

Dated- 27.05.2017



BHARAT HEAVY ELECTRICAL LIMITED

UNIT'S ADDRESS: CFFP, HARIDWAR, INDIA

Specification No: CFF/QM/RMI/01 REV 00 DATE- 27/05/17

SPECIFICATION OF HOT MODULUS OF RUPTURE TESTER (1450 degC)

NOTE:-

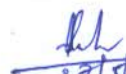
1. The vendor shall comply to the requirements of Qualifying Condition (Clause 3.0) and furnish all documents related with qualifying criteria along with technical bid. Offer submitted without required documents shall be treated as non-compliance and shall not be considered for further processing.
2. The vendor shall fill comments (as applicable) in column 4 of the specification against each clause. Offer submitted without this filled format shall be treated as non-compliance.
3. For filling of Column 4, following instructions shall be followed:
 - a) Where ever "confirm" is mentioned in column 3, the vendor shall fill "confirmed" in column 4 in case of compliance.
 - b) Where ever "Furnish" is mentioned in column 3, the vendor shall fill the reference of furnished document in column 4 and submit the relevant document along with technical bid.
 - c) Where ever "Specify" is mentioned in column 3, the vendor shall fill the required information against that clause.
 - d) In case of deviation from required specification, vendor shall clearly indicate the deviation in column 5 against the requirement.
4. Vendor shall essentially assign page nos. to their tender documents and in column 6 fill up the concerned page no. where the particular requirement/ document/s is/are written or placed.
5. Inadequate / incomplete, ambiguous, or non-relevant information against any of the clauses of the specifications/requirements shall be treated as non-compliance.
6. Any clarification asked by BHEL during evaluation of offer, shall be replied by vendor within a period of five days from the date of query. In case of no response, it will be treated as non-compliance and offer shall not be considered for further processing.
7. The offer and all documents enclosed with offer shall be in English/Hindi language only.

NAME & ADDRESS OF THE OEM :

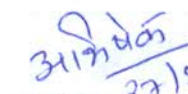
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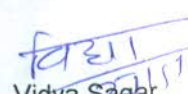
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E-MAIL ADDRESS :


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Clause No (1)	DESCRIPTION FOR BHEL REQUIREMENT (2)	To Confirm/ Specify/ Furnish by Vendor (3)
1.0	APPLICATION	
1.1	The Hot Modulus of Rupture (HMOR) tester shall be for determination of Hot modulus of rupture value for refractory brick specimen at temperature of 1450 °C or at higher temperature as per IS 1528(part-20) or its equivalent international standard (i.e IS,ASTM, DIN etc). It is for determination of three point bending strength in a batch furnace at temperature of 1450 °C or higher.	Vendor to Confirm
2.0	SCOPE OF SUPPLY	
2.1	With this equipment, Hot modulus of rupture of refractory brick sample at temperature of 1450 °C (minimum) can be measured. This equipment is applicable to all refractory brick.	Vendor to Confirm
		Vendor to Confirm
3.0	QUALIFYING CONDITIONS :	Vendor to Confirm
3.1	Vendor should be original equipment manufacturer (OEM) or authorized dealer/distributor of OEM. In case of dealer/distributor, they should furnish the details of OEM and valid authorization certificate from OEM.	Vendor to Confirm
3.2	Vendor must have well functioning service center in India. Details to be submitted.	Vendor to Confirm
3.3	Overview about OEM (When established, Product Range, market etc.) to be submitted.	Vendor to Confirm
3.4	Only those vendors shall quote, who or their principal have supplied and commissioned at least one number of HMOR tester for temperature range of 1450 °C or more capacity, for similar applications, within last 5 years from the date of tender enquiry for this item. The following documents shall be furnished along with technical bid to support this qualification criteria:	Vendor to Confirm
3.4.1	The list of supplied HMOR having following information:	Vendor to Furnish
3.4.2	Make & Model	Vendor to Furnish
3.4.3	Capacity	Vendor to Confirm
3.4.5	Month & Year of Supply	Vendor to Furnish
3.4.6	Customer Name	Vendor to Furnish
3.4.7	Customer Address	Vendor to Furnish
3.4.8	Customer Contact Person	Vendor to Furnish

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3.4.9	Customer Contact Nos/Email id details	Vendor to Furnish
3.4.10	Minimum one number copy of Purchase order of equipment supplied mentioned in clause 3.4	Vendor to Furnish
3.5	Minimum one number of Performance Certificate (issued by customer for satisfactory performance) of HMOR tester supplied mentioned in clause 3.4.	Vendor to Furnish the certificate
3.6	BHEL reserves the right to verify the information provided by vendor. If the information provided by vendor is found to be false/incorrect at any point of time, the offer shall be rejected.	Vendor to Furnish
4.0	GENERAL REQUIREMENTS	
4.1	The offer shall be submitted in two bids (Techno-commercial and Price Bid).	Vendor to Furnish
4.2	Unit prices of the main system along with required accessories shall be indicated in the price bid.	Vendor to Confirm
4.3	The vendor shall furnish unpriced copy of technical Bid along with price bid	Vendor to Furnish
4.4	The vendor shall quote itemwise unit price for Essential Items (Required essentially for fulfilling the purpose and complying the requirement of this specification).	Vendor to Confirm
4.5	The vendor shall provide list of Optional Items (Not required essentially but available with vendor for enhancement of performance/extension of machine capability/simplify the operations.	Vendor to Furnish
4.6	The vendor shall furnish itemwise scope of supply along with technical bid.	Vendor to confirm & furnish
4.7	The bidder's technical representative shall visit BHEL, CFFP, Haridwar for technical discussions and on -the- spot finalization of technical issues, if needed, within two weeks after technical bid opening. Exact date will be confirmed to vendor by BHEL.	Vendor to Confirm
4.8	The system offered shall be complete in all respects. It shall contain all additional hardware / accessories/ software required for satisfactory operation of the system for alt least 2 years.	Vendor to Confirm
4.9	Vendor shall also provide enough consumable items and essential spares for smooth functioning of equipment for at least two year from date of commissioning with equipment without any extra cost.	Vendor to Confirm


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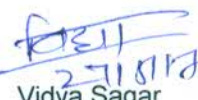

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5.0	TECHNICAL SPECIFICATION : The equipment should meet the testing criteria in accordance with IS 1528 (part -20) or ISO5013 or its equivalent international standard.	Vendor to Confirm
5.1	Working Temperature / = 1450 °C (Minimum)	Vendor to Confirm
5.2	Test sample dimension = 25x25x150 mm	Vendor to Confirm
5.3	Bearing Edge span = 125 ± 2 mm	Vendor to Confirm
5.4	Bending support material = SiC	Vendor to Confirm
5.5	Radius of curvature = 5 ± 1 mm	Vendor to Confirm
5.6	Load = 0-300 kg(minimum) with peak hold and tare facility	Vendor to Confirm
5.8	Loading speed (stepless) = 0.50 - 4.00 Kg / sec or better	Vendor to Confirm
5.9	Heating elements - Silicon Carbide	Vendor to Confirm
5.10	Temperature accuracy = 1450 deg C ± 2 Deg C or better	Vendor to Confirm
5.10	Heat-up Rate Capacity = 5°C per minute (minimum)	Vendor to Confirm and specify
5.11	Temp. Programmer / Data Logger - PID based or through temperature recorder with PC interfacing facility.	Vendor to Confirm and specify
5.12	Power Control - Thyristor Systems/drive system	Vendor to Confirm and specify
5.13	Power Supply/ Rating - 415 Volt, 3-phase A.C. , 50Hz	Vendor to Confirm and specify
5.14	Temperature indication / control - Digital PID temperature programmer / controller or PLC based	Vendor to Confirm and specify
5.15	Temperature sensor - Pt+ Rh13%/Pt - 'R' type or 'S type ' thermocouple with accuracy ± 2 deg C (or better)	Vendor to Confirm and specify
5.16	There should be suitable provision of temperature indication and temperature protection in the equipment.	Vendor to Confirm and specify


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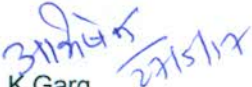
6.0	ELECTRICAL SYSTEM :	
6.1	Power = 3 Phase AC , 415 Volt	Vendor to Confirm
6.2	All type of cables, connectors, prefabricated communication cables etc. required for connecting different parts of the HMOR tester /control cabinets, shall be supplied by vendor, whether specifically mentioned or not..	Vendor to Confirm
6.3	All electrical & electronic control cabinets & panels should be dust, vermin, rodent proof & earthed when being installed.	Vendor to Confirm
6.4	All power supply related devices like Protection devices, Voltage Stabilizers, isolation transformer etc shall be supplied along with the HMOR tester .	Vendor to Confirm

7.0	CALIBRATION	
7.1	The HMOR tester shall be calibrated in all ranges covering minimum and maximum measurable points by any accredited (against ISO standard) calibration agency/ NMIs. The Calibration Certificate with at least one year validity from date of commissioning shall be compatible with ISO standard and shall be endorsed by accreditation logo. The calibration is to be done by the vendor and the calibration activities shall cover complete equipment alongwith all essential measuring instruments of HMOR tester.	Vendor to Confirm
8.0	COMPLIANCE	Vendor to Confirm
8.1	HMOR tester shall be complied with the requirement of IS 1528 part-20 or its equivalent ISO/ ASTM standard.	Vendor to Confirm

9.0	ENVIRONMENTAL PERFORMANCE OF THE HMOR TESTER :	Vendor to Confirm
9.1	The HMOR tester should conform to following factors related to environment :	Vendor to Confirm
9.2	Maximum noise level shall be ≤ 60 dB(A) at normal load condition, 1 meter away from the HMOR tester with correction factor for back ground noise, if necessary. This would be verified with practical demonstration.	Vendor to Confirm


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9.3	There shall not be any emissions from the HMOR tester except particles of samples produced during testing. Suitable arrangement shall be there to ensure that the particles of tested samples do not enter in to HMOR tester thereby interfering with its smooth operation. Vendor to provide details.	Vendor to Confirm and specify
9.4	No hazardous chemicals shall be required to be used in the HMOR tester.	Vendor to Confirm
9.5	If any safety / environmental protection enclosure is required, it should be built in the HMOR tester by the vendor.	Vendor to Confirm
9.6	Paint of the HMOR should be oil/ grease resistant and should not peel, off and mix up with them.	Vendor to Confirm
10.0	SAFETY ARRANGEMENTS:	
10.1	The following safety features in addition to other standard safety features should be provided on the HMOR tester:	
10.2	HMOR tester should have adequate and reliable safety interlocks / devices, guards to avoid damage to the HMOR, work piece and the operator due to the malfunctioning or mistakes or any danger arising out of the general use. HMOR functions should be continuously monitored and alarm / warning indications should be available. Details to be furnished.	Vendor to Confirm and furnish the details.
10.3	All the pipes, cables etc. on the HMOR tester should be well supported and protected.	Vendor to Confirm and specify
10.4	Emergency Switch at suitable location as per International Norms are to be provided.	Vendor to Confirm and specify

11.0	SPARES, CONSUMABLES AND AMC	Vendor to Confirm
11.1	All types of spares for total HMOR tester and accessories should be available with the vendor for at least ten years after supply of the HMOR tester . If HMOR tester or control is likely to become obsolete in this period, the vendor should inform BHEL sufficiently in advance and provide details of recommended spares & suppliers to enable BHEL to procure these in advance, if required.	Vendor to Confirm


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11.2	The vendor shall provide AMC services after the warranty period if required by BHEL.	Vendor to Confirm
12.0	PRE DESPATCH INSPECTION/ ACCEPTANCE OF HMOR TESTER	
12.1	Pre dispatch Inspection of the complete system including physical verification, functionality testing and accuracy verification shall be done by BHEL at OEM's works. Two weeks advance information shall be furnished for pre-inspection activities.. Travel, boarding & lodging charges will be borne by BHEL.	Vendor to Confirm
12.2	Specifications mentioned in clauses (5.0 to 5.16) & (6.0 to 6.4) shall be demonstrated by vendor to BHEL engineers during pre-acceptance tests at OEMs works. The equipment is to be completely tested and inspected and duly verified by BHEL Engineers before dispatch and four copies of inspection certificates are to be provided by vendor with HMOR tester.	Vendor to Confirm
13.0	ERECTION AND COMMISSIONING	Vendor to Confirm
13.1	Erection & Commissioning is to be done by vendor at Raw material Inspection dept, QM, BHEL CFFP, Haridwar , India.	Vendor to Confirm
13.2	Schedule of Commissioning shall be submitted with the offer.	Vendor to specify
13.3	Supplier shall carry out Erection, Commissioning and Testing of HMOR tester, it's control & all types of other supplied equipment, demonstration of all the features of the HMOR tester, testing of material samples and software etc. to the satisfaction of BHEL engineers without any price implication. In case there is price implication, the same shall be quoted as lumpsum price which shall be loaded to vendor's offer. Per day price will not be acceptable.	Vendor to Confirm
13.4	Service requirement like power shall be provided by BHEL at only one point to be indicated by supplier. Connectivity of the system with power supply from that point shall be the responsibility of the supplier. The Other requirements like crane, welding machines etc shall be provided by BHEL. Details of these requirements should be informed by vendor in advance.	Vendor to Confirm

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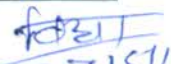
13.5	All tools and equipment required for erection of the HMOR tester shall be brought by the vendor. The clearance(between wall and platform) required for the rolling facility of heating chamber to be installed shall be clearly mentioned by the supplier.	Vendor to Confirm
13.6	Vendor shall submit the foundation layout drawing for BHEL's information within two weeks from the date of P.O. The Layout should consist of all requirements pertaining to HMOR tester and all accessories.	Vendor to Confirm
14.0	FINAL ACCEPTANCE	
14.1	Three nos of refractory brick specimens at temperature of 1450 °C for 30 minutes will be tested at BHEL, Haridwar and HMOR value determined in accordance with IS 1528(Part-20) or its equivalent international standard.	Vendor to Confirm
14.2	All the technical specifications including capacity, accuracy, speed, software performance etc. will be rechecked at BHEL.	Vendor to Confirm
14.3	Final acceptance of the HMOR tester at BHEL will be given after verification and ensuring that all the clauses of this specification are duly complied and the required training as per clause 17.0 has been provided to the BHEL personnel.	Vendor to Confirm

15.0	GUARANTEE	
15.1	The equipment should be guaranteed with respect of design, material construction, operation and any manufacturing defects for a period of 30 months from the date of receipt of complete equipment at BHEL Haridwar or 24 months from the date of commissioning, whichever is earlier. Four copies of Test certificates and Guarantee certificates are to be furnished before dispatch.	Vendor to Confirm
15.2	If the instrument remains out of order during this period, the guarantee period will stand extended for double the corresponding period.	Vendor to Confirm
15.3	Free after sales service including essential spares is to be provided during the guarantee period at BHEL,CFFP, Haridwar.	Vendor to Confirm


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16.0	PACKAGING	
16.1	Rigid, seaworthy packing for all items of complete equipment, all accessories and other supplied items to avoid any damage / loss in transit shall be done.	Vendor to Confirm
17.0	TRAINING	
17.1	BHEL Persons shall be trained at BHEL immediately after installation in the area of (a) use of all the aspect of HMOR tester and the controlling Software (b) Electrical, Electronic, Mechanical & general maintenance for HMOR tester & other supplied equipment and accessories. (c) Operation of the HMOR tester & other supplied equipment.	Vendor to Confirm
17.2	Competent, English & Hindi(Bilingual) speaking experts shall be arranged by the vendor during training for satisfactory & effective training of BHEL personnel without any price implication	Vendor to Confirm
17.3	Expenditure of training cost if any shall be quoted as total consolidated training cost (Inclusive of travel ,Lodging & boarding of Expert) which will be loaded to the vendor's offer. Per day charges are not acceptable.	Vendor to Confirm

18.0	LITERATURE WITH OFFER	Vendor to Confirm
18.1	The following documents amongst other shall be enclosed with offer by vendor.	Vendor to Confirm
18.1.1	Supplier shall enclose the leaflets/ catalogue/ brochure having detail specification, photograph, Model No & Manufacturers Name of offered equipment.	Vendor to Confirm
18.1.2	A detailed sketch/ drawing of the HMOR tester has to be submitted showing its dimensions, essential parts etc.	Vendor to Confirm
19.0	DOCUMENTATION TO BE SUPPLIED WITH THE HMOR	
19.1	Four sets of Operation and Service Manual shall comprise of operating procedure, calibration procedure, applicable calibration certificates, trouble shooting charts, electrical circuit/block diagram and parts list etc. have to be supplied.	Vendor to Confirm

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