



**NATIONAL CENTER FOR COMBUSTION RESEARCH
AND DEVELOPMENT (NCCRD)
INDIAN INSTITUTE OF TECHNOLOGY MADRAS
CHENNAI – 600036, INDIA**

Ref. No. RB/16-17/CHE/001/GAI/RVIN

Date: 4 Jun. 2016

Due date: 24 Jun. 2016

Item name: Research Grade Microwave Pyrolysis Unit (1 no.)

1. Quotations are invited in a **two bid system** for the items shown overleaf (in Annexure I). The offers / bids should be submitted as Technical bid and Financial bid. The Technical bid should consist of all technical details / specifications only. The Financial bid should indicate item-wise price for each item and it should contain all Commercial Terms and Conditions including Taxes, transportation, packing & forwarding, installation, guarantee, payment terms, pricing terms etc. The Technical bid and Financial bid should be put in separate covers and sealed. Both the sealed covers should be put in a bigger cover. The Tender for supply of “ _____ ” should be written on the left side of the Outer bigger cover and sealed.
2. The quotations should be valid for sixty days from the due date and the period of delivery required should also be clearly indicated.
3. The total cost of the equipment in terms of CIP Chennai should be clearly mentioned.
4. Terms of warranty and guarantee should be explicitly mentioned.
5. Packing and delivery charges, customs and clearance duty should be clearly stated.
6. Goods shall not be supplied without an official supply order.
7. Local firms : Quotations should be for free delivery to this institute. If quotations for ex-godown delivery charges should be indicated separately.
8. Firms outside Chennai: Quotations should be for F.O.R. Chennai. If F.O.R. consignor station, freight charges by passenger train / lorry transport must be indicated. If ex-godown, packing, forwarding and freight charges must be indicated.
9. The rate of sales / general taxes and the percentage of such other taxes legally leviable and intended to be claimed should be distinctly shown along with the price quoted. Where this is not done, no claim for sales / general taxes will be admitted at any stage and on any ground whatsoever. The taxes leviable should take into consideration that we are entitled to have Concessional Sales Tax (CST) applicable to non-government educational institutions run with no profit motive for which a concession sales tax certificate will be issued at the time of final settlement of the bill.
10. Payment : Specify the mode of payment and if advanced payment has to be made. Every attempt will be made to make payment within 30 days from the date of receipt of bill / acceptance of goods, whichever is later.
11. IIT Madras is exempt from payment of excise duty and is eligible for concessional rate of customs duty. Necessary certificate will be issued on demand.
12. IIT Madras has the right to accept the whole or any part of the tender or portion of the quantity offered or reject it in full without assigning any reason.
13. The sealed quotation may be sent to

Dr. R. Vinu (Assistant Professor)

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Annexure I

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Technical Specifications of Research Grade Microwave Pyrolysis Unit

1. Research grade microwave oven capable of delivering maximum power of 2.5-3 kW (frequency-2.45 GHz) consisting of microwave power controller (10-100% with 5% increment), time setter (1-180 min), temperature monitoring system (upto 1100°C) with PID controller, temperature measurement should be based on thermocouple
2. Opening (hole) at the top to allow collection/condensation of vapors (Refer Schematic)
3. Data acquisition of reactants temperature, either in a computer or in a USB drive
4. Provision for conducting reactions at constant microwave power input (actual power delivery)
5. Possible of conducting isothermal and non-isothermal heating modes
6. Rectangular cavity with spark free internal body for providing uniform wave distribution, and capable of pyrolyzing upto 1 kg of feedstock in cylindrical/spherical quartz reactor of 2-3L volume
7. Microwave power generator trip system for safe operation and microwave leak detection
8. Feed stock mixing should be possible via adjustable stirrer speed/turn table
9. Provision of gas purging ($N_2/H_2/CH_4$) through the reactor during pyrolysis.
10. Detailed operation manual or video demonstration should be provided
11. Warranty: minimum 1 year.
12. Power: 230 V, 50 Hz, Indian type socket should be provided.

For technical enquiries contact:

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Dr. R. Vinu, vinu@iitm.ac.in, +91-9500158723



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Figure: Schematic of the microwave reactor

