

							
BHARAT HEAVY ELECTRICAL LIMITED						Enquiry No. :	
UNITS ADDRESS						Due Date :	
UNITS PHONE NOS.						Supplier Qtn. No.:	
CONTACT PERSON'S NAME/DESIGN./PHONE NO./E-MAIL (FROM PURCHASE DEPT.)						Date :	
SPECIFICATION CUM COMPLIANCE CERTIFICATION FOR CRGO ELECTRICAL STEEL SLITTING LINE/MACHINE.							
NOTE:-							
1. Vendor must submit complete information's against clause no. 16.0 (Qualifying Condition). The offer meeting this clause would only be processed.							
2. Vendor to furnish the offer using this standard template of the specification. While furnishing the offer, no change is to be made in the first three columns (i.e. 'S.NO.', 'DESCRIPTION FOR BHEL REQUIREMENT' & 'ACTION BY VENDOR'). Only the "Offered" column and where applicable, the "Remarks" Column of this format shall be filled in by the Vendor and submitted along with the offer. Inadequate / incomplete, ambiguous, or unsustainable information against any of the clauses of the specifications/requirements shall be treated as non-compliance.							
3. The offer and all documents enclosed with offer should be in English language only.							
4. Vendor should confirm/clarity/specific pointwise (all the points) as per specification and provide original technical leaflet, technical details, photograph, scope of supply etc. at the first instance.							
ADDRESS OF THE SUPPLIER :				ADDRESS OF THE INDIAN AGENTS :			
TELEPHONE NOS.:				TELEPHONE NOS.:			
E-MAIL ADDRESS :				E-MAIL ADDRESS :			

SCOPE : DESIGNING, MANUFACTURING, SUPPLY AND COMMISSIONING OF CRGO ELECTRICAL STEEL SLITTING LINE/MACHINE, COMPLYING WITH SPECIFICATION AS BELOW :

S.NO	DESCRIPTION FOR BHEL REQUIREMENT	ACTION BY VENDOR	OFFERED	REMARKS
1.0	PURPOSE :			
1.1	The proposed machine is to be drive through type slitting line, used for the decoiling, slitting and recoiling of cold rolled grain oriented (CRGO) silicon Electrical steel. The speed of the machine shall be up to 140 meter/min. The equipment shall comprise the following major units:-			
	1) Coil Storage Saddle with Coil Car and loading jack	Vendor to note & confirm		
	(2) Decoiler/Uncoiler			
	(3) Slitter			
	(4) Scrap Chipper with collector			
	(5) Tensioning Unit			
	(6) Recoiler with strip divider			
	(7) Control equipment, panels, desks			
	(8) Unloader/coil Capstan			
2.0	TECHNICAL SPECIFICATIONS:			
2.1	INPUT MATERIALS:			
2.1.1	Material to be slit :	Vendor to confirm		
2.1.2	Thickness :	Vendor to confirm		
2.1.3	Entry strip width :	Vendor to confirm		
2.1.4	Weight of coil :	Vendor to confirm		
2.1.5	Coil ID entry :	Vendor to confirm		
2.1.6	Coil OD :	Vendor to confirm		

S.NO	DESCRIPTION FOR BHEL REQUIREMENT	ACTION BY VENDOR	OFFERED	REMARKS
2.2	DESCRIPTION OF Finished Coil after Sifting			
2.2.1	Minimum width of sifting	30 MM		
2.2.2	Maximum width of sifting	1180 MM		
2.2.3	Wound coil inner dia	508 mm		
2.2.4	Wound Coil outer dia	1000 mm (Max.)		
2.2.5	Wound Coil Condition	Silt strip should be wound with appropriate tension to prevent sliding of layers		
2.2.6	Burr permissible :	0.02 mm maximum.		
2.2.7	Bow permissible :	± 0.15 mm in a length of 1.5 m		
2.2.8	Width tolerance :	± 0.1 mm with guide.		
2.3	PROCESS SETTINGS:			
2.3.1	Linear speed variation at bare drum :	0 to 140 meter/min - programmable & maintain constant line speed)		
2.3.2	Threading / inching speed :	5 to 15 mtr/min - programmable		
2.3.3	Tension at Sifter	Vendor to take appropriate measures to achieve a smooth running of the strip through the shear without oscillations or bouncing, while avoiding exertion of unnecessary tension to the strip.		
2.3.4	Recoiler Winding Tension	A tensioning force up to 6500 N shall be generated from wiper pads exerting pressure against the strip by using pneumatic pressure adjustable in sections.		
2.4	MACHINE CONFIGURATION - Mechanical:			
2.4.1	No. of cutters on Max. Tk :	10 (max.) at line speed 0-140 meter/min		
2.4.2	Line direction :	Left hand design		
2.4.3	Pay off direction :	Over unwind/un-coiled from the upper side		
2.4.4	Recoil direction :	Over rewind/re-coiled onto the upper side		
3.1	COIL STORAGE SADDLE :			
3.1.1	Type : The Saddle shall be made of Fabricated steel frame with hardened plastic to position the coil symmetrically over the coil car pit used for storing coils prior to transfer to uncoiler.	Vendor to confirm		
3.1.2	Location : Infront of the uncoiler & above the coil car pit. Coil storage saddle unit can be either separate unit or part of the coil car unit.	Vendor to confirm		
3.1.3	Storage capacity : 1 coil.	Vendor to confirm		

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3.2	COIL CAR :			
3.2.1	Type : The Car shall have Four wheels, having facility of hydraulic/Electrical travel , duly mounted on rails. Coil car can be pit type/floor type compatible with coil storage saddle (as per cl. 3.1) suitable for 6 Tonnes weight & maximum / minimum CD is 1000 / 800 mm.	Vendor to confirm		
3.2.2	Lift : By hydraulic cylinder and guided by four cylinder guides or to suit the system. Lift speed : 0.5 mtr / minute (min) stroke to suit the system.	Vendor to confirm		
3.2.3	Travel : Travel speed : 1.5 mtr./minutes (min)	Vendor to confirm		
3.2.4	Safety : Rubber safety rails shall be used in a) interspace between saddle and car and b) at the car at both faces pointing to inward and outward moving, to stop the relevant motion in case obstacles are detected.	Vendor to confirm		
3.3	UNCOILER WITH SNUBER ROLL :			
3.3.1	Type : Cantilever reel type, 3/4 segment hydraulic mandrel expansion or to suit the system, indication for correct coil position	Vendor to confirm		
3.3.2	Mandrel expansion : The expansion shall be made by hydraulic cylinder/Any other suitable arrangement. It shall have shaft having three/four segment mandrel. The Expansion range shall be from 470 to 520 mm (Nominal I/D- 508 mm) . The Mandrel drive shall be through DC/AC geared motor with AC/DC drive . Face width of mandrel : suitable. A suitable snubber roll for holding the steel sheet shall also be provided so that during the feeding of the strip into the machine the coil does not spring open.	Vendor to confirm		
3.3.3	Drive : The uncoiler mandrel shall be driven by a DC/AC geared motor with variable speed drive (AC/DC drive) to maintain loop length at the specified slitting line speed. The drive shall have manual control to jog the spool forward or reverse for threading. The jog speed shall be settable	Vendor to confirm		
3.3.4	Pressure holding: Mandrel expansion to be fitted with unlockable non-return valve, so that after loss of hydraulic pressure (safety-related or after emergency stop) the mandrel clamping pressure is maintained for a reasonable time.	Vendor to confirm		

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3.4	LOOPING PITTS & INFEED TABLES : The table/support/lap shall be provided at both entry & exit of sifter (if applicable) and other places at per the requirement of the machine. It shall have Fabricated construction with surface covered with mica/ta/equivalent and rollers at both ends having no pulleys. The table/support can be of Louvre/Tilting type or slide-in table type, so that it can be easily removed/ lowered after use.	Vendor to confirm		
3.4.1	Type : Basket rolls (Loop pit Roll quadrant) minimum 300 mm radius at both ends of loop pit to maintain strip curvature for avoiding permanent deformation of strip.	Vendor to confirm		
3.4.2	Loop control : The loop to be maintained at maximum & minimum levels by infrared photo sensors/Ultrasonic sensors. Appropriate number of sensors shall be mounted at each level so that the slit strands may be sensed properly for proper opration of the machine.	Vendor to confirm		
3.5	SLITTER :			
3.5.1	Entry Guide: Guides are provided at either edge of the incoming strip to fix the position of the incoming strip in-line with the sifter. Far side edge guide shall be normally maintained as Zero position (zero position manually settable) and near side shall be settable through manual adjustment. To avoid edge damaging of the rolls, the guides shall be non-driven rolling type of suitable material and hardness (55-60RC) to ensure low wear for long life.	Vendor to confirm		
3.5.2	At the entry side of the sifting head a side guide adjustable to the width of the coil is fitted together with the holders for the guide pads while sifting. The side guides are in the form of roller guides with support for the coil edge. The roller holders shall be mounted on side ways on two sturdy pillars and the adjustment shall be made with the help of a lead screw and hand wheels arranged between the pillars.	Vendor to confirm		
3.5.3	A Transport unit shall be near the sifting head for the continuous pulling of strip through the sifting head	Vendor to confirm		
3.5.4	The cutter shaft is provided with a drive only for threading purposes. During automatic operation the coil material is under tension from the pinch rolls. In order to prevent a buildup of material between the pinch rolls and the cutter shaft the pinch rolls move slightly faster to take care of the difference in speed the overrun clutch in the cutter shaft drive is provided.	Vendor to confirm		

S.NO	DESCRIPTION FOR BHEL REQUIREMENT		ACTION BY VENDOR	OFFERED	REMARKS
3.5.5	<p>Sitting Arbor/Shaft : 125 mm dia.(suitable) X barrel length suitable for 1200 mm roll width x 2 nos. per cassette made from EN24 / EN31 / Cr-Mo steel or rust proof steel heat treated to 55 / 60 RC and ground to precision size and mirror polished. Both arbors shall be mounted in eccentric sleeves/suitable mounting system for cutter overlap adjustment. Overlap adjustment for max. adjustment to suit minimum cutter dia. effected through hand wheel coupled through adjustment worm gearing to mating pairs of adjustment gears coupled to eccentric sleeves. <i>Suitable measures for locking (incl. self locking effect) to be taken. Dial gauge shall be provided to read the distance between the arbors' axes.</i> Arbor & bearing arrangement shall be suitable for minimum deflection to maintain parallelism under severe load & to reduce wear & tear at continuous high speed operation. The cutter shaft should not sag when the front stand is moved out. The bearing support on the operator side should be able to move in axial direction to facilitate the changing of sifter.</p>		Vendor to confirm		
3.5.6	Cutter shaft dia. :	125 mm / suitable to cut	Vendor to confirm		
3.5.7	Cutter dia. (OD) :	250 mm (maximum)	Vendor to confirm		
3.5.8	<p>Note : The sifter shall be capable of satisfactorily sifting available coils with 5-10 mm (max.) edge trim on each side. It shall be ensured that no coolant is required in the system to be supplied.</p>		Vendor to confirm		
3.5.9	<p>Guide Pad/Brake Pad before Sifter/Stripper Arrangement:- The Top and Bottom set of guide pads are each supported on pressure rails across the width of the line. The upper pressure rails shall be adjustable in height by a pneumatic cylinder. A set of different width of stripper blocks made of aluminium channel / suitable material stuck with suitable lining shall be provided. Design & mounting shall be magnetic self holding type and should suit the system for trouble free operation.</p>		Vendor to confirm		
3.5.10	<p>Exit Pinch Rolls : To pull the coil material through the knives during automatic operation pinch rolls shall be provided beyond the cutter shaft. The drive of the pinch rolls shall be taken from the drive of the sifter and transmission shall be via shafts with universal joints, to the two rollers. The rollers shall be carried in roller bearings.</p>		Vendor to confirm		
3.5.11	<p>Drive : By DC/AC motor coupled to both rolls through reduction gear box and cardan shafts. Strip speed variable from 0 to 140 ml/minute. Encoder/Tacho/resolver generator for feed back of speed control shall be provided.</p>		Vendor to confirm		
3.5.12	<p>Line Interlocks : All necessary interlocks are to be provided wherever required.</p>		Vendor to confirm		
3.5.13	<p>Spacers (for spacer cutter arrangement for positioning of the cutters) . Spacer should be absolutely IDEAL in dimension. A maximum tolerance of +/-0.001 mm from the nominal width is allowed.</p>		Vendor to confirm		
3.5.14	<p>Strip brake: A strip brake at the exit side of the pinch rollers shall automatically act after achieving the strip end to avoid a falling of the same into the loop pit</p>		Vendor to confirm		1 coil done

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3.6	TENSION UNIT WITH TRAVELLING SUPPORT :			
3.6.1	Diverting Roller/Separator rolls/sift separator : 3 nos. roll type strip separator shafts suitable for easy loading and removal of the shaft and for quick resetting to meet the different width requirements shall be part of the machine. One extra shaft shall be also provided . Each shaft shall have 12 separating discs i.e. in total 48 numbers of Discs shall be in the scope of supply. These discs shall be of hardened steel and properly ground.	Vendor to confirm		
3.6.2	Wiper pad/Brake pad : The Braking unit shall be provided to guide the strip as well as generate necessary tension to achieve accurate and neat coil. 2 nos. wiper pads in full length / width having upper & lower drag plates shall be provided. The lower plates shall be lowered & raised pneumatically by the air tube fixed below the plates. Each drag plates will be of highly durable material. It should be easily replaceable. The wiper pads will be covered with felt/suitable lining . The wiper pad shall be suitable to exert pressure with the help of pneumatically actuated back pressure control. Pressure setting to be provided at a convenient location and to be possible during operation.	Vendor to confirm		
3.6.3	Travelling support: The tension unit shall have a motorized movement over the loop pit to come close to either the sitting shear or the upcoiler. The table/support/flap at the shall be provided above the loop pit entry to support the sit laminations to prevent it from falling inside the Loop Pit. The table/support can be of Louvre/Tilting type or slide-in table type, so that it can be easily removed/ lowered after use.	Vendor to confirm		
3.7	SCRAP COLLECTION SYSTEM :			
3.7.1	Scrap Chipper with Accumulator : An accumulator / Collector made of steel of capacity maximum 300-400 litre for collecting the sheared/chipped scrap from both sides of the sheet after sitting shall be required. It should be able to collect the scrap after chipping into a collector which shall come out easily. Suitable drive system, Chipping system mechanism and Container shall be provided by the supplier. The location of the container should be adaptable to the system.	Vendor to confirm		

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3.8	RECOILER :			
3.8.1	Type : Recoiler shall be of cantilever reel type. It shall have hydraulic mandrel expansion of 508mm dia. and coil end clamping. 2/3 segments mandrel, hydraulics pusher for unloading coils on to the coil capstan/unloader. The recoiler and over arm separator (see 3.8.5) shall ensure that coils shall be tightly wound without damage to the edges and without telescoping. Expand / collapse through hydraulic cylinder.	Vendor to confirm		
3.8.2	The speed between the slitting shear and re-coiler shall be controlled by scanning the longest slit loop inside the pit. The loop to be maintained at maximum & minimum levels by infrared photo sensors/Ultrasonic sensors. Appropriate number of sensors with sufficient length to cover the entire width of the roll shall be mounted at each level so that the slit strands may be sensed properly for proper operation of the machine.	Vendor to confirm		
3.8.2.1	Emergency stop: Line shall be fitted with a sufficient number of the emergency stop push buttons, forcing the machine operation to be stopped in a very fast yet controlled manner, i.e. to avoid damage to strip or uncontrolled movement of the same.	Vendor to confirm		
3.8.3	Drive : By DC motor/AC motor coupled to mandrel shaft by gear transmission. Speed feed back sensed by techs - generator / encoder and wound spool diameter measurement arrangement shall be provided. Strip speed variable up to 140 mtr/minute. Recoiler / uncoiler/slitter drives shall be provided with jog forward/jog reverse features. Speed of the re-coiler shall be automatically adjusted through PLC and drive to match the speed of the slitter in auto/ line mode.	Vendor to confirm		
3.8.4	Coil pusher : A Coil Pusher shall be provided in the hydraulically actuated plate with cylindrical guides. Spring loaded bronze shoes loaded by a wedge mechanism shall be provided for positively pushing of the inner most turns of the coil along with the rest of the coil. The slit coil shall be unloaded over the capstan with the help of this.	Vendor to confirm		
3.8.5	Over arm separator : The rearmost separator shaft (from Item 3.6.1) shall be mounted on a swinging arm operated by a pneumatic cylinder. The disc location shall be made suitable for quick resetting.	Vendor to confirm		
3.8.6	Pressure holding: Mandrel expansion to be fitted with unlockable non-return valve, so that after loss of hydraulic pressure (safety-related or after emergency stop) the mandrel clamping pressure is maintained for a reasonable time.	Vendor to confirm		

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3.9	UNLOADER/Coil Capstan :			
3.9.1	Type : Min. 2 Arm	Vendor to confirm		
3.9.2	Arm counter : U shape / suitable arm with suitable weight bearing capacity (as per coil roll weight).	Vendor to confirm		
3.9.3	Rotation : Motorized with gears.	Vendor to confirm		
3.9.4	The arm unloader shall consist of heavy U shaped/ suitable shape weldment / steel casting which is supported at the centre by taper roller bearings. Rotation of arm unloader shall be motorised and provision to be made for manual rotation also in case of emergency. The U shaped/suitable shaped arm is provided to facilitate the coil removal by means of C hooks.	Vendor to confirm		
3.10	HYDRAULIC EQUIPMENT :			
3.10.1	Type : Two Electrically operated Hydraulic power pack system shall be there for the entire line (One at Decoller end and other at Recoiler end) which in turn shall have compact manifold type construction for reduced space & orderly piping layout. Suitable oil cooling arrangements shall to be provided, if required.	Vendor to confirm		
3.10.2	Drive : AC/DC motor directly coupled to pump.	Vendor to confirm		
3.10.3	System pressure : Suitable for the machine operation/ Min 100 bar with flow rate varying from 0-15l/m.	Vendor to specify		
3.10.4	First fill of the hydraulic oil shall be provided by the supplier.	Vendor to confirm		

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3.11	PNEUMATIC EQUIPMENT :			
3.11.1	Suitable Air compressor having refrigerant dryer with all pneumatic elements shall be provided by the Vendor. Necessary valves/FRL unit etc shall be there for proper functioning of the machine. Wherever, there are frequent air flow requirements, adequately sized surge tank shall be provided. Suitable air filter for dust & moisture removal shall be provided along with the regulator for each unit.	Vendor to confirm		
3.12	TOOLING : Following items of tooling shall be supplied along with the system :	Vendor to confirm		
3.12.1	Sitting cutters with suitable mounting arrangement at arbor : 2 sets (40 Nos.)	Vendor to confirm		
3.12.2	Separator tooling (to suit the system) :	Vendor to confirm		
	5.0 mm width: 30 nos.			
	5.5 mm width: 15 Nos.			
	10.0 mm width : 15 Nos.			
	20.0 mm width : 15 Nos.			
	30.0 mm width : 15 Nos.			
	40.0 mm width: 15 Nos.			
	50.0 mm width: 15 Nos.			
3.12.3	100.0 mm width : 15 Nos.	Vendor to confirm		
	6 Nos. limit rings to be supplied with each above mentioned width spacers. Further in the range of 5mm to 5.04 mm minimum 15 numbers of Spacers shall be the scope of supply in the gap of 0.01 mm i.e 15*5.01, 15*5.02, 15*5.03, and 15*5.04 mm. Three numbers separate spacer of 5.005 mm shall also be provided . All of these separators shall be of positive and negative tolerance both. These shall be made of Hardened steel and shall be properly ground.			
3.12.4	All other necessary i.e. toolings, guides, braking pads, auxiliary shaft for loading the blades in a circular grinding machine in sufficient quantity for successful operation of machine to be supplied along with machine. List of such items to be provided at the time of technical offer	Vendor to specify		

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S.NO	DESCRIPTION FOR BHFL REQUIREMENT	ACTION BY VENDOR	OFFERED	REMARKS
	MACHINE CONFIGURATION - Electrical			
4.0	OPERATION AND CONTROL PANEL :			
4.1	OPERATOR'S PANEL :			
4.1.1	All switches (ON/OFF switches with indication, table up / down switches & STOP switch) on the Operator's panel should be within reach of operator of average height 1600 ¹⁶⁵⁰ for convenient, efficient & safe operation. Separate smaller switch consoles shall be provided close to the different sub-units enabling the operator to operate the respective units while visually monitoring the operation and without needing to move away to access switches.	1600 ¹⁶⁵⁰ Vendor to confirm		
4.1.2	PLC Control System - A touch panel/HMI shall be used for general operation of machine, programming & monitoring. Suitable touch screen with PLC should be provided to give information to the operator as per electrical specification / Drawing and will provide interactive working. All displays / indications should also be conveniently placed accordingly. All the control (MMI/HMI/touch panel) operations to be provided through a operator panel interface to the drive & PLC through a suitable communication link. Make for PLC and HMI : ABB, Siemens, Allen bradely, Mitsubishi, Schneider, Delta, Hitachi, Amron, Panasonic, Emerson (General Electric), B & R Industrial Automation, Fanuc. Final backup of PLC and HMI shall be provided at the time of machine commissioning. Licensed (perpetual) Operating software alongwith the connecting cable shall be provide for HMI and PLC program.	Vendor to confirm		
4.1.3	It should be possible to view the PLC program online on the screen of the separately delivered laptop while the machine is running. Editing of PLC program should also be possible. Backup of PLC and HMI is required with operating software Laptop (supplied by vendor) shall have following minimum specification: Processor: Intel i9 14th gen or latest, RAM: 16 GB or higher, DDR5 or latest, 1 TB SSD or higher, screen size shall be 15 inch or more, WINDOWS 10 or 11 (licensed), Optical mouse with set of interconnecting cables & suitable ports etc.	VENDOR TO CONFIRM		
4.1.4	Control System must be an OPCUA Compliant so that it can be configured for real time monitoring through our inhouse Industry 4.0 solution. Any neccessary licenses if required must be supplied.			

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4.2	MANUAL CONTROL :			
4.2.1	Complete manual control of machine with required switches / keys should be provided on operator's panel for selection of required work.	Vendor to confirm		
4.3	CONTROL PANEL:- A floor mounted sheet metal control panel to be provided complete with MCCB for incoming Power Supply, PLC for control system, all drive, contractors relays, starters, timer, single phasing preventer, MCCBS & HRC fuses, step down transformer for control voltage etc., indicating lamps for Power Supply, Status monitoring and fault annunciation with alarm etc. with desired inter locks and electrical safety provisions, indication and operation of all electro-pneumatic valves.	Vendor to confirm		
5.0	ELECTRICAL SYSTEM :-			
5.1	415V +/- 10% , 50 HZ +/- 1%, 3 phase AC (3 wire system without neutral) Power Supply Source will be provided by BHEL at a single point near the machine as per layout recommended by VENDOR . All step down transformers, rectifiers & regulators (if required to operate the machine) shall also be supplied by the 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 shall be the responsibility of VENDOR so that same could be incorporated during construction of foundation. Earthing on a single point shall also be provided.	Vendor to confirm		
5.2	Uncoiler, slitter & coiler are driven by AC/DC motors. Economically designed controls shall ensure max operator convenience. Comprehensive system of indications during threading operation shall be provided for systematic fault diagnosis. Length measurement and presetting of length to stop the machine as soon as the predetermined length is cut. Automatic response control for decoller & recoiler driven w.r.t. change in the diameters of the roll over decoller & recoiler simultaneously must be incorporated. Make of AC and DC motor : Siemens/ Allen Bradley/ Baldor/ Baumuller/Mitsubishi/ Delta/ Yaskawa/ Eurotherm/ Danfoss/Yaskawa/ Hitachi/ Panasonic/ FujiABB/Schneider/CG. Make AC and DC drive: Siemens/ Allen Bradley/ Baldor/ Baumuller/Mitsubishi/ Delta/ Yaskawa/ Eurotherm/ Danfoss/Yaskawa/ Hitachi/ Panasonic/ FujiABB/Schneider/CG.	Vendor to confirm		
5.3	Tropicalisation: All electrical / electronic equipment shall be tropicalized.	Vendor to confirm		
5.4	All electrical & electronic control cabinets & panels should be dust and vermin proof fitted with suitable panel air conditioners.	Vendor to confirm		
5.5	All electrical components in the cabinets should be mounted on DIN Rail.	Vendor to confirm		
5.6	Motors shall conform to IEC or Indian standards.	Vendor to confirm		
5.7	VENDOR should ensure the proper earthing for the machine and its peripherals.	Vendor to confirm		
5.8	All electrical equipments shall be suitably protected by HRC fuses/ MCBs/ Overload relays & single phase preventives.	Vendor to confirm		

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6.0	SAFETY ARRANGEMENTS: Following safety features in addition to other standard safety features should be provided on the silting machine.	Vendor to confirm		
6.1	silting machine should have adequate and reliable safety interlocks / devices to avoid damage to the workpiece and the operator due to the malfunctioning or mistakes. silting operation should be monitored and alarm / warning indication through lights / alarm number with message (on panels) should be available.	Vendor to confirm		
6.2	A detailed list of all alarms / indications provided on machine should be submitted by the supplier with the machine.	Vendor to confirm		
6.3	All the pipes, cables etc. on the machine should be well supported and protected.	Vendor to confirm		
6.4	All the rotating parts used on machine should be statically & dynamically balanced to avoid undue vibrations.	Vendor to confirm		
6.5	Emergency switches at suitable locations as per International Norms are to be provided.	Vendor to confirm		
7.0	AMBIENT CONDITIONS & THERMAL STABILITY: The silting machine including PLC based systems and all supplied items should work trouble free and efficiently under following operating conditions and should give specified accuracies. POWER SUPPLY: Voltage :- 415 V -10%, +10%. Frequency - 50 Hz +/- 1 % No. of phases - 3 , no neutral Ambient Conditions - Temperature = 5 to 45 degree celsius , Relative Humidity : 95 %	Vendor to confirm		
7.2	Weather conditions are tropical. Silting machine shall be kept in dust free area in the shop floor by BHEL. Max. temperature variation is up to 25 deg Celsius in 24 hours.	Vendor to confirm		
7.3	The silting machine including attachments and accessories, should be suitable for 24 hrs	Vendor to confirm		

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8.0	INSPECTION & TRAINING:			
	BHEL Persons should be trained at supplier's Works for mutually agreed period in the area of			
8.1	(a) Mechanical, Electrical & Electronic maintenance for machine & other supplied equipments. (b) Operator for machine operation.	Vendor to confirm		
8.2	Air-fare, boarding & lodging for the trainees shall be borne by BHEL.	Vendor to confirm		
8.3	Vendor to quote for training on man / <i>day</i> basis <i>fixed</i>	Vendor to confirm		
8.4	Vendor should commit to organize and quote for training of Electronics Engineers at Manufacturer's works for advanced features and specialised training if so required by BHEL.	Vendor to confirm		

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9.0	DOCUMENTATION:			
9.1	Three sets of following documents (Hard copies) in English language should be supplied along with the system. Soft copy (in USB drive) of the complete system back up is to be provided.	Vendor to confirm		
9.1.1	Operating manuals of Machine.	Vendor to confirm		
9.1.2	Detailed Maintenance manual of machine for necessary machine maintenance to be provided	Vendor to confirm		
9.1.3	Catalogues, O&M Manuals of all bought out items wherever applicable.	Vendor to confirm		
9.1.4	Detailed specification of all rubber items and hydraulic/tube fittings	Vendor to confirm		
9.1.5	Electrical Schematics of the machine with comments in English.	Vendor to confirm		
9.1.6	Soft copy of PLC project with symbols and comments in English (Soft copy of PLC program and drive parameters. Soft copy of HMI program (in case of HMI based system). Vendor shall provide the operating software of PLC, drive and HMI (as per applicability) with perpetual license. These software shall be used for diagnosis. Editing of PLC program should also be possible. Vendor shall also provide connecting cable for PLC, HMI and drive)	Vendor to confirm		
9.1.7	One additional set of all the above documentation on USB, wherever possible.	Vendor to confirm		
9.1.8	Necessary list of parts used in the machine shall be submitted by the vendor.	Vendor to confirm		
9.1.9	Complete Image back up of the system (e.g. Image of Harddisk in case of PC based system) Note: In case of system failure (e.g. Harddisk failure in case of PC based system), the above mentioned image backup should be able to restore the system to its original capacity.	Vendor to confirm		
9.1.10	Instructions and necessary software required for the restoration of Image back up as mentioned in clause 9.1.8 should be provided.	Vendor to confirm		
9.2	Documents to be submitted along with technical offer :	Vendor to confirm		
9.2.1	General arrangement diagram.	Vendor to confirm		

for initial review only

S.NO	DESCRIPTION FOR BHEL REQUIREMENT	ACTION BY VENDOR	OFFERED	REMARKS
10.0	FOUNDATION:			
10.1	<p>Vendor shall submit the preliminary layout drawing for getting BHEL's approval within one month from the date of Letter of Intent (LOI)/ P.O. Soil bearing capacity (SBC) data will be furnished by BHEL alongwith the approval.</p> <p>The submission of civil foundation drawings for the equipment specified in this tender is desirable. Vendors are encouraged to provide detailed foundation drawings after placement of P.O. Such foundation drawings shall include details such as (a) Excavation details (b) Reinforcement details (Rod dia & distances etc) (c) Concrete details (d) foundation bolt details are to be provided with drawings and final Layout Drawings by the supplier within three months after getting BHEL's approval. The Layout should consist of all requirements pertaining to Machine and its accessories etc.</p> <p>In case the vendor is unable to submit the foundation drawings, they shall be required to provide detailed load data, including but not limited to equipment weight, dynamic loads, and any other relevant load details that are necessary for the foundation design.</p> <p>If the vendor fails to submit the required foundation drawings and only submits load details, BHEL reserves the right to prepare the foundation design and drawings based on the load data provided by the vendor. It is the vendor's responsibility to ensure that the load details provided are accurate and complete to avoid any discrepancies in the foundation design process. The cost incurred by BHEL for the design and preparation of foundation drawings will be deducted from the vendor's payment/bill.</p> <p>BHEL shall construct complete foundation for the machine as per details supplied above and under supervision of supplier's representative (if deputed by vendor). The vendor shall also indicate detailed specifications of grouting compound and grouting procedure etc. for foundation bolts of the machine.</p>	Vendor to confirm		
10.2	Vendor shall submit the preliminary broader footprint of machine, weight and required civil work for machine.	Vendor to confirm		
10.4	LEVELING & ANCHORING SYSTEM	Vendor to confirm		
10.3.1	Complete anchoring system including foundation bolts, anchoring materials, fixators, leveling shoes etc shall be supplied for the Machine.	Vendor to confirm		

S.NO	DESCRIPTION FOR BHEL REQUIREMENT	ACTION BY VENDOR	OFFERED	REMARKS
11.0	Machine ACCEPTANCE : (Tests / Activities To be Performed by VENDOR) at supplier's works	Vendor to confirm		
11.1	Tests / Activities to be carried out at supplier's works in presence of BHEL Representative on the slitting machine before despatch :	Vendor to confirm		
11.1.1	Inspection of components, assemblies & sub assemblies etc.	Vendor to confirm		
11.1.2	Demonstration of all features of the slitting machine, PLC system and all Accessories.	Vendor to confirm		
11.2	Tests to be carried out at BHEL Works while commissioning the machine:	Vendor to confirm		
11.2.1	Accuracy Tests as per para (2.0)/BHEL process specifications.(TR10141C)	Vendor to confirm		
11.2.2	The slitting machine shall be tested for continuous running of 24 Hrs. If any major break down occurs due to malfunctioning of any machine parts, the test should be repeated for 24 Hrs from that time.	Vendor to confirm		
11.2.3	Demonstration of all features of the slitting machine, PLC system and all Accessories for their efficient and effective use.	Vendor to confirm		
11.2.4	Two weeks supervision of independent operation of machine by BHEL after proveout.	Vendor to confirm		
11.2.5	Training of BHEL operators in operation of complete equipment & accessories etc by the supplier's experts / engineers during their stay at BHEL works.	Vendor to confirm		

S.NO	DESCRIPTION FOR BHEL REQUIREMENT	ACTION BY VENDOR	OFFERED	REMARKS
12.0	ERECTION & COMMISSIONING :	Vendor to confirm		
12.1	Supplier to take full responsibility for carrying out erection, start up, testing of the machine and all types of supplied equipment's, machining of test pieces etc. The machine is to be erected at the site by the supplier with their own manpower, tools & tackles and other resources required for erection and commissioning etc.. However, EOT Crane will be provided by BHEL depending on the availability. Service requirement like air, water, electricity will be provided by BHEL at one point to be indicated by the supplier in advance. Complete commissioning & demonstration of all the features of machine/equipment according to contractual specifications (As per TR10141C) is the sole responsibility of vendors at BHEL, Bhopal work. Complete commissioning, testing including all the test shall be in the scope of supplier.	Vendor to confirm		
12.2	Successful Slitting of CRGO rolls by the supplier shall be considered as part of commissioning.	Vendor to confirm		
12.3	All tools necessary to carry out all erection and commissioning activities should be brought by the supplier.	Vendor to confirm		
12.4	Commissioning spares, required for commissioning of the slitting machine within stipulated time, shall be brought by the supplier.	Vendor to confirm		
12.5	Schedule, terms & conditions for E & C should be furnished in details separately by vendor along with offer.	Vendor to confirm		

S.NO	DESCRIPTION FOR BHEL REQUIREMENT	ACTION BY VENDOR	OFFERED	REMARKS
13.0	PROVEOUT:	Vendor to confirm		
13.1	Complete prove-out shall be done by vendor at BHEL works as per clause 2.0. on workpiece (i.e. CRGO silicon steel sheet) which shall be provided by BHEL. Vendor shall be fully responsible for proveout of components by slitting of three jobs (each approx. 100 tons) as per BHEL' drawings and as per this specification.	Vendor to confirm		
13.2	Vendor shall be responsible and fix the machine as soon as possible for any deviation /rejection as per TR 10141C in proveout component due to wrong process or major malfunctioning of the machine during proveout.	Vendor to specify		
14.0	GENERAL : The VENDOR should submit the following information :	Vendor to specify		
14.1	Slitting machine Model. :	Vendor to specify		
14.2	Total connected load (KVA)::	Vendor to confirm		
14.3	Floor area required (Length, Width, Height) for complete machine & accessories.	Vendor to specify		
14.4	Painting of machine : Polyurethane paint (Preferably Apple Green).	Vendor to confirm		
14.5	Total Weight of the machine.	Vendor to confirm		
15.0	WARANTEE :			
15.1	24 months from the date of commissioning of the machine.	Vendor to confirm		

S.NO	DESCRIPTION FOR BHEL REQUIREMENT	ACTION BY VENDOR	OFFERED	REMARKS
16.0	QUALIFYING CONDITION :			
16.1	Only Original Equipment Manufactures (OEM) of sitting line with Decolling and Recoiling facilities , who have supplied and commissioned at least 1 No. such machine in Transformer/ CRGO Lamination Processing industry for sitting of CRGO sheet of width 1000 mm (mm) at speed of 140 meter/minute or higher earlier in past Ten years and such machine is working satisfactorily for more than one year after commissioning should quote.	Vendor to confirm		
16.2	Vendors who do not meet above specified qualifying conditions, may also quote if they have a running Collaboration / Joint Working Agreement with Foreign OEM of CRGO Sitting line with Decolling and Recoiling facilities (meeting above specified qualifying conditions) for line of above specified Capacity (or Higher Capacity), and performance certificate of the order executed by foreign manufacturer will be acceptable. However Rules for Land Border Countries as per 144 (XI) of GFRs 2017 shall be applicable.	Vendor to confirm		
16.3	Following documents to be furnished to comply clause 16.1	Vendor to confirm		
16.3.1	Unpriced Purchase order copy of earlier supplied Machine in line with clause 16.1.	Vendor to furnish		
16.3.2	Performance certificate (in the name of OEM) from the customer regarding satisfactory performance of the supplied machine for atleast one year after commissioning of Machine as per P.O. given to meet cl. 16.1. Completion date of one year after commissioning should be before tender opening date.	Vendor to furnish		
16.3.3	Installation and commissioning report of Supplied Machine in line with clause 16.1.	Vendor to furnish		
16.4	Being a technology & safety intensive capital item, whose application has bearing on safety of workmen and job; no relaxation in PQR condition whatsoever is application to MSME / start-up companies. These vendors have to necessarily meet all the PQR conditions for consideration by BHEL - DTC.	Vendor to note		
16.5	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		
16.6	Financial POC: Vendor should have average turnover of Rs. 720 Lacs minimum for last 3 consecutive years ending March 2024 and it should be supported by copies of turnover certificate issued/certified by C.A./copies of Profit and loss statement.	Vendor to confirm and furnish		