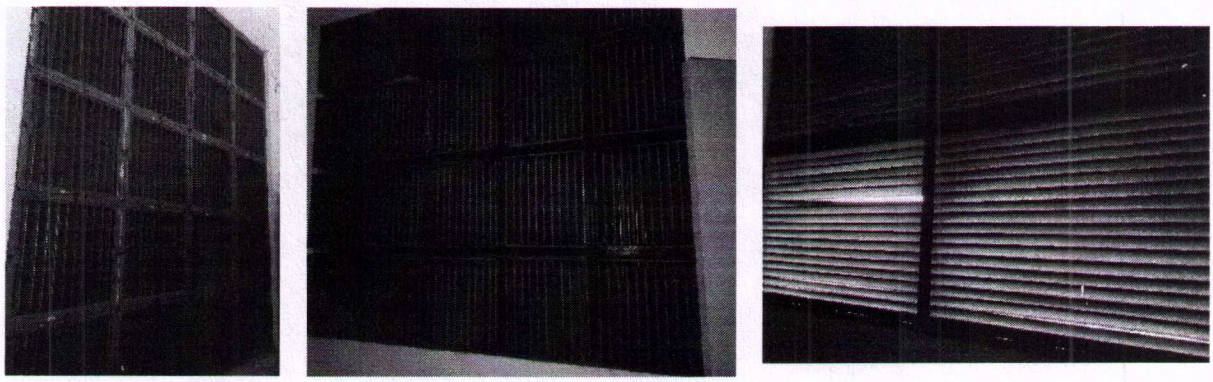

Fig.3 Air inlet mesh and filters

Fig.4 Blowers and HVAC ducting in the process area with louvres also shown

Annexure – III

Heat treatment area – Refurbishment of 1 no. process exhaust extractor unit

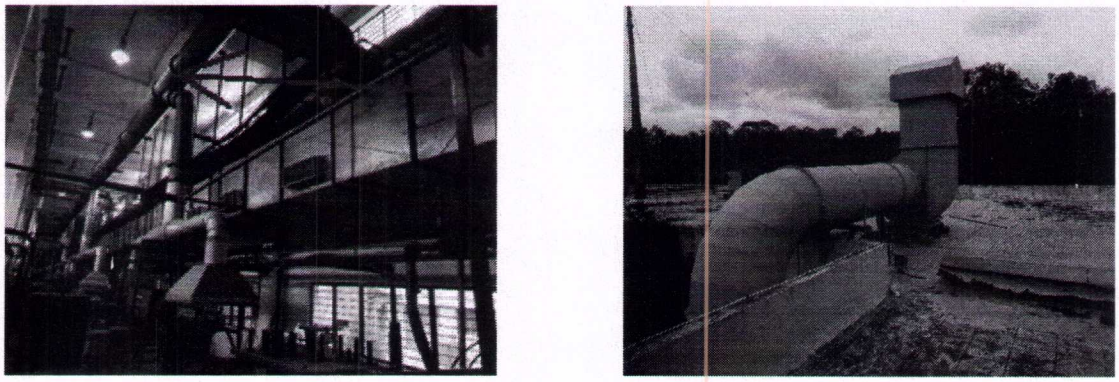

Fig. 5 Photographic images of process exhaust extractor in heat treatment area