



BHARAT HEAVY ELECTRICALS LIMITED
INSULATOR PLANT, JAGDISHPUR
Fax No: 05361-270140,270110, 270109

TENDER DOCUMENT FOR

Hydraulic powder compacting press- 4 pillar type with floating die Type of capacity 100 MT

Tender Enquiry No: BHEL/IP/MM/CAP/OT-3/2007

Contents

- **Technical Specifications, Scope of Supply , BHEL scope of work & Preferred makes of bought out components**
- **Specific Techno Commercial Requirement**
- **Annexure I : Product Description.**
- **Typical Die Drawing For Reference**
- **General Terms & Conditions, Loading Criteria**

Material Description	Unit	Quantity	Tender submission Last Date & time	Tender opening date & time
Hydraulic powder compacting press- 4 pillar type with floating die Type of capacity 100 MT C.	No.	01	12-07-2007, 2.30 PM	12-07-2007 3.00 PM

BHARAT HEAVY ELECTRICALS LIMITED

Insulator plant
Industrial Area, Jagdishpur 227817
Dist. Sultanpur (U.P.)

TECHNICAL SPECIFICATION
FOR HYDRAULIC POWDER COMPACTING PRESS

SL NO	DESCRIPTION	REMARKS
01	APPLICATION	For compacting ceramic powder (Aluminum oxide and clay) to form tiles of different shapes viz., square, ring segments, cuboids etc. The weight of tiles varies from 0.2 to 1.0 kg per piece and the compaction density 2.3 to 2.5 g/cc. Total pressing area : max. 350 cm ² Pressing pressure : max. 250 kg/cm ² The type of products to be manufactured by powder compaction and the typical die mounting dimension is given in Annexure – I
02	TYPE	4 Pillar, Floating die type
03	OPERATION MODE	Programmable by PLC
04	EJECTION	Automatic
05	TOP RAM CAPACITY (MT)	100
06	TOP RAM STROKE – MM	300, Range : 5 – 300
07	BOTTOM RAM STROKE – mm	200, Range : 5 – 200
08	DEPTH OF FILL – mm	200
09	CORE ROD STROKE – mm	200, Range : 5 – 150
10	MAX. PRESSING SPEED – mm/sec	15
11	MIN. PRESSING SPEED – mm/sec	2.5
12	DIE PLATE WORKING AREA – mm	380 x 380

13	ACCURACY / REPEATABILITY OF STROKE OF TOP & BOTTOM RAM	± 0.1 mm
14	SPEED RANGE OF mm/sec	
	Top ram approach (rapid)	200
	Top ram pressing	2.5 to 15
	Top ram withdrawal initial for stroke of 100 to 120 mm	15 to 80
	Top ram withdrawal (rapid)	200
	Bottom ram upward (filling)	15 to 80
	Bottom ram withdrawal (pressing)	2.5 TO 15
	Bottom ram upward (ejection)	4 to 25
	Bottom ram withdrawal	4 to 25
15	ACCURACY / REPEATABILITY OF SPEED FOR	
	Top ram approach (rapid)	$\pm 15\%$
	Top ram pressing	$\pm 1\%$
	Top ram withdrawal initial for stroke of 100 to 120 mm	$\pm 1\%$
	Top ram withdrawal (rapid)	$\pm 15\%$
	Bottom ram upward (filling)	$\pm 15\%$
	Bottom ram withdrawal (pressing)	$\pm 1\%$
	Bottom ram upward (ejection)	$\pm 1\%$

	Bottom ram withdrawal	$\pm 15\%$
16	CAPACITY – MT	
	Top ram forward (compacting)	10 – 100 ± 1.0
	Top ram return	Vendor to indicate the tonnage
	Bottom ram forward (pressing)	6 – 60 ± 0.6
	Bottom ram withdrawal	Vendor to indicate the tonnage
	Floating die ejection	10 – 100 ± 1.0
	Force float ratio (%)	20 – 100 % $\pm 1\%$
17	CONTROL SYSTEM	
	Type of Programmer	PLC (Programmable Logic Control)
	Operation mode selection	Inching / Single / Auto cycle pressing with die float
	Ejection held / not held	Both
	Limit / pressure sensing	Both
	Independent speed selection	For Compaction For Ejection For Fill depth positioning For Die force float ratio
	Independent pressure control	For Top Ram compaction force For Bottom ram withdrawal force For Float force For Ejection force
	Independent control of	Breathing time Dwelling time Decompression time
	Stroke adjustment provision for speed variation and height variation	For Top ram For Fill For Compaction For Ejection
	Control Voltage	BHEL prefers to have 230 V AC & 24 V DC supply for machine controls
	General requirement	1. All the cables shall be neatly terminated using terminal boxes with suitable cable glands at terminal boxes and at control panel. The cables should be secured in cable trays / conduits. The control wiring should be properly ferruled and identifiable in the control circuit. 2. All the switches & indicating lamps shall be

		identified with respective name plates.
18	HYDRAULIC SYSTEM	<p>Offer to indicate the complete technical specification of hydraulic system used for the press.</p> <p>The cooling system for hydraulic system shall be completely manifolded, using cartridge valve logic controls with solenoid valves. The return oil shall have in-line filtration before returning to reservoir. Oil cooling shall be of air-cooled radiator type or refrigerated type. Hydraulic power pack shall be fully sealed type to avoid ingress of dust. Hydraulic system shall have adequate safety features like oil level indicator, low level trip, high temperature trip etc. The following shall be specified in the offer :</p> <ol style="list-style-type: none"> Rating & make of hydraulic pumps Rating and make of electric motors Working pressure Hydraulic oil filters size & specification. Oil reservoir capacity Sealing arrangements for hydraulic power pack Grade of oil and quantity required for first charge. Type of controls used viz., pressure, temperature, level etc., Type of cooling system used and its technical specifications. Hydraulic cylinders – constructional features, accuracy, type of seals and connectors, covers used etc. Rating & make of hydraulic hoses, cartridge valves, solenoids, directional control valves, relief valves, etc.
19	MECHANICAL SYSTEM	<ol style="list-style-type: none"> Overall General Arrangement diagram and schematic of the press offered shall be provided with the techno-commercial offer. The hydraulic press shall have photo electric safety guard. Centralised lubrication system shall be included as part of the scope. All the tie rods & hydraulic pistons shall be provided with suitable protection covers. The geometrical accuracy (flatness, parallelism & perpendicularity) will be tested as per JIS 6403:1999 Grade II. The machine shall be painted as per general engineering practice adopting IS 10949 : 1984 with Apple green paint.

20	SCOPE OF SUPPLY (VENDORS)	<p>100MT CAPACITY POWDER COMPACTION 4 PILLAR FLOATING DIE TYPE HYDRAULIC PRESS COMPLETE WITH</p> <ul style="list-style-type: none"> a. Hydraulic System with oil cooler b. Press control & power panel c. Automatic centralised lubrication system d. Programmable Logic Controller (PLC) e. Core rod system f. Photoelectric safety guard g. Auto ejection h. Emergency stop i. Detailed Foundation drawings. j. Erection & Commissioning. k. Essential spares for 2 years of operation. List, specification and quantity to be given in the offer. l. Documentation: <ul style="list-style-type: none"> (i) Design documentation for all components in both soft & hard copy (3 sets) including assembly & sub-assembly drawings, hydraulic / electric circuits, Logic circuit (ii) Technical specifications and catalogs of all bought out components. (iii) Operation & Maintenance manual (3 sets soft and hard copies) m. On-site training to BHEL personnel.
21	SCOPE OF SUPPLY BHEL	<ul style="list-style-type: none"> a. All civil works including foundation for placing the press and its components b. Electric power supply at one point – mains incomer of the power panel (440 V, 3 Phase, 50 Hz, 4 wire) c. Hydraulic oil, lubricants, grease etc., (Specification to be provided by vendors) d. Licenses and permits for operating the press from regulatory authorities if any. e. Electric power, water, air, fuel and any other utilities required for installation of the press and its components. (Suppliers to provide the specific requirements in the offer) f. Material handling assistance during erection and commissioning.

22	PREFERRED MAKE OF BOUGHT OUT COMPONENTS	a. Hydraulic pumps & components : Vickers, Rexroth, Yuken b. Motors : Siemens / ABB / Bharat Bijlee c. Switchgear : L&T, Schneider, Siemens, ABB d. Bearings : SKF e. PLC : Siemens / Fanuc / Allen Bradley / Mitsubishi / Messung f. Sensors : Sony / Fagor / Omron / P & F g. Paint : Berger / Asian / J & N
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NOTE : The features given is indicative. New or state of the art features which can help in improving the productivity and enhance safety and operational features can also be incorporated as an optional feature and the price shall be quoted separately.

SPECIFIC TECHNO COMMERCIAL REQUIREMENT

1. The bill of quantity of supply should be listed in both bids . However the prices will appear against the bill of quantity in the price bid only
2. **QUALIFICATION CRITERIA:** Over and above meeting to the technical specification as detailed above, the past proven experience will be the qualifying criteria for accepting or rejecting the offer. The vendor shall have supplied similar hydraulic press for a similar application (Viz. Powder Compaction), which has been in operation for a minimum of 5 years. The supplier should furnish the list of customers along with the year of supply, address and contact telephone numbers to whom the hydraulic press has been supplied. Vendors are also requested to furnish performance certificate from their customers. These details shall be provided in the techno-commercial bid. Failure to provide this information, the offer is liable to be rejected.
3. Acceptance criterion shall be satisfactory performance of the hydraulic press at BHEL premises for a minimum of one week.
4. Inspection of the hydraulic press and its accessories as per the supplier's scope of supply shall be carried out by BHEL. Supplier to submit necessary test reports and calibration certificates as required.

ANNEXURE – I

PRODUCT DESCRIPTION

High Alumina (Alumina content minimum 85%, Maximum 99%) powder compacted ceramic products.

Size & Shape of the product:

- Average weight of the green product to be fired is 500 gms
- Both curved and flat tiles of 250 mm X 100 mm X 35 mm (L X H X Th) are going to be compacted in the press.
- In addition to this other ceramic products of various geometrical shapes like spheres, discs etc are also to be compacted.
- Typical shape of product being pressed are shown in the following photograph.



DIE MOUNTING DIMENSIONS

TYPICAL DIE DRAWING ENCLOSED FOR REFERENCE

Tender Enquiry No: BHEL/IP/MM/CAP/OT-03/2007**GENERAL TERMS AND CONDITIONS**

1. Sealed Tenders are invited for the following work from experienced parties who meet the Qualification Criteria.

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2. Address for purchase, submission & opening of Tender

a) **Purchase and opening of tender:**

Office of the Dy. G.M. / (MM)
 Insulator Plant
 Bharat Heavy Electricals Limited
 Jagdishpur Industrial Area
 Jagdishpur
 Distt Sultanpur (UP) 227 817
 Tel : 05361 270140
 Fax : 05361 270110
 Email: babulal@bhelepd.com

Contact Person: Shri G. K. Babulal, Dy. Gen. Mgr/MM

b) **Submission of tenders:**

AA) By Post/ Courier at

BHEL IP, Jagdishpur Liaison office
 2/247A, Vikas khand, Gomti Nagar (near Mayo Hospital)
 Lucknow (U.P) – 226016
 Phone: 0522-2398130, 2398142

or

BB) By hand : In the tender box located at BHEL, Insulator Plant, Jagdishpur (U.P.)

3. BHEL takes no responsibility for any delay / loss of documents or correspondence sent by courier or post.
4. The offer is to be submitted in a sealed envelope properly marked .The tender shall be submitted in two parts. The first part shall consist of the techno-commercial offer without price schedule and marked on top of the envelope as “Part I -Techno-commercial Bid” along with tender enquiry no. and due date. The second part shall be the price schedule and marked on top of the envelope as “Part II - Price Bid” along with tender enquiry no and due date. Each part shall be in a separate sealed envelope. Both the parts shall then

be put in a bigger sealed envelope. The tender enquiry no. & due date of opening must be clearly mentioned on top of the envelope.

5. Part I of the bid will be opened first and scrutinized. Successful bidders in techno-commercial bid Part – I will only be considered for opening of Price Schedule i.e. Part – II. Date of opening of Price Bid will be intimated separately to the Tenderers who qualify in the Techno-Commercial bid.
6. Offers should be strictly in accordance with the tender specifications & other terms and conditions enclosed herewith.
7. Only Tenderers who have previous experience are expected to quote for this Item. Offer from Tenderer who does not have proven and established experience in the field is liable to be rejected.
8. Details of similar equipment of above specification supplied earlier to other parties & their performance to be provided along with the offer in the techno-commercial offer.
9. Guarantee and Test Certificates are required along with the supply
10. Erection & Commissioning shall be done by supplier.
11. In the price bid cost of main equipment, E & C charges, Taxes, P & F Excise duty etc are to be quoted separately
12. Equipment will be inspected before dispatch by BHEL
13. Please quote your rates for FOR BHEL, Jagdishpur for indigeneous supply. FOB/CIF offer for import items.
14. Our payment terms are: 80% against receipt of material at site, 10% after Erection & Commissioning and balance 10% against performance bank guarantee.
15. AS delivery is the essence of the contract, BHEL's standard LD clause is applicable.
16. Operational manual & necessary drawings shall be provided to BHEL at the time of supply.
17. Prices to be firm with validity with validity of 90 days from the date of opening.
18. Parties are requested to adhere to commercial terms of BHEL, otherwise the loading in the commercial comparative statement will be as per loading factor enclosed.
19. BHEL reserves the right to accept or reject any of the bid / all bids with or without deviation or cancel / withdraw the invitation for bid without assigning any reason whatsoever and in such case no bidder shall have any claim arising out of such action by BHEL.
20. Order shall be awarded to technically suitable L-1 bidder only
21. L-1 (lowest bidder) shall be worked out based upon the cost to BHEL.basis.
22. Price to be mentioned both in words and figures in price bid

23. Tax / Excise break ups to be given clearly
24. Guarantee /Performance Guarantee of equipment shall be given by supplier
25. Unloading of materials at BHEL shall be done under the supervision of supplier.
- 27 Right of Acceptance:- BHEL reserves the right to reject any or all tenders without assigning any reason there of.
28. Risk Factor- BHEL has the option to terminate the contract and to purchase the material at the risk & cost of the vendor if vendor fails to deliver the material within the stipulated time mentioned in the contract.
29. Party shall submit relevant documents for available VAT benefits as and when applicable.
30. Performance Bank Guarantee of 10% value of the contract value valid for 12 months from the date of commissioning shall be applicable or 18 months from the Date of Dispatch.
31. Consortium Bankers of BHEL are State Bank of India, ABN Amro Bank, Bank of Baroda, Canara Bank, HDFC Bank Ltd., Deutsche, AG, ICICI Bank Ltd., IDBI Ltd, Punjab National Bank, CITI Bank, NA, State Bank of Hyderabad, State Bank of Travancore, The Hongkong and Shanghai Banking Corporation Ltd

For & on behalf of BHEL

Dy. GM/ MM
BHEL, IP, Jagdishpur



INSULATOR PLANT, JAGDISHPUR

LOADING FACTORS SHEET

DEVIATIONS ARE LIMITED TO FOLLOWING ONLY, FURTHER DEVIATION ON ANY OF THE FOLLOWING MAY LEAD BHEL TO REJECT THE OFFER UNILATERALLY ON COMMERCIAL GROUNDS.

NOTE: THIS LOADING FACTOR INDICATED BELOW WILL BE ADDED ON QUOTED PRICE TO EVALUATE THE LOWEST QUOTE (in CASE OF DEVIATION TO BHEL'S TENDER SPECIFIED TERMS).

SL NO	COMMERCIAL TERMS	BHEL STANDARD TERM	IF YOU QUOTE	LOADING FACTOR FOR NON – COMPLIANCE OF BHEL STANDARD TERM
A.	FOR INDIGENOUS SCOPE OF SUPPLY			
1	TERMS OF PAYMENT (WHERE SCOPE INCLUDES E&C) :	80% against receipt of material 10% against Erection & Commissioning 10% against Performance Bank Guarantee Note: No advance will be paid.	80% THROUGH BANK	2% ON THE 80% OF THE BASIC MATERIAL VALUE
		- SAME AS ABOVE-	80% AGAINST EXCHANGE OF DISPATCH DOCUMENTS (I.E. PROFORMA INVOICE)	2.50% ON THE 80% OF THE BASIC MATERIAL VALUE.
B.	FOR IMPORTED SCOPE OF SUPPLY :			
1	TERMS OF PAYMENT (WHERE SCOPE INCLUDES E&C)	80% against receipt of material 10% against Erection & Commissioning 10% against Performance Bank Guarantee Note: No advance will be paid.	80% THROUGH LETTER OF CREDIT. ALL BANK CHARGES OUTSIDE INDIA INCLUDING CONFIRMATION CHARGES TO BENEFICIARY'S ACCOUNT.	2% ON THE 80% OF THE BASIC MATERIAL VALUE
		-SAME AS ABOVE-	100% THROUGH LETTER OF CREDIT AGAINST DELIVERY. ALL BANK CHARGES OUTSIDE INDIA INCLUDING CONFIRMATION CHARGES TO BENEFICIARY'S ACCOUNT Note: If E & C Involved by the vendor this payment is not acceptable	3.5% ON THE 100% OF THE BASIC MATERIAL VALUE.

SL NO	COMMERCIAL TERMS	BHEL STANDARD TERM	IF YOU QUOTE	LOADING FACTOR FOR NON – COMPLIANCE OF BHEL STANDARD TERM
		-SAME AS ABOVE-	100% WITHIN 45 DAYS OF SIGNING OF HIGH SEA SALES AGREEMENT.	3% ON THE 100% OF THE CIF VALUE.
C	PERFORMANCE BANK GUARANTEE (COMMON FOR INDIGENOUS/IMPORTED/ HSS)	PBG for 10% of the basic material cost shall be furnished in the BHEL prescribed format only,	IF NOT AGREED	10% OF THE BASIC MATERIAL VALUE.
		- SAME AS ABOVE -	IF 5% IS AGREED	5% OF THE BASIC MATERIAL VALUE.
		- SAME AS ABOVE -	OTHER THAN THE ABOVE.	(10% MINUS THE AGREED MAX. %) OF THE BASIC MATERIAL VALUE WILL BE LOADED.
D	PENALITY CLAUSE	½% Per week subject to a maximum 10% for delayed delivery	IF PENALITY CLAUSE IS NOT AGREED.	10% OF THE BASIC MATERIAL VALUE.
E	WARRANTY	24 months from the date of dispatch or 18 months from the date of commissioning whichever is earlier.	IF NOT AGREED FOR THE STIPULATED WARRANTY PERIOD IN THE ENQUIRY.	0.5% OF THE BASIC MATERIAL VALUE PER MONTH FOR THE DIFFERENCE in PERIOD.