

# Enquiry Letter for Quotation of Hybrid Furnace with Microwave and Conventional (Resistive Heating) Capability

Enq. No.: IITK/MSE/AU/15-16/02

Enquiry Dated: 08.03.2016

Closing Date: 16.03.2016

Sealed quotations (in two separate envelopes namely “TECHNICAL ONLY” and second ‘FINANCIAL’ bid) are required for a Hybrid Furnace with Microwave and Conventional (Resistive Heating) Capability. The specifications for the equipment are in the addendum below:

The prospective suppliers are required to send quotation in two parts in sealed envelopes, as “**Technical Bid**” and “**Financial Bid**”. The two separate and sealed envelopes should be clearly marked appropriately as “Technical Bid” and “Financial Bid”.

(i) The **Technical Bid** should contain detailed technical specification of the product being offered and should not mention any price. This should also mention the guarantee and complete spare parts must be included that are required for functioning of the unit. Please also provide ‘performance report’ from the places where this equipment is provided.

(ii) The **Financial Bid** should include the detailed price quotation clearly including the cost of the equipment, taxes, service charges if any, shipping and handling charges.

Terms and Conditions:

1. Maximum education discount, if any should be offered
2. Validity of quotation should be at least for 60 days
3. Prices should be on CIF and FOB separately (if imported)
4. Prices should include the installation and training cost
5. Warranty should be for at least one year after installation
6. Normal payment terms for the Institute will be applicable (90% on delivery of the items and the remaining 10% after satisfactory installation/ inspection)
7. Quotation should carry proper certifications like agency certificate, proprietary certificate, etc.
8. An undertaking that the vendor will supply all the spares and services for the equipment for at least 5 years from the date of commissioning
9. Delivery must be within 6 months

Kindly submit the Technical and Financial bids in sealed envelopes latest by 5 PM on 16.03.2016:

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## SPECIFICATION FOR HIGH TEMPERATURE FURNACE

### FURNACE STRUCTURE

1. Furnace outer Shell :  $\approx 500 \times 500 \times 1200$  mm
2. Shell Construction : High quality fabrication of M.S.Body and M.S. Angle's structure with proper stiffeners and neat powder coat painting and main chamber made out of Stainless steel (316 grade)
3. Furnace panel box : Control panel box coupled with furnace bottom
4. Insulation : Insulation board of Zircar of MW transparent specification, USA
5. Number of susceptor : Ten numbers
6. SS Chamber size :  $300 \times 300 \times 300$  mm
6. Susceptor cavity size :  $\approx 75 \times 75 \times 75$  mm
7. Size of the sample : Less than 50 mm in all dimensions (maximum)
8. The furnace design should have the provision for incorporation of MW transparent tube can be inserted with the capability to provide inert/reactive atmosphere to the sample during sintering. In addition, it will be equipped to be operated in 100% MW or 100% Conventional (Resistive heating) or through Mixed (Hybrid) Mode. The maximum temperature capability desired of the furnace is  $1400^{\circ}\text{C}$  (though – if feasible-  $1500^{\circ}\text{C}$  would be preferable).

### HEATING SYSTEM

1. Heating system : Microwave by magnetron; conventional by Kanthal/SiC
2. Power rating : 2.45GHz with 1.1KW each x 4 numbers
3. Operation : Single phase / AC
4. Power out put : two magnetrons with total  $\approx 2.2\text{Kw}$  x 2 set (one set will work at time and using timer automatically shifted to another set for continuous operation)
5. Maximum temperature :  $1400^{\circ}\text{C}$  [ $1500^{\circ}\text{C}$  (preferred)]
7. Rate of heating : 10 to  $25^{\circ}\text{C}/\text{minute}$  (Max) (programmable) [MW and Conventional both]