



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 7360/7775 Fax : +91 431 252 0031 Email : ajay@bheltry.co.in viren@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	2631700083	08.11.2017	08.12.2017

You are requested to quote the Enquiry number, date and due date in all your correspondences. 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	Qty.
10	"Flux Baking Oven" as per the technical specification, BHEL commercial terms & conditions applicable (to be downloaded from web site www.bhel.com or https://eprocure.gov.in)	01 No.

Important points to be taken care during submission of offer:

1. Delivery terms shall be FOR BHEL Stores, Trichy-620014.
2. Compliance Form No.:TRY/IND/08 to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.
3. Delivery required 4 months from the date of purchase order.
4. Erection and commissioning shall be done at BHEL, Trichy by the supplier.
5. Erection & Commissioning period required 4 Weeks from the date of intimation by BHEL to vendor for deputation of their Engineers for E&C.
6. EMD: Not Applicable.
7. 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/GENL001), commercial Terms check list (Compliance Form) and Technical Specification can be downloaded from BHEL web site <http://www.bhel.com> or from the Government tender <https://eprocure.gov.in> under Enquiry reference "2631700083".

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.

PART - A
QUALIFYING CRITERIA FOR FLUX BAKING OVEN

S.No	BHEL Specification	Vendor's Offer
1.0	QUALIFYING CRITERIA	
1.1	The BIDDER / VENDOR (OEM) shall have a minimum of TEN Years of Continuous Experience in the Design, Manufacture & Supply of "ELECTRIC OVENS/ELECTRIC FURNACES". Vendor may indicate the actual no. of years of experience in the field	
1.2	Only those vendors (OEMs), who have supplied and commissioned at least ONE number of INDUSTRIAL ELECTRICALLY OPERATED FLUX BAKING OVEN WITH TEMPERATURE CONTROL AND WITH CHARGE CAPACITY OF 30KG OR MORE AND RATED TEMPERATURE OF 400 DEG C OR HIGHER in the last TEN years should quote.	
1.3	Vendor has to submit at least one Performance Certificate from their customers, for satisfactory performance of INDUSTRIAL ELECTRICALLY OPERATED FLUX BAKING OVEN WITH TEMPERATURE CONTROL AND WITH CHARGE CAPACITY OF 30KG OR MORE AND RATED TEMPERATURE OF 400 DEG C OR HIGHER as indicated in clause 1.2 , and is presently working satisfactorily for a minimum period of one year (as on date of opening tender (first date)). For obtaining the Performance certificate, a suggestive format is provided.	
1.4	BHEL reserves the right to verify the information provided by the vendor. In case the information provided by the vendor is found to be false/ incorrect, The offer shall be rejected.	

2.0	INFORMATION TO BE PROVIDED BY VENDOR	
2.1	Number of FLUX BAKING OVENS supplied and commissioned till date.	
2.2	The BIDDER/VENDOR to furnish Reference List of Customers with contact details	
2.3	BIDDER/VENDOR to furnish the PO details if supplied to any of the BHEL units till date	
2.4	Contact details(phone no & email id) including the Address of Agents / Service Centres in India to be provided	

Suggestive Format of Performance Certificate:

The performance certificate should be produced **on Customer's Letter Head.**

Date:

PERFORMANCE CERTIFICATE

- 1 Type of the Oven- Electrically operated: YES/NO
(Strike off whichever is not applicable)
- 2 Equipment used for :Flux baking-YES/NO
(Strike off whichever is not applicable)
- 3 Supplier of the Equipment
- 4 Month and Year of commissioning
- 5 Maximum charge capacity of the equipment in kgs:
- 6 Maximum temperature range of the equipment in Deg.C:
- 7 Temperature control available in the equipment: Yes/No
(Strike Off whichever is not applicable)
- 8 Types of jobs used in this equipment:
- 9 Performance of the equipment : Satisfactory / Not satisfactory
(Strike off whichever is not applicable)
- 10 Service after Sales: Satisfactory/Not satisfactory
(Strike off whichever is not applicable)
- 11 Any other remarks:

Signature & Seal of the Authority
Issuing the Performance Certificate

Date:
Name:
Designation:
Email ID:
Office No:

PART-B

SPECIFICATION FOR FLUX BAKING OVEN

No. of Flux baking ovens: 01 No

The flux baking oven is required for heating and baking the Welding-Flux used for Submerged Arc Welding process. The welding flux will be held in a metallic tray and loaded in the oven manually. While one tray of flux is under baking, another tray will be kept as standby for next loading. The oven should have a feature of maintaining the inside temperature through programmable automatic temperature controller system. It should have a Digital display arrangement for reading the oven present and set temperature simultaneously.

Sl. No.	Description	Specification	BIDDER'S OFFER
1.0	Type	Electric flux baking oven	
1.1	Operating Temperature range	Ambient to 400 deg.C	
1.2	Rate of Heating	150 to 200 deg. C / hr- Variable type. User can define/program the rate of heating	
1.3	Power rating (kW)	Bidder to specify.	
1.4	Input power supply	415V $\pm$ 10%, 50Hz, 3Ph (3 wire system – without neutral)	
1.5	No.of flux holding trays	Two Trays to be provided (One tray will be in the oven while another tray will be kept as standby)	
1.6	Temperature controller	The oven should be capable of heating the flux at various temperature values set for the duration as programmed. Minimum 2 programs can be stored.	
1.7	Temperature Tolerance	Within +/- 5 deg. C of set temperature	
2.0	Heating chamber Construction		
2.1	Effective heating chamber dimensions	Bidder to design the heating chamber size based on the tray dimensions for maintaining uniform heat transfer and circulation. Loading of ONE tray per cycle has to be considered. However considering maintenance aspects of replacing/rectification of internal parts/heating elements inside the chamber-Minimum clear heating chamber of 650mm x 550mm x 450mm to be provided. Vendor to provide the proposed design details.	
2.2	No.of Trays per cycle	One.	
2.3	Supports for the trays	Suitable handling supports in stainless steel (SS 304) to be provided to hold the tray and convenient for loading and unloading. Vendor to provide the details.	
2.4	Outer shell construction	The outer shell shall be of MS plates of suitable thickness. Vendor to specify the thickness. The construction of oven frame and outer shell shall be rigid enough to avoid distortion due to heat and mechanical handling The entire oven can be supported on four legs of around 100mm height. <i>3.2mm</i>	
2.5	Internal material	The inner wall shall be made of minimum 2mm SS 304 to withstand temperatures of up to 400 deg. C on continuous duty.	

2.6	Insulation	The construction of insulation between inner shell and outer shell of the oven shall be with ceramic fiber blanket of suitable thickness and density in order to maintain the skin temp. Vendor to provide details of insulation	
2.7	Skin temperature on continuous duty	The skin temperature on all outer walls and door shall not exceed 60 deg C. The ambient temperatures varies between 35 deg C and 45 deg C. Suitable insulation design details to be provided.	
2.8	Safety	The Oven should be provided with suitable earthing arrangements as IE regulations. The Oven door shall be electrically interlocked to shut off power when door in open condition.	
2.9	Oven Door	a. Oven shall be of single door type construction and loading should be done from the front side of the furnace. b. Handle should be provided on the door for opening and closing of the door. Handle grip should be provided with heat resistant material for easy closing and opening the door even during hot conditions. Also the handle should be designed to ensure that enough gap is available between door and handle for easy gripping even with glove hands. c. Suitable door locking mechanism shall be provided. The door locking shall be tight enough to prevent any hot air from inside the furnace escaping through the gaps. It shall be leak proof. Proper design care and insulation to be provided to avoid any leakage through the door d. The door position should be firm and should not shift with self-weight. Suitable Heavy duty hinges to be provided. e. The automatic engagement of temperature control switch with door while opening and closing to be ensured for long trouble free working life of the oven.	
2.10	Fan for circulation	a. The fan and motor to be mounted on the top. b. The fan to be connected to the motor by a belt drive so that the motor shaft does not get heated up. Forced air circulation is effected by an external pedestal/ flange mounted, belt driven motor for uniformity of inner chamber temperature. c. Vendor to specify motor capacity. d. Make of motor to be Crompton / Bharat Bijlee, NGEF/ABB/KEC/ Siemens. e. Noise level should not exceed 85 dB f. Motors shall conform to IEC or Indian standards	
2.11	Heating Elements	Ni-Cr 80/20 resistance wires in the form of coils. Vendor to confirm and specify the wire size and its melting point. Make: KANTHAL (A-1grade) OR any other make acceptable to BHEL. The original manufacturer's certificate for resistance wire shall be provided with oven. Heating element drawing showing the constructional aspects & dimensional details are to be submitted along with offer.	
2.12	Heating elements supporting ceramic	The heating elements to be supported by ceramics at regular intervals to ensure proper support. Vendor to	

		provide the dimension of heating elements and its supporting features	
2.13	Design of Heating Elements	Bidder to furnish heating element design drawing with all relevant design details. Mounting of heating elements to be clearly indicated.	
3.0	Flux holding tray		
3.1	No.of trays in the chamber at any time	ONE	
3.2	Flux holding capacity of tray	30 kg	
3.3	Material	Minimum 3.15mm Stainless Steel sheet (SS 304) suitably reinforced. Vendor to specify the thickness	
3.4	Tray dimensions	600mm x 450mm x 100mm (DxWxH). Refer annexure-1	
3.5	Handle	Suitable handle to pull or push the tray by hand, to be provided as shown in the sketch	
4.0	Flux properties to be considered by the bidder for designing		
4.1	Flux	Agglomerated, fused and bonded	
4.2	Grain size	12 to 65 in Tyler Mesh	
4.3	Bulk density	1.1 to 1.8 kg per litre	
5.0	The control panel should consist of the following:		
5.1	DIGITAL PROGRAMMABLE TEMPERATURE CONTROLLER (PID Controller)		
5.2	a. Display : Minimum 4 digit display b. Display Parameter : simultaneous colour display of PV, SV with units and out put c. Input : Universal (T/c inputs, RTD, mA, mV etc.) with user selectable d. Scale and Unit : User selectable e. Panel cut out size : 92X92 mm f. Alarm output : Relay. g. Operating ambient: 0 to 50 deg C, h. Configuration and programming: Through Front panel key. i. Accuracy : 0.25% of FSV j. No of program : Minimum 2 program k. Program pattern : Configurable for Ramp, Soak & cool (Min 16 steps/ program) l. Cold junction compensation: Automatic m. Power supply : Single phase 230 VAC $\pm$ 10%. n. Auto tuning : To be provided to perform precision control o. Standard Calibration facility: Standard error adjustment facility to be provided through front panel key. p. Front Panel key: Membrane keypad/ Bezel keypad (Miniature switch cover with sheet is not acceptable).		
5.3	The controller to be calibrated and the calibration certificate to be provided along with the equipment		
5.4	Make of the controller	Eurotherm /Honeywell/Yokogawa/Chino/Fuji	
5.5	Thermocouple	'K' Type thermocouple (duplex) with suitable compensating leads.	
5.6	Switches	(i) Fan motor control push button (ii) Control power ON-OFF switch (iii) Heater element contactors (iv) Reset button	

5.7	Indicators	(i) Mains on indicator for three phases separately (ii) Fan on indicator (iii) Heater on indicator	
5.8	Control Transformer	Control transformer for Single phase supply for control unit to be provided.	
6.0	Location of the control panel: It is preferable that the control panel can be annexed to side of the furnace with adequate protection from heat and vibration. However if it is not possible, then it can be kept separately. All the options as per 5.7 and 5.8 shall be provided at front face of the panel. Vendor to provide details.		
7.0	Safety temperature controller: ON/OFF type temperature controller shall be provided to switch off the oven if the temperature of the oven exceeds the maximum SET point of PID controller. Separate contactor (different from the control contactor) to be provided for actuation from the excess/safety temperature controller. This should switch-off the main power in case the control contactor gets jammed.		
7.1	Safety protective sheet: Safety protective sheet with holes/ deflectors to avoid heating elements in direct contact with the tray or the operators to be provided. Cables/ wires : All cables/wires etc coming inside the oven should be minimum 50mm from the inside base to avoid short circuit or flux clogging and for easy cleaning. Screws: All screws used in the oven should be made up of SS 310 material. The screw head should be of hexa type there by enabling easy removable even after continuous heating cycles.		
8.0	Spares		
8.1	O&M spares (Electrical and mechanical) are to be supplied along with oven: a) Heating elements - 2 sets (Each set must have the entire heating coils used for 1 phase in an equipment) b) Thermocouple - 2 Nos. c) Fan to motor belt - 1 No d) On/Off switch - 1 No e) Ceramic supports - 1 Set (1 set means heating entire supports used in one oven)		
9.0	General		
9.1	Painting: Durable powder-coated steel exterior with 2 coats of SIEMENS grey RAL 7032 shade for all non-working surfaces. The control panel shall be with one primer coat and 2 coats of SIEMENS grey paint.		
9.4	O&M manuals: Three copies of the detailed Operation and Maintenance manual and safety instructions in English to be provided along per equipment. The temperature controller operation & maintenance manual-1 No to be provided		
9.5	Pre Dispatch Inspection: The equipment shall be offered for inspection prior to dispatch at vendors works. One set of documentation to be offered at the time of inspection		
9.6	Commissioning: Supplier to commission the equipment at BHEL works.		
9.7	Performance Guarantee: The equipment performance shall be guaranteed for a minimum period of 12 months from the date of commissioning or 18 months from the date of dispatch whichever is earlier		

Technical Drawings to be provided along with the offer.

Without these drgs along with the offer, the offer is liable for rejection.

1.	General arrangement drawing for the oven shall be provided with the offer along with dimensions	
2.	Insulation type, material, thickness and make to be indicated in the drg	
3.	Details like rating, specification, make of electric and mechanical bought-out items shall be listed in the general arrangement drawing.	
4.	Heating element drg and its location, supporting details to be provided	
5.	Electric control drg should be provided	

Enclosure: Annexure-1-Tray

Annexure I

FLUX HOLDING TRAY

SKETCH (Not to scale)

