



An ISO 9001
Company

Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirapalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

ENQUIRY

NOTICE INVITING TENDER

Phone: +91 431 257 7421/7297

Email : vkaruna@bhel.in

: hari.r@bhel.in

Web : www.bhel.com

TWO PART BID

Tender to be submitted in two Parts

Enquiry
Number:

2631900075

Enquiry
Date:

18.12.2019

Due date for submission
of quotation:

10.01.2020

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 should reach physically on or before 14.00 Hrs(IST) on the Date of tender opening. Tenders received after 14.00Hrs (IST) will not be considered for evaluation.

Item	Description	Quantity	(Indigenous Vendors) Matl. Will be Delivered to
10	"Bomb Calorimeter" as per the technical specification & commercial conditions applicable(To be downloaded from web site www.bhel.com/tender/tender_home.php or https://eprocure.gov.in/epublish/app)	1.00 No.	FOR, BHEL,Stores, High Pressure Boiler Plant, Tiruchirappalli - 620014

Important points to be taken care during submission of offer

- 1) Delivery terms shall be FOR BHEL Stores, Trichy for indigenous vendors.
- 2) By Foreign Vendors: CFR Chennai Seaport / Airport
- 3) Compliance Form MM/ CE/ TRY/ IMP / 03 (for foreign vendors) and MM/ CE/ TRY/ IND / 03A (for indigenous vendors) to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.
- 4) Delivery period required is 4 months from the date of Purchase Order.
- 5) Erection and commissioning activities shall be done by the supplier, at BHEL Trichy works.
- 6) Time period required for Erection and Commissioning activities shall be 1 weeks from the date of intimation by BHEL
- 7) EMD applicable for this Enquiry is INR 40,000/-
- 8) 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 / GENL / 001-EMD) including bank guarantee formats and list of consortium banks, commercial terms check-list can be downloaded from BHEL web site www.bhel.com/tender/tender_home.php or from the Government tender website <https://eprocure.gov.in/epublish/app> under Enquiry reference 2631900075 .

Tenders should be submitted before 14.00Hrs (IST) 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

DGM / Capital Equipment / MM

V. KARUNAKARAN
Dy. General Manager
Capital Equipment / MM
BHEL / Tiruchirappalli - 620 014

BOMB-CALORIMETER FOR FUEL ANALYSIS, Qty. 1 no.

PART A

SECTION 1: Qualifying Criteria

The Bidder has to compulsorily meet the Qualifying criteria indicated in SECTION 1 to get qualified otherwise the technical offer will not be considered.

Sl. No.	BHEL Specification	BIDDER'S OFFER along with details
1.1	a) The bidder/OEM shall have a minimum of 10 years of continuous experience in the field of Design, manufacture and supply of bomb-calorimeter b) In case the offer is submitted by an agent, the Authorization letter from OEM should be attached along with the offer. c) The country of origin and manufacturing country shall be specified clearly with details.	
1.2	Only those bidders/OEMs who have supplied, and commissioned in India/abroad at least five nos. of bomb-calorimeter of the quoted model in the past 5 years (on the date of opening of tender) and such equipment is presently working satisfactorily for more than one year after commissioning (on the date of opening of tender) should quote. The details of the model, commissioning date, number of units commissioned shall be provided. Relevant purchase order copies shall be submitted along with the offer.	
1.3	The bidder shall submit at least one Performance certificate from any of their customers for satisfactory performance of bomb-calorimeter of the quoted model for a period of at least 1 year from the date of commissioning. A suggestive format of performance certificate is given in Annexure	
1.4	BHEL reserves the right to verify the information (part A & B) provided by the Vendor. In case the information provided by the vendor is found to be false/ incorrect, the offer shall be rejected.	

SECTION 2: The Bidder is requested to provide the following information:

S. No.	PARTICULARS	BIDDER'S RESPONSE
2.1	Product Information: The supplier has to give following information about the quoted model. Model Name, Year of launch of the Model, Name and postal address, email, mobile numbers of the customers / company where offered model has been supplied and working well.	
2.2	The BIDDER shall give details about supply of similar equipment to other BHEL units if any with Make, Model and Year of Supply & Commissioning etc.	
2.3	Servicing facility to be available in India. Details on Service-After-Sales Set-Up in India (Address of Agents / Service Centres), to be furnished compulsorily.	
2.4	Any Additional Data to supplement the manufacturing capability of the BIDDER.	

SECTION 3: The Bidder to comply with the following:

S. No.	PARTICULARS	BIDDER'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 BIDDER'S RESPONSE column against each clause in PART A & B of the offer should be filled by the Bidder compulsorily with complete details.	
3.3	The Bidder shall assure a continuous support for Spares and Service for 10 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 and complete technical details / literature on the quoted models.	
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.	

PERFORMANCE CERTIFICATE

(A suggestive format)

1 Supplier Name :

2 Make & Model Name of the bomb-calorimeter :

3 Month & Year of Commissioning :

4 After sales service: Satisfactory / Not Satisfactory:

(Strike off whichever is not applicable)

5 Any Other remarks :

6 Performance of the bomb-calorimeter :

Whomsoever it concerns, we M/s. (Company Name) have purchased bomb calorimeter(s) from the supplier (M/s. Supplier Details) as detailed above and we vouch that instrument(s) is/are working Satisfactorily / Not Satisfactorily (Strike off whichever performance option is not applicable)

Date:

**(Signature & Seal of the
Authority
Issuing the Performance Certificate)**

BOMB-CALORIMETER FOR FUEL ANALYSIS, Qty. 1 no.

PART B – Technical Specification

Sl.No.	BHEL Specification	Bidder's Offer with technical details
1.0	Description: The intended bomb calorimeter is a bench top apparatus used for the measurement of heat of combustion (gross calorific value) of mainly solid fuels such as various grades of coal and different liquid fuels. The bomb calorimeter shall work wholly under the principle of isoperibol mode (as per 3.1.6 BIS 1350 2017 PART 2) using dedicated microprocessor based control and measurement system. The calorimeter shall have automated external water cooling system for thermal stabilization of the calorimeter components.	
2.0	Temperature Measuring Resolution shall be ≤ 0.0001 ° C. Precise thermocouples shall be provided for the continuous monitoring of both calorimeter vessel (bucket) temperature and jacket temperature.	
3.0	The bomb calorimeter must have capacity to measure the calorific value of minimum 9000 kcal/kg. The combustion bomb supplied along with instrument shall be of measuring this calorific value.	
4.0	Sample Size: Max: min 0.2 g to max 1.0 g	
5.0	Precision Range: ≤ 0.5 % (RSD) in standard Benzoic Acid measurements.	
6.0	Analysis Time: When combustion bomb has been prepared and ready to be immersed in the bucket, the total time required for the measurement of the sample including the time taken for feeding the parameters into machine, the time taken for the instrument to ignite the sample and measuring, reporting the calorific value shall not exceed 15 minutes.	
7.0	I. Oxygen Pressure (Max): The combustion bomb shall be capable of withstanding the oxygen gas pressure minimum of 30 atm. II. Oxygen filling shall be carried out by specially designed filling valve so that after achieving the required set pressure in the bomb or after attaining 30 atm pressure, gas filling shall be automatically cut-off.	

Sl.No.	BHEL Specification	Bidder's Offer with technical details
	III. For monitoring the oxygen gas filling to the required pressure, a regulator equipped with two nos. of liquid free pressure gauges shall be supplied. IV. Relief valve for venting out the excess pressure over and above 30 atm in the filling line shall also be provided and shall be built in the regulator body.	
8.0	Resolution of the calorimeter shall be ≤ 0.1 g/cal	
9.0	Jacket Cooling: The calorimeter should be working based on the principle of isoperibol method where the outer jacket temperature is maintained in a constant temperature (isoperibol) by an external water circulation system. The water circulation system shall also be accompanied with a chiller for immediate cooling of the jacket temperature and maintaining the same throughout the analysis period in high ambient temperature. (as per A1.4. ASTM D 240 17 and B 3.1.6. BIS 1350 2017 part 2)). The water handling system shall be of imported origin and shall be coupled with auto pipette of 2000 ml capacity for filling the bucket. Jacket and calorimeter vessel (bucket) shall be sufficiently separated by an insulating medium e.g. air gap to avoid heat leakage.	
10.0	Repeatability Error: Repeatability error for the calorific value analysis shall be contained within ≤ 18 cal/g	
11.0	<i>Oxygen Bomb</i>: 01 Nos. shall be supplied along with the instrument with measuring capacity as per sl.no. 3 of technical specification. The oxygen bomb is to have an internal volume of $350 \text{ mL} \pm 10 \text{ mL}$. All parts are to be constructed of materials which are not affected by the combustion process or products; sufficiently to introduce measurable heat input or alteration of end products. If the bomb is lined with platinum or gold, all openings shall be sealed to prevent combustion products from reaching the base metal. The bomb must be designed so that all liquid combustion products can be completely recovered by washing the inner surfaces. There must be no gas leakage during a test. The bomb must be capable of withstanding a hydrostatic pressure test to a gauge pressure of 3000 psi (20 MPa) at room temperature, without stressing any part beyond its elastic limit. A test certificate for this hydro test	

Sl.No.	BHEL Specification	Bidder's Offer with technical details
	shall be submitted along with the bomb (as per A1.2 ASTM D 240). The MOC of the oxygen bomb shall be declared.	
12.0	The calorimeter shall be supplied with provisions for imparting thermochemical corrections for nitrogen, sulphur, ash, moisture and thermal radiation. This has to be demonstrated during commissioning.	
13.0	Sample Crucible: Sample Crucibles -5 no, 25 mm dia, 20 mm depth, 0.5 mm thickness shall be supplied. When combustion of the coal sample is carried out, ash is formed as a byproduct. To contain and avoid the expulsion of the ash product from the crucible during fierce combustion reaction, the sample crucibles are to be supplied with walls in a shape tapering inwards top down. The crucible shall be made up of nickel chromium alloy resistant to the corrosive reaction of the sulphur based products emanating from the solid fuel combustion mainly coal, liquid fuels. The sample holding capacity of crucible shall be min 1.5 g.	
14.0	Calorimeter vessel (bucket) should be removable / fixed and combustion bomb should be removable from the system as and when required for the regular operation of the instrument. The MOC of the bucket shall be declared.	
15.0	Instrument Control: The bomb calorimeter shall be equipped with a user friendly software based interface for feeding the test parameters and carrying out auto ignition of sample, auto measurement of various parameters up to the end of analysis of calorific value (GCV). In this regard it can have a separate input system such as a PC or it can have onboard control system with color LCD display with input peripherals. The calorimeter should have options for getting the data such as temperature increase vs time, energy release vs time. This feature should have demonstrated during commissioning.	
16.0	Essential Accessories to be supplied along with the instrument as standard scope of supply: 1. Pre calibrated Analytical Balance of make "Mettler Toledo "with precision up to ≤ 0.0001 g with certified class F1 standard weights max. 200 g. 2. One bottle of NIST certified reference coal sample of min 100 g specified with proximate, ultimate and gross calorific value.	

Sl.No.	BHEL Specification	Bidder's Offer with technical details
	3. Test certificate for the oxygen gas regulator as per applicable international guidelines, codes. 4. Calibration certificate for combustion bombs from OEM for ascertaining the applicability in the measurement of calorific value in the calorimeter as per applicable international guidelines, codes. 5. 200 numbers of pellets of benzoic acid (each 1.0 gram) shall be supplied along with the instrument with test certificates for calorific value. 6. Fuse Wire: minimum 2.0 m length or 80 inches shall be supplied. 7. Auto pipette system for filling the bucket with 2000 ml of water shall be supplied. 8. The instrument should have provisions for connecting a dot matrix printer for printing the results. If any printer driver software required for such connection the instrument shall be supplied suitable arrangement in their software interface referred in sl.no.15.0. 9. Connecting cables and peripherals shall be supplied along with the instrument, printer connection cables, connectors shall also be supplied during commissioning.	
17.0	Power Supply: The instrument should work at the input power supply of 230 V, 50Hz.	
18.0	Operation and Maintenance manual: Documentation in hard copy (1 set) and soft copy in CD (1 no.) to be provided along with the equipment	
19.0	Spares and Consumables: All required consumables and spares shall be supplied along with instrument for the continuous operation of two years after commissioning. Acceptance required. Bidder to confirm to provide Spares support for the instrument for at least 10 years.	
20.0	All the necessary spares, consumables and accessories required for successful installation and commissioning should be provided as standard scope of supply by the supplier and availability of such items shall be ensured by supplier at site during installation and commissioning activity. The supplier has to demonstrate the methodology of operation and calibration & corrections of equipment and impart adequate training to laboratory staff for this purpose.	

Sl.No.	BHEL Specification	Bidder's Offer with technical details
21.0	Commissioning & Installation: Commissioning and Installation has to be carried out by the supplier at BHEL, Trichy works.	
22.0	Warranty: "Two years from the date of commissioning ".	