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 79 38 Fax : +91 431 252 07 19 Email : tvenkat@bheltry.co.in Web : www.bhel.com

TWO PART BID Tender to be submitted in two Parts	**Enquiry Number:** **2620900245**	**Enquiry Date:** **20.11.2009**	**Due date for submission of quotation:** **24.12.2009**

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
10	**Steel Fin De-Coiling, Straightening and Re-Coiling Station** as per the technical specification & commercial conditions applicable (to be downloaded from web site www.bhel.com or http://tenders.gov.in)	**1 No**.

Important points to be taken care during submission of offer

1. **Delivery required 10 months from the date of purchase order.**
2. **Grace period of 2 months beyond the above delivery period will be considered.**
3. **Checklist to be filled and enclosed along with the offer failing which, the offer will not be considered for evaluation.**
4. **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/GT/001) 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 Enquiry reference "2620900245".

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 Manager / Capital Equipment / MM

PART A

QUALIFYING CRITERIA FOR THE SUPPLY OF
Steel Fin De-coiling, Straightening and Re-coiling Station

SECTION – I

The BIDDER is expected to give complete details against each clause in the table given below, with additional sheets those may be attached (giving clear reference number) to furnish and cover the requisite details / documents.

S. No.	PARTICULARS	BIDDER's RESPONSE
1	BIDDER to provide the Profile of their Company	
2	The Bidder (OEM) shall have a minimum of FIVE Years of Continuous Experience in the field of Design, Manufacture and Supply of Steel Fin De-coiling / Coiling Stations	
3	List of customers to whom De-coiling/Re-coiling stations were supplied, installed and commissioned till date, highlighting the field of manufacture of customers. The sizes of machines supplied may be furnished.	
4	Details on SERVICE-AFTER-SALES Set-Up in India including the Addresses of Agents / Service Centres in India.	
5	Any Additional Data to supplement the manufacturing capability of the BIDDER for the subject equipment.	

SECTION – II

The BIDDER has to compulsorily meet the following requirements to get qualified for submitting an offer for the Steel Fin De-coiling, Straightening and Re-coiling Station:

S. No.	REQUIREMENTS	BIDDER's RESPONSE
1	Only those Bidders (OEMs) should quote, who have supplied and commissioned at least **ONE Steel fin De-coiling Station OR Steel fin Coiling Station for minimum 4mm thickness fin**, in the past Ten years (on the date of opening of Tender) and such machine should presently be working satisfactorily for more than one year after commissioning (on the date of opening of Tender),. However, if such equipment has been supplied to BHEL, then the same must be currently working satisfactorily for not less than six months (as on date of Tender Opening) from the date of commissioning and acceptance.	
	The Bidder should submit following information where similar machine has been supplied:	
1.1	Name and postal address of the customer or company where similar equipment is installed.	
1.2	Name and designation of the contact person of the customer.	
1.3	Phone, FAX no and email address of the contact person of the customer.	
1.4	Month and Year of commissioning of the equipment.	
1.5	Application for which the equipment is supplied	
2	Along with the Technical offer, the Bidder should submit the Performance certificate from the customer for the satisfactory performance of the equipment supplied as per clause 1.0 above. (For obtaining the Performance certificate, a suggestive format is provided in **SECTION – IV**)	
3	Offers of only those Bidders who meet the above Qualifying Criteria will be considered for further evaluation.	
4	BHEL reserves the right to verify the information provided by Bidder. In case the information provided by Bidder is found to be false/ incorrect, the offer shall be rejected.	
5	DELIVERY - The bidder shall quote the best possible delivery. However the delivery period shall not exceed 10 months from the date of Purchase Order. A grace period of 2 months in addition is provided. The additional grace period will attract loading, which is explained in the commercial terms of the enquiry. The delivery period is reckoned from the date of purchase order to date of despatch from the Bidder works.	

SECTION – III

The BIDDER has to comply with the following, for accepting the Technical Offer for scrutiny by the Purchaser:

S. No.	REQUIREMENTS	BIDDER's COMPLIANCE
1	The BIDDER shall submit the offer in TWO PARTS- Technical **[with PART A & PART B]** & Commercial and Price Bid.	
2	The offer shall contain a comparative statement of Technical Specifications given by BHEL and the offered details submitted by the Bidder, against each clause. Merely stating 'CONFIRMED' or 'COMPLIES' or 'YES' or 'NO-DEVIATION' or similar words wherever 'Bidder to Specify' details in the technical comparative statement may lead to disqualification of the Technical Offer.	
3	The Technical Offer shall be supported by product Catalogues & Data Sheets and also technical details of Bought-Out-Items with copies of Product Catalogue to the extent possible.	
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 of the inclusion of all the accessories, toolings, attachments, auxiliary parts, spares, consumables, etc. with the main and basic equipment, to meet the technical specification requirements.	
5	BIDDER has to indicate the Country of Origin for the supply of equipment.	

SECTION – IV

PERFORMANCE CERTIFICATE

(On Customer's Letter Head)

1. Supplier of the machine :

2. Make & Model of the Equipment :

3. Month & Year of Commissioning :

4. Application for which machine is used :

5. Sizes of Jobs Performed in the machine

6. Performance of the Machine : Satisfactory / Good / Average / Not Satisfactory
(Strike off whichever is not applicable)

7. After Sales Service : Satisfactory / Good / Average / Not Satisfactory

8. Any other remarks :

Date:

Signature & Seal of the Authority
Issuing the Performance Certificate

PART B

Technical Specification for
STEEL FIN DE-COILING, STRAIGHTENING AND RE-COILING STATION

S.No.	PARTICULARS	SPECIFICATION / DESCRIPTION		Bidder's Offer with Complete Technical Details
1.0	**APPLICATION**	De-coiling of coiled flat fins, straightening and re-coiling of measured quantity of flat fin in to smaller coil or the flat fins to be cut in to straights of length varying between 6000mm to 13000mm.		
2.0	**JOB DESCRIPTION**			
2.1	Fin Width	10mm to 110mm (Regular sizes are 13.5mm, 96.2mm, 102mm)	Bidder to Confirm	
2.2	Fin Thickness	5mm to 12mm	Bidder to Confirm	
2.3	Fin Length (Cut length)	Minimum Length : 6m Maximum length : 13m	Bidder to Confirm	
2.4	Fin Material	Carbon Steel: ASTM A 576 Tensile Strength: 390 MPa Alloy Steel: a) ASTM A 387Gr.12 (TS: 450 to 585MPa) b) ASTM A 387Gr.22 (TS: 515 to 690 MPa)	Bidder to Confirm	
2.5	Fin Coil Weight	Max: 2200 kg	Bidder to Confirm	
2.6	Fin Coil OD	Min: 1000mm / Max: 1500mm	Bidder to Confirm	
2.7	Fin Coil ID	Min:450mm / Max: 700mm	Bidder to Confirm	
3.0	**Speed of fin feeding**	15m/min or more	Bidder to Confirm	

S.No.	SPECIFICATION / DESCRIPTION			Bidder's Offer with Complete Technical Details
4.0	**MACHINE CONFIGURATION:** The machine shall have the following elements / Components:			
4.1	Coiled Fin Mounting Arrangement		Bidder to Confirm	
4.2	De-Coiling Unit		Bidder to Confirm	
4.3	Fin Butt Welding Bench		Bidder to Confirm	
4.6	Fin Horizontal Straightening Unit		Bidder to Confirm	
4.7	Fin Vertical Straightening Unit		Bidder to Confirm	
4.8	Fin Length Measuring Unit		Bidder to Confirm	
4.9	Hydraulic Fin Cut-Off / Shearing Unit.		Bidder to Confirm	
4.10	Fin Re-coiling unit		Bidder to Confirm	
4.11	Fins storage rack		Bidder to Confirm	
4.12	Portable fin strapping unit		Bidder to Confirm	
4.13	Control Panel		Bidder to Confirm	
5.0	**COILED FIN MOUNTING ARRANGEMENT & DE-COILING UNIT**			
5.1	Coil Loading	Manual loading with the help of crane.	Bidder to Confirm	
5.2	Fin Coil Maximum OD	1500mm	Bidder to Confirm	
5.3	Fin Coil Minimum ID	450mm	Bidder to Confirm	
5.4	Width of coil mounting arrangement - Maximum	200mm	Bidder to Confirm	
5.5	No.of coils loaded	As many no.of smaller width coils that can fit in 200mm, will be loaded.	Bidder to Confirm	
5.6	Coil Weight - Maximum	2200 kg. (maximum)	Bidder to Confirm	
5.7	Coil Clamping arrangement	Mechanical Jaws –Four jaws – Self Centering type	Bidder to provide details	

S.No.	SPECIFICATION / DESCRIPTION			Bidder's Offer with Complete Technical Details
5.8	Device to prevent free uncoiling of the coiled fin	Friction Brake (with adjuster)	Bidder to provide details	
5.9	Uncoiling and Fin feeding	By pinch rolls / Motorized de-coiling.	Bidder to provide details	
5.10	Fin Coil end Sensing	Suitable Mechanical type Sensor or any other sensing device for stopping the machine automatically once the fin comes to an end in the de-coiling unit.	Bidder to provide details	
6.0	**FIN BUTT WELDING BENCH**			
6.1	To be of simple and compact design to weld the leading end with trailing end of fin			
6.2	Clamping	Manually operated clamps for clamping the ends of fins and aligning.	Bidder to Confirm	
6.3	Welding Process	MIG / MAG / SMAW Welding Power Source is under BHEL scope.	Bidder to Confirm	
6.4	Construction	During fin feeding, the weld bench shall be retracted from the fin feeding line. Weld bench may be mounted on slides or by wheels.	Bidder to provide details	
7.0	**FIN FEEDING SYSTEM – PINCH ROLLER DRIVE OR MOTORIZED DECOILER**			
7.1	Pinch Roller driving mechanism / Motorized decoiling system to be deployed for fin feeding the decoiler. The structure shall be rigid to handle the loads.		Bidder to provide details of the feeding system	
7.2	If pinch roller drive is provided, then it has to be either hydraulically or electrically operated		Bidder to Specify	
7.3	The pinch roller unit to be adjustable to accommodate the range of fin thicknesses / widths.		Bidder to Specify	

S.No.	SPECIFICATION / DESCRIPTION			Bidder's Offer with Complete Technical Details
7.4	The speed of feeding the fin shall be 15m/min or more. The speed shall be adjustable. Bidder to specify the max. fin feed rate.		Bidder to Specify	
7.5	Bidder to specify the pinch roller diameters		Bidder to Specify	
7.6	If motorized de-coiler is provided, then bidder has to be furnish details of the Motor, its capacity, make and the braking arrangement.		Bidder to Specify	
7.7	Inching feed to be provided in both the cases.		Bidder to Confirm	
8.0	**HORIZONTAL AND VERTICAL FIN STRAIGHTENING UNIT**			
8.1	Vertical Straightening	One Fin Vertical straightening unit, Mechanically Adjustable in line with the De-coiling and Coiling Station. The fin to be straightened in the vertical direction through roller mechanism	Bidder to provide the details and arrangement	
8.2	Adjustment	The rollers shall be mechanically adjustable suitable for thickness of the fin.	Bidder to confirm	
8.3	Horizontal Straightening	One Fin Horizontal straightening unit, Mechanically Adjustable in line with the De-coiling and Coiling Station. The fin to be straightened in the horizontal direction.	Bidder to provide the details and arrangement	
8.4	Adjustment	The rollers shall be mechanically adjustable suitable for width of the fin.	Bidder to confirm	

S.No.	SPECIFICATION / DESCRIPTION			Bidder's Offer with Complete Technical Details
9.0	**FIN LENGTH MEASURING DEVICE**			
9.1	Length Measuring Devices	Online Length measurement before the shearing unit to be provided.	Bidder to Confirm	
9.2	Reference point	The reference point for length measurement to be from the shearing edge.	Bidder to Confirm	
9.3	Length setting 0 to 13000mm variable setting.	Length setting through MMI/HMI panel after straightening. If PLC is used, bidder has to provide the details of the make and model of the PLC.	Bidder to Specify	
9.4	Accuracy on Length of Fin	± 10mm	Bidder to Confirm	
9.5	Length display	The actual length to be continuously displayed by the side of set length on the display panel.	Bidder to Confirm	
9.6	Digital display	The length setting and actual length display panel shall be of digital display.	Bidder to Confirm	
9.7	Fin feeding control	The fin feeding shall stop once the set length is reached. The operator shall operate the hydraulic shear to cut-off the fin.	Bidder to Confirm	
9.8	Encoder	Bidder to provide the details of the length measuring unit. The make and model of the encoder used. The encoder shall be of reputed make acceptable to BHEL.	Bidder to provide details	

S.No.	SPECIFICATION / DESCRIPTION			Bidder's Offer with Complete Technical Details
10.0	**HYDRAULIC CUT OFF UNIT**			
10.1	Cutting	Hydraulic Shear	Bidder to Confirm	
10.2	Operation	By shearing operation shall be operated by manually pressing a button in the operator control panel after the fin feeding stops once set length is reached.	Bidder to Confirm	
10.3	Interlock	Hydraulic shearing unit shall not operate when the fin feeding is running. An interlock has to be installed for this purpose.	Bidder to Confirm	
11.0	**FIN RE-COILING UNIT / STRAIGHT FIN STORAGE RACK**			
11.1	Purpose: The fins to be wound into smaller coils or straight cut fins. The re-coiling station for winding the fin into smaller coils and storage rack for storing the cut straight fins.			
11.2	Coiling Unit	The coiling unit shall firmly grip the end of the fin and start winding.	Bidder to Confirm	
11.3	Tensioner	The tensioner unit shall be used to produce back tension during coiling and tight winding of the coil.	Bidder to Confirm	
11.4	ID of coil	The coiling unit shall wind the coil with an ID of 450mm	Bidder to Confirm	
11.5	Fin Coil Maximum OD	1500mm	Bidder to Confirm	
11.6	Width of coil - Maximum	200mm	Bidder to Confirm	
11.7	Coil Weight - Maximum	2000 kg (maximum)	Bidder to Confirm	

S.No.	SPECIFICATION / DESCRIPTION			Bidder's Offer with Complete Technical Details
11.8	Coil Winding arrangement	Mechanical Jaws –Four jaws – Self Centering type	Bidder to provide details	
11.9	Device to prevent free uncoiling	Friction Brake (with adjuster) or any other device	Bidder to provide details	
11.10	Retention roller	The coiling unit shall have retaining roller (hydraulic / spring loaded) to prevent the free end of the fin, after shearing, from opening out / unwinding. The roller shall be constantly applying force on the coil to prevent uncoiling.	Bidder to provide details	
11.11	Strapping	After winding the coil of the required length is completed, the free end of the fin will be tack welded or the coil will be strapped with steel straps. Welding power source is under BHEL scope.	Bidder to confirm	
11.12	Portable strapping unit	A portable steel strapping unit to be provided along with the machine or any other method of strapping of the coil to be suggested by the bidder.	Bidder to confirm	1" straps
11.13	Drive for re-coiling unit	Bidder to provide details of the drive provided for the coiling unit. The motor rating, make/model has to be furnished by the bidder.	Bidder to Specify	
11.14	Fin storage rack	Fin storage rack shall be placed after the coiling unit.	Bidder to Confirm	

S.No.	SPECIFICATION / DESCRIPTION			Bidder's Offer with Complete Technical Details
11.15	Fin Storage rack design	The fin storage rack on the out feed side has to be rigid by design.	Bidder to Confirm	
11.16	Width/Length of Fin storage rack	The width of the fin storage rack on the out feed side shall have a width 750mm and 14metres long.	Bidder to Specify	
11.17	Out feed Rollers	The pitch between rollers in the out-feed rack shall be close. Bidder to specify the roller diameter and pitch.	Bidder to provide details	
12.0	**OPERATOR'S CONTROL PANEL:**			
12.1	Operator's control panel has controls to operate the entire machine including the length setting / shearing / fin feeding start-stop / inching of fin feeding, increasing or decreasing the fin feed rate, emergency stop button etc		Bidder to provide details of the control panel.	
12.2	The make and model of the HMI/MMI used with display type and size to be provided. If PLC is used, bidder has to provide the details of the make and model of the PLC. The PLC/ HMI/MMI shall be of reputed makes acceptable to BHEL.		Bidder to provide details	
12.3	The control panel shall be standalone type with a cable length of minimum 15metres. All switches should be within reach of operator. All displays/indications should also be conveniently placed.		Bidder to Confirm	
13.0	**HYDRAULICS**			
13.1	The System should be centralized, modular / stacked valve construction having minimum number of pipes / pipe joints and located at suitable location with easy accessibility of components for maintenance.		Bidder to Furnish Details	

S.No.	SPECIFICATION / DESCRIPTION		Bidder's Offer with Complete Technical Details
13.2	Pumps, valves, accessories etc shall be of Bosch-Rexroth / Vickers or equivalent reputed make acceptable to BHEL. (Details to be submitted). The seals used in cylinders shall be of Merkel / Parker / Bushak + Shamban / Hunger / Simrit make.	Bidder to confirm & furnish details	
13.3	Suitable filtration system should be provided. The filter unit shall be of Hydac / Parker / Rexroth or equivalent reputed make acceptable to BHEL. (Details to be submitted).	Bidder to confirm & furnish details	
13.4	The flexible hoses used in the system shall be of Gates / Aeroquip / Parker or any other reputed make acceptable to BHEL.	Bidder to Specify	
13.5	Failure indication for oil level, temperature, pressure, filter clogging should be provided	Bidder to confirm & furnish details	
13.6	Automatic shut off provision during hose failures, low oil level etc. Pump unloading feature during idle running to be provided for energy conservation. Details should be submitted.	Bidder to Specify	
13.7	Suitable Cooling system of sufficient capacity to maintain complete Hydraulic System at a temperature not exceeding 50 deg C irrespective of the ambient conditions.	Bidder to confirm & furnish details	
13.8	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	Bidder to furnish details	
13.9	Maximum Operating Pressure of hydraulic system	Bidder to Specify	
13.10	Main Pump flow in lpm and Motor Power in kW	Bidder to Specify	
13.11	Reservoir capacity (in litres)	Bidder to Specify	
13.12	All oil pipelines shall be of seamless steel and should undergo pickling process.	Bidder to Confirm	

S.No.	SPECIFICATION / DESCRIPTION		Bidder's Offer with Complete Technical Details
13.13	Pressure gauge of suitable range to be provided to check the hydraulic oil pressure of the system	Bidder to Confirm	
13.14	All cylinders used in the machine should have standard bore and rod sizes. The piston rod shall be hard chrome plated.	Bidder to furnish details	
13.15	The Power pack should be designed taking into account the energy efficiency (Hi-low pump system, proper unloading during idling, etc.). The motor used for pumps shall be energy efficient ones.	Bidder to furnish details	
13.16	The oil to be used shall be of standard ISO Viscosity Grades – 32 / 46 / 68	Bidder to Specify	
13.17	The maximum pressure of the system should preferably not to exceed 310 bar	Bidder to Specify	
13.18	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 light indicating solenoids.	Bidder to Specify	
13.19	The pipelines to be painted with standard colours as per the colour coding accepted internationally for hydraulic systems.	Bidder to furnish details	
13.20	All hydraulic pipelines, hoses and electrical control cables to be neatly laid out with proper clamps and flexible hose conveyors wherever required.	Bidder to Confirm	
13.21	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.	Bidder to Confirm	
13.22	Hydraulic oil will be supplied by BHEL during commissioning at BHEL works. Bidder to provide the oil during pre-dispatch inspection.	Bidder to Confirm	

S.No.	SPECIFICATION / DESCRIPTION		Bidder's Offer with Complete Technical Details
14.0	**LUBRICATION :**		
14.1	Machine lubrication: Bidder to provide details of the lubrication system arranged in the machine.	Bidder to Confirm	
14.2	First filling of Lubrication Oil to be supplied by the supplier. Indian equivalent shall be mentioned.	Bidder to Specify	
14.3	First filling of Grease should be supplied by the supplier. Indian equivalent shall be mentioned.	Bidder to Specify	
15.0	**PNEUMATIC SYSTEM:**		
15.1	The pneumatic operated elements of the machine shall work efficiently with BHEL compressed air supply at a pressure of 3.5 to 4.5 kg/cm2. If higher air pressure is required for efficient operation of the machine, Bidder shall quote for a suitable Air Compressor / Air Booster of suitable capacity as an option.	Bidder to Confirm	
15.2	BHEL will provide compressed air at only one point near / on the machine. Bidder shall provide suitable filter-regulator-lubrication (FRL) unit and in addition a hand wheel valve. at this point	Bidder to Confirm	
15.3	Hydraulic, Pneumatic & Lubricating 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.	Bidder to Confirm	
15.4	Pneumatic components shall be of FESTO / NORGREN make or equivalent reputed make acceptable to BHEL.	Bidder to Specify	

S.No.	SPECIFICATION / DESCRIPTION		Bidder's Offer with Complete Technical Details
16.0	**ELECTRICAL & ELECTRONICS SYSTEMS**		
16.1	415V with a voltage fluctuation of +/- 10%, 50HZ with a fluctuation of +/-3%, 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 Bidder. All cables, connections, circuit breakers etc. required for connecting BHEL's power supply to the machine shall be in the scope of Bidder.	Bidder to Confirm	
16.2	Tropicalization**:** All electrical / electronic equipment shall be tropicalized.	Bidder to Confirm	
16.3	All electrical components in the cabinets should be mounted on DIN Rail	Bidder to Confirm	
16.4	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.	Bidder to Confirm	
16.5	Motors & other electrical components shall conform to IEC or Indian Standards.	Bidder to Confirm	
16.6	Motors and drives shall be of Fanuc / Siemens / Allen Bradley / ABB / Indramat / SEW or any other internationally reputed makes conforming to IS / IEC Standards, acceptable to BHEL (Bidder should indicate make and type in the offer)	Bidder to Confirm	
16.7	All electrical items shall be of from SEW / ROCKWELL Allen Bradley/ Telemechanique / Delta or reputed makes acceptable to BHEL.	Bidder to Confirm	
16.8	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.	Bidder to Confirm	
16.9	All components/devices/terminals are to be incorporated with numbered ferrules.	Bidder to Confirm	

S.No.	SPECIFICATION / DESCRIPTION		Bidder's Offer with Complete Technical Details
16.10	External wiring from / to control panel, control desk, external motors etc shall be by means of screened multi-core cables.	Bidder to Confirm	
16.11	All electrical motors, limit switches etc, on the machine shall be wired using PVC sheathed cable running in conduits and converging to common terminal block.	Bidder to Confirm	
16.12	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.	Bidder to Confirm	
16.13	Bidder should ensure the proper earthing for the machine and its peripherals.	Bidder to Confirm	
16.14	Cables shall be routed through totally enclosed cable trays. There shall not be cable trenches.	Bidder to Confirm	
16.15	All electrical & electronic control cabinets & panels should be vermin and dust proof. All Electric enclosures shall have IP 54 protection	Bidder to Confirm	
16.16	Air Conditioners with Dehumidifiers of suitable capacity to be provided for all Electrical / Electronic Panels / Cabinets including Operator's Panel considering specified ambient conditions. Make: Rittal / Warner & Finley or any other reputed make acceptable to BHEL. Detailed specifications to be submitted.	Bidder to Specify	

S.No.	SPECIFICATION / DESCRIPTION		Bidder's Offer with Complete Technical Details
17.0	**MACHINE SPARES:**		
17.1	List of spares with itemized break-up of mechanical, hydraulic, pneumatic, electrical and electronic spares used in the machine in sufficient quantity as per recommendation of Bidder for 2 years of trouble free operation on three shifts continuous running basis shall be furnished by Bidder along with offer. The list is to include following, in addition to other recommended spares: **(Unit Price for each item of spare shall be offered)**	Bidder to Confirm	
17.2	Bidder 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	Bidder to Confirm	
18.0	**DOCUMENTATION:**		
18.1	GA drawings, Machine detailed constructional drawings with dimensions, Civil Foundation layout drawings, Hydraulic / Pneumatic / Electrical / Electronic circuits with BOM, are to be submitted within 45 days from the date of ordering (in case of an order) for approval by BHEL.	Bidder to Confirm	

S.No.	SPECIFICATION / DESCRIPTION		Bidder's Offer with Complete Technical Details
18.2	The following documents in English language should be supplied along with the machine: **Hard Copies - 3 Sets** **Bidder to confirm** **In CD form - 1 Set** .GA Drawing of the complete station. 1. GA & Sub-Assembly Drawings for sub-systems for maintenance purpose. 2. Operating manuals of Machine & its contorl System 3. Maintenance manuals with all drawings of machine assemblies / sub-assemblies with parts list 4. Electrical circuit diagrams with bill of materials 5. Hydraulic circuit diagrams with bill of materials 6. Pneumatic circuit diagrams with bill of materials 7. Maintenance & Interface manuals for Machine Control System 8. Preventive Maintenance check list for Electrical and Mechanical System 9. Catalogues, O&M manuals for all bought out items used in the machine. 10. Operating Manuals, Maintenance Manuals & Catalogues for all supplied Accessories. 11. Detailed specification of all rubber items / hydraulic / lubrication fittings 12. Complete list of Alarm log, Error code, error messages & remedies.. 13. Complete list of spares for machine, along with item part no /specification / type / model and make & address of the sub-vendor.		
19.0	**MACHINE INSPECTION & ACCEPTANCE:**		
19.1	**PRE-DISPATCH INSPECTION AT SUPPLIER'S WORKS:**		
19.1.1	Machine shall be offered for inspection by BHEL Engineers at supplier's works	Bidder to Confirm	
19.1.2	The Fin de-coiling, straightening and coiling station and its accessories shall be tested for its performance prove-out as per Technical Specifications, at the Supplier's Works prior to dispatch.	Bidder to Confirm	

S.No.	SPECIFICATION / DESCRIPTION		Bidder's Offer with Complete Technical Details
19.1.3	One full coiled fin will be supplied by BHEL for trials at Supplier's works. The performance of the complete station to be proved out by winding into smaller coils and straights cut fins. Welding to be arranged by the supplier.	Bidder to Confirm	
19.1.4	The tolerances and feed rate will be checked as per clauses 7.4 & 9.4.	Bidder to Confirm	
19.1.5	All the fins after prove out are to be returned to BHEL and shall be dispatched along with the machine.	Bidder to Confirm	
19.2	**PROVE-OUT AND ACCEPTANCE AT BHEL WORKS:**		
19.2.1	After the machine has been erected and energized, a few idle runs have to be done to demonstrate the good working condition of the machine.	Bidder to Confirm	
19.2.2	The Fin De-coiling, Straightening and Coiling station and the accessories shall be tested for its performance prove-out as per Technical Specifications, at the BHEL works after erection.	Bidder to Confirm	
19.2.3	Fin De-coiling, Straightening and Coiling station shall be carried out on 2 Nos of full coiled flats continuously, as prove out test to observe the performance of the station. The machine performance and the tolerances shall be tested at max.feed rate as per clauses 7.4 & 9.4.	Bidder to Confirm	
20.0	**TRAINING:**		
20.1	The supplier shall train TWO BHEL Engineers in Operation and Maintenance (Mechanical, Electrical/ Electronics and Programming) of the Machine for ONE day at supplier's works after the pre-dispatch inspection.	Bidder to Confirm	
20.2	Bidder to clearly mention whether the training is offered free of cost or chargeable. If chargeable, the Bidder has to quote on manday basis.	Bidder to Specify	

S.No.	SPECIFICATION / DESCRIPTION		Bidder's Offer with Complete Technical Details
20.3	Travel charges, board & lodging for the BHEL Engineers who will be visiting supplier's works for pre-dispatch inspection and training, shall be borne by BHEL.	Bidder to note	
20.4	The Supplier shall impart training to BHEL's Machine Operators and Maintenance crew in Operation and Maintenance (Mechanical, Electrical/ Electronics and PLC System) during commissioning of the Machine at BHEL works for TWO working days.	Bidder to confirm	
20.5	The training shall include specialized coaching in i) Safety ii) Operation of the machine iii) PC based System & Operation, iv) Trouble-Shooting, v) Software Application vi) All special features of the machine vii) Electrical / Mechanical / Electronics systems	Bidder to confirm	
20.6	Competent, English speaking experts shall be arranged by the Bidder during training for satisfactory & effective training of BHEL personnel	Bidder to confirm	
21.0	**MACHINE FOUNDATION:**		
21.1	Bidder shall submit the preliminary layout drawing for getting BHEL's approval within one month from the date of Letter of Intent (LOI) in case of an order. Complete details like static and dynamic loads etc required for foundation design shall be submitted by the Bidder within three months after getting BHEL's approval.	Bidder to confirm	
21.2	BHEL shall design and construct complete foundation for the machine as per the Bidder's recommendation	Bidder to confirm	
21.3	Complete anchoring system including foundation bolts, anchoring materials, fixators, levelling shoes etc should be supplied	Bidder to Specify	

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22.0	**ERECTION & COMMISSIONING**		
22.1	Supplier to take full responsibility for Supervision of the erection and for start up, testing and commissioning of machine, its controls and accessories. Supplier shall send suitable qualified Engineers for supervision of Erection and Commissioning of the machine at BHEL works.	Bidder to Confirm	
22.2	Service requirement like power, air & water shall be provided by BHEL at only one point to be indicated by Bidder in their foundation/layout drawings. Other requirements like crane and helping personnel shall also be provided by BHEL.	Bidder to Confirm	
22.3	Successful proving of BHEL components by the Bidder shall be considered as part of commissioning. All tests, as mentioned (Machine Acceptance) shall form part of the commissioning activity.	Bidder to Confirm	
22.4	Commissioning spares, required for commissioning of the machine shall be supplied free of cost	Bidder to Confirm	
22.5	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 Bidder. For this purpose, the Bidder should supply sufficient quantity of touch-up paint of various colours of paint used.	Bidder to Confirm	
23.0	**IN-BUILT SAFETY ARRANGEMENTS**		
23.1	Following safety features in addition to other standard safety features should be provided on the machine:		
23.2	A detailed list of all alarms / indications provided on machine should be submitted by the Bidder.	Bidder to Specify	

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23.4	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.	Bidder to Confirm	
23.5	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.	Bidder to Specify	
23.6	Machine functions should be continuously monitored and alarm / warning indications through lights/ alarm number with messages (on the display and operator panels) should be available.	Bidder to Confirm	
23.7	All the rotating parts used on machine should be statically & dynamically balanced to avoid undue vibrations and suitably guarded.	Bidder to Confirm	
23.8	Emergency Switches should be provided in the operator panel.	Bidder to Confirm	
24.0	**THERMAL STABILITY FOR AMBIENT CONDITIONS & ENVIRONMENTAL PERFORMANCE OF THE MACHINE:**		
24.1	The machine shall be suitable for an ambient temperature of +45 deg C and relative humidity of 90% respectively, but both do not occur simultaneously.	Bidder to Confirm	
24.2	The Bidder should ensure trouble free operation of the machine with Thermal Stability of the complete machine and accuracy requirements of BHEL components, keeping in view of ambient conditions as mentioned above.	Bidder to Confirm	
24.3	The machine, including attachments and accessories, should be suitable for continuous duty.	Bidder to Confirm	
24.4	If any safety / environmental protection enclosure is required it shall be built in the machine by the Bidder.	Bidder to Confirm	
24.5	Paint of the machine should be oil / coolant resistant and should not peel off	Bidder to Confirm	

S.No.	SPECIFICATION / DESCRIPTION		Bidder's Offer with Complete Technical Details
24.6	Maximum noise level shall be 85 dB(A) at normal load condition..	Bidder to Confirm	
25.0	**PAINTING:**		
25.1	Painting of Machine / Electrical Panels: **RAL 6011 Apple Green** (Polyurethane Paint)	Bidder to Confirm	
26.0	**GUARANTEE:**		
26.1	Performance Guarantee to be given for 12 months from the date of commissioning OR 18 months from the date of dispatch whichever is earlier.	Bidder to Confirm	
27.0	**MACHINE PACKING:**		
27.1	Sea worthy & rigid packing for all items of complete machine, control System, 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	Bidder to Confirm	
28.0	**GENERAL:**		
28.2	Total connected load (KVA):	Bidder to Specify	
28.3	Floor area required (Length, Width, Height) for complete machine & accessories	Bidder to Specify	
28.4	Total weight of the machine (approx)	Bidder to Specify	
28.5	The general arrangement drawing showing the machine & associated systems with salient dimensions shall be submitted along with the offer. The drawing should be clear and legible	Bidder to provide compulsorily	