

# DEPARTMENT OF METALLURGY AND MATERIALS ENGINEERING

Indian Institute of Engineering Science and Technology, Shibpur  
Howrah-711 103

Enquiry No. 5/MET/IIEST/2018-19

Date: December 19, 2018

To,  
All the Enlisted Suppliers/Dealers/Manufacturers

Sealed quotations are invited for supply of the following Equipment for the Dept. of Metallurgy and Materials Engineering, IIEST, Shibpur. The sealed quotations should be addressed to the Head of the Department indicating enquiry no. with date on the top of the sealed envelope. The sealed quotations should be submitted at the office of the department on any of the working day up to 01/01/2019 till 5.00 P.M.

## MUFFLE FURNACE

Electrically heated High Temperature Muffle Furnace. Maximum working temperature 1400<sup>0</sup>C for continues running, accuracy  $\pm 1^{\circ}$ C. Using silicon carbide heating element with microprocessor based digital PID temperature programmer controller with thyristor power drive. Hot zone cavity size details below:

<u>Hot Zone or Working Chamber size</u>	<u>Power</u>	<u>Load</u>
200 mm (W) X 200 mm (H) X 300 mm (D)	430 V AC	4 KW

### Name of Equipment:

Electrically heated table top type front loading High Temperature Chamber Furnace. Maximum working temperature 1400<sup>0</sup>C for continues running, accuracy  $\pm 1^{\circ}$ C for using silicon carbide heating elements with Microprocessor based digital PID temperature programmer controller with thyristor power drive.

### Working Chamber Size & Door:

200 mm (W) X 200 mm (H) X 300 mm (D) and overall dimension 550 X 540 mm X 620 mm with front opening insulated Insert-type swing-aside parallel-moving gear with chain pulley type door, which facing away from the Operator. It's made from CUMILAG 29 bubble Alumina with a peep hole 10 mm for viewing.

### Details of Heating Elements:

'KANTHAL' make silicon carbide heating elements. Heating element fitted horizontally both side of working chamber for ensure temperature uniformity in the chamber. Heating elements and inside cover free from all the analytic elements as the contaminants of the trace and ultra trace level of determination. Size of element is 14mm dia 200 mm hot zone and 600 mm total length.

### Temperature controller:

Microprocessor based digital PID temperature programmer controller with computer interface, with minimum 5 (five)segment pairs with each a ramp and a dwell. Programming for heating, cooling and holding. Software : Windows based

### Thermocouple

'R' type (Positive Material: Pt/Rh (30 %) Negative Material: Pt/Rh (6 %) Minimum Std. Error: +/-1.4) with high alumina refractory sheath and connecting holder.

**Thyristor Power Drive:**

Phase angle control thyristor power drive with energy regulator with soft start and current limit facility and silent operation of furnace power control. 430 VAC, Input 4-20 mA

**Thermal Insulation:**

For best thermal efficiency shall be used Carborundum make CUMILAG 29 withstand 1550<sup>0</sup>C. 2nd stage MORGAN make KAOWOOL brand vacuum compressed fiber board to withstand temperature up to 1477<sup>0</sup>C, 3rd stage SIMVAC fiber board to withstand temperature up to 1260<sup>0</sup>C, 4th stage high seal board to withstand temperature up to 800<sup>0</sup>C finally air insulation.

**Rate of Temperature Rise:**

Pre- determined temperature rising rate are available by the programmer and normal raising rate are available by the controller.(0.5 – 20<sup>0</sup>C)

**Temperature Accuracy & Uniformity:**

±1<sup>0</sup>C at set temperature above 500<sup>0</sup>C and suitable element placement, System to ENSURE better uniform temperature.

**Safety:**

Over temperature protection by safety controller, Over current protection by SRC Fuse and TC failure by mail controller.

**Cooling Fan Blower:**

1/8 Hp fan blower used for cooling furnace outer cell and long life of furnace refractory.

**Construction:**

Body fabricated by MS angle, sheet and SS sheet combinations with double-walled for low skin temperatures(<45<sup>0</sup>C). Furnace and control panel place vertically(floor top type).

**Control Panel:**

Electrical equipment for running of furnace LED Indicator Lamp, Safety MCB, On/Off rotary switch, Ammeter, Magnetic contractor, Safety fuses.



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For details the vendors may contact Dr. Manojit Ghosh (Mobile No. 9874865163) during working hours.