

**Department of Physics, University of Kerala, Kariavattom,  
Thiruvananthapuram, Kerala, India – 695 581, Ph: 91 471 2308920**

05/07/2019

**E-Tender Notice (Re-tender)**

Department of Physics, University of Kerala, Kariavattom, invites tenders (retender) for the purchase of Microwave synthesiser with following specifications under two bid systems.

Last date and time for submission of tender online	: 12.07.2019 :6 PM
Date and time of opening of tender	: After Technical Evaluation
Hard copies of the sealed tenders to be submitted to the office of	The Registrar University of Kerala Trivandrum
For technical details contact	Dr. G. Subodh Assistant Professor and Head Department of Physics University of Kerala Ph. No. 8921996523 e-mail: gsubodh@gmail.com

Microwave assisted focused monomode organic synthesis system should be able to handle synthetic reactions involving Nano materials synthesis, routine organic, organometallic, fluorination, caustic solutions, catalysts using palladium, non - polar solvents like toluene, hexane etc.

- Power Output : Microwave power of minimum 600 W or higher
- Microwave Power field density : 6000 Watts/liter or more
- Maximum Pressure & Temperature: 30 bar and 300°C or greater for all vessel types (10 mL as well as 30 mL) for scale up reactions without re-optimization of parameters.
- Ability to effectively heat polar as well as non-polar solvents like Toluene, Dioxane etc without heating aids.
- Temperature Measurement: IR measurement as standard facility with multi point calibration for accurate temperature measurement of reaction/s.
- Integrated Pressure Sensor to measure, display as well as document reaction pressure.
- Should have inbuilt magnetic stirrer device with variable speed from 0 rpm upto at least 1000 rpm or more to ensure uniform temperature in the reaction mixture volume for uniform heating of even high viscous reactions.
- Self-tuning cavity for optimum heating efficiency with all vessel types.
- Should be supplied with Glass Vials of 10 ml and 30 ml capacity with sustainable material of construction and allow for multiple reaction runs to be conducted in the same vial.
- Should be supplied with a vessel made of material of at least 10ml capacity to allow for carrying out reactions involving metallic particles, in-situ fluorination, caustic solutions of high alkaline pH such as NaOH at elevated temperatures and reactions using other aggressive reactants and can be used for unlimited reactions.
- Sealing of reaction vessels should be easy and without use of any tools.
- Heating Performance benchmarks with glass vessels and without any heating aids :
  - System should have ability to heat 20 mL Ethanol to 200 °C in 2 min
  - System should have ability to heat 5 mL Toluene to 200 °C in less than 5 min
- Large inbuilt Touchscreen display with capability for online graphical display of reaction parameters like pressure, power and temperature and review of previous reaction runs.
- Direct printout to PDF files or export of data to excel via USB ports.
- Suitable air compressor for operation of the instrument and cooling of reaction vials after a reaction is over should also be quoted.
- Must have an integrated camera for monitoring the reactions with display on the screen of the instrument.
- Consumables: Stir Bars for both 10 mL as well as 30 mL vessels, Caps, Silicone Septum must be quoted in the main offer along with the instrument for trouble free operation.( prices should be quoted separately).
- Optional Fiber optic Ruby Thermometer with ability to measure internal reaction temperature simultaneously along with IR sensor and simultaneous display of both, IR and Ruby temperature on screen should be quoted separately.
- The system must be upgradable with an autosampler with minimum 24 reaction vessels handling (10 mL and 30 mL) for unattended operation and the same should be quoted as optional.

### **General Conditions:**

1. Every tenderer should submit Tender fee of **Rs. 2,500/-**
2. Every tenderer should submit an Earnest Money Deposit (EMD) of **Rs. 20,000/-**
3. The tender shall be submitted in the two bid viz. Technical Bid and Financial Bid. Only those qualified in technical bid will be eligible for participating in financial bid. A presentation regarding the technical specification and item to be supplied shall be done before the technical evaluation committee if requested.
4. The bidder should be a manufacturer or their dealer specifically authorized by the manufacturer to quote on their behalf for this tender as per Manufacturer Authorization From and Indian agents of foreign principals, if any, who must have designed, manufactured, tested and supplied the equipment(s) similar to the type specified in the "Technical Specification". Such equipment must be of the most recent series/models incorporating the latest improvements in design. The models should be in successful operation for at least one year as on date of Bid Opening.
5. **Compliance Statement:** Along with the technical details provide a tabular column indicating whether the equipment quoted by you meets the specifications by indicating 'YES' or 'NO'. If 'YES', support the claim by providing original brochures. **Venders should provide clear brochures/data sheets about the equipment and its working. Also include adequate proof for the claim regarding the performance.**
6. **Reference:** Names of Institutes with contact person and telephone/ email where similar equipment supplied by you in India [Preferably South India] shall be mentioned in the bid.
7. Incomplete & conditional tenders and tenders received after the due date will be summarily rejected without assigning any reasons thereof.
8. The price should be inclusive of all taxes, duties, transportation, insurance, installation etc. Nothing extra will be paid in addition to the quoted rate. Any amount in Indian rupees for installation, commission, labour, spares, service etc shall be entered in item 2 of BoQ.
9. Payment Terms: TT after order acknowledgement.

10. Validity of tender: Tender submitted shall remain valid at least for 120 days from the date of opening the tender. Validity beyond 120 days, from the date of opening of the tender shall be by mutual consent.
11. Delivery and installation: Proposed delivery schedule should be mentioned clearly. Delivery and installation and training (one week) should be made at the Department of Physics, University of Kerala, Kariavattom campus, Trivandrum without extra cost (inclusive of documentation, demurrage, customs duty, clearance and transportation charges). University of Kerala will provide customs duty exemption certificates if required.
12. Service facility: Supplier should mention their details of service setup and manpower in Thiruvananthapuram who are responsible for after sales support.
13. The model number, make, and a printed literature of the product shall submit positively.
14. In case of any dispute, the decision of the University authority shall be final and binding on the bidders.
15. The undersigned reserves the right to reject any or all of the tenders received without assigning any reason thereof.
16. The quoted item should be under **comprehensive warranty for three years** or more.
17. If any component is found to be defective during the warranty period, the vendor has to replace the defective item immediately at their own cost.

**Documents to be uploaded:**

1. Signed Compliance Matrix
2. Detailed Technical Brochure
3. Under taking of support for next 10 Years
4. BoQ
5. Tender fee