



Telephone : 22575284

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Department of Civil Engineering

Indian Institute of Technology, Madras

I.I.T.P.O., MADRAS - 600 036.

Ref. No.

CIE	INDU	2014	1008	SPLX
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Date : 02-06-2014

Dear Sirs,

DUE DATE : 16-06-2014

1. Quotations are invited in duplicate for the various items shown below / overleaf / enclosed list.
2. The Quotations duly sealed and superscribed on the envelope with the reference No. and due date, should be addressed to the undersigned so as to reach him on or before the due date stipulated above.
3. The Quotations should be valid for sixty days from the due date and the period of delivery required should also be clearly indicated.
4. If the item is under DGS & D Rate contract. Rate Contract Number and the price must be mentioned. It may also please be indicated whether the supply can be made direct to us at the Rate contract price. If so, please send copy of the R.C. (Please note that we are not Direct Demanding Officers)
5. Relevant literature pertaining to the items quoted with full specifications (and drawing, if any) should be sent along with the Quotations, wherever applicable samples if called for, should be submitted free of charges, and collected back at the supplier's expenses.
6. Local Firms : Quotations should be for free delivery to this Institute. If Quotations are for Ex-Godown, delivery charges should be indicated separately.
7. 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.
8. 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 applicable to Non-Government Educational Institutions run with no profit motive for which a concession. Sales Tax Certificates will be issued at the time of final settlement of the bill.
9. Goods should be supplied carriage paid and insured.
10. Goods shall not be supplied without an official supply order.
11. Payment : Every attempt will be made to make payment within 30 days from the date of receipt of bill / acceptance of goods, whichever is later.

✓ Details as per enclosed list.

Yours faithfully

For HEAD OF THE DEPT.

*Strike out whichever is not applicable.

SPECIFICATIONS OF CEM MICROWAVE DIGESTION SYSTEM

Sr. No.	Parameters	Specifications
1.	Instrument	<p>The system should be a stand alone work station and should have:</p> <ul style="list-style-type: none"> ❖ The capacity to digest soil, plant and sludge samples ❖ Auto sensing of temperature and pressure inside the vessel. <p>The following should be essential parts for an effective microwave Digestion unit.</p>
2.	Display	<p>The Instrument should have the Large, high-resolution, LED screen Should have Data management – Easy access to stored methods, real-time data, and results of past runs This should be able to display the detailed methods, graphs of temperature and pressure against time and temperature of individual vessels.</p>
3.	Vessel System	<p>The instrument should be capable of performing Digestions in high-pressure vessels of Teflon. In case of Digestion, a maximum pressure of 500 psi & 55mL capability of the vessels is a must. It should be possible to individually load and removed from the microwave for ease of handling. Above Digestion, vessels must be vent-able before uncapping the vessel in order to meet current and pending EPA procedures as well as for safety reasons. For ease of use, the vessels must not require the use of an energizing tool in order to reform seals prior to operation.</p>
4.	Microwave Power	<p>The Instrument should have Dual magnetrons – 1800W of delivered energy, should provide the power needed for difficult samples and high-throughput vessel sets delivering unpulsed continuous power & Precisely tuned wave guide disperses microwave energy uniformly throughout the cavity.</p>
5.	Uniform Energy Distribution	<p>The Instrument should have “waveguide” between the magnetron (the microwave energy source) and the cavity. This waveguide fed system should provide maximum tuned transfer of microwave energy from the magnetron to the load in the microwave cavity. Waveguide fed systems provide a uniform wave pattern inside the cavity in all planes. This should result in uniform heating of the sample load.</p>
6.	Microwave Cavity	<p>The microwave cavity should be heavy duty The vessel assembly during a run should be visible from outside. The coating inside the cavity should be acid/ chemical resistant special polymer coating like fluoropolymer / PTFE</p>
7.	Controls	<p>The Instrument should have a) Reliable Temperature and b) Pressure controls independent of each other.</p>
a.	Temperature	<p>Fiber Optic Temperature Sensor preferred and should give very precise reading on all the vessels.</p>
b.	Pressure Controls	<p>The System should have a pressure sensor which has a total capability of up to 500psi. It should be possible to remove the pressure device at a high pressure. The Vessels should act as self-regulators of Pressure.</p>
8.	Control Terminal	<p>Should have Onboard Controller No need for a laptop or external controller and should be capable to store previous DIGESTIONS and program for repeated DIGESTIONS. Continuous display of temperature and pressure inside the reaction vessels is required.</p>
9.	Safety	<p>There has to be multiple levels of safety: The instrument should be capable of shutting off in the event of the following:</p> <ol style="list-style-type: none"> 1) If there is a very loud noise or bang near the instrument. 2) If the temperature of the vessel is near its highest tolerance limits.
10.	Tri-Cooling	<p>The Instrument should have A Tri-Cooling™ standard feature, which eliminates the need for any extra water-cooling or forced air-cooling. This powerful exhaust is more importantly a mechanism to ensure fast and efficient heat dissipation and allows twice Microwave irradiation.</p>

11.	ISO	:	The manufacturer should be ISO 9001 certified for design and manufacture of microwave Digestion system
12.	Approvals	:	Instrument should have the following internationally accepted approvals for electrical and electronic safety and emission
13.	PC	:	System should be able to operate without a PC but there should be a provision for operation through a PC with the required software (optional). The Onboard Printer to print the Graphs, Parameters and Methods as optional. Should have the Improved connectivity to Connect to multiple peripherals such as keyboards, printers, or computers Should have the min Available ports: USB and Ethernet
14	Power Supply	:	240 Volts 50 Hz, AC Operated.



PROJECT CO-ORDINATOR