



An ISO 9001  
Company

# Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

CAPITAL EQUIPMENT / MATERIALS MANAGEMENT

## ENQUIRY

### NOTICE INVITING TENDER

Phone: +91 431 257 76 53  
Fax : +91 431 252 00 31  
Email : [skaruna@bheltry.co.in](mailto:skaruna@bheltry.co.in)  
Web : [www.bhel.com](http://www.bhel.com)

## TWO PART BID

Tender to be submitted in two Parts

Enquiry  
Number:

**2851400009**

Enquiry  
Date:

**17.01.2014**

Due date for submission  
of quotation:

**21.02.2014**

You are requested to quote the Enquiry number date and due date in all your correspondence. This is only a request for quotation and not an order.

Please note that under any circumstances both delayed offer and late offers will not be considered. Hence vendors are requested to ensure that the offer is reaching physically our office before 14.00 hrs on the Date of tender opening.

Item	Description	Quantity	Delivery Required	Delivery Terms Required
10	<b>Pipe End Chamfering Machine – 800 mm</b> as per the technical specification & commercial conditions applicable (to be downloaded from web site <a href="http://www.bhel.com">www.bhel.com</a> or <a href="http://tenders.gov.in">http://tenders.gov.in</a> )	01 No.	10 months from the date of Purchase Order	Indigenous Bidders:- F.O.R, BHEL Stores, PEFP, BHEL, Bhandara District, Maharashtra. Foreign Bidders:- CFR Chennai/Mumbai Seaport or Airport

### Important points to be taken care during submission of offer:-

1. The rate of EMD for this Tender will be (INR): 2,00,000/-.
2. The Compliance Form for Commercial Terms & Conditions to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.
3. All updates, amendments, corrigenda, etc., (if any), for each tender will be posted only on the above websites from time to time, as and when required, until each tender is opened. There will be no publication of such updates, amendments, corrigenda, etc., through newspapers or any other media

**BHEL's General guidelines / instructions (refer MM/CE/GENL/001-EMD) including bank guarantee formats and list of consortium banks, commercial terms check-list can be downloaded from BHEL web site <http://www.bhel.com> or from the Government tender website <http://tenders.gov.in> (public sector units > Bharat Heavy Electricals Limited page) under above Enquiry reference.**

Tenders should reach us before 14:00 hours on the due date

Tenders will be opened at 14:30 hours on the due date  
Tenders would be opened in presence of the tenderers who have submitted their offers and who may like to be present

Yours faithfully,  
For **BHARAT HEAVY ELECTRICALS LIMITED**

Engineer/ Capital Equipment / MM

## **PIPE END CHAMFERING MACHINE - Ø 800**

### **SECTION- 1: Qualifying Criteria**

### **PART-A**

The BIDDER has to compulsorily meet the Qualifying Criteria indicated in **Section 1** to get qualified. Otherwise the technical offer will not be considered.

<b>S NO.</b>	<b>REQUIREMENTS</b>	<b>VENDOR'S RESPONSE</b>
1.1	The BIDDER / VENDOR (OEM) shall have a minimum of TEN Years of Continuous Experience in the Design, Manufacture & Supply, Erection & Commissioning of heavy duty machine tools / special purpose machines. Vendor shall indicate the actual no. of years of experience in the field	
1.2	Only those vendors (OEMs) should quote, who have commissioned in the past (10) years (on the original date of opening of Tender) at least ONE horizontal boring machine / lathe / SPM, supplied. <b>EITHER</b> (i) in at least one country other than the country of origin to establish vendor's (OEM's) global business activity <b>OR</b> (ii) in India; and the referred machine is presently working satisfactorily for more than one year after commissioning (on the original date of opening of Tender). The name and contact addresses of the customers to whom the machine has been supplied has to be furnished with details. BHEL reserves the right to accept or reject the OEMs based on the assessment of their technical and financial capability.	
1.3	Vendor has to submit at least <b>ONE PERFORMANCE CERTIFICATE</b> from their customers in India or from the customers to whom the machine was supplied outside the country of origin, for satisfactory performance of the machine as given under Clause 1.2 above, for a minimum period of one year from the date of commissioning. (as on the original date of opening of Tender). (Original Certificate or through E-mail directly from the customer). The original performance certificate may be returned after verification by BHEL, if required. For obtaining the Performance certificate, a suggestive format is provided in the annexure.	
1.4	BHEL reserves the right to verify the information provided by the Vendor for the referred machine at their referred customer's works. It shall be the responsibility of the vendor to facilitate the visit of BHEL's team at their referred customer works .The Travel, Board & Lodging expenses for BHEL Personnel shall be borne by BHEL. In case the information provided by vendor is found to be false/ incorrect, the offer shall be rejected.	

**SECTION - 2:**

The BIDDER / VENDOR are requested to provide the following information:-

S NO.	REQUIREMENTS	VENDOR'S RESPONSE
2.1	The BIDDER / VENDOR to furnish Reference List of Customers, with complete address, details of contact person, where heavy duty machine tools / special purpose machines have been supplied in the past with capacity details.	
2.2	Specify details of heavy duty machine tools / special purpose machines supplied to other units of BHEL, if any (Year of commissioning with details etc.)	
2.3	Details on SERVICE-AFTER-SALES Set-up in India including the Address of Agents / Service Centres in India.	
2.4	Any Additional data to supplement the manufacturing capability of the BIDDER for the subject equipment.	

**SECTION – 3:**

The BIDDER to note:

S NO.	REQUIREMENTS	VENDOR'S RESPONSE
3.1	The BIDDER / VENDOR shall submit the offer in TWO parts. 1. Technical Offer [ <b>with PART A &amp; PART B</b> ] 2. Commercial Offer and Price bid.	
3.2	The Technical Offer shall contain complete details against all clauses of Technical Specifications given by BHEL.	
3.3	The Technical Offer shall be supported by copies of product Catalogues, Data Sheets and technical details of Bought- Out- Items	
3.4	The Commercial Offer (given with the Technical Offer) shall contain the Scope of Supply and the Un-Priced Part of the Price-Bid, for confirmation.	

**Suggestive Format of Performance Certificate:**

The Performance certificate should be produced on **Customer's Letter Head** and submitted along with the offer.

**PERFORMANCE CERTIFICATE**

1.0	Machine Supplied by(Manufacturer's name)		
2.0	Make & Model number of the Machine		
3.0	Month & Year of Commissioning		
4.0	Application for which m/c is used		
5.0	<b>Machine Details</b>		
5.1	Maximum possible Pipe Diameter to machine in mm		
5.2	Minimum possible Pipe Diameter to machine in mm		
5.3	Maximum pipe thickness which can be machine		
5.4	Main motor capacity in KW		
5.5	Machine control system		
5.6	Is the machine Hydraulically operated?		
5.7	Machining accuracy of the machine		
6.0	Performance of the Machine (Please tick the appropriate option)	Not Satisfactory	
		Average	
		Good	
		Satisfactory	
7.0	Service after sales (Please tick the appropriate option)	Not Satisfactory	
		Average	
		Good	
		Satisfactory	
8.0	Other remarks (if any)		
Date:		Signature & Seal of the Authority Issuing the Performance Certificate	

**PIPE END CHAMFERING MACHINE DIA 800 MM**

**PART B – TECHNICAL SPECIFICATION**

**Note:-**

- 1.0 The Column “**Vendor’s offer with Technical details & Remarks**” 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.
- 2.0 The offer and all documents enclosed with offer should be in **English language** only.

Name & Address of the Vendor:	Name & Address of the Indian agent:
Telephone no.:	Telephone no.:
Fax no.:	Fax no.:
e-mail:	e-mail:

- 3.0 Scope: - Design, Manufacture, Supply, Erection & Commissioning of **Pipe Edge Preparation Machine – 1No** for BHEL complying with the specification as below.

Pipe End Chamfering Machine

S.No.	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER (with complete Technical Details)
<b>4.0</b>	<b>PURPOSE &amp; WORKPIECE MATERIAL:</b>	
4.1	The machine is meant for facing and edge preparation of <b>straight pipes</b> which form high pressure components for Power Boilers, and Industrial boilers of Process Industries. The machine shall be capable of machining edge preparation on Pipes by using form tools. The Edge preparation of the above jobs shall be done by tools mounted on a rotating faceplate/chuck, keeping the pipe stationary by clamping the pipe with self-centering Electric / Hydraulic pipe clamping vice.	
4.2	<b>Material specification:</b>	
	<b>A) CARBON STEEL:</b> SA 106 Gr.B / Gr C (ASTM), AP15L Gr B (ASTM)	
	<b>B) ALLOY STEEL:</b> SA 335 P11, P12,P22	
4.3	<b>Material Sizes</b>	
4.3.1	The machine shall be suitable for edge preparation of pipe sizes The standard sizes are furnished below.  Pipe OD Min. 400mm Max. 800mm Pipe Thickness Min. 5mm Max. 25mm Length of the straight pipe Min. 350mm Max. 10000mm	
4.3.2	Sl.No Pipe Size (OD), mm Wall Thickness Range, mm 1 406.4 5 to 17 mm 2 457.2 5 to 19 mm 3 508 6 to 25 mm 4 559 6 to 15 mm 5 609.6 8 to 20 mm 6 660 6 to 20 mm 7 711.2 12 to 25 mm	
4.4	<b>Edge Preparation Styles</b> Edge Preparation Profile Styles (Style'D'& 'P') to be machined As per ANNEXURE .I	

Pipe End Chamfering Machine

S.No.	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER (with complete Technical Details)
4.5	The pipe ends subjected to facing and edge preparation will be either flame cut or saw cut.	
5.0	MACHINE DETAILS:	
5.1	HEADSTOCK:	
5.1.1	Geared Head stock unit shall be of cast steel or fabricated steel fully enclosed type with Integral facing unit mounted on the spindle nose. Vendor to Confirm	
5.1.2	Minimum & Maximum Facing diameter 400mm to 800mm. Vendor to Confirm	
5.1.3	Maximum turning diameter 800 mm. Vendor to Confirm	
5.1.4	Maximum weight of the job 5,000 kgs. Vendor to Confirm	
5.1.5	Maximum boring & turning length 100 mm. Vendor to Confirm	
5.1.6	Headstock longitudinal travel – Min. 500mm. Vendor to Confirm & Specify	
5.1.7	Spindle speed range - Vendor to specify to achieve max. Cutting speed of 120m/min. Speed shall be variable to machine with tools with cutting speed varying from 70m/min to 120m/min.	
5.1.8	No. of speed ranges & speeds in each range. Vendor to Specify	
5.1.9	Max. material removal rate – Vendor to specify in cc/min (Q = Cutting Speed x Depth of cut x feed per rev)	
5.1.10	Motor power to be suitable to achieve the max. Material removal rate. KW rating of AC spindle motor (S1 duty), minimum 22 KW. Motor should be Energy Efficient, Type: EFF1 (Vendor to furnish complete technical details along with offer) Also variable frequency drive may be quoted as optional item with panel AC unit. Vendor to Specify.	
5.1.11	Vendor to specify the details of the Gear Box. Gear Box make to be specified. Standard gearboxes of make like Radicon / Elecon / Allryod / SEW / Bonfiglioli/Compton Greaves are preferred.	
5.1.12	Torque-Power-Speed characteristics of the spindle system to be submitted by the vendor along with offer. Vendor to specify	
5.1.13	Sliding type Chip guard on the headstock for the safety of the operator, operator's panel and to avoid spillage of chips on shop floor (Details should be furnished in offer). Vendor to confirm	
5.1.14	Forward and reverse rotation of spindle motor with suitable braking mechanism.	

Pipe End Chamfering Machine

S.No.	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER (with complete Technical Details)
<b>5.2</b>	<b>FEED DRIVE SYSTEM:</b>	
5.2.1	Feed motor details of model, make, and type, power rating to be furnished. Only A.C drive required Vendor to specify	
5.2.2	Maximum feed force. Vendor to specify	
5.2.3	Feed rate of Headstock longitudinal travel 0.5mm /min – 1500mm/min. Vendor to Confirm	
<b>5.3</b>	<b>FACING UNIT:</b>	
5.3.1	Facing plate shall be of Heavy steel casting. Vendor to specify the material used.	
5.3.2	Diameter of the face plate shall be not less than 1000mm. Face plate to suit for machining of pipe diameter 400 – 800 mm with minimum overhang of Tool holder slide, with suitable counter weight. Vendor to specify.	
5.3.3	Min. distance between the faceplate and the clamping vice. Vendor to specify	
5.3.4	Face plate shall have Four T-slots for mounting tool holders. Vendor to Confirm To edge prepare thin wall pipes, an inner roller support to be provided in the tool holder to support while cutting. Vendor to confirm.	
5.3.5	Tool holder shall be manually adjusted and clamped. In order to set the tool holder position, graduations may be provided on the face plate with least count of 0.5mm. Vendor to confirm.	
5.3.6	Tool holder clamping shall be easily clamped with minimum effort by the operator.	
5.4	<b>MACHINE BED:</b>	
5.4.1	No. of Guide ways. LM guide ways are preferable. Vendor to specify.	
5.4.2	Bed width across guide ways. Vendor to specify	
5.4.3	Type of guide ways: (Details should be furnished in the offer). Vendor to specify	
5.4.4	Hardness of guide ways. Vendor to specify	
5.4.5	Metallic Telescopic Covers of rust resistant material (carton steel) shall be provided with wipers for guide ways. Joints of telescopic covers should be so sealed to avoid ingress of dust. Vendor to specify	
5.4.6	Supply of Centralized Lubrication system for all sliding surfaces. (Guide ways on m/c and pipe clamping unit). Vendor to confirm.	



Pipe End Chamfering Machine

S.No.	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER (with complete Technical Details)
5.5	<b>STRAIGHT PIPE CLAMPING</b>	
5.5.1	The clamping system shall be suitable for centering and clamping straight pipes (Complete details should be furnished in the offer). Vendor to Confirm	
5.5.2	The clamping system shall be equipped with a horizontally moving electrically/hydraulically operated self-centering vice. The Vice shall incorporate "V" type jaws with knurled detachable jaw face plate which can be moved up & down for job centering. Vendor to Confirm	
5.5.3	Pipe Diameter range OD 400mm to 800mm. Vendor to Confirm	
5.5.4	Bed width. Vendor to specify	
5.5.5	Bed length. Vendor to specify	
5.5.6	Clamping force / pressure. Vendor to specify	
5.5.7	Min straight length of the job available for clamping 350 mm for straight pipes. Vendor to confirm.	
5.5.8	Pipe clamping operation through Electric / Hydraulic. Vendor to specify	
5.5.9	Pipe clamping jaws "V" type horizontal. Vendor to confirm.	
5.5.10	Safety system to prevent the rotation of the cutting tool unless the horizontal vice is properly clamped. (Details should be furnished in the offer). Vendor to confirm.	
5.5.11	Vertical movement of the clamping jaws for job centering. Vendor to confirm	
5.5.12	Suitable manual pressure control valve / adjustment device shall be provided for varying the clamping pressure for various thickness & dia of pipe, if the pipe clamping system shall be Hydraulic.	
5.6	<b>PIPE SUPPORTING STEADY:</b>	
5.6.1	Two numbers of manually operated Vertically adjustable "V" type supports for supporting the free end of pipes. The supports shall have facility to be moved on the floor / rail, by means of wheels, to accommodate different lengths of pipes and should have horizontal movement for center shift adjustment. (Vendor to submit complete details with drawings of the supports in the offer). Vendor to confirm	
5.7	<b>CHIP CONVEYOR:</b>	
5.7.1	Suitable Chip Conveyor to be provided for removal of chips from the machine area.	
5.7.2	Chip Bin with wheels of adequate capacity to hold chips produced in three shifts shall be provided	

Pipe End Chamfering Machine

S.No.	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER (with complete Technical Details)
<b>6.0</b>	<b>CONSTRUCTION:</b>	
6.1	Vendor to furnish details of material, hardness & constructional details including explanatory drawings of various components/assemblies like Headstock, Facing Unit, Tool Holder , Machine Bed, Feed Transmission System, Pipe & Pipe Bend Clamping System Pipe supporting steady. Vendor to Confirm	
<b>7.0</b>	<b>HYDRAULICS</b>	
7.1	Hydraulic system should be centralized. Hydraulic Tank shall preferably be located at floor level. All hydraulic pipelines to be neatly laid out with easy accessibility of components for maintenance. Vendor to Furnish Details.	
7.2	Pumps, valves, accessories etc shall be of Bosch-Rexroth / Vickers or reputed make acceptable to BHEL. (Details to be submitted). The seals used in cylinders shall be of Merkel/Parker/Bushak + Shamban/Hunger/Simrit make and shall withstand an over-loading of 25 % Vendor to confirm & furnish details.	
7.3	The flexible hoses used in the system shall be of Gates / Aeroquip / Parker or any other reputed make acceptable to BHEL. Vendor to specify	
7.4	Each pump should have an Energy efficient, Type: EFF1 independent motor. Tandem pumps should not be used. Vendor to confirm	
7.5	Supply of suitable capacity of refrigerant type oil chiller for maintaining the Hyd. Oil temperature. Vendor to confirm.	
7.6	Hydraulic circuits shall be designed with minimum number of control valves and to suit oil of ISO VG 46 or 68 only. It should be possible to replace hydraulic elements like valves, manifolds etc, without disturbing the associated pipelines. The positioning of hydraulic elements should allow easy maintenance. Also hydraulic system should have power saving device during operation and Pressure gauge with push & lock arrangement with selection on the power pack for pumping pressure and the system pressure. The power pack shall have the provision for indicating oil low & high level, over temperature, filter clog etc. and oil collecting tray arrangement to avoid spill the oil on the floor. Vendor to furnish details	
7.7	One hand held minimeess pressure gauge of suitable range with minimeess hose (1.0 to 1.5m length) to be supplied along with the power pack. Check points to be provided in the system.	

Pipe End Chamfering Machine

S.No.	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER (with complete Technical Details)
7.8	The control voltages for all the Solenoids of the valves shall be of 24-V DC and all solenoid operated DC valves should have manual over-ride provision and LED indications. Vendor to specify	
7.9	Suitable filtration system should be provided with Duplex / standby filter units. It is preferable to use re-usable type of filter elements in the system. The filter unit shall be of Hydac / Parker / Rexroth or equivalent reputed make acceptable to BHEL. (Details to be submitted). Vendor to confirm & furnish details	
7.10	Failure indication for oil level, temperature, pressure, filter clogging should be provided. Vendor to confirm & furnish details	
7.11	Automatic shut off provision during hose failures, chiller failure, low oil level etc. Pump unloading feature during idle running to be provided for energy conservation. Details should be submitted. Vendor to specify	
7.12	Cooling system of sufficient capacity to maintain complete Hydraulic System at a temperature not exceeding 40 deg C irrespective of the ambient conditions. Vendor to confirm & furnish details	
7.13	Hydraulic pump capacity (flow / pressure). Vendor to specify	
7.14	The pipelines to be painted with standard colours as per the colour coding accepted internationally for hydraulic systems. Vendor to furnish details	
7.15	All hydraulic pipelines, hoses and electrical control cables to be neatly laid out with proper clamps and flexible hose conveyors wherever required. Vendor to confirm	
7.16	All the components in the hydraulic power pack shall be provided with identification numbers, as per the hydraulic circuit and should be pasted with metallic identification number plates. Vendor to confirm	
7.17	<b>First filling of all required Oils &amp; Grease etc.</b> should 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	
8.0	<b>ELECTRICAL:</b>	
8.1	415V +/- 10%, 50HZ, 3 Phase AC (3 wire system without neutral) power supply will be provided by BHEL at a single point near the machine, as per layout recommended by Vendor. All cables, connections, circuit breakers etc. required for connecting BHEL's power supply to the machine shall be in the scope of vendor. Vendor to confirm	
8.2	Tropicalization: All electrical / electronic equipment shall be tropicalized. Vendor to confirm	
8.3	All electrical & electronic control cabinets & panels should be dust and vermin proof. Vendor to confirm	
8.4	Cables shall be routed through totally enclosed cable trays. There shall not be cable trenches. Vendor to Confirm	

Pipe End Chamfering Machine

S.No.	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER (with complete Technical Details)
8.5	All the Cable Hoses Shall be of Spiral Steel Reinforced PVC Conduit type. Vendor to confirm	
8.6	All the Power & Control Cables Shall be from IGUS, LAPP or equivalent make acceptable to BHEL.	
8.7	All electrical devices like contactors, relays and limit switches, push buttons etc. shall be from Siemens / L&T / Alstom / Cutter Hammer / Telemecanique.	
8.8	All electrical components in the cabinets should be mounted on DIN Rail. Vendor to confirm	
8.9	All electrical and electronic panels including operator's panel should be provided with CFL lamps for sufficient illumination and power receptacles of 230Volts, 5/15 Amp AC. All adapters /receptacles should have compatibility with Indian equivalents. Vendor to confirm	
8.10	Motors & other electrical components shall conform to IEC or Indian Standards. Motors shall be of SIEMENS/ABB / CROMPTON/NGEF/KEC or such reputed make. All switches and control elements shall be of Seimens / L&T / GEC / Alstom /telemecanique or such reputed make. Vendor to confirm	
8.11	The control panel shall have the suitable rating of energy meter at input side and load meter for spindle motor. Vendor to confirm	
8.12	No component / device mounted on the bottom cover and door of the control panel. Vendor to confirm	
8.13	Suitable lamp to provide sufficient illumination for working condition of m/c. Vendor to confirm	
8.14	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	
8.15	Vendor should ensure the proper earthing for the machine and its peripherals. Vendor to confirm	
8.16	All electrical & electronic control cabinets & panels should be vermin and dust proof. All Electric enclosures shall have IP 54 protection. Vendor to confirm	
8.17	Air Conditioners with Dehumidifiers of suitable capacity to be provided for all Electrical / Electronic Panels / Cabinets including Operator's Panel considering specified ambient conditions. Vendor to Specify. Make: Rittal / Warner & Finley or any other reputed make acceptable to BHEL. Detailed specifications to be submitted.	
8.18	All components/devices/terminals are to be incorporated with ferrules. ( Numbered ) Vendor to confirm	
8.19	All feedback systems & field sensors, limit switches, proximity switches, pressure switches, temperature controllers, should be for heavy duty application and wired up with flexible PVC insulated screened cables. All field elements shall have easy accessibility for maintenance. Vendor to confirm	

Pipe End Chamfering Machine

S.No.	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER (with complete Technical Details)
8.20	All S1 Duty Motors shall be of Energy Efficient IE2 type as per IS 12615: 2011. Vendor to confirm	
<b>9.0</b>	<b>OPERATION AND CONTROL SYSTEM:</b>	
9.1.1	Low cost Automation. Vendor to offer a low cost automation with basic control to suit the requirements specified. Vendor to specify with details.	
9.1.2	All sequence of operation of the EP Machine shall be through TWO AXIS PLC control. Machine shall be able to operate through auto and manual cycles. Vendor to Confirm	
9.1.3	The PLC controls shall be from Messung / Seimens / Allen Bradley / ABB.	
9.1.4	PLC & MMI Shall be of latest Version.	
9.1.5	Licensed Software of PLC & MMI suitable for Windows 7 to be Supplied by vendor.	
9.1.6	Interfacing Cable for PLC CPU & MMI to be Supplied by Vendor.	
9.2	<b>OPERATOR'S PANEL</b>	
9.2.1	Control of operation through operation panel to be located suitably.	
9.2.2	Safety devices for hydraulic circuit, emergency stop buttons to be provided in the operation panel and suitable interlock safety systems.	
<b>10.0</b>	<b>MACHINE LIGHTS</b>	
10.1	24 Volt Machine Lights for sufficient illumination of complete End preparation area should be provided for clear visibility. (Details should be furnished in the offer)	
10.2	All light fittings, consumables, adapters/receptacles should have compatibility with Indian equivalents	
<b>11.0</b>	<b>SAFETY ARRANGEMENTS:</b>	
11.1	Following safety features in addition to other standard safety features should be provided on the machine:	
11.2	Protective chip guard as sliding hood to be provided to prevent chips flying out of the cutting area.	
11.3	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 specify	
11.4	A detailed list of all alarms / indications provided on machine should be submitted by the Vendor. Vendor to Confirm	
11.5	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 Confirm	

Pipe End Chamfering Machine

S.No.	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER (with complete Technical Details)
11.6	All the rotating parts used on machine should be statically & dynamically balanced to avoid undue vibrations and suitably guarded. Vendor to Confirm	
11.7	Emergency Switches at suitable locations as per International Norms should be provided. Vendor to Confirm	
11.8	All lubricated parts like Bed, guide ways shall have provision for collecting the used Lubrication oil from machine guide ways and preventing them from spilling over on to the ground. Vendor to Confirm.	
12.0	<b>ENVIRONMENTAL PERFORMANCE OF THE MACHINE:</b>	
12.1	The Machine should confirm to following factors related to environment:	
12.2	Maximum noise level shall be 85 dB (A) at normal load condition, 1meter away from the machine with correction factor for back ground noise. Vendor to demonstrate compliance to noise level, if required.	
12.3	If any safety / environmental protection enclosure is required it should be built in the machine by the vendor. Vendor to confirm	
12.4	Paint of the machine should be oil resistant and should not peel off. Vendor to confirm	
13.0	<b>TOOLING:</b>	
13.1	<p>Tooling system should consist of</p> <p>1) 3 base tool holders mounted on the faceplate slide. One tool holder each for OD turning, chamfering and boring, respectively.</p> <p>2) Standard ISO cutting tools / special form tools with indexable carbide inserts / brazed carbide capable of generating all the edge preparation styles indicated.</p> <p>Parameters for cutting tools</p> <p>Cutting speed : 70-120 meters per minute.</p> <p>Depth of cut : 5-18 mm</p> <p>Feed : 0.2- 0.6 mm per revolution.</p> <p>Vendor to specify</p>	
13.2	Details of special cuttings tools to suit the actual profiles to be machined ( <b>ref Clause No 1.4</b> ), Tool size for different tool holders. Vendor to specify	

Pipe End Chamfering Machine

S.No.	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER (with complete Technical Details)
13.3	Limitation regarding length & weight of tool / tool holder clamped in different tool holders for trouble free operation. Vendor to specify	
13.4	5 nos each of all types of cutting tools, 2 nos. of tool holders each, recommended by vendor for complete machining of prove out components should be offered. Vendor to confirm	
13.5	Tool holders may be designed with a roller for providing inside support while machining on thin wall pipes	
14.0	<b>LEVELLING &amp; ANCHORING SYSTEM</b>	
14.1	Complete anchoring system including foundation bolts, anchoring materials, fixators, leveling shoes etc should be supplied. Vendor to specify	
15.0	<b>TOOLS FOR ERECTION, OPERATION &amp; MAINTENANCE:</b>	
15.1	The Vendor shall bring special tools and equipment required for erection of the machine. 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	
15.2	Any Test mandrel and other items required for checking & alignment of the machine components etc. should be supplied. Vendor to confirm.	
16.0	<b>SPARES:</b>	
16.1	Itemized 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: <b>(Unit Price of each item of spare should be offered).</b> Vendor to confirm	
16.2	<b>Mechanical &amp; Hydraulic Spares:</b> All types of Pumps, Valves, Pressure Switches, Transducers, Flow Switches, Filters, Seals, O-rings, and Hydraulic Hoses etc.1 set. Vendor to confirm	
16.3	<b>Electrical /Electronic Spares:</b> All types of Relays, Contactors, Push Buttons, Indicating Lamps, Semiconductor Fuses, Special Fuses, Circuit Breakers, Main Power Switch, spares for Feed Drives, Main Drive, PLC Drive etc. each 1 no. Vendor to confirm.	

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S.No.	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER (with complete Technical Details)
16.4	All types of spares for total machine and accessories should be available for at least ten years after supply of the machine. Vendor to confirm	
16.5	Vendor to confirm that complete list of spares for machine and accessories, along with item part no / 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	
<b>17.0</b>	<b>DOCUMENTATION:</b>	
17.1	Three sets of following documents (3 Hard copies,) in English language should be supplied along with the machine. Vendor to confirm	
17.2	Operating manuals of Machine. Vendor to confirm	
17.3	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 shall be supplied with the part list also. Vendor to confirm	
17.4	Manufacturing drawings for all supplied tool holders, cutting tools, adapters, sleeves, pipe clamp jaws, etc. Vendor to confirm	
17.5	Catalogues, O&M Manuals of all bought out items including drawings, wherever applicable. Vendor to confirm	
17.6	Detailed specification of all rubber items and hydraulic/lube fittings. Vendor to confirm	
17.7	Operating Manuals, Maintenance Manuals & Catalogues for all supplied Accessories. Vendor to confirm	
17.8	The vendor shall submit complete Master List of parts used in the machine. Vendor to confirm	
17.9	One additional set of all the above documentation on CD. Vendor to confirm	
<b>18.0</b>	<b>MACHINE FOUNDATION</b>	
18.1	BHEL shall construct complete foundation for the machine. Vendor shall furnish the foundation details with dynamic load and static load.	
<b>19.0</b>	<b>DRAWING APPROVAL</b>	
19.1	Vendor to submit the mechanical, Hydraulic, electrical & electronic drawings with bill of materials and major dimensions related to the equipment for BHEL approval within 1 month of ordering by BHEL.	



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S.No.	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER (with complete Technical Details)
19.2	BHEL shall provide approval within 15 days after all the clarifications sought have been submitted by supplier.	
19.3	Within one month after BHEL approval of manufacturing drawings, supplier to submit foundation drawing with details of static & dynamic loads.	
<b>20.0</b>	<b>ERECTION &amp; COMMISSIONING</b>	
20.1	Vendor to take full responsibility for supervision of the erection. Vendor shall start up, test the machine, its control & all types of other supplied equipment, and carry out machining of test pieces. Service requirement like power, air & water shall be provided by BHEL at only one point to be indicated by Vendor in their foundation/layout drawings. Details of these requirements should be informed by Vendor in advance	
20.2	Successful proving of BHEL components by the Vendor shall be considered as part of commissioning. All tests, as mentioned in <b>(clause 21.0)</b> shall form part of the commissioning activity. Vendor to confirm	
20.3	Tools, Test Mandrels, instruments and other necessary equipment required to carry out all above activities should be brought by the Vendor. Vendor to confirm	
20.4	Commissioning spares, required for commissioning of the machine within stipulated time, shall be brought by the Vendor on returnable basis. Vendor to confirm	
20.5	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	
20.6	Schedule of Erection and Commissioning shall be submitted with the offer. Vendor to confirm	
20.7	Charges, duration, terms & conditions for E&C should be furnished in detail separately by Vendor along with offer. Vendor to confirm.	

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S.No.	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER (with complete Technical Details)
<b>21.0</b>	<b>ACCURACY TESTS:</b>	
<b>21.1</b>	<b>GEOMETRICAL ACCURACY</b>	
21.1.1	Geometrical Accuracy Tests shall be in accordance with applicable standard recommended by the Vendor. Detailed Test Charts for the same, clearly showing the accuracies to be achieved on the machine, shall be submitted with the offer. Vendor to confirm	
21.1.2	All the above accuracies should be demonstrated to BHEL engineers during pre-acceptance tests at Vendors works and during Erection & Commissioning at BHEL Works.	
<b>21.2</b>	<b>AMBIENT CONDITIONS &amp; THERMAL STABILITY:</b>	
21.2.1	Total machine and all supplied items should work trouble free and efficiently under following operating conditions and should give specified accuracies.  The machine shall be suitable for an ambient temperature of +10 deg C to +50 deg C and relative humidity of 85 % respectively, but both do not occur simultaneously. Vendor to confirm	
21.2.2	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. Vendor to confirm that machine is suitable for above. Vendor to confirm	
21.2.3	The machine, including attachments and accessories, should be suitable for 24 hrs. Continuous operation to its full capacity for 24 hour a day and 7 days a week throughout. Vendor to Confirm	
<b>21.3</b>	<b>PROVEOUT OF BHEL COMPONENTS:</b>	
21.3.1	The prove-out trials of the edge preparation shall be for the straight pipes for sizes given by BHEL during the technical discussions / at the time of releasing the Purchase Order. The pipe ends subjected to facing and edge preparation will be either <b>flame cut or saw cut. At least 5 jobs in the size range &amp; edge preparation style specification should be proved out.</b> Vendor to confirm. Pipes shall be provided by BHEL.	

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S.No.	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER (with complete Technical Details)
<b>22.0</b>	<b>MACHINE ACCEPTANCE: (Tests/Activities to be Performed by Vendor)</b>	
22.1	<b>Tests/Activities to be carried out at Vendor's works on the machine before dispatch:</b>	
22.1.1	Geometrical accuracies as per applicable standard test chart recommended by the Vendor. Vendor to confirm	
22.1.2	Full load test to demonstrate the maximum power & cutting capacity of the machine. Vendor to confirm	
22.1.3	Demonstration of all features of the machine, control system & accessories. Vendor to confirm	
<b>22.2</b>	<b>Tests / Activities to be carried out at BHEL works while commissioning the machine:</b>	
22.2.1	Geometrical accuracies as per applicable standard test chart recommended by the Vendor. Vendor to confirm	
22.2.2	Full load test to demonstrate the maximum power & cutting capacity of the machine. Vendor to confirm	
22.2.3	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	
22.2.4	The prove-out trials <b>as per Clause 21.3.1</b> . Vendor to confirm	
22.2.5	Supervision by vendors of independent operation of machine by BHEL after job prove out during the training period of 3 working days. Vendor to confirm	
<b>23.0</b>	<b>TRAINING:</b>	
23.1	The Vendor shall train two BHEL's Engineers in Operation and Maintenance (Mechanical, Electrical/ Electronics) of the Machine at BHEL works. Vendor to confirm	
23.2	Airfare, boarding & lodging for the trainees shall be borne by BHEL.	
23.3	The Vendor shall impart training to BHEL's Machine Operators and Maintenance crew in Operation and Maintenance while commissioning of the Machine at BHEL works for not less than 3 working days. Vendor to confirm	
23.4	Vendor to quote for training on per man per day basis for training at BHEL work	
23.5	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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S.No.	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER (with complete Technical Details)
<b>24.0</b>	<b>PAINTING</b>	
24.1	a) The heavier machine parts are to be shot blasted for surface preparation prior to painting. b) One coat of Primer c) Two coats of Polyurethane Paint (Colour–Reseda Green–RAL 6011)	
<b>25.0</b>	<b>PACKING:</b>	
25.1	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 dispatched in containers, all small loose items shall be suitably packed in boxes. Vendor to confirm	
<b>26.0</b>	<b>GUARANTEE:</b>	
26.1	12 months from the date of acceptance of the machine or 18 months from the date of dispatch whichever is earlier. Vendor to confirm	
<b>27.0</b>	<b>GENERAL:</b>	
27.1	Machine Model No. Vendor to specify	
27.2	Total connected load (KVA): Vendor to specify	
27.3	Floor area required (Length, Width, and Height) for complete machine & accessories. Vendor to specify	
27.4	Machine lubrication. Automatic centralized lubrication system.	
27.5	All gears are to be hardened and ground. Vendor to specify.	
27.6	Total weight of the machine. Vendor to specify	
27.7	Weight of heaviest part of machine. Vendor to specify	
27.8	Vendor to submit, along with offer, reference list of customers where similar machines have been supplied mentioning broad specifications of the supplied machine i.e. Model, Load Carrying Capacity, Main Drive Rating. Vendor to confirm	
27.9	Detailed catalogues, sketch/ photographs of the m/c and accessories/ attachments should be submitted with the offer. Vendor to confirm	

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S.No.	PARTICULARS AND BHEL SPECIFICATION	BIDDER'S OFFER (with complete Technical Details)
27.10	Hydraulic, Pneumatic & oil piping should be preferably metallic except places where flexible piping is essential. All the pipes required for the same shall be included in the standard scope of the machine. In case of pneumatic air requirement BHEL can supply air at 4 bar pressure only. Vendor to confirm	
<b>28.0</b>	<b>SCOPE OF SUPPLY</b>	
<b>28.1</b>	<b>SUPPLIER'S SCOPE</b>	
	<ol style="list-style-type: none"> <li>1. Design, Manufacture, Supply, Erection, Commissioning and prove out of Heavy duty end preparation machine for pipes up to diameter 800 mm</li> <li>2. Tooling's</li> <li>3. Accessories</li> <li>4. Hydraulic Oil, grease, tooling during pre-dispatch inspection</li> <li>5. All anchoring &amp; foundation bolts, levelling plates for the complete machine.</li> <li>6. Levelling Instruments, Power Tools / Hand Tools / Special tools for erection of the machine.</li> <li>7. Crane required for handling outside shop, if any.</li> <li>8. Commissioning Engineers for supervision of erection and commissioning</li> <li>9. Manpower for erection</li> <li>10. First Fill of Hydraulic Oil</li> <li>11. Job Quality and Productivity Prove-out</li> </ol>	
<b>28.2</b>	<b>BHEL SCOPE</b>	
	<ol style="list-style-type: none"> <li>1. Drawings approval</li> <li>2. Civil foundation work as per manufacturer's drawing</li> <li>3. EOT crane facility inside shop</li> <li>4. Pipes for trials and prove out</li> <li>5. Single Compressed air point at the location indicated in the drawing</li> <li>6. Single Electrical Supply point at the location indicated in the drawing</li> <li>7. Welding machines and consumables required for erection if any</li> </ol>	

**Enclosures:** Annexure 1: Edge Preparation Styles