



Bharat Heavy Electricals Limited,

Enquiry No. :

Due Date :

Supplier's Ref.:

Date :

Part A (Techno-Commercial Bid)

Section IV

Specification cum Compliance Certificate for 4 ROLL HYDRAULIC PLATE ROLLING MACHINE

Note:-

1. The 'Offered' Column and where applicable, the 'Deviations' & 'Remarks' Column of this format shall be filled in by the Vendor and submitted along with the offer. Inadequate / incomplete, ambiguous or unsustainable information against any of the clauses of the specifications / requirements shall be treated as non-compliance.

2. The offer and all documents enclosed with offer should be in English language only.

Name & Address of the supplier:

Name & Address of the Indian Agent:

Telephone No.

Telephone No.

Fax No.

Fax No.

e-mail :

e-mail :

Scope: Supply, Erection & Commissioning of 4 ROLL HYDRAULIC PLATE ROLLING MACHINE complying with the following specification

S No.	Description - BHEL's Requirement	Specified	Offered	Deviations	Remarks
1.0	PURPOSE & WORK PIECE MATERIAL				
1.1	Purpose: Rolling of metals	Full Rolling			
1.2	Work Piece Material:	Aluminium Alloy(Tensile strength 35kgf/mm ²) & mild steel			
2.0	SPECIFICATION				
2.1.1	MACHINE CONFIGURATION: Electronic Synchronized Full Hydraulic , 4 roll Plate Rolling Machine controlled by using high performance electronic - hydraulic valve system with Permanent Lubricant Technology- Lubricated for life , Sealed bearings & Multiple Independent hydraulic Motors for each Powered roll	Vendor to confirm			

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2.1.2	The Machine should have the features so that there is no Need to Prebend both ends before starting to roll, Automatic Prebending of trailing edge & the flat end remains shortest.	Vendor to confirm			
2.1.3	ESSNTIAL ACCESSORIES:-				
2.1.3.1	Induction Surface Hardened Rolls	Vendor to confirm			
2.1.3.2	Intelligent programmable PLC with LED display,memory of 50 program of multiple steps(approx. 24)	Vendor to confirm & give details			
2.1.3.3	Hydraulic overhead support to hold thin plates at large diameter(approx,2000mm),overload protection,maximum holdable weight(approx.1000kg)	Vendor to confirm & give details			
2.2	CAPACITY & SIZE				
2.2.1	Rolling Capacity (Aluminium Alloy)	20 mm x2500 mm			
2.2.2	Rolling width	2600 mm			
2.2.3	Maximum Rolling Dia				
	At tk 4.78mm	Ø680			
	At tk 6.35mm	Ø680-Ø1000			
	At tk 8.0mm	Ø1000-Ø1800			
	At tk 15-16mm	Ø450-Ø800			
2.2.4	Rolling speed:	6 Mtr/Min or Vendor to confirm			
2.2.5	Motor Power	Vendor to Specify suitably			

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2.2.6	Working Height from floor level	Vendor to Specify suitably			
2.3	CONSTRUCTION:				
2.3.1	Vendor to furnish details of material, hardness & constructional details, including explanatory drawings, of various components like Rolls, frame, clamping & adjusting system, Lubrication system, etc .of the machine.	Vendor to furnish			
2.3.2	Video images on CD including hard copy explaining the technical features / Literature with photographs, drawings explaining the technical features should be enclosed with the offer.	Vendor to furnish			
2.3.3	Both Clamping Rolls Powered In Rotation , to Perfectly clamp the plate during prebending & avoiding its slipping.	Vendor to Confirm			
2.3.4	Clamping Pressure Control to pre-set the upward pressure of the bottom roll against the top roll for each batch of parts & should prevent squeezing of the material due to excessive pinching pressure and marking of soft material	Vendor to Confirm			
2.3.5	The working principle of the above mechanism shall be explained clearly.	Vendor to Explain			
2.3.6	Plate is introduced Horizontally (Not tilted)	Yes			
3.0	OPERATION AND CONTROL SYSTEM:				
3.1	CONTROL PANEL:				
3.1.1	Control panel side and Layout showing complete details shall be submitted.	Vendor to submit			
3.1.2	Machine shall be provided with main switch with key and signal light.	Vendor to Confirm			
4.0	MANUAL CONTROL :				
4.1	On manual control ,the System should balance the rolls to remain parallel, with variable speed.	Vendor to confirm			
4.2	Inching facility and cycle control facility shall be provided	Vendor to confirm			
5.0	HYDRAULIC SYSTEM : Details should be Submitted by the Vendor				
5.1	The Hydraulic Motors directly splined on the roll's shaft so that the torque is transmitted directly to the plate , without any deviation.	Vendor to confirm			
5.2	Filtration System	Vendor to confirm			

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5.3	Failure indication	Vendor to confirm			
5.4	Hydraulic Oil Cooling system of sufficient capacity to maintain the oil temperature not exceeding 40 deg C, if required. Complete details should be submitted	Vendor to confirm			
5.5	Hydraulic pump capacity (flow / pressure)	Vendor to furnish			
5.6	Complete hydraulic circuit shall be submitted along with technical bid.	Vendor to confirm			
6.0	First filling of all required Oils & Grease etc. to be supplied by vendor. Indigenous (Indian) source or Indian equivalent and specifications of oils/ greases are also to be provided by the vendor.	Vendor to confirm			
6.1	Lubrication shall be life time lubricated wherever possible. Other lubrication points shall be of automatic type. Details shall be submitted.	Vendor to confirm			
7.0	ELECTRICAL :				
7.1	415V + 10% / -10%, 50HZ +/-3 HZ, 3 Phase AC (3 wire system with out neutral) Power Supply Voltage will be provided by BHEL at a single point near the machine, as per layout recommended by Vendor. All types of cables, connections, circuit breakers etc. required for connecting BHEL's power supply point to different parts of the machine/control cabinets, shall be the responsibility of vendor. Requirement of grounding/earthing with required material details is to be informed by vendor well in advance so that same could be incorporated during construction of foundation.	Vendor to confirm			
8.0	Tropicalisation: All electrical / electronic equipment shall be tropicalized	Vendor to confirm			
8.1	All electrical & electronic control cabinets & panels should be dust and vermin proof	Vendor to confirm			
8.2	All electrical components in the cabinets should be mounted systematically	Vendor to confirm			

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8.3	All electrical and electronic panels including operator's panel should be provided with Compact Fluorescent Lamps for sufficient illumination and power receptacles of 220Volts, 5/15 Amp AC. All adapters/receptacles should have compatibility with Indian equivalents.	Vendor to confirm			
8.4	Motors shall conform to IEC or Indian Standards	Vendor to confirm			
8.5	All cables and cable trays required for the machine should be included in the offer.	Vendor to confirm			
8.6	Vendor should ensure the proper earthing for the machine and its peripherals.	Vendor to confirm			
8.7	The electrical components used shall be from reputed international makes such as Siemens / Telemecanique / Merlin Gerin / GE/ ABB and shall be accordance with DIN/IEC Standards.	Vendor to confirm			
9.0	SAFETY ARRANGEMENTS:				
	Following safety features in addition to other standard safety features should be provided on the machine:	Vendor to furnish details			
9.1	Machine should have adequate and reliable safety interlocks / devices to avoid damage to the machine, work piece and the operator due to the malfunctioning or mistakes. Details shall be submitted in the technical bid.	Vendor to furnish details			
9.2	Rolling operation control through hand/foot switch	Vendor to furnish details			
9.3	In case of overloads due to wrong manoeuvres /malfunctions the machine should stop to avoid damage to machine and man.	Vendor to furnish details			
9.4	Detailed list of safety alarms / indications provided on the machine shall be submitted along with the offer.	Vendor to furnish details			
9.5	All the pipes, cables etc. on the machine should be well supported and protected. These should not create any hindrance to machine operator's movement for effective use of machine.	Vendor to furnish details			
9.6	Emergency Switches at suitable locations as per International Norms should be provided.	Vendor to furnish details			

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9.7	Necessary protection shall be provided in the Hydraulic power pack to prevent from over loading.	Vendor to furnish details			
10.0	ENVIRONMENTAL PERFORMANCE OF THE MACHINE :				
	The Machine shall conform to following factors related to environment :	Vendor to confirm			
	(a) Maximum noise level shall be 85 dB(A) at normal load condition, 1 meter away from the machine with correction factor for back ground noise, if necessary. This will be measured as per international standards like DIN 45635-16. Supplier to mention the requirement of accoustic chamber/Enclosure separately and demonstrate compliance to noise level, if so required.				
	(b) If any safety / environmental protection enclosure is required it should be built in the machine by the vendor.				
	(c) Paint of the machine should be oil / coolant resistant and should not peel off and mix up with coolant.				
11.0	ROLLS DRAWING:				
11.1	Rolls material High Tensile " C 46 " forged corbon steel Rolls hardening 45-62 HR Rockwell C Drawing indicating material specification, tolerance and hardness shall be furnished in case of ordering.	Vendor to confirm			
12.0	LEVELING & ANCHORING SYSTEM				
12.1	Complete anchoring system including foundation bolts, anchoring materials, leveling shoes etc should be supplied	Vendor to confirm			
13.0	TOOLS FOR ERECTION, OPERATION & MAINTENANCE :				
13.1	Special tools and equipment required for erection of the machine shall be brought by the vendor. Necessary tools like Torque Wrench, Spanners, Keys, grease guns etc. for operation and maintenance of the machine should be supplied. List of such tools should be submitted with offer	Vendor agree			
14.0	SPARES:				

S No.	Description - BHEL's Requirement	Specified	Offered	Deviations	Remarks
14.1	<p>Item wise breakup of (1) standard-mechanical, hydraulic, electrical and electronic accessories & spares (included in Basic machine cost),(2) Essential -spares/accessories required for the Purpose and (3)Optional in sufficient quantity as per recommendation of Vendor for 5 years (After initial 24 month's Guarantee period)of trouble free operation on three shifts continuous running basis should be offered by vendor.If machine or control is likely to become obsolete in this period, the vendor should inform BHEL sufficiently in advance and provide drawings of parts / details of spares & suppliers to enable BHEL to procure these in advance, if required</p> <p>The list to include following, in addition to other recommended spares: (Unit Price of each item of spare should be offered in the price bid)</p>	Vendor to agree			
	a) Mechanical & Hydraulic Spares: All types of Pumps, Valves, Pressure Switches, Transducers, Flow Switches, Filters, Seals, O-rings, Hydraulic Hoses etc.	Vendor to confirm			
	b) Electrical /Electronics: All types of Relays, Contactors, Proximity Switches, Push Buttons, Indicating Lamps, Semiconductor Fuses, Special Fuses, Circuit Breakers, Main Power Switch, etc.	Vendor to confirm			
14.2	Vendor to supply 2 Sets of Electronic cards or PCBs or LCD Monitors, Modules or PLCs or Display Boards if used in the machine along with machine as essential spares.	Vendor to confirm			
14.3	Recommended set of spares for all attachments are to be offered with details.	Vendor to confirm			
14.4	Vendor to confirm that complete list of spares for machine and accessories, along with specification / type / model, and name & address of the spare supplier shall be furnished along with documentation to be supplied with the machine	Vendor to confirm			
	DOCUMENTATION :				

S No.	Description - BHEL's Requirement	Specified	Offered	Deviations	Remarks
15	Three sets of following documents (Hard copies) in English language should be supplied along with the machine. Only originals shall be supplied. Photocopies will not be accepted.	Vendor to confirm			
15.1	Operating manuals of Machine & Control system	Vendor to confirm			
15.2	Programming Manuals of Machine & Control system	Vendor to confirm			
15.3	Detailed Maintenance manual of machine with all drawings of machine assemblies/sub-assemblies/parts including Electrical / Pneumatic/ Hydraulic circuit diagrams. All Assembly/ Sub Assembly Drawings including ladder drawing shall be supplied with the parts list.	Vendor to confirm			
15.4	Manufacturing drawings for all supplied Rolls , Tables frame ,fixtures etc.	Vendor to confirm			
15.5	Catalogues, O&M Manuals of all bought out items including drawings, wherever applicable.	Vendor to confirm			
15.6	Detailed specification of all rubber items and hydraulic/lube fittings.	Vendor to confirm			
15.7	Complete Master List of parts used in the machine shall be submitted by the vendor.				
15.8	One additional set of all the above documentation on CD ROM, wherever possible.				
16	TRAINING				
16.1	BHEL Persons should be trained at supplier's Works for mutually agreed period in the area of (a) Electrical, Electronic maintenance for machine & other supplied equipments (b) Mechanical & Hydraulic maintenance of the machine & other supplied equipments (c) Operation of the machine & other supplied equipments.	Vendor to confirm			
16.2	Fare, boarding & lodging for the trainees shall be borne by BHEL.	Vendor to confirm			
16.3	Competent experts shall be arranged by the vendor during training for satisfactory & effective training of BHEL personnel.	Vendor to confirm			
16.4	Vendor to quote for training on <i>per diem</i> basis	Vendor to confirm			

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17.0	FOUNDATION :				
17.1	Vendor shall submit the layout drawing within one month from the date of Letter of Intent (LOI) / P.O. Layout should contain layout of the machine and load points including details viz. static / dynamic load details etc. The layout should consist of all requirements pertaining to complete machine including space requirement for Voltage Stabilizer, Isolation Transformer, Air compressor, Chip Bin & any other accessories. Foundation of the machine will be designed by supplier. BHEL shall construct complete foundation for the machine under supervision of supplier and at supplier's responsibility. supplier should arrange equipments required for the testing of foundation, if required. The vendor shall also indicate detailed specifications of grouting compound and Grouting procedure etc. for foundation bolts of the machine.	Vendor to agree			
18.0	ERECTION & COMMISSIONING				
18.1	Supplier to take full responsibility for carrying out the erection, start up, testing of machine, it's control & all types of other supplied equipment, machining of test pieces etc. Service requirement like power, air & water shall be provided by BHEL at only one point to be indicated by supplier in their foundation/layout drawings. Other requirements like crane and helping personnel shall also be provided by BHEL. Details of these requirements should be informed by vendor in advance.	Vendor to agree			
18.2	Successful working of full capacity of the machine by the supplier shall be considered as part of commissioning. All tests, as mentioned at clause 19 & 20 shall form part of the commissioning activity.	Vendor to agree			
18.3	Tools, Tackles, instruments and other necessary equipments required to carry out all above activities should be brought by the supplier.	Vendor to agree			
18.4	Commissioning spares, required for commissioning of the machine within stipulated time, shall be brought by the supplier on returnable basis.	Vendor to agree			

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18.5	Portion, if any, of the machine, accessories and other supplied items where paint has rubbed off or peeled during transit or erection should be repainted and merged with the original surrounding paint by the vendor. For this purpose, the vendor should supply sufficient quantity of touch-up paint of various colours of paint used.	Vendor to agree			
18.6	Schedule of Erection and Commissioning shall be submitted with the offer.	Vendor to agree			
18.7	Charges if any ,Duration, terms & conditions for E&C, should be furnished in detail separately by vendor along with offer.	Vendor to confirm			
19.0	TESTING STANDARD & PROCEDURE	Vendor to specify the Standard.			
19.1	Straightnes and parellality of Rollers surface.				
19.2	Repeatability of settings				
19.3	Any other testing if required				
20.0	MACHINE ACCEPTANCE: (Tests/Activities should be Performed by Vendor)				
20.1	Tests/Activities should be carried out at supplier's works on the machine before dispatch :				
20.1.1	The machine should be tested for full load test at supplier works before despatch.	Vendor to confirm			
20.1.2	Demonstration of all features of the machine, control system & accessories.	Vendor to confirm			
20.1.3	Any other tests/activities	Vendor to confirm			
20.2	Tests/Activities should be carried out at BHEL works while commissioning the machine :				
20.2.1	Full load test to demonstrate the maximum power & cutting capacity of the machine at BHEL works.	Vendor to agree			
20.2.2	Demonstration of all features of the machine, control system & accessories to the satisfaction of BHEL for efficient and effective use of the machine.	Vendor to agree			

S No.	Description - BHEL's Requirement	Specified	Offered	Deviations	Remarks
20.2.3	Training of BHEL machine operators in operation of complete machine & accessories etc by the supplier's experts / engineers during their stay at BHEL works.	Vendor to agree			
20.2.4	Demonstration by actual use of all supplied attachments and accessories to their full capacity for actual jobs.	Vendor to agree			
21.0	PACKING:				
21.1	Sea worthy & rigid packing for all items of complete machine with all Accessories and other supplied items to avoid any damage/loss in transit. When machine is despatched in containers, all small loose items shall be suitably packed in boxes.	Vendor to confirm			
22.0	GUARANTEE :				
22.1	Guarantee for 24 months from the date of acceptance of the machine at BHEL works . During this Guarantee period at least 2 visits per year and/or whenever called by BHEL (within 24 hours of call) by the service engineer of the supplier to be made & the parts, items, spares etc. needing replacement to be replaced by the supplier free of cost. In support a Performance Bank Guarantee of 10% of Basic Value of P.O. valid for 24 months from the date of commissioning will have to be furnished by supplier	Vendor to confirm			
23.0	GENERAL :				
23.1	Machine Model	Vendor to furnish			
23.2	Total connected load (KVA):	Vendor to furnish			
23.3	Floor area required (Length, Width, Height) for complete machine & accessories	Vendor to furnish			
23.4	Painting of Machine / Electrical Panels : RAL 6011 Apple Green (Polyurethane Paint)	Vendor to confirm			
23.5	Total weight of the machine	Vendor to furnish			
23.6	Weight of heaviest part of machine	Vendor to furnish			
23.7	Weight of the heaviest assembly / sub-assembly of the Machine	Vendor to furnish			
23.8	Dimensions of largest part/ sub-assembly/ assembly of the machine	Vendor to furnish			

S No.	Description - BHEL's Requirement	Specified	Offered	Deviations	Remarks
23.9	Detailed catalogues, sketch/photographs of the m/c and accessories/ attachments should be submitted with the offer.	Vendor to submit			
23.10	Hydraulic, Pneumatic & oil pipings should be preferably metallic except places where flexible pipings are essential. All the pipes required for the same shall be included in the standard scope of the machine.	Vendor to confirm			

Signature & Seal of Tenderor