

	<u>BHARAT HEAVY ELECTRICAL LIMITED</u>			Enquiry No. :	
	<u>UNIT'S ADDRESS:</u>			Due Date :	
	<u>UNIT'S PHONE NOS.</u>			Supplier Qtn. No.:	
<u>CONTACT PERSON'S NAME/DESIGN./PHONE NO./E-MAIL (FROM PURCHASE DEPTT.)</u>			Date :		
<u>SPECIFICATION CUM COMPLIANCE CERTIFICATE FOR VERTICAL HYDRAULIC PLATE BENDING MACHINE</u>					
NOTE:-					
1. Vendor must submit complete information against clause no. 24.0 The offer meeting this clause would only be processed.					
2. 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.					
3. The offer and all documents enclosed with offer should be in English language only .					
ADDRESS OF THE SUPPLIER :			ADDRESS OF THE INDIAN AGENTS :		
TELEPHONE NOS.:			TELEPHONE NOS.:		
FAX NOS.:			FAX NOS.:		
E-MAIL ADDRESS :			E-MAIL ADDRESS :		

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
1.0	PURPOSE & WORKPIECE MATERIAL				
1.1	Purpose: 4000 Ton capacity, Vertical plate bending machine, capable of bending plates in cold condition working on progressive 'press-bend' principle.	Vendor to Confirm			
1.2	Work Piece Material: Mild steel plates of 460 N/mm ² max. tensile strength and 260 N/mm ² yield point. Tensile and alloy plates of 600 N/mm ² max. tensile strength and 450 N/mm ² yield point.	Vendor to Confirm			
2.0	SPECIFICATION:				
2.1	MACHINE CONFIGURATION				
2.1.1	Maximum Force: 4000 Ton	Vendor to Confirm			
2.1.2	Maximum Plate width: 3600 mm	Vendor to Confirm			
2.1.3	Minimum inside dia capable to form full cylinder using main roller: 1200 mm	Vendor to Confirm			
2.1.4	Maximum Stroke: 480 mm	Vendor to Confirm			
2.1.5	Maximum plate thickness which can be bent/ formed on the machine: 200 mm	Vendor to Confirm			
2.1.6	Pressing Speed in mm/min.:	Vendor to Specify			
2.1.7	Return Speed in mm/min:	Vendor to Specify			
2.2	CAPACITY & SIZE of WORKPIECE				

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS																																			
2.2.1	Typical Jobs requirement of Cone Bending to be confirmed by Vendor : <table><tr><td>Thickness (mm)</td><td>Width (inclined height) (mm)</td><td>MinorDia. (mm)</td><td>Cone Angle</td><td>Material Yield Strength (N/mm²)</td></tr><tr><td>80</td><td>1025</td><td>1043</td><td>31°</td><td>400</td></tr><tr><td>80</td><td>3000</td><td>1043</td><td>41°</td><td>400</td></tr><tr><td>80</td><td>3000</td><td>1043</td><td>20°</td><td>400</td></tr><tr><td>150</td><td>2000</td><td>1800</td><td>30 °</td><td>315</td></tr><tr><td>120</td><td>2000</td><td>1400</td><td>30 °</td><td>315</td></tr><tr><td colspan="5"></td></tr></table>	Thickness (mm)	Width (inclined height) (mm)	MinorDia. (mm)	Cone Angle	Material Yield Strength (N/mm ²)	80	1025	1043	31°	400	80	3000	1043	41°	400	80	3000	1043	20°	400	150	2000	1800	30 °	315	120	2000	1400	30 °	315						Vendor to Confirm			
		Thickness (mm)	Width (inclined height) (mm)	MinorDia. (mm)	Cone Angle	Material Yield Strength (N/mm ²)																																		
		80	1025	1043	31°	400																																		
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		80	3000	1043	20°	400																																		
		150	2000	1800	30 °	315																																		
		120	2000	1400	30 °	315																																		
2.2.2	Typical Jobs requirement of Cylinder Bending to be confirmed by supplier <table><tr><td>Thickness (mm)</td><td>Height (mm)</td><td>Dia. (mm)</td><td>Material Yield Strength (N/mm²)</td></tr><tr><td>100</td><td>3600</td><td>1600</td><td>315</td></tr><tr><td>100</td><td>2040</td><td>1260</td><td>315</td></tr><tr><td>150</td><td>2500</td><td>1500</td><td>315</td></tr><tr><td colspan="4"></td></tr></table>	Thickness (mm)	Height (mm)	Dia. (mm)	Material Yield Strength (N/mm ²)	100	3600	1600	315	100	2040	1260	315	150	2500	1500	315					Vendor to Confirm																		
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		100	3600	1600	315																																			
		100	2040	1260	315																																			
		150	2500	1500	315																																			
2.3	Roller																																							
2.3.1	Roller should be dual purpose to provide the central thrust surface of the 3 point bending configuration and also provides the means of feeding the plate through the machine.	Vendor to Confirm																																						

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2.3.2	Machine to be designed to accept the auxillary Roller for forming smaller diameter cylinder & cone as defined at 2.3.4	Vendor to Confirm			
2.3.3	Rollers to be manufactured from surface hardened alloy steel forgings. Material details to be specified by vendor.	Vendor to Confirm			
2.3.4	The roller to be rotated by helical spur and pinion gearing at its lower end. The final reduction gearing is driven by high efficiency geared hydraulic	Vendor to Confirm			
2.3.5	Provision for attaching flanging nose bar on roller to be provided	Vendor to Confirm			
2.4	One additional Alloy forged Steel interchangeable roller of diameter 680 mm (approximate) to be supplied with machine for bending full length, thinner plates. Provision for attaching flanging nose bar on roller to be provided	Vendor to Confirm			
2.5	Vicing Rams , within the reciprocating beam, to provide a friction grip against the main roller to drive the plate through the machine.	Vendor to Confirm			
2.6	Fixed Back Beam to incorporat two integral forged cylinders of deep box section fabricated steel to withstand the full force of the machine with the minimum of deflection. The beam to be firmly located and bolted into the top and bottom slabs	Vendor to Confirm			

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2.7	Top and Bottom Slabs to transmit the load reaction from the back beam to the bending roller journals and should be of solid section high quality forged steel. The top slab to be hinged such that the front section can lift clear of the roller to allow removal of the completed cylinder. Replaceable low maintenance slideways to be incorporated within the slabs to guide the reciprocating beam	Vendor to Confirm			
2.8.1	Reciprocating Beam to be of fabricated steel box section construction and will move horizontally between the top and bottom slabs. The beam to be with fully machined top and bottom to match the slideways in the slabs ensuring that it remains square to the fixed back beam and bending roller during reciprocation, Replaceable low friction slideway strips to be located between the guide surfaces for long maintenance free life and should be easily replaced insitu if necessary.	Vendor to Confirm			
2.8.2	Front face of tool mounted on reciprocating beam to be serrated across its entire width to give a positive adjustable location for the two bending bars which provide the outer thrust surfaces of the three point bending configuration	Vendor to Confirm			

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2.9	Bending Bars					
2.9.1	Centre adjustment of the bending bars to be operated by an electric motor driven system within the moving beam with hydraulic locking to allow the operator to alter the bending bar centres by push button control, even whilst the workplate is in the machine.		Vendor to Confirm			
2.10	The reciprocating beam should house the four hydraulic Vicing Rams by means of the roller mounted on the end of each vicing ram, the workplate should firmly push against the main roller to ensure that the plate is fed through the machine without slippage, giving a constant feed. These rams are also to be used to provide the return stroke of the reciprocating beam motion during the normal feed bend operation cycle.		Vendor to Confirm			
2.11	Two additional Return Rams diagonally opposed on the vertical support columns to return the beam when the plate vicing feature is not being used, (i.e.) when inserting or removing the plate from the machine.		Vendor to Confirm			
2.12	Balancing arm should be rigidly attached to the reciprocating beam to ensure that during the forward motion of the reciprocating beam, the beam is always maintained in a truly parallel alignment with the forming roller, particularly during the pressing part of the stroke, to ensure an accurate and true bending performance.		Vendor to Confirm			

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2.13	Back Stop System to limit the backward travel during the reciprocating beam cycle and give only the stroke necessary for the bending operation. It should be located at the top and bottom extremities of the reciprocating beam and the operating mechanism to be mounted on the back beam. Its secondary function is to ensure that the reciprocating beam is perpendicular and exactly parallel to the main roller prior to the commencement of each forward bending motion.	Vendor to Confirm			
2.14	2 number Jib cranes of 5 meter radius and 7.5 MT capacity to be provided along with the machine and fitted accordingly to hold plates while bending	Vendor to Confirm			
2.15	FLANGING NOSE BARS: One forged steel nose bar for fitting to main roller for flanging work.	Vendor to specify			
2.16	Laser beam light to be provide on machine for bend line alignment.	Vendor to specify			
3	ROLLER SKATES				
3.1	Four roller skates to be supplied with each machine. These skates should accept a load of 20 tonnes per skate.	Vendor to Confirm			
3.2	4 No Upper roller of the skates each for square edge preparation, J and double V preparations.	Vendor to Confirm			

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4	HYDRAULIC EQUIP MENT				
4.1	High pressure, variable delivery, piston pumps to ensure high efficiency and long life	Vendor to Confirm			
4.2	Hydraulic pumps and valves contained in a single unit, base mounted adjacent to the machine. The pumps to be driven directly by electric motors. The solenoid / pilot operated control valves etc. to be mounted on manifold blocks and controlled electrically. The use of 'block hydraulics' to reduce the number of pipe connections and the risk of oil leakage in the system for easier maintenance.	Vendor to Confirm			
4.3	Unit should be with complete plug in test pressure connections at various points throughout the hydraulic circuit to facilitate fault finding. Tell tale indicator lamps visible on the outside of the unit to indicate when solenoids are activated	Vendor to Confirm			
4.4	Main ram and servo oil pressure indicated by gauges mounted on the hydraulic unit.	Vendor to Confirm			
4.5	The oil system to be continuously cleaned by high efficiency replaceable element filters with warning lamp indication for replacement. If necessary due to ambient conditions as specified, an air glass cooler is fitted to maintain the hydraulic oil at a satisfactory temperature. Similarly, electric emersion heaters to be fitted in the oil tank to maintain a satisfactory minimum temperature for starting in cold conditions.	Vendor to Confirm			

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4.6	All hydraulic rams to be ground; hard chrome plated forged steel, and operated within cylinders fitted with replaceable phosphor bronze liners. The main cylinders should be sealed by high pressure multi lipped type 'V' ring packings split for ease of replacement 'insitu'. All rams should be protected by efficient scraper rings within the glands	Vendor to Confirm			
4.7	Hydraulic system to be fully protected against any unintentional overload conditions which could damage the machine or interchangeable rollers.	Vendor to Confirm			
4.8	For operator & machine safety tonnage meter will be provided on the machine. Details to be given by supplier	Vendor to specify			
4.9	When smaller diameter interchangeable roller is fitted, the load to be applied should automatically reduced to ratings which will not over stress or cause unacceptable deflection.	Vendor to Confirm			
4.10	Indigenous (Indian) source or Indian equivalent and specifications of oils/ greases are also to be provided by the vendor.	Vendor to Confirm			
4.11	The main hydraulic pumps to be driven by high efficiency, totally enclosed AC induction motors, in accordance with IEC 34-5 IP55 protection standards and Class -F insulation to IEC34-1. These motors should start on no load by push button operated star delta starters with automatic sequence for multiple motors. The motors should be protected by thermal and electro-magnetic overload breakers.	Vendor to Confirm			
5	CONSTRUCTION:				

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5.1	Vendor to furnish details of material, hardness & constructional details, including explanatory drawings, of various components/assemblies like Column, Cross Rail, Ram head, Table, Guideways/slides, Feed Transmission system, Ram, Hydraulic and Lubrication system, Feedback system etc .of the machine.	Vendor to Confirm			
5.2	Critical & main parts of machine to be constructed from forging &/or fabricated structure	Vendor to Confirm			
5.3	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 Confirm			
6 OPERATION AND CONTROL SYSTEM:					
6.1	Complete control of the machine is effected from a portable desk type control console on the floor area adjacent to the machine. The console is mounted on wheels and connected to the electrical panel by an armoured type trailing cable, thereby allowing operator mobility and unrestricted view of the working area. The face of the control console has an engraved legend plate with all operating features depicted in colour coded international sign language	Vendor to Confirm			
6.2	An auxiliary pendant control station is fitted on the opposite side of the machine with selected duplicate controls to facilitate the edge setting operations	Vendor to Confirm			

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6.3	The machine should have both basic modes of operation: Automatic and Manual. In Automatic Cycle mode the bend and feed cycle to be repeated continually until a complete pass is performed, with the length of feed and amount of stroke being pre selected by the operator and in Manual mode the beam stroke and feed movements to be controlled by hold to run pushbuttons. The direction of movement of the plate through the machine can be in either direction for both modes of operation.	Vendor to Confirm			
6.4	The control voltage for push buttons is 24V DC and for contactors, solenoids, etc. shall be 110 volts AC. All limit switches have 'tell tale' indicator lights.	Vendor to Confirm			
7	MACHINE LIGHTS: All light fittings, consumables, adapters/receptacles should have compatibility with Indian / International equivalents.	Vendor to Confirm			
8	ELECTRICAL :				
8.1	415V + 10% / -10%, 50HZ +/-3 %, 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			

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8.2	Tropicalisation: All electrical / electronic equipment shall be tropicalized for temperature variation 5 to 45 degree celsius and Relative Humidity = 90% max.	Vendor to Confirm			
8.3	All electrical & electronic control cabinets & panels should be dust and vermin proof	Vendor to Confirm			
8.4	All electrical and electronic panels including operator's panel should be provided with 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			
8.5	Motors shall conform to IEC or Indian Standards	Vendor to Confirm			
8.6	All cables moving with traversing axes should be installed in caterpillar / Drag chain. Additionally, all the cable trays required for laying of cables should be included in the offer.	Vendor to Confirm			
8.7	Vendor should ensure the proper earthing for the machine and its peripherals.	Vendor to Confirm			
9	SAFETY ARRANGEMENTS: Following safety features in addition to other standard safety features should be provided on the machine:	Vendor to Confirm			
9.1	Machine should have adequate and reliable safety interlocks / devices to avoid damage to the machine, workpiece and the operator due to the malfunctioning or mistakes. Machine functions should be continuously monitored and alarm / warning indications through lights/ alarm number with messages (on display and panels) should be available.	Vendor to Confirm			

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9.2	The electrical control circuits should be so arranged that in the event of power failure or interruption the press cannot inadvertently restart or make any uncontrolled movements.	Vendor to Confirm			
9.3	Emergency stop buttons of the turn to release type should be positioned on both sides of the machine in addition to one on the control desk and the integrity of the emergency system is continually monitored in compliance with recognised safety standards.	Vendor to Confirm			
9.4	A detailed list of all alarms / indications provided on machine should be submitted by the supplier.	Vendor to Confirm			
9.5	All the pipes, cables etc. on the machine should be well supported and protected. These should not create any hinderance to machine operator's movement for effective use of machine.	Vendor to Confirm			
9.6	All the rotating parts used on machine should be statically & dynamically balanced to avoid undue vibrations.	Vendor to Confirm			
9.7	Emergency Switches at suitable locations as per International Norms should be provided.	Vendor to Confirm			
10	ENVIRONMENTAL PERFORMANCE OF THE MACHINE :				
	The Machine shall conform to following factors related to environment :				
	a) Safety / environmental protection enclosure should be provided.	Vendor to Confirm			
	(b) Paint of the machine should be oil / coolant resistant and should not peel off and mix up with coolant.	Vendor to Confirm			

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11	LEVELING & ANCHORING SYSTEM: Complete anchoring system including foundation bolts, anchoring materials, fixators, leveling shoes etc should be supplied	Vendor to Confirm			
12	TOOLS FOR ERECTION, OPERATION & MAINTENANCE: 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 to Confirm			
13	SPARES:				
13.1	Itemised breakup of mechanical, hydraulic, electrical and electronic spares used on the machine in sufficient quantity as per recommendation of Vendor for 2 years of trouble free operation on three shifts continuous running basis should be offered by vendor. The list to include following, in addition to other recommended spares: (Unit Price of each item of spare should be offered)	Vendor to Confirm			
13.1.1	Mechanical & Hydraulic Spares: All types of Pumps, Valves, Pressure Switches, Transducers, Flow Switches, Filters, Seals, O-rings, Hydraulic Hoses etc.	Vendor to Confirm			
13.1.2	Electrical /Electronic / Spares: All types of Relays, Contactors, Proximity Switches, Push Buttons, Indicating Lamps, Semiconductor Fuses, Special Fuses, Circuit Breakers, Main Power Switch, Operator's panel with Display Unit	Vendor to Confirm			

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13.2	All types of spares for total machine and accessories should be available for atleast ten years after supply of the machine. 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	Vendor to Confirm			
13.3	Recommended set of spares for all attachments are to be offered with details.	Vendor to Specify			
13.4	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			
14	DOCUMENTATION : Four sets of following documents (Hard copies) in English language should be supplied along with the machine	Vendor to Confirm			
14.1	Operating manuals of Machine system	Vendor to Confirm			
14.2	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 shall be supplied with the part list also	Vendor to Confirm			
14.3	Catalogues, O&M Manuals of all bought out items including drawings, wherever applicable.	Vendor to Confirm			
14.4	Detailed specification of all rubber items and hydraulic/lube fittings	Vendor to Confirm			
14.5	Complete Master List of parts used in the machine shall be submitted by the vendor.	Vendor to Confirm			

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14.6	One additional set of all the above documentation on CD ROM, wherever possible.	Vendor to Confirm			
15	TRAINING				
15.1	BHEL Persons should be trained at supplier's Works for 10 mandays/ mutually agreed period in the area of: (a) Technology, Use of all Features, Systems & supplied accessories etc. (b) Electrical & Electronic maintenance for machine & other supplied equipments (c) Mechanical & Hydraulic maintenance of the machine & other supplied equipments (d) Operation of the machine & other supplied equipments.	Vendor to Confirm			
15.2	Air-fare, boarding & lodging for the trainees shall be borne by BHEL.	Vendor to Confirm			
15.3	Competent, English speaking experts shall be arranged by the vendor during training for satisfactory & effective training of BHEL personnel.	Vendor to Confirm			

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16	FOUNDATION :				
16.1	Vendor shall submit the preliminary layout drawing for getting BHEL's approval within one month from the date of Letter of Intent (LOI) / P.O. whichever is earlier. Soil condition data will be furnished by BHEL along with the approval. Complete Foundation Design including details of reinforcement and Final Layout drawings shall be submitted by the supplier within three months after getting BHEL's approval. The layout should consist of all requirements pertaining to complete machine including space requirement for Voltage Stabilizer, Isolation Transformer (if any), Air compressor (if any), & any other accessories. BHEL shall construct complete foundation for the machine under supervision of supplier and at supplier's responsibility. Vendor should arrange equipments required for the testing of foundation, if required by the vendor. The vendor shall also indicate detailed specifications of grouting compound and Grouting procedure etc. for foundation bolts of the machine.	Vendor to Confirm			
17.0	ERECTION & COMMISSIONING				
17.1	Supplier to take full responsibility for carrying out the erection, start up, testing of machine, its 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 Confirm			

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17.2	Successful proving of BHEL components by the supplier shall be considered as part of commissioning. All tests, as mentioned at clause 20 (Machine Acceptance) shall form part of the commissioning activity.	Vendor to Confirm			
17.3	Commissioning spares, required for commissioning of the machine within stipulated time, shall be brought by the supplier on returnable basis.	Vendor to Confirm			
17.4	All Cover Plates required for the machine and its peripherals including pits, if any, shall be supplied and installed by the vendor. The plates should be sourced from India	Vendor to Confirm			
17.5	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 Confirm			
17.6	Schedule of Erection and Commissioning shall be submitted with the offer.	Vendor to Specify			
17.7	Charges, duration, terms & conditions for E&C should be furnished in detail separately by vendor along with offer.	Vendor to Specify			
18	AMBIENT CONDITIONS & THERMAL STABILITY :				
18.1	Total machine and all supplied items should work trouble free and efficiently under following operating conditions and should give specified accuracies. Ambient Conditions: Temperature = 5 to 45 degree celsius Relative Humidity = 95% max. (Vendor to confirm that machine is suitable for above and details of provisions on the machine for the same are to be furnished by Vendor)	Vendor to Confirm			

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18.2	Weather conditions are tropical, Atmosphere may be dust laden during some part of the year. Machine shall be kept in the normal shop floor condition. Max. temperature variation is up to 25 deg Celsius in 24 hours. (Vendor to confirm that machine is suitable for above and details of provisions on the machine for the same are to be furnished by Vendor)	Vendor to Confirm			
18.3	Thermal Stability of the complete machine keeping in view specified Ambient Conditions and accuracy requirements of BHEL components and trouble free operation of the machine should be ensured by vendor. (Confirm that machine is suitable for above and details of provisions on the machine for the same should be furnished)	Vendor to Confirm			

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19.0	PROVEOUT OF BHEL COMPONENTS :				
19.1	Complete bending of any two components as mentioned at 2.2.1 & 2.2.2 shall be done by Vendor at BHEL works to the specified design and accuracy, Supplier will also prove the machine capacity to bend 200 mm thickness plate. Material for the proveout components shall be provided by BHEL. Vendor shall be fully responsible for bending of proveout components as per drawing and other requirements specified by BHEL to the full satisfaction of BHEL. Clarifications, if any required by vendor, regarding accuracy requirements of the proveout components, whether specified or not, should be discussed and cleared by vendor during initial technical discussions.	Vendor to Confirm			
19.2	Vendor shall be responsible for any deviation/rejection in proveout component due to wrong malfunctioning of the machine during proveout machining and also for the delay due to improper use of machine etc. The cost of such deviation / rejection, if any, shall be refunded by the vendor to BHEL.	Vendor to Confirm			
20	MACHINE ACCEPTANCE: (Tests/Activities should be Performed by Vendor)	Should be accepted & confirmed by Vendor			
20.1	Tests/Activities should be carried out at supplier's works on the machine before dispatch :	Vendor to Confirm			
20.1.1	Demonstration of all operational features of the machine, control system & accessories and proving full load capacity of 4000T.	Vendor to Confirm			
20.2	Tests/Activities should be carried out at BHEL works while commissioning the machine :				

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20.2.1	Full load test to demonstrate the maximum power & bending capacity of the machine.	Vendor to Confirm			
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 Confirm			
20.2.3	One week supervision of independent operation of machine by BHEL after job proveout	Vendor to Confirm			
20.2.4	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 Confirm			
20.2.5	Demonstration by actual use of all supplied attachments and accessories to their full capacity.	Vendor to Confirm			
21.0	PACKING: Sea worthy & rigid packing for all items of complete machine, 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	Provision for attaching horse shoe (Yoke) on the machine. (Vendor to quote separately for this provision on machine.)	Vendor to Specify			
23	GENERAL :				
23.1	Machine Model				
23.2	Total connected load (KVA):	Vendor to Specify			
23.3	Floor area required (Length, Width, Height) for complete machine & accessories	Vendor to Specify			

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23.4	Painting of Machine / Electrical Panels:	Vendor to Specify			
23.5	Total weight of the machine	Vendor to Specify			
23.6	Weight of heaviest part of machine	Vendor to Specify			
23.7	Weight of the heaviest assembly / sub-assembly of the Machine	Vendor to Specify			
23.8	Dimensions of largest part/ sub-assembly/ assembly of the machine	Vendor to Specify			
23.9	Vendor to submit, along with offer, reference list of customers where similar machines have been supplied mentioning broad specifications of the supplied machine.	Vendor to Specify			
23.10	Detailed catalogues , sketch/ photographs of the m/c and accessories/ attachments should be submitted with the offer.	Vendor to Specify			
23.11	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 Specify			

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
24	REFERENCE LIST / QUALIFYING CONDITIONS :				
24.1	Only those vendors, who have supplied and commissioned at least one Vertical Hydraulic Bending Machine of 3000 tonne capacity or more with a plate width of 3000 mm or more for cone and cylinder bending or similar applications in the past ten years (on the date of opening of tender) and such machine is presently working satisfactorily for more than one year after commissioning (on the date of opening of tender) , should quote. However if such machine(s) has/had been supplied to BHEL, then such machine should be presently working satisfactorily for more than six months after its commissioning and acceptance (on the date of opening of tender) in BHEL should quote. The following information should be submitted by the vendor about the companies where similar machines have been supplied. This is required from all the vendors for qualification of their offer.	Vendor to Specify			
24.1.1	Name of the customer / company where similar machine is installed.	Vendor to Specify			
24.1.2	Complete postal address of the customer.	Vendor to Specify			
24.1.3	Month & Year of commissioning.	Vendor to Specify			
24.1.4	Application for which the machine is supplied .	Vendor to Specify			
24.1.5	Name and designation of the contact person of the customer.	Vendor to Specify			
24.1.6	Phone, FAX no. and email address of the contact person of the customer.	Vendor to Specify			
24.1.7	Performance certificate from the customers regarding satisfactory performance of machine supplied to them in original.	Vendor to Specify			
24.1.8	BHEL reserves the right to verify information provided by vendor. In case the information provided by vendor is found to be false/incorrect, the offer shall be rejected.	Vendor to Specify			