



भारतीय
प्रौद्योगिकी
संस्थान
काशी हिन्दू विश्वविद्यालय



INDIAN
INSTITUTE OF
TECHNOLOGY
BANARAS HINDU UNIVERSITY

Department of Metallurgical Engineering, IIT (BHU) Varanasi (UP), INDIA-221005

Dated: 18/12/2019

Ref. No. : R&D/SERB/Met//19-20/02A/Corr1

CORRIGENDUM NOTICE

With reference to notice inviting tender **R&D/SERB/Met//19-20/02A** dated **28/11/2019** for Supply of Controlled-Atmosphere High Temperature Furnace in the Dept. of Metallurgical Engineering, IIT (BHU), Varanasi, following clarification/corrigendum in the technical specification are added.

Wherever necessary, manufactures/authorized dealers may quote equivalent technologies to fulfill the same functions/objectives without any compromise in the quality/performance. In the same context, one should read the following changes on pages 3, 28 (i.e. Annexure 1) and 31 (i.e. Annexure 2) of the tender document.

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CRITICAL DATE SHEET (changes are underlined)

Published Date	28.11.2019 (05:00 PM)
Bid Document Download Start Date	28.11.2019 (05:00 PM)
Clarification Start Date	28.11.2019 (05:30 PM)
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Bid Submission Start Date	28.11.2019 (05:00 PM)
Bid Document Download End Date	<u>23.12.2019 (03:00 PM)</u>
Bid Submission End Date	<u>23.12.2019 (03:00 PM)</u>
Bid Opening Date	<u>24.12.2019 (03:00 PM)</u>

Annexure-1

Controlled-Atmosphere High Temperature Furnace of following Specification required.

SL. No.	Technical Requirement (Original)	Changes/addition in technical specifications
1.	Controlled-Atmosphere High Temperature Furnace for high temperature gas-solid, redox cycling reactions.	<i>No change</i>
2.	Furnace Type: Bottom Loading Vertical Tube with L-stand 1. Maximum Attainable Temperature: 1600°C or higher 2. Continuous Operating temperature: 1500°C or higher 3. Material of Construction (furnace): Refractory/Stainless Steel 4. Heating Element: Super Canthal	4. Heating Element- Either Silicon Carbide or Super Canthal
3.	Work tube 1.Type: One end (top) closed tube with provisions in the gas-tight lid for i) gas outlet, ii) suspending of a B-type thermocouple in the hot zone above the crucible and iii) suspending of a waffle in the hot zone. The gas-tight lid is to flush-fit onto a quick opening metal flange. 2. Dimension: 22mm ID(± 1) x 600mm Length (hot zone included); Wall thickness: >4 mm 3. Uniform hot Zone: 80 mm	2. Dimension: 25mm ID(± 1) x 600mm Length (hot zone included); Wall thickness: >4 mm 3. Uniform hot Zone: 80 mm 4. Material: <u>RCA</u>
4.	Temperature Indication & Control 1. Temperature accuracy of +/- 1°C) 2. Control: programmable temperature control using a minimum of 8 segments. Each segment may be defined as a ramp a step or a dwell 3. Safety PID (other than the control PID)	Controller Make: Eurotherm
5.	Insulation The insulation/cooling should be such that the skin temperature of the furnace is no more than 75°C from the ambient temperature. - Two fibre insulation plugs with a central 15mm diameter hole are required to stop the heat losses	Outer Temp according to BSEN61010 Document required Instrument should be WEE Comply Instrument should be CE Complied
6.	Atmospheric Control Arrangements: 1. No vacuum arrangement is needed 2. One end (top) of the work tube was described in item 3 above. The other end is open and has a o a quick opening metal flange with an ID of 30 mm (+/- 1 mm) OD 50 mm (+/- 2 mm with a circular groove in the center of the flange for a silicon O-ring. This end of the work tube will be fitted to a separate environment chamber. The bidder is to be not concerned with this environment chamber.	2-. One end (top) of the work tube was described in item 3 above. The other end is open and has a o a quick opening metal flange with an ID of 25 mm (+/- 1 mm) OD32 mm (+/- 2 mm with a circular groove(16 mm) in the center of the flange for a silicon O-ring. This end of the work tube will be fitted to a separate environment chamber. The bidder is to be not concerned with this environment chamber.
7.	Control Panel: 1. The control panel should have necessary controller and indicators such as Programmable Digital Temperature controller, Power control unit, ON/OFF switches, All other necessary accessories 2. The voltage and current fed to the heating element will be indicated with a digital display	Controller Make: Eurotherm
8.	Accessories -A B-type thermocouple suspendable from the top lid into the hot zone (it should be decoupled from furnace control) - Spare heating elements; 2 in nos -All necessary tubes, fittings, sensors & valves to be provided.	-A R-type thermocouple suspendable from the top lid into the hot zone (it should be decoupled from furnace control) - Spare heating elements: one set (sufficient to replace all elements one time)

Annexure- 2 should read as below

TECHNICAL COMPLIANCE STATEMENT
(To be submitted by bidder duly filled)

SL. No.	Technical Requirement	YES/NO
1.	High Vacuum High Temperature furnace	
2.	Maximum attainable temperature: 1600 °C Continuous operating temperature 1500 °C	
3.	Uniform hot Zone: 80 mm	
4.	Temperature accuracy $\pm 1^\circ\text{C}$	
5.	Spare of heating element: one set	
6.	A B-/R-type thermocouple suspendable from the top lid into the hot zone (it should be decoupled from furnace control)	
7.	Over Temperature Controller	
8.	Programmable Digital Temperature Controller and safety PID (Eurotherm Make)	
9.	Digital display for heating element	
10.	All necessary accessories arrangements	
11.	Worktube material: RCA	
13.	Instruction manual and Reference Materials for High Vacuum High Temperature Furnace should be included	
14.	Warranty: Comprehensive warranty for 3 years from the date of commissioning for the main system.	
15.	Spares: State availability of spares for three years.	
16.	Indian agency Commission (if applicable): Should be clearly stated in the financial bid in Indian currency.	

Randhir Singh, 18.12.19

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