

**DEPARTMENT OF METALLURGY AND MATERIALS ENGINEERING**

Indian Institute of Engineering Science and Technology, Shibpur

Howrah-711 103

Enquiry No. **3**/MET/IEST/2018-19

Date: December **17**, 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, IEST, 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 27/12/2018 till 5.00 P.M.

**Specification for TUBULAR FURNACE**

**TUBULAR FURNACE, Model no: DC-TF/2**

'DASS' makes electrically heated table top/floor type Tubular Furnace. Maximum working temperature 1100<sup>0</sup>C with accuracy  $\pm 1^{\circ}$ C. Using Silicon carbide heating element and microprocessor based digital PID temperature programmer controller with thyristor power drive. Gas purging flange provide both end of Quartz working tube. Hot zone cavity size details below:

<b><u>Hot Zone or Working Chamber size</u></b>	<b><u>Power</u></b>	<b><u>Load</u></b>
75 mm ID X 200 mm hot zone	230 V AC	4 KW

Working Tube: Both end open Quartz/Alumina/SS310 tube, ID 75 mm 750 mm.

**Name of Equipment:**

Electrically heated floor mounted Horizontal Tubular Furnace. Maximum working temperature 800<sup>0</sup>C, accuracy  $\pm 1^{\circ}$ C. Using KANTHAL A1 heating element with microprocessor based digital PID temperature programmer controller with thyristor power drive. Water cooled gas purging/vacuum flange install both side of working tube.

**Working Chamber Size:**

Both end open Quartz/Alumina/SS 310 working tube, tube size 75 mm ID and 750 mm length.

**Details of Heating Elements:**

'KANTHAL' make KANTHAL A1 heating element(registrant type, coil formation, 16 SWG).

**Temperature controller:**

Microprocessor based digital PID temperature programmer controller, Single program 16 segments(8 ramp 8 shock). Programming for heating, cooling and holding.

**Thermocouple**

'K' type with quick response and slight variations in temperature and should have thermocouple break protection to prevent the failure of thermocouple for 1200<sup>0</sup>C with high alumina refractory sheet and connecting holder.

**Thyristor Power Drive:**

Phase angle control thyristor power drive for automated power regulated and safe guard of heating elements.

**Thermal Insulation:**

For best thermal efficiency shall be used in SIMVAC fiber board 1450<sup>0</sup>C. Fibrous ceramic of different grade of backup insulation(Temperature limit of 2nd layer – 1250<sup>0</sup>C, 3rd layer – 1040<sup>0</sup>C) and finally air insulation.

**Rate of Temperature Rise:**

Pre- determined temperature rising rate are available by the programmer and normal raising rate (0.5 – 15 deg C/min) are available by the controller. Time to reach maximum temperature: 110 minutes.

**Temperature Accuracy:**

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

**Construction:**

MS angle and CRC and SS sheet construction of thick gauge double walled with fan cooling for minimum skin temperature <40<sup>0</sup>C . Furnace and control panel place vertically floor mounted type with enamel finishing.

**Gas flow/Vacuum Flange:**

Stainless Steel (grade 304) made gas purging/vacuum flange for both end of working tube. High precision ball valves(Swagelok fittings) for gas purging fitted with flange.

**Electrical Control Panel:**

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



17/12/2018

(Prof. Sumit Ghosh)

Head

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Copy forwarded for information to:

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