



An ISO 9001  
Company

## Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT/ MATERIALS MANAGEMENT

### ENQUIRY

### NOTICE INVITING TENDER

Phone: +91 431 257 70 49

Fax : +91 431 252 07 19

Email : [csguna@bheltry.co.in](mailto:csguna@bheltry.co.in)

Web : [www.bhel.com](http://www.bhel.com)

<b>TWO PART BID</b>	<b>Enquiry Number:</b>	<b>Enquiry Date:</b>	<b>Due date for submission of quotation:</b>
Tender to be submitted in two parts.	<b>2620900226</b>	<b>10.10.2009</b>	<b>12.11.2009</b>

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	<b>250 KN Capacity Dynamic Test System</b> as per the technical specification, general guidelines instructions & commercial conditions applicable (to be downloaded from web site <a href="http://www.bhel.com">www.bhel.com</a> or <a href="http://tenders.gov.in">http://tenders.gov.in</a> )	<b>1 No</b>

#### Important points to be taken care during submission of offer

1. Delivery required 9 months from the date of purchase order.
2. Grace period of 2 months beyond the above delivery period will be considered.
3. Checklist to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.

**BHEL's General guidelines / instructions (refer MM/CE/GT/001) including bank guarantee formats and list of consortium banks, commercial terms check-list 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 "2620900226".**

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

Sr.Manager / MM / Capital Equipment

**PART A****QUALIFYING CRITERIA FOR SUPPLY OF  
UTM-DYNAMIC TEST SYSTEM 250 kN CAPACITY WITH  
HIGH TEMPERATURE & FATIGUE TEST FACILITY****SECTION – I**

The BIDDER / VENDOR has to compulsorily meet the following requirements to get qualified for submitting an offer for the impact tester.

<b>S. No.</b>	<b>REQUIREMENTS</b>	<b>VENDOR's COMMENTS</b>
<b>1.0</b>	The BIDDER / VENDOR shall have a minimum of FIVE Years of Continuous Experience in the Design, Manufacture & Supply of UTM 250kN – Servo Electric / Hydraulic Closed Loop Quasi Dynamic System. Indicate the actual experience.	
<b>2.0</b>	The BIDDER / VENDOR shall have supplied at least one number of UTM 250kN – Servo Electric / Hydraulic Closed Loop Quasi Dynamic System in the last Five years. Indicate the number of equipments sold in India	
<b>3.0</b>	The BIDDER / VENDOR shall have supplied at least one number of UTM 250kN – Servo Electric / Hydraulic Closed Loop Quasi Dynamic System (of the MODEL quoted) within the last five years. Kindly confirm and indicate the number of equipments (quoted model) sold around the world.	
<b>4.0</b>	Reference List of Customers and Performance Certificate from CUSTOMER with full contact details of CONTACT PERSON.	
<b>5.0</b>	BHEL reserves the right to verify the information provided by vendor. In case the information provided by vendor is found to be false/ incorrect, the offer shall be rejected.	

<b>6.0</b>	DELIVERY - The bidder shall quote the best possible delivery. However the delivery shall not exceed 9 months with an additional grace period of 2 months. The additional grace period will attract a penalty which is explained in the commercial terms of the enquiry. The delivery period shall be reckoned from date of purchase order to despatch from the vendor works.	
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## **SECTION – II**

The BIDDER / VENDOR has to necessarily provide the following details, for making an assessment of the firm's capability and competency:

[The BIDDER is expected to give complete details against each clause in the table given below and wherever necessary an additional sheet may be attached (giving clear reference number) to cover the required details]

<b>S. No.</b>	<b>PARTICULARS</b>	<b>VENDOR's RESPONSE</b>
<b>7.0</b>	Number of Years of Experience of the BIDDER/ VENDOR in the field of design, manufacture and supply of 'UTM 250kN – Servo Electric / Hydraulic Closed Loop Quasi Dynamic System'	
<b>8.0</b>	Number of UTM 250kN – Servo Electric / Hydraulic Closed Loop Quasi Dynamic System supplied, installed and commissioned till date, in the following category (in India and other countries)	
<b>9.0</b>	YEAR of LAUNCH of the Model quoted against this ENQUIRY	
<b>10.0</b>	Is there any other model launched after the quoted Model? Otherwise, indicate the likely year in which the next model is likely to be launched	

<b>11.0</b>	Number of UTM 250kN – Servo Electric / Hydraulic Closed Loop Quasi Dynamic System supplied, installed and commissioned till date in the QUOTED MODEL	
<b>12.0</b>	Number of UTM 250kN – Servo Electric / Hydraulic Closed Loop Quasi Dynamic System supplied, installed and commissioned till date for the following category of CUSTOMERS (within INDIA): a)Government Organizations b)Private Sector Companies [Large Scale Industries]	
<b>13.0</b>	Number of UTM 250kN – Servo Electric / Hydraulic Closed Loop Quasi Dynamic System supplied, installed & commissioned till date in the following Category (around the GLOBE) : a)Universities b)R&D Labs c)Reputed Heavy Engineering/Manufacturing Firms	
<b>14.0</b>	Details of Design Set-Up and Technology Back-Up assured for the Principal Equipment Maker	
<b>15.0</b>	Details on International Standards followed in Design of the Equipment (including Analysis Methodology and Calibration of Equipment)	
<b>16.0</b>	Comprehensive Details on Performance Testing - of the Equipment quoted, to be ensured in presence of BHEL Engineers, before dispatch	
<b>17.0</b>	Details of Quality System followed (Kindly furnish the salient aspects of the QA system followed)	
<b>18.0</b>	Details on SERVICE-AFTER-SALES Set-Up in India including the addresses of Agents / Service Centre's in India and Asia	
<b>19.0</b>	Any Additional Data to supplement the manufacturing capability of the BIDDER	

**SECTION – III**

The BIDDER / VENDOR has to comply with the following, for accepting the Technical Offer for scrutiny by the Purchaser:

<b>S.No.</b>	<b>REQUIREMENTS</b>	<b>VENDOR's COMPLIANCE</b>
<b>20.0</b>	The BIDDER / VENDOR shall submit the offer in TWO PARTS - Technical [ <b>with PART A &amp; PART B</b> ] & Commercial and Price Bid.	
<b>21.0</b>	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.	
<b>22.0</b>	The BIDDER / VENDOR shall assure a continuous support for SPARES and SERVICE for TEN Years, from the date of commissioning of the equipment at BHEL Works.	
<b>23.0</b>	The Technical Offer shall be supported by Product Catalogue and Data Sheets in ORIGINAL and complete technical details of 'Bought-Out-Items' with copies of Product Catalogue and Selection Criteria	
<b>24.0</b>	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	
<b>25.0</b>	The reference List of Customers shall be accompanied with the details (Phone Number /E-Mail ID) of the CONTACT PERSON for cross reference by BHEL	

**PART – B****TECHNICAL SPECIFICATIONS FOR UTM - DYNAMIC TEST SYSTEM 250kN CAPACITY  
WITH HIGH TEMPERATURE & FATIGUE TEST FACILITY**

<b>S. No.</b>	<b>PARTICULARS</b>	<b>BHEL SPECIFICATIONS</b>	<b>BIDDER's OFFER [with Complete Technical Details]</b>
<b>1.0</b>	Area of Application	Universal Testing Machine 250 kN is meant for use in testing of Test specimens (Tensile, Bend, High Temperature Tensile, Fatigue) prepared from Test Plates taken out for Critical Pressure Parts coming in High Pressure Boilers, Castings and wide range of materials from Plain Carbon Steel, Low Alloy, Quenched & Tempered Steels & High Alloy Steels, Nickel, Copper and Titanium alloys.	
<b>2.0</b>	Principle of Operation	Application of uni-axial Tensile/Compressive force by a servo-Electric / Hydraulic closed loop quasi dynamic two column System	
<b>3.0</b>	Design Base	The equipment shall meet all the requirements specified under <b>ASTM E4, E8, E9 and E21</b> (latest). Calibration of the equipment along with accessories meant for testing as per ASTM E8, E21 and low cycle fatigue tests.	
<b>4.0</b>	<b>Equipment Configuration</b>	The minimum desired features are enlisted below	
<b>4.1</b>	Testing Capacity	±250 kN max (Floor mounted) – Servo Electric / Hydraulic Quasi Dynamic System	
<b>4.2</b>		High stiffness load frame is to be provided for the capacity ±250kN	

S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER's OFFER [with Complete Technical Details]
4.3		Single test space design for tension, compression and low cycle fatigue testing at room temperature and at elevated temperatures up to 1200°C.	
4.4		Over-travel safety limit switches / Mechanical stoppers	
4.5		Provision for split furnace mounting with swivel arrangement	
4.6		Mechanism for direct transmission of load / force to the specimen	
4.7		Anti-rust plated column	
4.8		Maintenance free drive technology and low noise drive system with proper selection of air cooled AC motor.	
4.9		Slow strain rate (even less than 10 MPa / sec) to conduct tensile tests at room temperature and at high temperatures up to 1200°C.	
4.10		Equipment must be suitable for continuous & uninterrupted operation (at least for 48 hrs.) without getting overloaded / overheated. If required suitable cooling / chilled water arrangement must be provided.	
5.0	<b>Load Cell</b>		
5.1		Fatigue rated capacity of $\pm 250\text{kN}$ . Accuracy and calibration certificate of the load cell as per ISO 7500 -1 (latest)	
5.2		Highly insensitive to transverse forces, bending moments and torque	
6.0	<b>Frame Specification</b>		

S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER's OFFER [with Complete Technical Details]
6.1	Height of the UTM	Less than 2.25 meter	
6.2	Day light space	Not less than 1000 mm	
6.3	Horizontal opening	Not less than 600 mm	
7.0	<b>Servo Electric / Hydraulic Actuator</b>		
7.1		Stroke limit 300mm minimum	
7.2		Capacity $\pm 250$ kN	
7.3		Displacement rate : 0.001 to about 1000 mm/hr	
7.4		Anti rotation clamping	
7.5		Can be used for slow strain rate and cyclic testing of the materials.	
8.0	<b>Crosshead</b>		
8.1		Stroke: Minimum 300 mm	
8.2		Test speed: 0.0005 to 600 mm / minute	
9.0	Manual / Remote Control Panel	Control panel for complete access to all control functions with action buttons for start, stop of UTM, speed control, cross head movement, grips etc.	
10.0	Operating Voltage	230V $\pm$ 10%, Single phase 50 Hz 440V $\pm$ 10% 3 phase 50 Hz	
11.0	Semi opened cross heads	The machine should have semi opened cross heads for easy loading and unloading of test specimens	
12.0	<b>Grips</b>	UTM shall be provided with following grips	
12.1		Semi open front cross heads with wedge grips	



S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER's OFFER [with Complete Technical Details]
12.2		Set of 4 Wedge Grips jaws for flat specimens from 0.5 to 16 mm thick by up to minimum 50 mm wide	
12.3		Set of 4 Wedge Grips jaws for round specimens from diameter 6.0 to 16.0 mm.	
12.4		Compression bridge assembly for use in UTM to permit the mounting of compression test fixture without the removal of the tensile grips and fixtures.	
12.5		Pair of through zero cyclic testing high temperature tensile grips to hold round type (ASTM E8) specimens of threaded shoulder of sizes M8, M10, M12 and M16 for temperatures up to 1200°C.	
13.0	<b>Extensometer for Room Temperature Tensile Testing</b>		
13.1		Clip on type Strain Gage Extensometer which can be removed from the specimen during test	
13.2		10, 25 & 50 mm gauge length	
13.3		-10 to +100% maximum strain	
13.4		Accommodate round specimen diameter 2 to 10 mm.	
13.5		Flat specimen to 20 mm wide and 1 to 16 mm thick	
13.6		It shall be high resolution digital type and satisfy ASTM Specification E 83 Class better than B-1.	
14.0	<b>3 Zone High Temperature furnace</b>	It shall have the following features	

S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER's OFFER [with Complete Technical Details]
14.1		Split type furnace preferable.	
14.2		Made up of SS shell and terminal covers	
14.3		Heating temperature: 1200°C maximum	
14.4		Bore diameter: About 50 mm	
14.5		Outer diameter: About 300 mm	
14.6		Height of the furnace shall be about 400mm	
14.7		Furnace operating voltage: 230 ± 10% and 50 Hz	
14.8		3 nos. suitable thermocouples for three zones	
14.9		Temperature shall be maintained to an accuracy of ± 3°C and also the variation within the furnace	
14.10		The furnace shall reach the set temperature within 60 minutes	
14.11		Furnace shall be provided with appropriate asbestos free insulation capable of adequately withstanding the highest testing temperature.	
14.12		Power shall be controlled by suitable DIGITAL CONTROL DEVICE with Auto/Manual options with real time temperature display facility.	
15.0	<b>Computer Based Data Acquisition System</b>		
15.1		Force, stroke and strain control and measurement channel	
15.2		System of Units in SI	
15.3		Single range system to eliminate range cross over transients	

S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER's OFFER [with Complete Technical Details]
15.4		AC excitation with synchronous sampling to reduce noise on transducer signals	
15.5		Load measurement accuracy $\pm 0.5\%$ of the reading.	
15.6		Strain measurement accuracy $\pm 0.5\%$ of reading down to 1/50 of full range with ASTM E83 Class B1 extensometer	
16.0	Calibration	Calibration of the UTM for load in the compression mode with Calibration Certificate traceable to National/International Standards	
17.0	<b>Material Testing Software:</b>	The basic software shall provide the following functions and features	
17.1	Soft ware	Calibrated and preloaded Simple user friendly software DESK TOP System (PC) using Windows XP or latest for material testing- High performance interfaces to communicate with all current IT system.	
17.2		Shall run on all standard PCs or Laptops	
17.3		Tensile testing Package for most metals and alloys including 0.2% Proof Stress measurement	
17.4		Selecting speed of test and change of speed during test.	
17.5		Statistical evaluation of test results	
17.6		Live routine test plots	
17.7		Provision for conversion load unit to N, kN, Kg, ton, lb and displacement unit to mm, cm and inch	
17.8		Report generation	
17.9		Saving and retrieval of test data	

S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER's OFFER [with Complete Technical Details]
17.10		Provided with Layout Editor, Results Editor, Export Editor, Channel Editor and Report Editor.	
17.11		Compression Testing of most metals and alloys application package	
17.12		Connection for specimen dimensional measuring instruments	
17.13		Test program for low cycle fatigue	
17.14	Desk Top System	Intel Pentium Core 2 Duo Processor @ 2.2 GHz or more, 2GB DDR 2 RAM, 160 GB S-ATA HDD, DVD writer 16X/40X, VGA graphics with 1280x1024 pixel resolution and 65 K colors (High Color), one free serial RS232 interface, 17" TFT Monitor. Sound Card: Multimedia kit with 2 speakers and one sound card, 10x100 mbps Ethernet card, Windows XP Licensed Pack and good quality HP laser printer. UPS for PC with 30 minutes back up	
18.0	User control panel	In addition suitable user control panel to provide user friendly flexible interface conveniently mounted on the load frame designed to work with the system software shall be provided	
19.0	Installation and Commissioning	The Equipment with all Accessories is to be installed & commissioned at BHEL Works, FREE OF COST, by the Service Engineer of the SUPPLIER. (Civil Work under BHEL Scope). if any should be indicated by the supplier in advance.	

S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER's OFFER [with Complete Technical Details]
20.0	Performance Prove-Out at BHEL	The Supplier's Service Engineer has to calibrate the Equipment & Accessories as per <b>ISO 7500-1 latest / IS 1828 CII (calibration of the equipment along with accessories).</b>	
21.0	Documentation in ENGLISH Language	3 Copies of the Operation & Maintenance Manuals containing Electric Schematics, Circuit Diagrams, PCB Drawings, Trouble Shooting Charts, Mechanical Sub-Assemblies, Rating of Bought-Out Items, etc. shall be supplied, at the time of inspection by BHEL Engineers. In addition, one SOFT COPY in CD to be supplied.	
22.0	Performance Guarantee	The Equipment & Accessories (including Bought-Out Items) are to be guaranteed for its performance for a minimum period of one year from the date of performance acceptance at BHEL Works.	
23.0	Training on Operation & Maintenance	Complete Training for Lab staff is to be given on Operation & Maintenance of the OFFERED EQUIPMENT at BHEL on free of cost, after the successful commissioning of the Equipment & Accessories.	
24.0	Service Support Requirements.	Vendor shall ensure AMC service facilities in India after the guarantee period, through trained service personnel in India	
25.0	Annual Maintenance Contract - AMC	The BIDDER has to QUOTE (as an optional, which may or may not be ordered along with equipment) for AMC under two patterns given below, for a period of THREE YEARS after the expiry of ORIGINAL WARRANTY period.	

S. No.	PARTICULARS	BHEL SPECIFICATIONS	BIDDER's OFFER [with Complete Technical Details]
25.1	AMC – CASE I	Technical Service for Preventive Maintenance, Trouble Shooting and Re- Commissioning of the Equipment <b>excluding</b> the Cost of SPARES and Consumables [BHEL will make available the required Spares & Consumables on demand]	
25.2	AMC – CASE II	Technical Service for Preventive Maintenance, Trouble Shooting and Re- Commissioning of the Equipment <b>including</b> the Cost of SPARES and Consumables [BHEL will not be responsible for the timely availability of Spares & Consumables]	
25.3	AMC - RESPONSE	THE BIDDER HAS TO FURNISH / INDICATE THE RESPONSE TIME FOR THE SERVICE ENGINEER TO BE AT BHEL WORKS, FROM THE TIME OF REPORTING BREAKDOWN THROUGH E-MAIL or TELEFAX.	
25.4	AMC – Service Calls	The BIDDER has to furnish details on service calls for preventive maintenance (number of calls and intervals) and break-down maintenance	