



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 79 38 Fax : +91 431 252 07 19 Email : tvenkat@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	2620900201	18.09.2009	30.10.2009

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	Computer Controlled Scanning Electron Microscope as per the technical specification & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	1 No.

BHEL commercial terms & conditions with Price Bid and Bank Guarantee formats 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 “2620900201”.

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

Manager / Capital Equipment / MM

Coal Research Centre

Technical Specifications For Computer Controlled Scanning Electron Microscope (CCSEM)

Ref: CRC- 10HS

Dt. 01.09.2009

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1.0 Application:

The CCSEM must allow fully automated data collection, making it possible to acquire information such as mineral grain size, shape, composition and abundance of minerals in coal/ash/ deposit. Typical minerals of our interest in coal are:

Sl.no	Minerals	Sl.no	Minerals	Sl.no	Minerals
1	Quartz	12	Na. Al Silicate	23	Apatite
2	IronOxide	13	Alumino Silicate	24	Ca.Al.Phospate
3	Periclase	14	Mixed Al.Silicate	25	kcl
4	Rutile	15	Fe Silicate	26	Gypsem Borite
5	Alumina	16	Ca Silicate	27	Gypsem/Al.Silicate
6	Calcite	17	Ca. Aluminate	28	Si-Rich
7	Dolomite	18	Pyrite	29	Ca-Rich
8	Ankerite	19	Pyrrohotite	30	Ca-Si- Rich
9	Kaolinate	20	Oxidised Pyrrohotite	31	Unknown etc
10	Montmorillonite	21	Gypsem		
11	k.Al. Silicate	22	Barite		

The system should quantify type of minerals (included or excluded) as per grain size wise.

2.0 Scope of Supply:

Brief scope:

- Fully automated Hardware includes SEM and EDX
- Application software for automated interpretation of results.
- Testing at vendor's works
- Inspection
- Installation and Commissioning
- Proving Performance.
- Training at BHEL Trichy (site)
- Warrantee
- Upgradation
- Documentation.
- 3 years comprehensive Annual maintenance Contract after 1 year Warrantee period.

Detailed scope:

Complete **CCSEM** system with a fully automated electron beam image analysis instrumentation package based upon a scanning electron microscope. Using fully automated Computer Controlled Scanning Electron Microscopy (CCSEM), particles are initially located using a back-scattered electron image, then analysed on a pixel by pixel basis using energy dispersive X-ray analysis with a combination of up to four detectors. The pixel spacing can be set by the operator and can vary from a fraction of a micrometre to tens of micrometres. The X-ray spectral information is used to assign an individual pixel to a particular mineral species by comparison with a look-up table to produce a phase composition map of the sample. Morphological and textural information is also obtained.

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Features:

- a. Magnification range 10 xs to 3000000x or better.
- b. The Tungsten filament life atleast 2000Hrs continuous operation.
- c. Large specimen chamber with specimen exchange setup.
- d. Motorized stage movement in X, Y, Z direction.
- e. BSE&SE detectors.
- f. High vacuum system with oil free turbo molecular pump.
- g. Auto and Manual control with minimum 2 Nos of EDS detectors. (Additional provision for 2 more is required).
- h. Liquid Nitrogen cooled or liquid Nitrogen free.
- i. Resolution: 3.0-4.0 or better.
- j. Objective lens aperture- 3 to 4 stop opening.
- k. Digital image processor.
- l. Graphical user interface digital image store.
- m. Software package for fully Computer Controlled SEM& EDX.
- n. Fully integrated data analysis and reporting software package
- o. The elemental compositions of individual grains collected through EDS will be processed and converted into mineral phases for different size fractions of mineral grains.
- p. Complete system (Hardware and Software) latest PC, 17" TFT monitor, laser color printer, UPS.
- q. Complete sample preparation equipment and consumables.
- r. Particulate samples when operating in tandem under the control of imaging and spectral analysis software.

3.0 Installation Commissioning:

Installation and commissioning at BHEL, Tiruchirapalli will be in the scope of supplier.

4.0 Warrantee:

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.

5.0 Proving Performance:

Proving performance of CCSEM at BHEL Trichy will be in the scope of supplier.

6.0 Upgradation:

Software upgrading shall be free.

7.0 Inspection at vendor works:

BHEL's Inspection is applicable.

8.0 Documents:

Installation, Operation & Maintenance Manual in English.-2 Nos Hard copies & 1No soft copy

All original software-1 set in CDS

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9.0 Available power supply:

Single phase 230 V AC, 50 HZ (1 feeder).

10.0 Spares & Consumables during 1 year warrantee period.

Vendor's scope.

11.0 Critical spares:

BHEL will procure and keep these spares in stores for vendor's use during comprehensive maintenance period. Please furnish the list.

12.0 Comprehensive Annual Maintenance Contract:

Please quote for 3 years labor @ 2 visits /year effective after the guarantee period.
Replacement of any faulty component is in vendor scope. Please refer point 11.0 above.

13.0 Typical results/output format: Given below.

Note: Mineral fraction % is by weight

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Mineral Fraction, %	16.319						
Size Bins, μm	1.0-2.2	2.2-4.6	4.6-10	10-22	22-46	46-100	Total
Mineral Phase							
Quartz	1.0	2.9	4.6	6.5	3.3	3.9	22.2
Iron Oxide	0.1	0.4	0.6	0.8	1.8	2.7	6.4
Periclase	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rutile	0.1	0.3	0.1	0.3	0.1	0.0	0.9
Alumina	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calcite	0.1	0.5	0.1	1.2	1.0	2.4	5.2
Dolomite	0.0	0.0	0.0	0.1	0.0	0.0	0.2
Ankerite	0.0	0.0	0.0	0.0	0.1	0.2	0.3
Kaolinite	2.0	6.8	5.9	5.9	1.9	2.3	24.8
Montmorillonite	1.6	2.3	1.4	1.3	0.7	1.0	8.5
Potassium aluminosilicate	0.5	1.2	1.0	1.8	0.8	0.7	5.9
Iron aluminosilicate	0.9	2.0	1.2	1.1	0.8	0.9	6.9
Calcium aluminosilicate	0.0	0.1	0.1	0.0	0.0	0.0	0.2
Sodium aluminosilicate	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aluminosilicate	0.1	0.4	0.3	0.5	0.2	0.1	1.6
Mixed aluminosilicate	0.3	0.4	0.4	0.5	0.3	0.2	2.1
Iron Silicate	0.0	0.0	0.0	0.3	0.0	0.0	0.3
Calcium Silicate	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calcium Silicate	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pyrite	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Pyrrhotite	0.0	0.1	0.0	0.3	0.6	0.0	1.0
Oxided Pyrrhotite	0.0	0.0	0.1	0.0	0.0	0.0	0.1
Gypsum	0.0	0.2	0.1	0.0	0.0	0.3	0.6
Barite	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Apatite	0.1	0.2	0.2	0.2	0.1	0.0	0.8
Calcium Aluminum-Phosphate	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Potassium Chloride	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gypsum-Barite	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gypsum-Aluminosilicate	0.1	0.0	0.1	0.0	0.0	0.0	0.2
Silica-Rich	0.3	0.7	0.4	0.5	0.3	0.4	2.6
Calcium-Rich	0.0	0.0	0.0	0.1	0.0	0.1	0.2
Calcium-Silica-Rich	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown	1.1	2.2	1.7	2.0	1.3	0.7	9.0
Totals	8.3	20.6	18.4	23.3	13.4	16.0	100.0

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Size Bins, μm	Percentage of excluded minerals					
	1.0-2.2	2.2-4.6	4.6-10	10-22	22-46	46-100
Mineral Phase						
Quartz	0.8	0.0	14.3	37.5	25.9	56.3
Iron Oxide	0.0	0.0	61.1	70.6	60.0	64.5
Periclase	0.0	0.0	0.0	0.0	0.0	0.0
Rutile	0.0	0.0	58.1	100.0	60.2	0.0
Alumina	0.0	0.0	0.0	0.0	0.0	0.0
Calcite	0.0	19.3	27.5	54.6	61.1	69.2
Dolomite	0.0	0.0	0.0	0.0	0.0	100.0
Ankerite	0.0	0.0	0.0	0.0	76.6	0.0
Kaolinite	0.0	1.2	6.5	22.2	31.7	41.5
Montmorillonite	0.3	0.0	4.1	18.0	19.1	16.3
Potassium Aluminosilicate	0.0	6.9	23.4	51.3	25.0	66.8
Iron Aluminosilicate	1.8	0.0	19.7	34.7	44.2	70.0
Calcium Aluminosilicate	0.0	0.0	0.0	0.0	0.0	0.0
Sodium Aluminosilicate	0.0	0.0	0.0	0.0	0.0	0.0
Aluminosilicate	0.0	0.0	3.6	0.0	9.9	100.0
Mixed Aluminosilicate	0.0	0.0	34.4	0.0	0.0	39.6
Iron silicate	0.0	0.0	0.0	0.0	0.0	0.0
Calcium Silicate	0.0	0.0	0.0	0.0	0.0	0.0
Calcium Silicate	0.0	0.0	0.0	0.0	0.0	0.0
Pyrite	0.0	0.0	0.0	0.0	0.0	100.0
Pyrrhotite	0.0	100.0	0.0	100.0	90.6	0.0
Oxided Pyrrhotite	0.0	0.0	100.0	0.0	0.0	0.0
Gypsum	0.0	0.0	28.6	100.0	65.2	48.4
Barite	0.0	0.0	0.0	0.0	0.0	0.0
Apatite	0.0	0.0	18.1	100.0	17.2	0.0
Calcium Aluminum-Phosphate	0.0	0.0	0.0	0.0	0.0	0.0
Potassium Chloride	0.0	0.0	0.0	0.0	0.0	0.0
Gypsum-Barite	0.0	0.0	0.0	0.0	0.0	0.0
Gypsum-Aluminosilicate	0.0	0.0	0.0	0.0	0.0	0.0
Silica-Rich	0.0	0.0	13.9	81.5	23.1	69.6
Calcium-Rich	0.0	0.0	0.0	100.0	0.0	43.9
Calcium-Silica-Rich	0.0	0.0	0.0	0.0	0.0	0.0
Unknown	0.0	0.0	18.4	38.7	29.1	51.3

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Rev No. 0/Dt. 01.09.2009
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QUALIFYING CRITERIA

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

The bid consists of 3 parts namely Qualifying Criteria, Technical bid and Price bid. Vendor shall submit Qualifying Criteria & Technical bid together in a sealed cover. Price bid shall be in a separate sealed cover.

[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]

Name of the product: Computer Controlled Scanning Electron Microscope (CCSEM)

S. No.	PARTICULARS	VENDOR's RESPONSE
1.0	The BIDDER / VENDOR shall have a minimum of 2 Years of Experience in the Design, Manufacture & Supply of Computer Controlled Scanning Electron Microscope (CCSEM). Please indicate the actual experience.	
2.0	YEAR of launch of the Model quoted against this ENQUIRY	
3.0	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.	
4.0	Number of Computer Controlled Scanning Electron Microscope (CCSEM) supplied, installed and commissioned till date in India and outside India... Please furnish contact person name, address, phone number, fax number and mail id .Please mention that how many are used for coal analysis purpose.	
5.0	Please enclose Performance Certificates, Reports etc from atleast one customer for the model quoted.	
6.0	Details of Design Set-Up and Technology Back-Up assured from the PRINCIPAL Equipment Maker.	
7.0	Details on Service-after-Sales set-up in India including the addresses of Agents/Service Centre in India.	
8.0	The BIDDER / VENDOR shall assure a continuous support for SPARES and SERVICE for 5 Years, from the date of commissioning of the equipment at BHEL Works. This is a qualifying criteria.	

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9.0	The " <u>Technical Bid</u> " shall have vendor's responses along with Product Catalogue, Data Sheets in ORIGINAL and complete technical details of 'Bought-Out-Items' with copies of Product Catalogue. All Technical & Commercial terms can be here.NO PRICE DETAIL IS ENTERTAINED HERE.	
10.0	The " <u>Price Bid</u> " shall have Price Part with following. Basic Equipment. Latest PCs (17" TFT monitor, Laser printer -color, Windows XP+ services packages also.) All software CDs (1 set) with valid license. Installation & Maintenance manuals (2 Hard copies & 1 set of CDs) Spares & Consumables considering 1 year warrantee and 3 years Annual Maintenance Contract.	

Committee Members	Name & Design.	Signature	Initial
	Kannan K/DGM/CR/CRC		
	Lawrence Dr A /Mgr/Labs		
	Soundararaj M/AGM/CR		
For Specifications having reference number	CRC- 10HS	DATE : 01.09.2009	