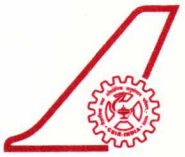
वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद्
Council of Scientific & Industrial Research
राष्ट्रीय वांतरिक्ष प्रयोगशालाएं
National Aerospace Laboratories



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

INVITATION FOR BIDS/NIT

Tender No: CCFP/PUR/2K20/41

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
1	Agitated thin film deaerator (ATFD) as per specification enclosed	No	1

No

Single / Double Bid	**Single**
Bid Security (EMD) (in INR)	Bid Securing Declaration Form to be submitted.

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 amount of the **Performance Security** shall be **10% of the contract value** to be submitted within 21 days from the date of Purchase Order valid up to 60 days after the date of completion of performance obligations including warranty obligations.

06.The Bidder shall comply the terms and conditions of the tender, failing which; the offer shall be liable for rejection.

07.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)
For & Behalf of CSIR-NAL

पी बी सं. 1779, एचएएल एयरपोर्ट रोड , बेंगलूर- 560 017, भारत,
P B No 1779, HAL Airport Road, Bengaluru - 560 017, INDIA
फोन / Phone : (का./ Off) : +91 - 80 - 2508 6097 / 6710, फैक्स / FAX : +91-80-2526 9611
http//www.nal.res.in purchaseccadd@nal.res.in

SPECIFICATION FOR AGITATED THIN FILM DEAERATOR (ATFD)

1.0 Scope of the vendor:

Design, fabrication, supply, installation, erection and commissioning for agitated thin film evaporator (ATFD). Vendor to check for the completeness of his system to meet the process requirements as specified herein. The operational guarantee for the equipment supplied shall be provided by the vendor.

2.0 Equipment duty and mode of operation:

This equipment is for deaeration of viscous polymer solution. The mode of operation will be batch type.

3.0 Brief description of the Equipment:

This equipment if to be used for removing air bubble from the polymer solution (dope). The polymer (Polyacrylonitrile_ is dissolved in solvent (Dimethyl Acetamide/Dimethyl sulfoxide) which forms a high viscous solution. During dissolution/mixing process the air bubbles are trapped in this viscous solution. Due to high viscosity the air bubble removal by vacuum alone becomes difficult. A thin film of this solution in ATFD exposes bubble on the surface and under vacuum this de-aeration process become more efficient. The viscous solution is extruded through spinneret to fibers. The trapped air bubble causes filament breakages in fiber spinning process. The dope is fed through the ATFD through a VFD driven stainless steel gear pump (max capacity 50 LPH). The dope is pre filtered through a stainless steel pleated mesh filter. The filtered dope enters through ATFD and the bubble free dope collected at bottom vessel and from there later it transferred to a collection tank for fiber spinning. The schematic drawing for the ATFD system is shown in **Figure 1.**

The design parameters for the equipment are as given below.

1) Material of construction: stainless steel 316 (all wetted part for polymer solution). The support structure can be made of MS with powder coated painting on that.
2) Jacket for ATFD: Yes, Hot water circulation (1000 lph at 3.0 kg/cm2)
3) Jacketed for bottom vessel : Yes, Hot water circulation (1000 lph at 3.0 kg/cm2)
4) Vacuum: full vacuum
5) Temperature of operation: 70 C (Max 100 C)
6) Polymer solution : Polyacrylonitrile + Dimethyl sulfoxide /dimethyl acetamide
7) Polymer solution viscosity: 100-500 poise (max 800 poise) at 50 C
8) Polymer solution feeding flow rate : 10 (min)- 50 (max) Liter/hour

9) Bottom vessel Tank capacity: 75-100 liters
10) Density of polymer solution : 1.116 g/cc
11) Thickness of thin film: Vendor is to provide details
12) RPM of agitator : Vendor is to provide details
13) Height and diameter of ATFE : Vendor is to provide details
14) Type of Blades for ATFE : Vendor is to provide details
15) Air/volatile component at operating condition: max 5 % of polymer solution feed rate
16) Stainless steel housing and stainless steel pleated mesh filter:

Liquid to be filtered	:	Polyacrylonitrile dissolved in Dimethylacetamide or Dimethyl sulfoxide solvent
Operating temperature	:	Max 100 C
Operating pressure	:	Max 20 Bar
Pressure drop across filter medium	:	< 1 Bar
Liquid viscosity	:	Max 800 Poise @ 50 C
Liquid density	:	980 Kg/cm^2
Foreign particle present in liquid	:	<1 % wt/wt
Liquid flow rate	:	Max 50 LPH
Quantity	:	1nos.
Filter dimensional specifications	:	As per **Figure 2**
Material of construction (all parts)	:	SS 304/316
End connection	:	Threaded connection as per drawing
Direction of flow	:	Outside to inside of filter
Pleated Filter mesh size	:	**50 micron SS mesh**
SS mesh joining and end connection	:	**Welded ONLY**
Identification on filter	:	**50 µm punch mark on filter for identification**

17) Gear Pump for Dope feeding:

The gear pump for dope feeding is a variable frequency driven to control the dope flow rate in the ATFD.

Liquid to be filtered	:	Polyacrylonitrile dissolved in Dimethylacetamide or Dimethyl sulfoxide solvent
Operating temperature	:	Max 100 C
Operating pressure	:	Max 20 Bar
Liquid viscosity	:	Max 800 Poise @ 50 C
Liquid density	:	980 Kg/cm^2
Liquid flow rate	:	Max 50 LPH
Quantity	:	1nos.
Material of construction (all parts)	:	SS 316

The motor details ae given in section 7.

8/18/2020

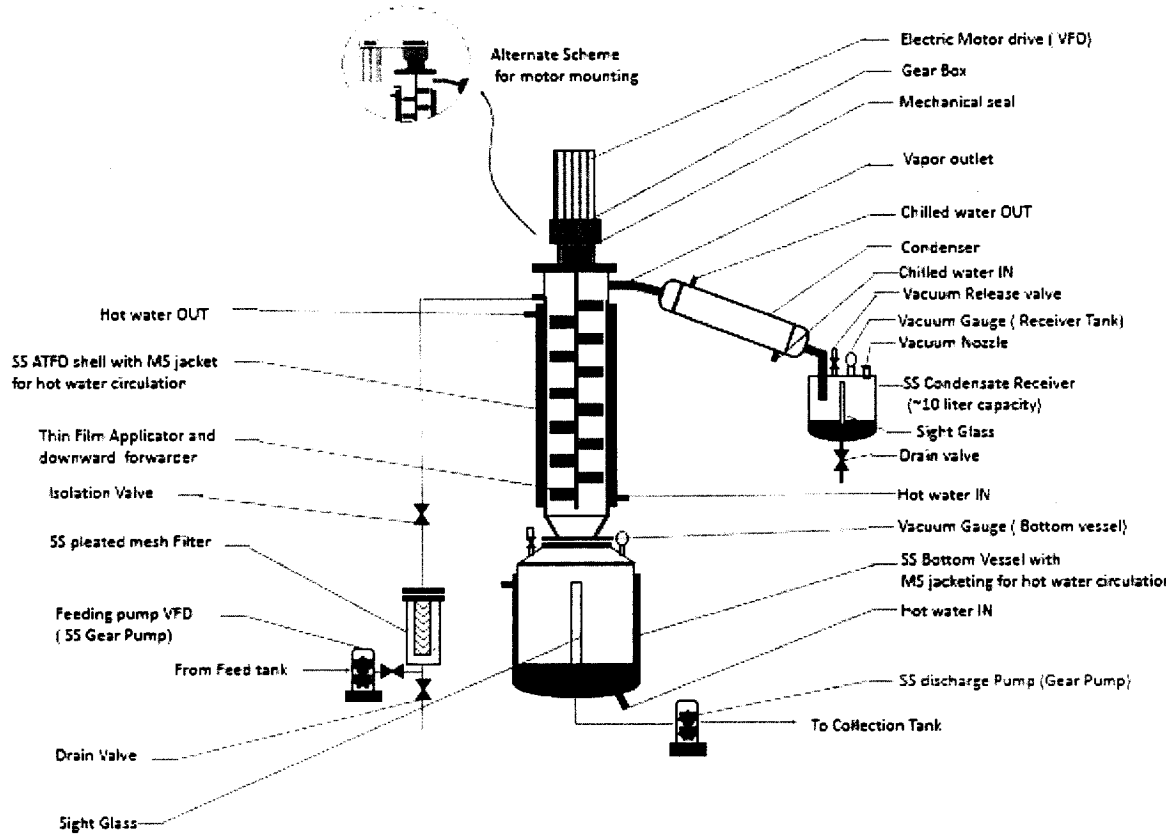


Figure 1: Schematic design for agitated thin film deaerator

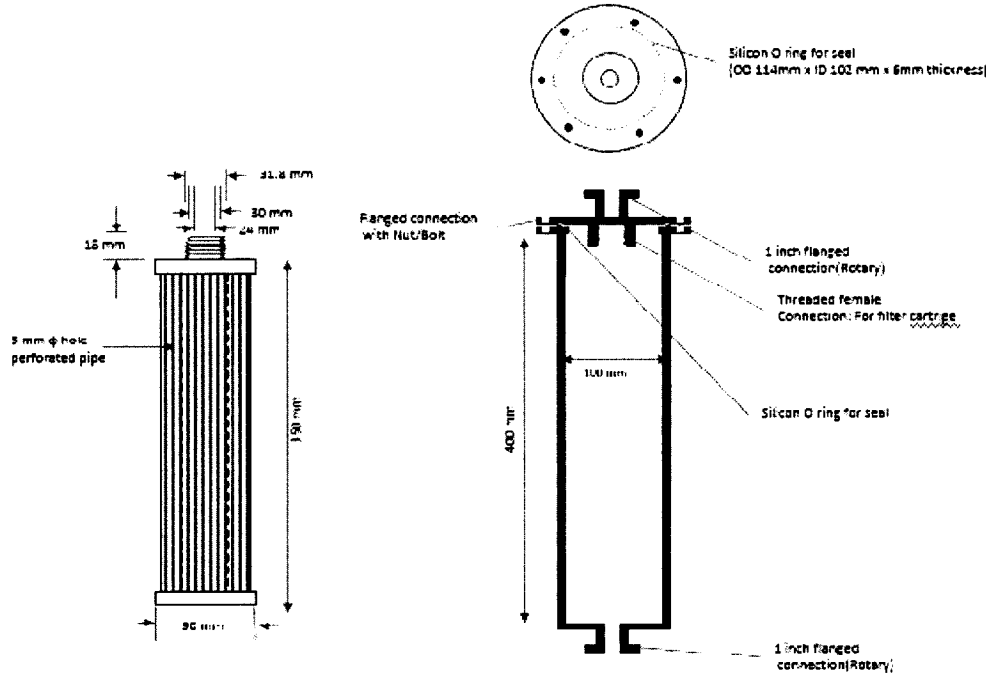


Figure 2: Stainless steel filter housing and stainless steel pleated mesh filter cartridge

8/10/2020

4.0 General requirement

a) **The equipment will be located on the first floor as skid mounted. Ceiling height of floor is 3.7 meters.**
b) All flanged connections to be as per ASME B 16.5. All pipe fitting will be sockets type.
c) Vendor should submit along with his offer the detailed specifications and the standard make of the motor, gear box and other bought out items.
d) Vendor should submit test certificate, performance data and warranty certificate from the OEM for all bought out items.
e) Vendor has to submit the drawing for approval before commencement of fabrication.
f) Electrical drive for agitator of standard make only (see Motor details in **section 7).**
g) Vendor has to provide all necessary spares parts for trouble free operation of equipment.
h) Vendor has to submit all the material test and chemical analysis test report.

5.0 Scope of supply:

a) Jacketed agitated thin film deaerator with standard make gear box, motor and related accessories (vacuum gauges, temp gauges etc.).

b) Jacketed Stainless steel bottom vessel

c) Condenser (stainless steel MoC)

d) Associated piping for ATFD

e) Installation, erection, commissioning of equipment at site.

f) Feeding pump (Gear pump) of rated capacity (1 no.) motor compatible for VFD drive

i) SS filter housing (1 no.) with a SS pleated mesh (50 micron, 2 No.)
j) A sturdy support structure for the ATFD including condenser and condensate receiver. The support structure could be of MS steel.

6.0 Exclusion:

a) All electrical wiring from Distributed controls system to field.
b) Vacuum pump for Agitated thin film evaporator.
c) Hot water circulation system for ATFE shell
d) Cold water circulation system for condenser
e) VFD drive and control

31/8/2020

7.0 Motor Details:

415 V, 3 phase, TEFC, squirrel cage, AC motor, Class IP55, continuous duty, Insulation class F, temperature rise class B. Efficiency shall be high and service factor shall be 1.15. Motor windings shall be coated with epoxy gel. Vendor shall furnish motor data sheet (Mechanical and Electrical) indicating motor KW, rpm, BKW, GD2, acceleration time, speed range, % loading during starting / running etc., Speed torque curves for all the motors shall be furnished. The Motor should be of standard make such as ABB, Crompton, Bharat Bijli etc only.

8.0 Inspection & testing:

Inspection shall be carried out during fabrication & prior to delivery in accordance with the requirements of drawing, specification and applicable code. Approval of the inspector shall not relieve the contractor of his responsibilities for mechanical design and workmanship guarantee and proper execution of the work.

Client and his authorized representatives shall have the right to inspect, test and expedite to get inspected, tested and expedited the Work at the plant of the VENDOR or his sub-sellers at any time during the process of fabrication, erection, testing. The work shall not be deemed accepted until after the said inspection and testing.

In the event of discovery of any unauthorized deviation from the specification / data sheet, and the same is not accepted by the client, the vendor shall carry out necessary rectification / modification at no extra cost and complete the task within the specified time. Failing which, the client reserves the right to get the work done himself and back charge the cost of rectification / modification to the vendor.

9.0 Delivery:

The items are to be delivered at CCFP, NAL, Belur Campus. CSIR- National Aerospace Laboratories, Bangalore 560037

31/8/2020

CCFP/PUR/2K20/41

SCHEDULE CUM CRITICIAL DATE SHEET

1	Name of Organization	CSIR-National Aerospace Laboratories, Bengaluru	
2	Tender Reference No	**CCFP/PUR/2K20/41**	
3	Tender Type (Open/Limited/EOI/Auction/Single)	**Open Tender**	
4	Type/Form of Contract (Work / Supply / Auction / Service / Buy / Empanelment / Sell)	Supply	
5	No of Covers (One/Two/Three/Four)	One	
6	Tender Category (Services/Good/Works)	Good	
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	**Agitated thin film deaerator (ATFD)**	
11	Work Description	**Agitated thin film deaerator (ATFD) as per specification enclosed**	
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	No	
15	a) Tender Publishing Date -	14 Sep 2020	1800 Hrs
	b) Document download start Date:	14 Sep 2020	1800 Hrs
	c) Bid Submission Start Date	14 Sep 2020	1800 Hrs
	d) Bid Submission End Date-	08 Oct 2020	1000 Hrs
	e) Bid Opening Date-	09 Oct 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	25086097, 25086710	
20	E-mail Address	purchaseccadd@nal.res.in/spo@nal.res.in	
21	Detailed specification of item	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(www.nal.res.in) under the icon Tender-Purchase before formulating and submitting their bids.**	

Terms & Condition

Delivery Term	FOR- NAL
Delivery Schedule	Within 90 days from the date of PO
GST (Goods)	Extra @ 5% against Concessional GST Exemption Certificate
GST (Service/AMC)	Extra @18%
Payment Term	NAL Term (Payment would be made within 30 days, only after receipt of material in good conditions, inspection and acceptance by end user).
Payment Term (for AMC)	Quarterly/half yearly/yearly on certification by end user based on scope of AMC
Installation & Commissioning (if any)	
Training (if any)	
Warranty Certificate (if any)	
Any other Certificates (if any)	

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 reuse 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.**

ANNEXURE-J

Tender No.:

PERFORMANCE SECURITY FORM/STAND-BY LETTER OF CREDIT

MODEL BANK GUARANTEE FORMAT FOR PERFORMANCE SECURITY/ STAND-BY LETTER OF CREDIT

To,

.....

WHEREAS ..... (name and address of the supplier) (hereinafter called "the supplier") has undertaken, in pursuance of contract No. ..... dated .....to supply (description of goods and services) (herein after called "the contract").

AND WHEREAS it has been stipulated by you in the said contract that the supplier shall furnish you with a bank guarantee by a scheduled commercial bank recognized by you for the sum specified therein as security for compliance with its obligations in accordance with the contract;

AND WHEREAS we have agreed to give the supplier such a bank guarantee;

NOW THEREFORE we hereby affirm that we are guarantors and responsible to you, on behalf of the supplier, up to a total of ..... (amount of the guarantee in words and figures), and we undertake to pay you, upon your first written demand declaring the supplier to be in default under the contract and without cavil or argument, any sum or sums within the limits of (amount of guarantee) as aforesaid, without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the supplier before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the contract to be performed there under or of any of the contract documents which may be made between you and the supplier shall in any way release us from any liability under this guarantee and we hereby waive notice of any such change, addition or modification.

This guarantee shall be valid until the ..... day of ....., 20.....

(Signature of the authorized officer of the Bank)

.....

Name and designation of the officer

.....

Seal, Name & Address of the Issuing Branch of the Bank

Note:

Whenever, the bidder chooses to submit the Performance Security in the form of Bank Guarantee, then he should advise the banker issuing the Bank Guarantee to immediately send by Registered Post (A.D.) an unstamped duplicate copy of the Guarantee directly to the Purchaser with a covering letter to compare with the original BG for the correctness, genuineness, etc.