



An ISO 9001
Company

Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

ENQUIRY	Phone: +91 431 257 7653 Email : skaruna@bheltry.co.in ajay@bheltry.co.in Web : www.bhel.com
NOTICE INVITING TENDER	

TWO PART BID	Enquiry Number:	Enquiry Date:	Due date for submission of quotation:
Tender to be submitted in two Parts	2601700046	03.08.2017	29.08.2017

You are requested to quote the Enquiry number date and due date in all your correspondence. This is only a request for quotation and not an order.

Please note that under any circumstances both delayed offer and late offers will not be considered. Hence vendors are requested to ensure that the offer is reaching physically our office before 14.00 hrs on the Date of tender opening.

Item	Description	Quantity
10	High Temperature Ageing Furnace as per the technical specification & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	03 Nos.

Important points to be taken care during submission of offer

1. Compliance Form No: TRY/ IND/ 06 to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.
2. Delivery period required is 3 months from the date of P.O.
3. Commissioning and performance prove out shall be done at BHEL Trichy by the supplier
4. Time period required for commissioning and performance prove out shall be 2 week from the date of intimation by BHEL
5. EMD for this tender Rs.1,00,000/-. (Note: for EMD exemption for MSME vendors, please refer Compliance form No. TRY/IND/06)
6. All updates, amendments, corrigenda, etc., (if any), for each tender will be posted only on the above websites from time to time, as and when required, until each tender is opened. There will be no publication of such updates, amendments, corrigenda, etc., through newspapers or any other media.

BHEL's General guidelines / instructions (refer MM/CE/GENL/001- EMD), compliance form and technical specification can be downloaded from BHEL web site <http://www.bhel.com> or from the Government tender website <http://tenders.gov.in> (public sector units > Bharat Heavy Electricals Limited page) under Enquiry reference.

Tenders should reach us before 14:00 hours on the due date
Tenders will be opened at 14:30 hours on the due date
Tenders would be opened in presence of the tenderers who have submitted their offers and who may like to be present

Yours faithfully,
For BHARAT HEAVY ELECTRICALS LIMITED

AJAY V. ASALKAR

Sr. MANAGER

MM / Capital Equipment

BHEL, Tiruchirappalli - 620 014.

Sr. Manager / Capital Equipment / MM

PART - A

TENDER REQUIREMENTS FOR THE SUPPLY OF HIGH TEMPERATURE AGEING FURNACE

SECTION – I: Qualifying Criteria

The BIDDER has to compulsorily meet the Qualification Criteria indicated in Section 1 to get qualified. Otherwise the technical offer will not be considered.

S.No.	TENDER PARTICULARS	VENDOR's RESPONSE
1.1	The VENDOR or Original Equipment Maker (OEM), might have supplied and commissioned at least TWO complete "HIGH TEMPERATURE AGING FURNACE" with temperature rating of 1600°C or more, in the past Five Years (as on the date of opening of this Tender).	
1.2	Only those vendors (OEMs) should quote, who have supplied and commissioned in the last Five years (as on the original date of tender opening) at least Two "HIGH TEMPERATURE AGEING FURNACE- Tubular Furnace" in the offered model/design, in India. The so referred furnaces shall be presently working satisfactorily for more than one year from the date of commissioning (as on the original date of tender opening). The name and contact addresses of the customers. to whom the above said furnace were supplied, to be furnished with details.	
1.3	Vendor has to submit at least ONE PERFORMANCE CERTIFICATE for satisfactory performance of "HIGH TEMPERATURE AGING FURNACE - Tubular Furnace" as referred under clause 1.2 above, for a minimum period of one year from the Date of commissioning (as on the original date of tender opening) from their customers in India, supplied and commissioned in the last 05 years. Performance certificate as Original Certificate of from the customer may be submitted through telefax or E-mail directly to BHEL. The original certificate may be returned after verification by BHEL, if required. For obtaining the Performance certificate, a suggestive format is provided in ANNEXURE-A .	

S.No.	TENDER PARTICULARS	VENDOR's RESPONSE
1.4	The vendor's form should be ISO 9001 certified company and the copy of the certificate should be submitted along with technical offer.	
1.5	BHEL reserves the right to verify the information provided by the Vendor for the referred furnace at their referred customer's works. It shall be the responsibility of the vendor to facilitate the visit of BHEL's team at their refereed customer works. The Travel, Board, and Lodging expenses for BHEL Personnel shall be borne by BHEL. In case the information provided by vendor is found to be false / incorrect, the offer shall be rejected. BHEL reserves the right to accept or reject the OEM'S based on the assessment of their technical and financial capability.	

SECTION – II

The BIDDER/VENDOR are requested to provide the following information:-

S.No.	TENDER PARTICULARS	VENDOR's RESPONSE
2.1	The BIDDER / VENDOR to furnish Reference List of Customers, with complete address, details of contact person, where "HIGH TEMPERATURE AGING FURNACE" have been supplied in the past.	
2.2	Specify details of "HIGH TEMPERATURE AGEING FURNACE" supplied to any other unit of BHEL, if any (Year of commissioning with details etc.).	
2.3	Details on SERVICE -AFTER-SALES Set-up in India including the Address of Agent/Service Centers In India.	
2.4	Any Additional data to supplement the manufacturing capability of the BIDDER for the subject equipment.	

SECTION – III

The BIDDER to note:

S.No.	TENDER PARTICULARS	VENDOR's RESPONSE
3.1	The BIDDER shall submit the offer in TWO PARTS - Technical [with PART A & PART B] & Commercial and Price Bid.	
3.2	The Offer shall contain a comparative statement of Technical Specifications given by BHEL and the Offer Details submitted by the Bidder, against each clause. A just 'CONFIRMED' or 'COMPLIES' or 'YES' or 'NO-DEVIATION' or similar words in the technical comparative statement may lead to disqualification of the Technical Offer. In case of any deviations in any of the technical specifications, such deviations should be clearly specified in the comparative statement. All systems and sub systems proposed in the solution should be detailed in description with illustrations/photographs, if required	
3.3	The BIDDER shall assure a continuous support for SPARES and SERVICE for five years, from the date of commissioning of the equipment at BHEL Works.	
3.4	The Technical Offer shall be supported by Product Catalogue and Data Sheets in ORIGINAL and complete technical details / literature on the QUOTED MODELS of HIGH TEMPERATURE AGING FURNACE (s).	
3.5	The Commercial Offer (given with the Technical Offer) shall contain the Scope of Supply and the Un-Priced Part of the Price-Bid, for confirmation for the scope of supply.	
3.6	Earlier performance & field experience (service support) with BHEL (if any) will be a reckoning factor for the technical qualification of the OFFER. Vendor can quote of supply to BHEL units of systems of similar capability.	

ANNEXURE - A

Suggestive Format of Performance Certificate

The Performance should be certified by the customer on Customer's Letter Head and submitted along with the offer.

PERFORMANCE CERTIFICATE

1.0	Type of the Furnace:	
2.0	Supplier's Name and Address	
3.0	Make & Model Number of the Furnace Sub-systems, Temperature Controllers / Recorders and other Major Accessories	
4.0	Month & Year of Commissioning	
5.0	Application for which the Furnace is used	
6.0	FURNACE DETAILS :	
6.1	Size of the Furnace (L X W X H mm)	
	Maximum Operating Temperature	
7.0	Performance of the Furnace (Please tick the appropriate option)	Satisfactory Non Satisfactory
8.0	Service after Sales support given (Please tick the appropriate option)	Satisfactory Non Satisfactory
9.0	Other remarks (if any)	
Date :		Signature & Seal of the Authority Issuing the Performance Certificate

PART B

TECHNICAL SPECIFICATIONS FOR 'HIGH TEMPERATURE AGEING FURNACE / TUBE FURNACES'

S. No.	PARTICULARS & BHEL SPECIFICATIONS		VENDOR's OFFER
1.0	FURNACE CONFIGURATION		
1.1	a) The application of Tube Furnaces is for high temperature ageing studies at 800°C for 3000 hour continuous operation. b) It should contain high quality alumina fiber insulation and molybdenum silicide heating elements. c) A double walled steel internal housing to help minimize heat loss to exterior surface. d) Furnace operation should be controlled by PID programmer cum Digital Temperature controller cum Indicator (40-segment digital controller with built-in RS485 digital communications port and USB adaptor), allowing the user to connect to a PC for remote control and monitoring of the furnace. e) The supply should be for 3 (Three) furnaces of identical design and each furnace should have an independent vacuum creating system,		
2.0	GENERAL SPECIFICATION		
2.1	Shell Construction	M. S. Body and M. S. Angles structure with proper stiffeners and neat powder coat painting	
2.2	Tube material	High purity (99%) Al ₂ O ₃ alumina	
2.3	Tube size	120mmOD x 1m L	
2.4	Heat zone length	300 mm minimum	
2.5	Constant temperature zone	150 mm minimum (both side of the heat zone)	
2.6	Long time working temperature	800°C for longer heating element life	
2.7	Max/Constant working temperatures	1750°C / 1600°C	
2.8	Rated vacuum pressure	0.001 Pa / 0.0075 millitorr / 0.00001 mbar	
2.9	Rated positive pressure	0.02 MPa / 150 torr / 3 psi	
2.10	Refractory lining	High quality 1800 grade fiber alumina	
2.11	Heating element type	Molybdenum Silicide (MoSi ₂)	
2.12	Temperature controller precision	+/- 1°C	
2.13	Electrical requirements	208-240VAC, 50/60 Hz, single phase	
2.14	Power rating	6 KW minimum	
2.15	Max heating & cooling rate	5°C /min above 1200°C and 10°C /min below 1200°C	

S. No.	PARTICULARS & BHEL SPECIFICATIONS		VENDOR's OFFER
2.0	GENERAL SPECIFICATION		
2.16	Temperature Control	PID programmer cum Digital Temperature controller cum Indicator (paperless recorder should be included in the scope of supply)	
2.17	Temperature Sensor	B type thermocouple	
2.18	Power control	through the phase angle controlled thyristor	
2.19	Indications	a) Ammeter b) Mains Indicator c) Output Indicator	
2.20	Control switches	Mains on, out put on	
2.21	Vacuum sealing flange kit	Stainless steel vacuum sealing flanges with one vacuum gauge, two valves and four thermal ceramic blocks	
3.0	END FLANGES		
3.1	Fittings for controlled atm	Stainless steel (SS310) fittings are provided with water cooling arrangement, 'o' ring and suitable for vacuum and purging multiple gases (Water chilling plant should be attached)	
3.2	Multiple ports in the fittings	The above SS fittings have the following ports 1. Evacuation 2.vacuum gauge 3. Gas inlet, 4. Gas inlet	
4.0	WATER COOLER & ACCESSORIES		
4.1	Water chilling unit	A chiller unit to chill the water to circulate the SS fittings for the Recrystallised alumina tube for better vacuum and air purging.	
4.2	Capacity	50 liters tank capacity	
4.3	Temperature controller	Automatic on/off with set temperature Digital temperature controller	
4.4	Cooling	Automatic cooling on/off facility	
4.5	Working temp range	5- 100C	
4.6	Water circulation	20lit/min	
4.7	Wheel mounting	The water chilling plant is constructed with the wheel to move the equipment easily	
4.8	Switches	independent control for chilling plant and water circulation pump	

S. No.	PARTICULARS & BHEL SPECIFICATIONS		VENDOR's OFFER
5.0	VACUUM SYSTEM		
5.1	Ultimate vacuum	$\geq 10^{-6}$ mbar	
5.2	Inlet collar diameter	65mm	
5.3	Power supply	230V $\pm$ 10%, 50 $\pm$ 2 Hz, Single Phase, AC supply	
5.4	Rotary Pump		
5.4.1	(I) Displacement capacity	100liter/min	
5.4.2	(II) Ultimate vacuum	10 $^{-3}$ mbar	
5.5	Diffusion Pump		
5.5.1	(I) Effective pumping speed	125 liter/sec	
5.5.2	(II) Nominal dia	65mm	
5.6	Vacuum measuring gauges		
5.6.1	(I) Pirani gauge	Two pirani gauges heads 0.5 to 0.001 mbar through a selector switch 1 no.	
5.6.2	(II) Penning gauge	metal gauge head 1st range 1 x 10 $^{-3}$ to 1 x 10 $^{-5}$ mbar, 2nd range 2 x 10 $^{-5}$ to 1 x 10 $^{-6}$ mbar	
5.7	High vacuum valve	To facilitate isolation of the diffusion pump	
5.8	Safety device	(I) A water flow switch in the water circulation Line of the unit to protect the diffusion pump in case of water supply failure/low pressure (II) Over load protection devices for the vacuum pump motor and diffusion pump	
5.9	Mounting frame	All the above components are to be housed in an MS frame with a front panel for mounting gauges and controls. The valve control knobs are towards the front of the frame. The unit is to be mounted on 4 wheels for easy maneuverability.	
5.10	Vacuum	10 $^{-5}$ mbar possible up to 1400 deg C only.	

S. No.	PARTICULARS & BHEL SPECIFICATIONS		VENDOR's OFFER
6.0	MASS FLOW CONTROLLERS		
6.1	Mass flow controllers	Three mass flow controllers should be provided. MFC 0-200 sccm – 3 NUMBERS **(for O2, CO2, NO2 GASES etc)	
6.2	Pipe lines	High Pressure stainless steel pipe lines from -1/4" OD / HP with necessary valves	
7.0	ACCESSORIES AND SPARES (for all the three furnaces)		
7.1	Stainless steel vacuum sealing flange set with pressure meter	6 set	
7.2	Alumina tube 1000 mm length	10 pcs	
7.3	Flow meter	6 pc	
7.4	Spare heating element	20 pcs	
7.5	Alumina ceramic thermal block	20 pairs	
7.6	Thermal gloves	20 pair	
7.7	High temperature Al2O3 alumina crucible	100 pcs	
7.8	Spare fuse	25 Nos.	
7.9	USB/RS485 computer interface kit	3 set	
7.10	Connecting hoses	20 meter length	
7.11	Spare thermocouples	2 pcs	
7.12	Gas mixing chamber –	3 number for mixing of three or more different gases with different ratios	
8.0	ACCEPTANCE CRITERIA		
	1. Furnace casing should be GLP & GMP compliant Non Rust textured stainless steel 2. Advanced Thyristor power control for no noise control 3. Vendor must show the maximum vacuum which is mentioned in the specification at the time of inspection at Vendor's Works		

S. No.	PARTICULARS & BHEL SPECIFICATIONS	VENDOR'S OFFER
9.0	INSTALLATION & COMMISSIONING	
	a) Installation & Commissioning of the furnace and other accessories/attachments with all electrical & mechanical connections shall also be responsibility of the vendor. b) Successful proving of BHEL components by the supplier shall be considered as part of commissioning for the machine. All features and functions, as mentioned at Machine Acceptance shall also be part of the commissioning activity. c) Commissioning spares, required for commissioning of the complete furnace within stipulated time, shall be brought by the supplier on returnable basis. d) Terms & conditions for Erection & Commissioning should be furnished in detail separately by vendor along with offer.	
10.0	TRAINING OF BHEL PERSONNEL	
	a) Training of BHEL furnace operators in operation of complete machine & accessories etc. by the supplier's experts / engineers during their stay at BHEL works. b) Training of BHEL maintenance personnel in maintenance of complete furnace & accessories etc. by the supplier's experts / engineers during their stay at BHEL works. c) Training of BHEL Instrumentation personnel in programming and maintenance of controller in detail to be provided at company's specialised training center or at BHEL works by supplier's experts/engineers.	

S. No.	PARTICULARS & BHEL SPECIFICATIONS	VENDOR'S OFFER
11.0	GUARANTEE:	
	Guarantee for complete Furnace and all supplied accessories/attachments/equipment's/items for 18 months from the date of acceptance of the machine.	
12.0	DOCUMENTATION:	
	a) Three sets of following documents (Hard copies) in English language should be supplied along with the furnaces b) Operating Manuals of Heat Treatment Furnace and Vacuum Generating System. c) Detailed Maintenance Manual of the furnace with all drawings of machine assemblies/sub-assemblies/parts including Electrical / Electronic circuit diagrams. All Assembly/ Sub Assembly Drawings shall be supplied with the part list also. All Electrical schematic, wiring diagram, cable layout and junction box diagram, circuit diagram and interface diagram of Electronic PCB's used in the Furnace. d) Catalogues, Operation & Maintenance Manuals of all bought out items including drawings, wherever applicable. e) Detailed specification of all rubber items and pneumatic fittings f) Complete list of parts/items (Bill of materials) used in the furnace in English language. g) One additional set of all the above documentation on CD ROM, wherever possible. h) Calibration certificate of all controllers are to be provided	