TAMIL NADU DR.J.JAYALALITHAA FISHERIES UNIVERSITY
FISHERIES COLLEGE AND RESEARCH INSTITSUTE
THOOTHUKUDI – 628 008.

TENDER SCHEDULE

Tender for the purchase of "Photobioreactor" are invited for the DST - SERB scheme entitled "Production of Eicosapentaenoic acid (EPA) from marine diatom *Phaeodactylum tricornutum* isolated from the coastal waters of Gulf of Mannar"- (Sc. No. 14-103-05)" at Department of Aquatic Environment Management, Fisheries College and Research Institute, Thoothukudi – 628 008.

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Sl. No.	No. of Unit required (in Nos.)	Particulars of the equipment	Rate in figures & words	Unit in figures & No.	Total
1	One (1)				

Technical Specification for Photobioreactor

Specification for Photobioreactor	No. required
1. Control System: • Control Panel will be non-corrosive material. • Touch screen PLC control system • Database facility. • Emergency Switch • Independent power for UPS & Raw power source. **1.1 Controls :** Automatic Temperature &Measurement: • Control through PLC • Control system for temperature in the range from 12 to 24 degree Celsius DO measurement system: • DO Sensor system with accessories • Provision to consider to control Air through Rotameter with accessories. CO_2 Measurement: • CO_2 Control through manual rotameter pH measurement system: • pH measurement and control • Autoclavable Feeding bottles for acid and base 500ml with 0.2Micron filters and silicon tubes 2Set. • Control through fixed speed peristaltic pump. • Control system for pH from 2 to 12 Turbidity measurement • Measurement and display • Monitoring system for density of algae **2. PBR- Reactors:** • Working volume: 10L (Main reactor holding volume -50% to 60% and illumination reactor – 50%-60%). **2.1 PBR-Main reactor:** • Glass reactor • D:H Ration 1:2 or1:2.5 or 1:3. • Volume: 5L or lesser then 10L • Top Plate will be Teflon for non-corrosion. • Jacketed for raw water and Chill water circulation. • All sensor are located at top plate • Dip sampling / circulation. **2.2 PBR-Tubular Bioreactor (illumination collector).** • Glass Tube with fittings • Independent Panel – Horizontal type • Glass tube Ø is lesser then 60mm. • Inter connected to main reactor through silicon tube **2.3 Illumination System:** • Variable light intensity control and day/night cycle simulation for outdoor conditions in the laboratory. • Light Measurement system: Lux Meter • Measurement value will be Display in the PLC system. • Light: Variable light intensity. • Light Source: 2000Lux to 4000Lux • Water proof light system & produce Low heat. **2.4 Media circulation:** • Media circulation from main fermenter to tubular reactor through diaphragm pump.	**1 No.**

- Control through PLC.

3. Accessories

3.1. Chiller :

- Suitable chiller and cum circulation
- Bi-pass facility for chiller circulation with ball valve.

4. Downstream Instruments:

LAB Basket Centrifuge:

- **Outer drum:** Cylindrical drum mode out of S.S
- **Inner drum:** Revolving perforated drum made out of S.S 316
- **Volute:** M.S. Fabricated shell & bottom
- **Drive system:** The machine is driven by 440v, 3ph TEFC motor through clutch pulley V belts
- **Brake :**Mechanical leg brake system
- **Suspension:** Cast iron tri Column suspensions with springs
- **Bearing housing:** Made out of graded cast iron machined for close tolerance to heavy duty bearing
- **External finish:** Polished S.S surface, ASPA paint on M.S

Technical Details :

Capacity in Kgs	15
Rpm	1000
Motor power in Hp	1
Basket Dimension in mm	450
Loading type	Top

5. Other requirement :

- Warranty- 1 Year.
- PLC Programme upgradation (process modification) for 1 year- free of cost.

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TENDER FORM AND CONDITIONS

No. 501/ FC&RI/DAEM /DST - SERB/ 2020

I. GENERAL

Last date for submission of Tender - 04.12.2020 up to 4.00 pm

Date of Opening of Tender - 04.12.2020 at 4.30 pm

Tenders should state in the body of their letter

Whether they are: i) Manufacturer

ii) Manufacturer's authorized agents

iii) Holders of stock of the stores tendered for

iv) GST No. should be furnished

II. DEVIATION FROM SPECIFICATION

The tenderers are requested to study the specification state below.

Specifications for Photobioreactor	No. required
1. <u>Control System:</u> • Control Panel will be non-corrosive material. • Touch screen PLC control system • Database facility. • Emergency Switch • Independent power for UPS & Raw power source. **1.2 <u>Controls :</u>** Automatic Temperature &Measurement: • Control through PLC • Control system for temperature in the range from 12 to 24 degree Celsius DO measurement system: • DO Sensor system with accessories • Provision to consider to control Air through Rotameter with accessories. CO_2 Measurement: • CO_2 Control through manual rotameter pH measurement system: • pH measurement and control • Autoclavable Feeding bottles for acid and base 500ml with 0.2Micron filters and silicon tubes 2Set. • Control through fixed speed peristaltic pump. • Control system for pH from 2 to 12 Turbidity measurement	**1 No.**

- Measurement and display
- Monitoring system for density of algae

2. PBR- Reactors:

- Working volume: 10L (Main reactor holding volume -50% to 60% and illumination reactor – 50%-60%).

2.1 PBR-Main reactor:

- Glass reactor
- D:H Ration 1:2 or1:2.5 or 1:3.
- Volume: 5L or lesser then 10L
- Top Plate will be Teflon for non-corrosion.
- Jacketed for raw water and Chill water circulation.
- All sensor are located at top plate
- Dip sampling / circulation.

2.2 PBR-Tubular Bioreactor (illumination collector).

- Glass Tube with fittings
- Independent Panel – Horizontal type
- Glass tube Ø is lesser then 60mm.
- Inter connected to main reactor through silicon tube

2.3 Illumination System:

- Variable light intensity control and day/night cycle simulation for outdoor conditions in the laboratory.
- Light Measurement system: Lux Meter
- Measurement value will be Display in the PLC system.
- Light: Variable light intensity.
- Light Source: 2000Lux to 4000Lux
- Water proof light system & produce Low heat.

2.4 Media circulation:

- Media circulation from main fermenter to tubular reactor through diaphragm pump.
- Control through PLC.

3. Accessories

3.1. Chiller :

- Suitable chiller and cum circulation
- Bi-pass facility for chiller circulation with ball valve.

4. Downstream Instruments:

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Technical Details :

Capacity in Kgs	15
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Basket Dimension in mm	450
Loading type	Top

5.Other requirement : • Warranty- 1 Year. • PLC Programme upgradation (process modification) for 1 year- free of cost.	

SERVICE CONDITION

Guarantee period and after sales service condition to be mentioned. In case of deviation or alterations, the same should be brought out boldly and prominently in the offer made.

III. Any terms or conditions not brought out in the body of the offer will not be considered.

IV. In case any condition or terms of contract applicable in the invitation of tender is not acceptable to the tendering firm, they should specifically state deviation there from in the body of their tender.

V. In the body of the letter, the tenderer should specially state that he agrees for sale arbitration by The Dean, Fisheries College and Research Institute, Thoothukudi – 628 008.

VI. PRICE

a. Prices must be in terms of rupees and paise.
b. The unit prices should be for the equipment as indicated in the schedule of tender
c. Prices quoted should be for delivery at site, as specified by The Dean, Fisheries College and Research Institute, Thoothukudi – 628 008.
d. Discount if any, should be indicated prominently.
e. Prices quoted shall be firm in all respects and for each equipment
f. Tenders with price variation basis will not be accepted
g. The offer should be kept valid for six months from the date of tender and supply is expected before.

VII. The tenderer is solely responsible for the equipment till delivery and demonstration of the equipment.

VIII. EARNEST MONEY, SECURITY DEPOSIT AND EXECUTION OF AGREEMENT

Each tender should be accompanied by an **Earnest Money Deposit (EMD)** of **1% of the total value** in the form of Demand Draft drawn in favour of **The Dean, Fisheries College and Research Institute, Thoothukudi – 628 008 payable at Thoothukudi** failing which the tender will not be considered. Cheques will not be accepted. If for any reason the tenderer withdraws the tender before or after being selected or before being rejected by the competent authority, The Dean, Fisheries College and Research Institute, Thoothukudi – 628 008 reserves the right to forfeit the deposit in part or in full. The Earnest Money Deposited will be refunded to the unsuccessful tenderers. In case of successful tenderers, the amount will be adjusted towards Security deposit.

The successful tenderer (herein after referred to as Contractor) shall also furnish a **Security deposit of not less than 5% of the total value of the equipment** within 15 days from the date of intimation of the acceptance of the tender.

The security deposit will be refundable only after the expiry of a period of ONE YEAR from the date of handing over the stores in working condition/completion of work to the full satisfaction and upon The Dean, Fisheries College and Research Institute, Thoothukudi – 628 008 issuing a certificate that no amount is due from the contractor under the agreement and that the contract executed an agreement on a non-judicial stamp paper of the value of to be fixed incorporating the terms and conditions of the contract within one month from the date of intimation of the acceptance of the tender. In case of default of these conditions i.e. remitting security deposit and executing agreement within the time allowed, the Earnest Money Deposit (EMD) will be forfeited without prejudice to any other right of the University will also be entitled to make other arrangement for obtaining these items from others and recover from the university over the contract price together with in charges, expenses and damages attending to such purchases provided The Dean, Fisheries College and Research Institute, Thoothukudi – 628 008 in specific application from the contract grant extension of time in specific circumstances in the matter of payment of security deposit and execution of agreement.

IX. DELIVERY

The supplies shall be subject to inspection and acceptance of rejection by The Dean, Fisheries College and Research Institute, Thoothukudi – 628 008 or such other person as The Dean, Fisheries College and Research Institute, Thoothukudi – 628 008 shall from time to time name and appoint for this purpose, the said person to be named and appointed being hereafter referred to as the Inspection Officer. Delivery of the item should be done at "DEPARTMENT OF AQUATIC ENVIRONMENT MANAGEMENT, FISHERIES COLLEGE AND RESEARCH INSTITUTE, TAMIL NADU DR. J. JAYALALITHAA FISHERIES UNIVERSITY, THOOTHUKUDI – 628 008".

The supplier made by the tenderer which in the opinion of The Dean, Fisheries College and Research Institute, Thoothukudi – 628 008 or the Inspecting Officer in bad order, unsound in quality or description or not in accordance with specifications as have been prescribed in that behalf of otherwise faulty or unfit for use, shall be rejected.

The supplies so rejected shall be removed by and that the expenses of tenderer within 15 days after he has been given notice of the rejection. If not taken away, The Dean, Fisheries College and Research Institute, Thoothukudi – 628 008 may cause the goods to be removed and disposed off in the manner he may deem fit and recover from the tenderer the expenses incurred in such removal and disposal.

The substitution of supplies which have been rejected by The Dean, Fisheries College and Research Institute, Thoothukudi – 628 008 or the Inspecting Officer in whole or in part under the provisions herein before contained the tenderer shall and will within the time permitted by The Dean, Fisheries College and Research Institute, Thoothukudi – 628 008 or the Inspection Officer after such rejection shall have been notified to him as aforesaid supply and delivery without causing

any extra cost of expenditure. If not so supplied and delivered by the tenderer or substitution as aforesaid and also in case of failure by the tenderer to supply and deliver supplies demanded from line under this tender within the period prescribed for supply and delivery/. The Dean, Fisheries College and Research Institute, Thoothukudi – 628 008 or the inspecting officer shall have power to purchase from others *in lieu* of rejected or not delivered goods and any excess expenditure or cost incurred by the University over and above the tenderer price together with all charges and expensed attending to the purchase shall be recoverable from the tenderer. Nothing herein contained shall prejudice any other right of the University in that behalf under the tender or otherwise.

X. A guarantee towards the supply of spares parts if any when required on the agreed basis for an agreed price.

XI. The tenderer shall furnish the following Guarantee: A guarantee to the effect that articles supplied shall be of the best quality and workmanship and shall be in with such quantities and such price. A guarantee for a period of one year or more from the date of handing over the equipment for the proper functioning of the equipments and systems and any defects in their proper function during the guarantee period should be rectified by the tenderer free of charge. If during the guarantee period, the supplies are found not to the description and quality offered, the University will be entitled reject the articles and the supplier shall replace or pay the University such damages as may arise including the replacement of cost and towards delay and damages. Nothing herein contained shall prejudice any other right of the University if that behalf under the tender otherwise.

XII. TRANSFER OF SUPPLY

The tenderer shall not transfer or assign the supply or any part there or any interest therein directly or indirectly to any person or persons whomsoever without the written consent of the University.

XIII. If the supply order is placed on a higher tenderer as a result of inability of the tenderer then he will be liable to pay the University the difference between the supply rate and that the lowest acceptable tender. This is in addition to and without prejudice to other rights under the terms of the tender.

XIV. INSTALLATION AND TESTING

All the deliveries of goods should be accompanied by invoice bills in triplicate to the officer at site to whom the goods are supplied - "DEPARTMENT OF AQUATIC ENVIRONMENT MANAGEMENT, FISHERIES COLLEGE AND RESEARCH INSTITUTE, TAMIL NADU DR. J. JAYALALITHAA FISHERIES UNIVERSITY, THOOTHUKUDI – 628 008".

a) The time allowed for completion of supply and delivery as prescribed including demonstration under the conditions of the tender is the essence of the tender.

b) Without prejudice to other rights under the terms of this tender or otherwise.

If the tenderer fails in the due performance of this supply within the time fixed in the supply or any extension thereof, the tenderer is liable to pay as liquidated damages upto 2% per month of the supply value of such portion of the materials as have not been delivered, installed and commissioned and having been delivered, installed and commissioned cannot in consequence of the delay be used efficiently during each month between the appointed or extended time as the case may be and the actual time or delivery installation.

The tender is not entitled for any enhancement of the rates once accepted. It shall be lawful for the purchaser to set off any loss or expense or cost of damages sustained or incurred by the purchaser by reason of the cancellation of the tender from and out of nominees for the time being payable or due to the tenderer from the University otherwise apart from forfeiting the security deposit furnished by their tenderer.

All sums found due to the University under or by virtue of these presents shall be recoverable from the tenderer in any manner as the University may deem fit.

XV. Any notice of communication to the tenderer shall be deemed to be sufficiently served if given or left in writing at his usual or last known place or abode.

XVI. All questions, disputes or differences arising under, out of or in connection with the supply, if not concluded shall be subject to the exclusive jurisdiction of the place from which the acceptance of the tender is issued, is situated.

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