

PONDICHERRY UNIVERSITY

R.V.Nagar, Kalapet, Puducherry- 605014

Date 08-04-2019

Tender Notification

Sub: Pondicherry University- Supply & Installation of following equipment under Department of Science and Technology (DST-MES & DST-RFBR) funded project -Sealed Quotations called for – reg.

Sealed quotation are invited from reputed manufacturers / authorized dealers of reputed manufacturers for Supply & Installation of following equipment as per following specifications

LIST OF EQUIPMENTS:

Sr. No	Name of the equipment	Quantity
1.	Process & Development equipment 1. Computer controlled Continuous Stirrer Tank Glass Reactor (CCSTR) including thermostat unit Chiller (Imported) 2. Agitated Nutsche Filter Cum Dryer (Indigenous) 3. Laboratory Microwave Electric Heating Muffle Furnace (Indigenous)	1 1 1
2.	Battery Cyler (Imported)	1

1. Technical Specifications for Computer Controlled Continuous Stirrer Tank Glass Reactor, CCSTR (IMPORTED)

(i) At maximum of **10 Litter** capacity Double walled Glass Reactor system with pH and temperature control includes robust base frame, vessel clamp, drip tray and stirrer seal with facility for wide range of **250 ml, 500 ml, 1L, 2L, 5L and 10 Litter** (Provide separate pricing of each vessel) jacketed vessels Tori-spherical by volume with excellent heat transfer and temperature control should be provided and be instant change of vessel **without requiring any special tools also very important.**

(ii) **Torque based vessel clamp** should be provided to prevent the vessels from breakage during fixing and over tightening of the vessel and should allow quick and easy vessel changes and vessel height adjustment

(iii) Should be provide **two different clamps** for **small** volume (from 100 ml to 2 liters) and **large** volume (from 1 liter to 10 liter) vessel for large neck and easily interchangeable size should be provided

(iv) Digital **display Stirrer motor** should provide with high speed up to **1600 RPM** with high torque of up to **50Ncm** and it can be easily lifted and rotate out of the way

(v) Reaction vessel operating temperature should be **(-) 40°C to (+) 200°C** and pressure should be vacuum **(50 mbar) to 0.25 bar**

(vi) Should provide dual **syringe pumps** for pH-controlled dosing or temperature-controlled dosing pH probe, Temperature probes connected to the circulator (thermostat) offer accurate closed loop temperature control with holder should provide for monitor the pH controlled reaction all volume of reaction vessel PTFE coated RTD probe with LEMO or DIN connector should provide.

(vii) Pipe connectors should provide and contain provision for temperature probes to record the jacket temperature in case to perform other application like calorimetry and should have single stroke operation for removing the stirrer motor with side arm,

(viii) Ease of handling due to the lowest operation position of all the functional parts & no realignment should be required during operation. All wetted parts should be chemical resistance glass or PTFE

(ix) There must be complete upgradeability with software and other hardware to fully automatic version, pH and temperature control, calorimetry.

(x) PTFE stirrer with 4 blade and anchor with suitable propeller for respective different volume of vessels should be provided

(xii) Should be Leak free vessels optional with simple oil drain press button should be provided to drain thermo fluid for spill free vessel changes. The sprung bottom outlet valve has maximum chemical resistance and eliminates leaks even at extremes of temperature and pressure.

(xiii) Spring loaded bottom valve should be provided for additional safety to prevent breakage of bottom glass holding the valve during high temperature operation

(xiv) Should provide compatible virtual circulator (**thermostat unit chiller**) with Fluid reaction temperature range should be (-) 40 to (+) 200 °C above at closed for 10 L capacity vessel operating to lower volume of the CSTR, Interface digital should be Ethernet, USB (Host u.Device), RS232, Safety classification should be Class III / FL

(xv) Warranty: The instrument should have warranty for a trouble free operation and Performance for a minimum period of 3 years

(xvi) HP/Dell/Apple branded computer should be provided to operate system software to control entire reaction protocols and evaluation

2. Technical Specifications for Agitated Nutsche Filter-Cum-Dryer (INDIGENOUS)

- (i) **Agitated Nutsche Filter** with vertical movement, Detachable Bottom Type, Heated Shaft & Blades, GMP Construction should be provided
- (ii) Total volume should be Gross Volume is **15 Ltrs**, Working Volume **10 Ltrs**. (Volume above filter plate. Maximum Cake Holding Capacity **5 Ltrs**)
- (iii) Filter Area should be 0.3 m² and more with batch size 1 to 3Kg cake
- (iv) Construction of Main shell is AISI SS 316, The standard Torispherical Top Dished end welded with main shell should be provided
- (v) **Agitator Shaft & Blade** should be Solid& Sturdy design, special S- shaped agitator/ Impeller is very effective & suitable for multiple operation like mixing, dispersion should be provided & should be possible squeezing, blending, drying and discharging. Manually operated, up-down agitator, manually operated Open and close discharge valve. Manually operated detachable bottom mounted on wheel
- (vi) Jacket should be SS 304 must 3mm will be welded on main shell
- (vii) Must be provide double dry mechanical seal with bellow of AISI SS 316, for shaft sealing
- (viii) RPM of Agitator 8 – 10 RPM, Vertical Stroke of Agitator should be manually 100 mm
- (ix) Manually Bottom of the vessel is flat, detachable having SS304 plate of 8mm Thick. Bottom to be hold in position by SS 316 clamp bolts
- (x) **Detachable Bottom:** Manually Bottom of the vessel is flat, detachable having SS304 plate of ~ 8mm Thick. Bottom to be hold in position by SS 316 clamp bolts
- (xi) Discharge valve should be **100 mm NB**, hydraulic operated plug type discharge valve, flushed with inside of vessel. The hinged type valve mounted with shell to be open for complete cleaning
- (xii) **Filter System** should be 10 micron Non woven type PP Filter cloth, silicon lined to be used as filter media with SS clamps along with SS 316 wire mesh screen. An arrangement will should be provided to draining the mother liquid through the bottom in the form of SS 316 pipe manifold
- (xiii) **Top Assembly** should consist of drive unit mounted on a rigid **frame that Moves up and down on Single-pillar** guide bars along with the agitator assembly

- (xiv) **Drives and control** of 0.25HP X 1440RPM Hindustan/ Bharat Bijlee make Non Flameproof motor, Nord Make/ Standard make Inline helical gear box Suitable Gear Box along with necessary accessories should be provided
- (xv) **Insulation & Gasket & O- Ring** The shell, Top Dish and product filter to be insulated with 50mm LRB mineral wool and is covered / clad by SS 304 x 3mm thick sheet & PTFE Gasket/ Silicon Rubber food grade.
- (xvi) **Material of Construction** : All wetted & product contact parts like shell, shaft, Agitator, Nozzle, Bolt & Nuts and other contact parts will be made of SS 316 quality material. Support lugs, Nut & Bolts, pipe, motor base plate will also be made of SS 304 quality material
- (xvii) **Operating Panel:** Non flame proof mounted adjacent to machine having On/Off push controls for agitator, power pack, reverse forward etc. Power pack panel should be provided which includes MCB's for motor, Contractor and Overload relays, indicating lamps, timer with pulsating arrangement for dust collector
- (xviii) **Condenser & Receiver** condenser / Heat exchanger, shell & Tube type made out of AISI SS304 seamless tube having 0.5 Sq meter as heat transfer capacity Condensate Receiver made out of AISI SS 304 of 10 Ltrs capacity
- (xix) **Fittings/ Instrumentations:** Temperature gauge for both shell and limpet of dryer. Vacuum Gauge for shell. N₂ purging/ vent / drain arrangement On/Off valve with timer for N₂ purging to dust collector. Limit switch for man-hole interlock with main shaft motor.
- (xx) **Finish:** All dryer internal/ contact parts surface are polished to **Mirror finish** of 240 Gritt & External surface are buffed to matt finish of 180 Gritt
- (xxi) **Testing & Safety:** Hydro test for **Jacket** is carried out at **1.5 Kg/Sq cm**, and main shell (i.e dryer is tested for leak under vacuum/ hydro test). Pressure relieve valve for the hydraulic power pack. Mechanical stopper for the vertical movement of the agitator. Electrical overload relays with circuit breakers for all the motors Limit switch will be provided for discharge valve cover and detachable bottom
- (xxii) **Accessories** Jacketed dust collector with PP filter(0.4Sq mtr) and air/N₂ purging arrangement. Spray assembly for cake washing provided on top dish. Rotary Union installed on top of agitator for hollow agitator
- (xxiii) **Warranty:** The instrument should have warranty for a trouble free operation and Performance for a minimum period of 3 years

3. Technical Specification for Laboratory Microwave & Electric Heating Muffle Furnace (INDIGENOUS)

Outer Structure : Mild steel shells fabrication with powder coat painting protected against corrosion with polymer coating

Inner Structure : 18/8 Stainless Steel with multi-layer PTFE coating

Crucible material : **High quality Silicon Carbide**

Chamber Size : 150 mm W x 150 mm D x 100 mm Height

Heating Mode : **By Microwave & Electric Heating**

Microwave : 2 KW, 2.45 GHz

Inert Setup : Specially designed quartz vessel suitable for inert gas atm

Ports : Gas in, Gas Out, Temperature sensor

Insulation : Energy saving high purity Al₂O₃ fibrous insulation liner

Door : High Quality easy operation hinged furnace door

Current Rating : 10 Amps for 220V - 230V

Working Temperature: Max. Temperature: **1200 °C**

Heating Rate : **30°C /min- Programmable**

Temperature Distribution : **Heating Zone ±5°C**

Temperature Controller: PID automatic control and auto-tune function. 16 programmable segments for precise thermal processing.

Temperature sensor : **Non contact temperatrue sensor**

Temperature control : in the level of 100W

Indications : Load voltage & Load Current indication

Safety : Output fuse for safety, Input through MCB

It should have a door with automatic locking system, with multiple independent safety interlocks to prevent microwave emission outside in case of improper closure or misalignment.

Temperature sensors : Advanced (thermocouples) for accurate monitoring and control

Exhaust system : built-in high speed exhaust system

It should have multiple USB and Ethernet (RS-232 port) ports for interfacing the instrument to external devices.

The furnace should comply with international emission & safety standards.

The equipment compliant to ASTM, USP and ISO standard methods

The standard methods should be pre-loaded in the control terminal.

Internal cavity should be well illuminated with high intensity LEDs.

System should be up-gradable to ultra-fast heating model

System be supplied with hard copies of operations manual, service manual and application notes.

Warranty: The instrument should have warranty for a trouble free operation and

Performance for a minimum period of 3 years.

4. Technical Specification for Battery cycler

No of channel :	8 Channel
Electricity requirement:	110V AC or 220V AC selectable for universal use
Power Consumption:	200W
Input resistance :	$\geq 1M\Omega$
Current:	1. Range: 3.0mA – 3000mA 2. Accuracy: $\pm(0.05\%$ of reading + 0.1% of range)
Voltage :	1. Range: 0.5 - 5V programmable 2. Accuracy: $\pm(0.05\%$ of reading + 0.1% of range)
Data register conditions:	Time interval: 1 - 900s
Max. measurement cycles :	9999 cycles
Product Dimensions:	W245mm *D197mm * H60mm
Accuracy :	$\pm 0.05\%$ of FS
Current : per channel :	Range 1 : 0.5mA – 0.1A
Time : current response time :	≤ 1 ms (0-full Range)
Data recording :	10Hz
Channels:	1.Eight independent programmable channels 2.Each channel can set different working modes and functions independently
Programs & Software:	1. The software with calibration function is included to set various working modes for measuring capacity and lifecycle for all types of rechargeable batteries 2. Working modes Include constant current discharge, constant current charge, constant voltage charge, constant resistance discharge, rest, cycles, etc. 3.Limited threshold conditions include voltage, current, time, capacity, negative voltage slope, etc. 4.With real-time monitoring windows and integrated graph/data windows, the testing process can be observed more directly and efficiently 5.During the test, the software will provide instructions and warnings for assistance

	6.The calibration software can be used to calibrate the analyzer
Test Reports and Curves for analysis:	1. Different types of curves can be created by software base on user definition. (Voltage-time curve, current-time curve, capacity-voltage curve, loops times charge/discharge capacity curve, loops times charge/ discharge efficiency curve, etc) 2. Data reports are created by software. User can easily compare the performance of the batteries tested in channels both visually and statistically
Protection and Auto-recover:	If the power failure occurs during testing, the system will shut down all operating channels. Once power is recovered, the system will automatically resume those stopped channels and ensure that the test is normally conducted, so that no cases will lose any data.
Battery Holders:	Two types of battery holders are included in the standard package: 1. 8 alligator clips with cable for universal connecting 2. 8 spring load holders with adjustable length for measuring cylinder battery up to 70mm(H)
Compliance:	CE Certified
Warranty:	Two Year limited warranty with lifetime support for the battery analyzer.
Net Weight:	11.5 kg (26 lbs)

Warranty: System should have **three years** unconditional warranty for complete maintenance free operation.

TERMS AND CONDITIONS

I. General Information:

- a) Last date and time of receipt of the Quotations: **April 26th, 2019, 3.30 PM**
- b) Date and Time of Opening of the Quotations: **April 26th, 2019, 4.30 PM**
- d) Quotation / Tender Document fee: Rs. 500/-
- e) EMD rates: 2.5% of the quoted price for each equipment.
- f) **Two bid systems have to be strictly followed.** One for Technical bid and another for commercial bid and each bid should be submitted in separate sealed covers.
- g) However, the tender document fee and EMD as specified above should be remitted by each firm/bidder, collectively for all their bids advertised under this tender.

- h) Quoting merely the lowest price does not confer any right to any bidder for award of supply order. The University's Purchase Committee, reserves the right to select the equipment any bid under the grounds of specification compliance, technologically advanced quality, proven performance track record, brand reputation, service backup support & training, offer of additional / special features, compatibility with the existing System, etc.
- i) The Tender Document Fee and EMD should be submitted in a separate cover superscribing **Bank Demand Draft and which should be enclosed with the technical bid.**
- j). The Photo Copies of the Bank Instruments on payment of EMD should be attached with each bidding covers.
- k) The tender / quotation must be submitted along with the stipulated tender document fee and EMD in the sealed cover, super-scribing the name of the Department / Centre for whose equipments the tender is quoted for.
- l) The cover should also contain the information like, Name of the Equipment and Serial Number of Equipments for which the bids are submitted. The name and address of the bidder should also be mentioned at the from address space.
- m) The tenders should be addressed to the Principal Investigator, Pondicherry University.

The examples for super-scribing the envelopes of the different categories of tenders are given below:

Tender submitted under two bid system for the <u>Centre for Nanoscience and Technology</u>	
Name of the Equipment: _____	To
	Dr. A. VadivelMurugan
	Associate Professor,
	Principal Investigator (DST-MES),
	Centre for Nanoscience and Technology,
Madajeet School of Green Energy Technology Building, Room No. G-6 & 7, Pondicherry	University,
	R.V. Nagar, Kalapet,
	Puducherry – 605014.
From	
Supplier's Address	

In case of local delivery, all tenders are to be dropped in the tender box placed at the Information Facilitation Counter, Bharat Ratna Dr. B. R. Ambedkar Administrative Block, Pondicherry University, R.V. Nagar, Kalapet, Puducherry – 605 014.

n) Quotations will not be accepted through fax / e-mail.

II. Common Conditions (Import or Indigenous)

1. Purchase of Quotation Document:

The Quotation / Tender document can be downloaded from the University website www.pondiuni.edu.in or procured from the Pondicherry University on payment of fee as specified above, by means of a D.D,

drawn in favor of **The Finance Officer, Pondicherry University, payable at Puducherry**. The downloaded application should be accompanied with the quotation document fee, in the form of a Demand Draft.

2. Price Schedule

The rates should be quoted for a single unit and also for the total quantity required by the University. The price should include the delivery, installation, training charges, etc. at the respective Department, Pondicherry University. The prices quoted shall remain firm until the equipment is supplied to the respective Department, Pondicherry University.

3. Quoting the Core price & Tax, Duties, Discount etc.

The taxes / duties / discounts, if applicable, are to be explicitly and separately shown in the bid.

4. Eligibility:

The firm must have the requisite domain expertise with regard to supply, installation and post sale service of the items they are quoting. The firm should have been in existence for at least six years as on the date of this quotation and must have executed at least three orders for this kind of equipment during the last three years. Company should be ISO certified. The firm should have not incurred any loss in the last three years.

5. Installation:

The engineer should install the equipment **free of cost** at the site. However, utilities like power, water, air etc. will be provided.

1. Delivery:

Within 3 months from the date of receipt of approved drawings.

5. Duty Exemption

The University has been granted the benefit of exemption from the payment of the Central Excise Duty and Customs Duty by the Department of Scientific and Industrial Research (DSIR), India, vide their Notification No.10/97 dt. 01-03-1997 and 51/96 dated 23.07.96 respectively, in respect of

- a) Scientific and technical instruments, apparatus, equipment, Software including computers.
- b) Accessories and spare parts of goods specified in (a) above and consumables.
- c) Computer software, compact disks, CD ROM, Recording magnetic tapes, microfilms, microchips etc.
- d) Prototypes.

Customs duties at Indian port, if any, will be to the account of the University.

6. WARRANTY:

- i) The equipments covered under the purchase order, when installed, shall be warranted for the quality, workmanship, trouble free operation and performance for a period of at **least 36 months** from the date

of putting the system into operation at the Centre for Nanoscience and Technology, Pondicherry University, or at least 42 months from the date of receipt of the last lot of the consignment in India.

- ii) If any item covered under warranty fails, the same shall be replaced free of cost including all the applicable charges including shipping cost both ways.
- iii) Complete technical specifications to be included in the Technical bid.
- iv) The necessary service support should be provided by Bidder during the agreement period.
- v) The training should be provided by the supplying companies for a minimum period of two days from the date of installation with an expert team.
- vi) Technical post sale support by email and telephone will be provided during the period.
- vii) Operating Manual should be provided in English.
- viii) A clear statement regarding availability of after-sales service and availability of spare-parts for next 5 to 10 years should be included.
- ix) A recent customer list (within last five years) with contact details including email address is to be submitted with technical bids / bids as the case may be.
- x) If the equipment is proprietary a product, a proprietary product certificate should be enclosed.
- xi) The information pertaining to infrastructural, power and any other requirement for satisfactory installation and commissioning of the whole system must be provided by the bidder, at least 30 days in advance of the installation to be commenced if purchase order is issued.
- xii) The equipment must operate at 230V/50 Hz single phase and / or equivalent three phase electrical power.
- xiii) If the bidder is an authorized representative in India, they are requested to inform their technical ability to take care of the problems in the system, if developed later within the warranty and outside the warranty period. The responsibility of the Indian agent must be clearly specified.
- xiv) The bidder from abroad shall obtain, if required, export permission from the appropriate authorities in his country or the country of origin for items to be shipped to India in case of items to be imported. The University shall provide necessary information if required for this purpose.
- xv) The validity of the each quotation should be at least for SIX MONTHS from closing date.**
- xvi) The offers will not be considered if received after the bid closing date and time.
- xvii) The offers received through telex / telefax / e-mail will not be accepted by the University under any circumstances.
- xviii) The University shall not be responsible for any delay / loss or non-receipt of quotations by post / courier service.

- xix) No unsolicited correspondence shall be entertained after the submission of the offer.
- xx) If an order is placed with the firm, the purchase shall be governed by an agreement as per the University rules in force at the time.
- xxi) Additional terms and conditions will be incorporated in the purchase order, if needed, to safe guard the interests of the University.
- xxii) Quotation is not transferable.
- xxiii) In case of any dispute in respect of the quotation, all legal matters shall be instituted within the jurisdiction of the place where the purchaser ordinarily resides.

7. Power to reject the offer:

- i) Pondicherry University reserves the right to accept / reject any offer in full or in part or accept any offer other than the lowest offer without assigning any reason thereof. Any offer containing incorrect and incomplete information shall be liable for rejection.
- ii) No Agency commission will be paid to any authorized agent in India.
- iii) Liquidated damages: Timely supply of the ordered items, installation, commissioning (wherever is applicable) and training etc. is the essence of the contract. In case of failure to supply within the time specified in the Purchase order, a penalty / LD of 0.5% of the total value per week or a part thereof shall be levied subject to a maximum of 7.5% in respect of items which are not supplied. The decision of Pondicherry University shall be final in this regard.
- iv) Bidder(s) must be authorized business partners of Global / National service providers of the respective equipment.
- v) The Bidders must enclose authorization letter from the respective global / national service providers of the above equipments particularly mentioning an undertaking that in case of default by the Bidder, they (Global Service Provider) shall take over all the responsibilities of the Bidder.
- vi) The Bidder should not be involved in any Bankruptcy filing for protection from it.
- vii) The training should be provided by the supplying companies on the specimen and operation of the equipments for a minimum period of two weeks from the date of installation with an expert team.
- viii) For any clarification with respect to technical specifications, please contact the PI of the project as per the details given below: -

Sl. No.	Name of the Department/Centre	Name of the PI	Contact Details
01.	Centre for Nanoscience and Technology	Dr. A.VadivelMurugan Associate Professor & PI	+91 9488566463

III. Specific Conditions for Imported Equipments

1. *Payment of EMD:*

The Quotation must be accompanied by EMD as stated above, by means of a Demand Draft, drawn in favor of ***The Finance Officer, Pondicherry University, payable at Puducherry.*** *The Small Scale units are exempted from payment of EMD provided they enclose the proof of their exemption Certificate issued by the competent authority.*

2. *Payments terms:*

- i) Normally a letter of Credit will be opened for 90% of CIP price, on receipt of order acknowledgement. However, 100% of the LC also be considered, if the supplier provide Bank Guarantee towards performance Security for the 10 % of the total cost of the equipment to cover the Warranty Period.
- ii) Bank charges in India shall be borne by the purchaser and outside India shall be borne by the contractor / supplier.
- iii) The offer must be in English. The rates should be indicated both in figures and words against item specified in the given table. It is preferable that the price be quoted in Rupees or in US Dollars or in major foreign currencies.
- iv) The total cost should be quoted for FOB as well as CIF – Pondicherry University.
- v) However, the price quoted under FOB or should also include the following cost if they are required during the initial stage:
 - a) Local freight / insurance for Chennai airport to University laboratory.
 - b) Installation cost if any.
 - c) Cost of consumables which are required for the equipment for initial operation upto a reasonable time.
- vi) In case of the Principal supplier of foreign country unable to meet the conditions stated at para no.4, the local agent / dealer should fulfill the above said conditions in respect of Local Insurance, Freight, safety transport and installation, etc.
- vii) The bidder from within India shall obtain the requisite approval for Imports etc., if required.
