

**BHARAT HEAVY ELECTRICAL LIMITED, JHANSI**



Specification No.	M.T-6247
Item No.	MT-1/1/1569
Location	FBM
Quantity	1

**Note:**

1. Vendor must submit complete information against clause No. 19 (Qualifying criteria) and the offers meeting this clause would only be processed.
2. The "bidder offer" column and the "deviation/remark" column (if applicable) of this format shall be filled in by the vendor and submitted along with the offer. Technical details also need to be submitted along with the offer. Inadequate / incomplete, ambiguous, or unsustainable information against any of the clauses of the specification / requirements shall be treated as non - compliance.
3. The offer and all the documents enclosed with the offer shall be in English only.

**SPECIFICATION CUM COMPLIANCE CERTIFICATE OF HYDRAULIC SHEARING MACHINE**

**Scope:** Design, manufacturing, supply, erection & commissioning of HYDRAULIC SHEARING MACHINE complying with the following specification

Sr. No.	Description	Specified/ To be confirmed by vendor	Offered	Deviation / remark
<b>1</b>	<b>PURPOSE &amp; WORK PIECE MATERIAL</b>			
1.1	Purpose: Shearing of metal sheets & plates with precision and efficiency.	Vendor to confirm		
1.2	Work Piece Material: Mild Steel & Stainless Steel.	Vendor to confirm		
<b>2</b>	<b>SPECIFICATION</b>			
<b>2.1</b>	<b>MACHINE CONFIGURATION</b>			
2.1.1	The machine consists of a stationary cutting blade and a vertically moving blade that is controlled by a hydraulic system. The sheet metal is placed on the cutting table and the moving blade is brought down to cut through the metal. Hydraulically operated shearing machine shall be equipped with hold downs, rake angle adjustment, blade clearance adjustment, suitable safety guards, electrically controlled back gauge etc.	Vendor to confirm		
<b>2.2</b>	<b>CAPACITY</b>			
2.2.1	Shearing Range (Mild Steel) -1.5 mm to 12 mm	Vendor to confirm		

50



Sr. No.	Description	Specified/ To be confirmed by vendor	Offered	Deviation / remark
2.2.2	Shearing Range (Stainless Steel) - 1.5 mm to 8 mm	Vendor to confirm		
2.2.3	Machine shearing Length - 2500 mm Min.	Vendor to confirm		
2.2.4	No. of Shearing strokes per minute for max. cutting width 2500 mm (with 12 mm thick plate) - 6 Minimum.	Vendor to confirm		
2.2.5	No. of hold downs - 13 Min.	Vendor to confirm		
2.2.6	Working Height from floor level.	Vendor to specify		
2.2.7	Throat depth.	Vendor to specify		
2.2.8	Back gauge range - 10 mm – 1000 mm and above swing sway/Flip off mechanism by push button control for jobs of length more than 1000 mm.	Vendor to confirm		
2.2.9	Rake angle adjustment - The blade angle of shearing machines shall be adjustable to optimize the cutting performance for various sheet thickness. A suitable hydraulic mechanism shall be provided for adjusting the rake angle, along with a clear display of the set angle for accurate operation.	Vendor to confirm and specify the range of rake angle adjustment		
2.2.10	Blade gap adjustment - The blade gap of shearing machines shall be adjustable to optimize the cutting performance for various sheet thickness. A suitable provision shall be provided for adjusting the blade gap.	Vendor to confirm and specify the range of blade gap adjustment		
2.2.11	Direct shearing length / stroke adjustment facility to increase no. of strokes on shorter cuts.	Vendor to confirm		
2.3	<b>MACHINE CONSTRUCTION:</b>			
2.3.1	Machine frame shall be typically made from high-strength steel to withstand significant stress during cutting operation.	Vendor to confirm		
2.3.2	Frame shall be rigidly welded, monoblock steel frame for minimum deflection under load.	Vendor to confirm		
2.3.3	Machine frame support shall be suitably reinforced to ensure consistent performance during heavy-duty operations.	Vendor to confirm		
2.3.4	Main frame of the machine shall be fabricated from Mild steel conforming to IS 2062. Main frame structure shall be strong enough to withstand heavy jerks and loading encountered during operation. The frame shall be fabricated by following standard welding practices. It shall be stress relieved before machining, and also accurately machined to obtain the accurate fitment bearings housing etc.	Vendor to confirm		

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2.3.5	The blade beam guides shall have hardened slide ways and heavy duty pre-loaded guide rollers ensuring constant gap between blades during full stroke.	Vendor to confirm		
2.4	<b>SHEARING BLADES</b>			
2.4.1	The blades shall be of tough and wear resistant alloyed material, single piece rectangular in construction with four cutting edges allowing for rotation to extend blade life.	Vendor to confirm		
2.4.2	Blade Material and size.	Vendor to specify		
2.4.3	Blade hardness : 55 - 58 HRC	Vendor to confirm		
2.4.4	Blade Mounting System shall Ensure stability during operation.	Vendor to confirm		
2.4.5	Quick blade change provision shall be provided to allow faster blade replacements.	Vendor to confirm		
2.4.6	Blade Holders: Must securely support the blades and allow for precise adjustments to maintain optimal cutting angles and clearances.	Vendor to confirm		
2.4.7	The Shear blade shall be of single blade with 4 cutting edges construction and detailed manufacturing drawing indicating material specification, tolerance and hardness shall be furnished along with documentation.	Vendor to confirm		
2.5	<b>TABLE</b>			
2.5.1	Ball transfer table of min 500 mm width throughout cutting length for in feed.	Vendor to Confirm		
2.5.2	Squaring arm of 1.1 metre long on Left side & 1.0 metre on right side.	Vendor to Confirm		
2.5.3	Front support arm (5 Nos. of 1 metre long each)	Vendor to Confirm		
2.5.4	Hydraulic hold downs operation - manual / auto	Vendor to Confirm		
2.5.5	Shadow line cutting facility with lighting.	Vendor to Confirm		
2.5.6	See through Finger guard.	Vendor to Confirm		
2.5.7	Sheet support facility for the smooth disposal of sheared materials.	Vendor to Confirm		
2.6	<b>MOTORIZED BACK GAUGE:</b>			
2.6.1	The machine shall be provided with Motorized Back Gauge (10 mm to 1000 mm) with precision ball screws.	Vendor to Confirm		
2.6.2	Back Gauge position accuracy = +/- 0.5 mm / Meter. Back Gauge should have sufficient support to avoid cantilever stress.	Vendor to Confirm		

52



Sr. No.	Description	Specified/ To be confirmed by vendor	Offered	Deviation / remark
2.6.3	The back gauge shall be of swing away/Flip Off type and operated by push button for cutting sheet length beyond 1000 mm.	Vendor to Confirm		
3	<b>OPERATION AND CONTROL SYSTEM:</b>			
3.1	Control panel shall be placed in the left side of the machine. Layout showing complete details shall be submitted along with the offer.	Vendor to confirm and submit layout		
3.2	Machine shall have main switch with key and signal light.	Vendor to Confirm		
3.3	Movable electrically operated foot switch along with hand switch shall be provided for shearing operation.	Vendor to confirm		
3.4	Inching facility and cycle control facility shall be provided for shearing operation	Vendor to confirm		
3.5	Control for back gauge operation and rake angle adjustment shall be housed on the control panel.	Vendor to confirm		
4	<b>HYDRAULIC SYSTEM:</b>			
4.1	The System should have centralized Hydraulic Tank minimum capacity 4 times of the pump flow.	Vendor to confirm		
4.2	Make of pump, valves, pressure switches and other hydraulic components (Rexroth / Vickers/ Parker / any other reputed make acceptable to BHEL)	Vendor to confirm		
4.3	Oil filtration System	Vendor to confirm		
4.4	Failure indication (Low oil level, filter choke, low or no pressure)	Vendor to confirm		
4.5	The hydraulic system shall be compatible to work with servo system – 68 oil.	Vendor to confirm		
4.6	Hydraulic Oil Cooling system of sufficient capacity to maintain the oil temperature not exceeding 45 deg C. Details of cooling system should be submitted	Vendor to confirm and submit detail		
4.7	Hydraulic pump capacity (flow / pressure)	Vendor to Specify		
4.8	Complete hydraulic circuit shall be submitted along with offer.	Vendor to submit		
4.9	First filling of all required Oils & Grease etc. to be supplied by vendor. Machine should be compatible to operate with hydraulic oil IOCL servo system - 68 or equivalent.	Vendor to confirm		
4.1	Max. hydraulic pressure.	Vendor to Specify		
4.11	Tandem pump shall not be provided.	Vendor to confirm		

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4.12	Provision for adjustable cutting and clamping force for quality cutting and power saving.	Vendor to confirm		
5	<b>LUBRICATION SYSTEM:</b>			
5.1	Lubrication shall be life time lubricated wherever possible. Other points shall be lubricated with automatic centralised lubrication system.	Vendor to confirm		
6	<b>ELECTRICAL :</b>			
6.1	415V( $\pm 10\%$ ), 50HZ $\pm 3$ HZ, 3 Phase AC (4 wire system with 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		
6.2	All electrical / electronic equipment shall be tropicalized.	Vendor to confirm		
6.3	All electrical & electronic control cabinets & panels should be dust and vermin proof.	Vendor to confirm		
6.4	All electrical components in the cabinets should be mounted on DIN Rail.	Vendor to confirm		
6.5	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		
6.6	Motors shall conform to IEC or Indian Standards	Vendor to confirm		
6.7	All cables and cable trays required for the machine should be included in the offer.	Vendor to confirm		
6.8	Vendor should ensure the proper earthing for the machine and its peripherals.	Vendor to confirm		
6.9	The electrical components used shall be from reputed international makes such as Siemens / ABB / L&T / SCHNEIDER and shall be accordance with DIN/IEC Standards.	Vendor to confirm		

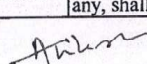
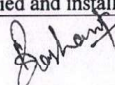

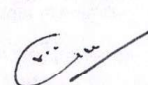


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6.10	In case NC/PLC/HMI/Drive based control system is offered, then the vendor shall include corresponding: 1.Licensed NC/PLC/HMI/Drive Programming software, 2.Complete NC/PLC/HMI/Drive Backup 3.All Communication hardware incl. cables and adapters for NC/ PLC/ HMI/ Drive to PC/ Laptop communication, along with the offered control system.	Vendor to confirm		
7	<b>SAFETY ARRANGEMENTS:</b> Following safety features in addition to other standard safety features should be provided on the machine.			
7.1	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.	Vendor to confirm		
7.2	Shear operation control through hand and foot combination switch.	Vendor to confirm		
7.3	In case of overloads due to wrong manoeuvres /malfunctions the machine should stop to avoid damage to machine and man.	Vendor to confirm		
7.4	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 confirm		
7.5	Emergency Switches at suitable locations as per International Norms should be provided.	Vendor to confirm		
7.6	Necessary protection shall be provided in the Hydraulic power pack to prevent from over loading.	Vendor to confirm		
7.7	The vendor shall ensure that the shearing operation is performed only after the hold-down mechanism is applied. A suitable interlock shall be incorporated to enforce this requirement	Vendor to confirm		
8	<b>ENVIRONMENTAL PERFORMANCE OF THE MACHINE :</b>			
8.1	The Machine shall conform to following factors related to environment :			
8.2	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.	Vendor to confirm		
8.3	If any safety / environmental protection enclosure is required it should be built in the machine by the vendor.	Vendor to confirm		

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8.4	Paint of the machine should be oil / coolant resistant and should not peel off and mix up with coolant.	Vendor to confirm		
9	<b>ESSENTIAL ACCESSORIES:</b>			
9.1	Additional Blades: One spare set of shear blades required additionally apart from one set fixed on the machine.	Vendor to confirm		
10	<b>DOCUMENTATION :</b>			
10.1	Three sets of following documents (Hard copies along with one soft copy) in English language should be supplied along with the machine.	Vendor to confirm		
10.2	Operating manuals of Machine	Vendor to confirm		
10.3	Detailed Maintenance manual of machine with all drawings of machine			
10.4	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		
10.5	Manufacturing drawings for supplied shear blades and assembly drawing of back gauge etc.	Vendor to confirm		
10.6	Catalogues, O&M Manuals of all bought out items including drawings, wherever applicable.	Vendor to confirm		
10.7	Detailed specification of all rubber items and hydraulic/lube fittings.	Vendor to confirm		
11	<b>TRAINING</b>			
11.1	BHEL Persons should be trained at BHEL Works during Installation & Commissioning of the machine in the area of a) Mechanical, Hydraulic, Electrical and Electronic maintenance for machine & other supplied equipments b) Operation of the machine & other supplied equipments.	Vendor to confirm		
11.2	Competent, English & Hindi speaking experts shall be arranged by the vendor during training for satisfactory & effective training of BHEL personnel.	Vendor to confirm		
12	<b>FOUNDATION :</b>			



Sr. No.	Description	Specified/ To be confirmed by vendor	Offered	Deviation / remark
12.1	Vendor shall submit the finalised layout & foundation drawing within 15 days 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 other accessories. Foundation of the machine will be designed by vendor and shall be sent to BHEL to review. BHEL shall construct complete foundation for the machine. Vendor shall supervise the construction of foundation if requires so.	Vendor to confirm		
12.2	Complete anchoring system including foundation bolts, anchoring materials, leveling shoes etc should be supplied by vendor	Vendor to confirm		
13	<b>ERECTION &amp; COMMISSIONING</b>			
13.1	Supplier to take full responsibility for carrying out the erection, start up, testing of machine, it's control & all types of other supplied equipment, shearing 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 (crane capacity 10T) be provided by BHEL. If Crane is required for more than 10T capacity, vendor has to arrange at his own cost. Details of these requirements should be informed by vendor in advance.	Vendor to confirm		
13.2	Successful working of full capacity of the machine by the supplier shall be considered as part of commissioning. All tests, as mentioned at Clause 15 (Machine Acceptance) shall form part of the commissioning activity.	Vendor to confirm		
13.3	Tools, Tackles, instruments and other necessary equipment required to carry out all above activities should be brought by the supplier.	Vendor to confirm		
13.4	Commissioning spares, required for commissioning of the machine within stipulated time, shall be brought by the supplier on returnable basis.	Vendor to confirm		
13.5	All Cover Plates required for the machine and its peripherals including pits, if any, shall be supplied and installed by the vendor.	Vendor to confirm		



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13.6	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		
14	<b>TESTING STANDARD &amp; PROCEDURE</b>			
14.1	Vendor to submit QAP/ Test chart inline with relevant standard for inspection of machine during Pre dispatch inspection and after commissioning at BHEL's work.	Vendor to submit QAP / Test chart		
15	<b>MACHINE ACCEPTANCE: (Tests/Activities should be Performed by Vendor)</b>			
✓ 15.1	Tests/Activities should be carried out at Vendor's works on the machine before dispatch :			
15.1.1	The machine should be tested for full load test (with min & Max thickness) at supplier works before despatch.	Vendor to confirm		
15.1.2	Demonstration of all features of the machine, control system & accessories before despatch	Vendor to confirm		
15.1.3	Cutting Accuracy: +/- 0.2 mm for 1 meter square length & width (finished & burr free)	Vendor to confirm		
15.1.4	Job proveout: Machine capacity verification (In line with clause 2.2) Material for job proveout shall be provided by vendor.	Vendor to confirm		
15.1.5	Demonstration by actual use of all supplied attachments and accessories to their full capacity for actual jobs.	Vendor to confirm		
✓ 15.2	Tests/Activities should be carried out at BHEL works while commissioning the machine :			
15.2.1	The machine should be tested for full load test (with min & Max thickness).	Vendor to confirm		
15.2.2	Demonstration of all features of the machine, control system & accessories.	Vendor to confirm		
15.2.3	Cutting Accuracy: +/- 0.2 mm for 1 meter square length & width (finished & burr free)	Vendor to confirm		
15.2.4	Job proveout: Machine capacity verification (In line with clause 2.2).	Vendor to confirm		

58



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15.2.5	Demonstration by actual use of all supplied attachments and accessories to their full capacity for actual jobs.	Vendor to confirm		
16	<b>PACKING:</b>			
16.1	Rigid packing for all items of complete machine with all accessories and other supplied items to avoid any damage/loss in transit. All small loose items shall be suitably packed in boxes.	Vendor to confirm		
17	<b>GUARANTEE :</b>			
✓ 17.1	Guarantee for the entire machine for a period of 24 months from the date of commissioning. During guarantee period, if any part / component found defective, the same shall be replaced free of cost.	Vendor to confirm		
18	<b>GENERAL :</b>			
18.1	Machine Model	Vendor to specify		
18.2	Total connected load (KVA):	Vendor to specify		
18.3	Floor area required (Length, Width, Height) for complete machine & accessories	Vendor to specify		
18.4	Total weight of the machine	Vendor to specify		
18.5	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		
18.6	Painting of Machine / Electrical Panels shall be Apple green, to colour code RAL 6011 (polyurethane). Paint of the machine shall be oil resistant and shall not peel off. Note: Supplier will repair the painting with the original paint in case the same is damaged in transit.	Vendor to Confirm		
18.7	In addition all other items, accessories or feature required to prove out job at BHEL shall be in vendor's scope without any extra cost.	Vendor to Confirm		
✓ 18.8	Duration of supply of machine: preferably 5 Months from PO date.	Vendor to specify		
✓ 18.9	Duration of E&C of machine: preferably 2 Months from PO date. <i>CO.C. 12/12/2021</i>	Vendor to specify		
18.10	GA drawing of the machine shall be submitted along with the offer.	Vendor to submit		
19	<b>QUALIFYING CRITERIA</b>			

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19.1	Only OEM or OEM authorized dealer, who have supplied at least one number Hydraulic Shearing Machine of cutting/shearing length of minimum 2500 mm for cutting MS/SS plate in the past 7 years from the date of this tender opening should quote. If the bidder is OEM-authorized dealer, then bidder to submit valid authorization certificate from OEM & Letter from OEM for technical support for this tender. The following information is also to be submitted by all the bidders for qualification of their offer.	Vendor to Confirm		
19.2	Purchase order copy (Unpriced) along with proof of supply (Tax Invoice / GEM CRAC etc.) and proof of commissioning (commissioning certificate / commissioning MOM etc.) of at least one number Hydraulic Shearing Machine of cutting length minimum 2500 mm for cutting of MS /SS plate during last 7 years from date of this tender opening.. If the bidder is OEM-authorized dealer, credentials (purchase order, prrof of supply & proof of commissioning) in the name of principal is also accepted.	Vendor to Submit		
19.3	Saisfactory Performance report from the customer for at least one year from date of commissioning of the same Hydraulic Shearing Machine or self declaration regarding staisfactory working of supplied Hydraulic Shearing Machine for last one year from date of this tender opening.	Vendor to Submit		
19.4	Name of the customer/company	Vendor to Submit		
19.5	Complete postal address of the customer	Vendor to Submit		
19.6	Date of supply	Vendor to Submit		
19.7	Date of commissioning	Vendor to Submit		
19.8	Name, designation, Phone number & email address of the contact person of the customer	Vendor to Submit		
19.9	BHEL reserves the right to verify information submitted by vendor. In case the information is found to be false / incorrect, the offer shall be rejected.	Vendor to Confirm		

60

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(Ashish Kumar)

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(Ashish Kr Mondal)

(Vivek Kumar Gupta)