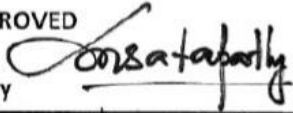
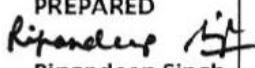


	PURCHASE SPECIFICATION FOR SLITTING MACHINE	PS-251-604
		REV. 00

EQUIPMENT: Slitting Machine

REVISION HISTORY SHEET

REV NO	DATE	NATURE OF CHANGE	REASON	PREPARED BY	APPROVED BY
00	09-05-18	New Issue	-	Ripandeep Singh	LN Satapathy

REVISION : 00	APPROVED  LN Satapathy		
	PREPARED  Ripandeep Singh	ISSUED ENGG	DATE 09-05-2018

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	PURCHASE SPECIFICATION FOR SLITTING MACHINE	PS-251-604
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SCOPE: Design, Supply, Installation & commissioning of Slitting Machine at BHEL for Lithium Ion cell Manufacture. Slitting Machine is required to slit & rewind the copper foil, aluminium foil, separator, and battery positive & negative electrodes which shall be fed in a continuous form.

Pre-Qualification Criteria (PQC)

The supplier shall necessarily meet the following conditions.

Sl. No	Particulars	Supplier's confirmation (Yes/No)
1	The vendor shall be an Original Equipment Manufacturer (OEM) or their authorized dealers/representative. A latest valid authorization letter from OEM giving full contact details (add., email & phone no) shall be furnished along with offer (by dealer/ representative).	
2	Offer shall be for new equipment and not for any refurbished or used equipment. All the parts used in the equipment shall be new and not used / refurbished ones. A declaration to that effect to be furnished.	
3	Supplier shall supply, install and commission the equipment as per BHEL Specification.	
4	Vendor shall have an experience of supplying similar Slitting Machine to at least 3 customers (details of customers to be provided) as on date of tender opening. Certificate of satisfactory performance/ User acceptance certificate/ Successful commissioning certificate shall be furnished from at least one such customer. Out of 3 customers at least 1 shall be from a country other than the country of origin.	
5	Supplier shall agree for Annual Maintenance Contract (AMC) for a period of three (03) years after the expiration of warranty period. The vendor or their authorized service representative should be equipped to provide prompt after sales service, spares & support for the offered equipment at BHEL ESD.	

Note: 1-The Pre-Qualification Criteria are mandatory requirements and the technical bid will be considered only if all the above PQC are met.

2-All Supporting documents related to PQC shall be enclosed in techno-commercial offer.

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	PURCHASE SPECIFICATION FOR SLITTING MACHINE	PS-251-604
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SCOPE

This document establishes the specifications for the design, supply and commissioning of Slitting Machine as per details below. It includes the hardware specifications & requirements, deliverables, documents and other general conditions. The equipment shall be commissioned at 1st floor, Old Production Block, Electronics Systems Division, BHEL, Electronic City, Bangalore. The slitting machine shall consist of following systems:

- Unwinding/ splicing mechanism
- Slitting mechanism
- Pull roll
- Rewinding mechanism
- Web-cleaning system
- Control system

Technical Specification

SL No	MATERIAL/PROCESS DESCRIPTION	TECHNICAL SPECIFICATION	Supplier's confirmation (Yes/No)
1	Line speed	• 3 m/min to 30 m/min or more (adjustable) • Speed resolution: 0.1m/min	
2	Electrode/ Foil Thickness	Electrodes: 50-350 micron or more (adjustable) Foil/ Separator: 8-25 micron or more (adjustable)	
3	Roll Core (bobbin)	Diameter: 76 mm (3 inch)	
4	Max roll diameter	At least 250 mm	
5	Minimum electrode width	50mm	
6	Maximum electrode width	300mm or more	
7	Number of slitting lanes	At least 3 with adjustable width (At least 3 rewinding shafts). Provision to operate in single lane also.	
8	Cutting Method	Tangent shear knife slitting type or laser slitting. Changeable design slitter head.	

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	PURCHASE SPECIFICATION FOR SLITTING MACHINE	PS-251-604
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		Shear knife shall be made of Hardened tool steel with adjustable axial position. Vendor shall provide 5 spare sets of knives along with the equipment.	
9	Slitting precision	±0.1 mm	
10	Rolling precision	±0.3 mm	
11	Tension	1-10 kgf (adjustable): for both winding & unwinding. Vendor to explicitly mention the tension control method.	
12	Unwind/ rewind mechanism	• Pneumatic chuck for holding the roll. • Removable shafts with Tilt lock safety chuck. • Alloy steel construction (4130CD or equivalent) • The shaft shall be able to take a weight of at least 50 kg. • Integrated web-guide with sensors shall be provided.	
13	Power Input	BHEL shall provide 230V, single phase / 415V (+/- 2.5%), 3 phase, 50 Hz (+/-2.5%) power supply for the equipment.	
14	Control System	• PLC control system for operation of slitting machine • The PLC shall be from reputed vendors like Allen Bradley, Siemens etc. • HMI panel of 12" or more. • Provision for Ethernet connection • Independent controls for: Unwinding, Edge control, Slitting speed, Rewinding & Web tension. • Both Auto and manual modes of control shall be possible. • Auxiliary control panel shall be provided for all controls.	
15	General Requirement	• The equipment shall be capable of slitting copper foil and aluminium foil of thickness 8-25µm and separator of thickness 10-30µm. • The equipment shall be able to slit coated positive electrodes (Lithiated metal oxide) & negative electrodes (Graphite based) of thickness as specified.	

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PURCHASE SPECIFICATION FOR SLITTING MACHINE

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		• The system shall have provision for monitoring, measuring and logging of parameters like slitted electrode length, width. • There shall be Edge position control in built to control the meandering. • It shall be possible to Pause & Continue, Reset or Abort the slitting operation at any point of time • There shall be provision for automatic/self-cleaning of the slitting machine, including the slitting device. • Splicing unit to be provided to join old material with new roll. • The Machine frame shall have a precision machined finish. • There shall be provision within the machine for collecting waste generated while slitting. • The machine shall be capable of resuming automatically from where it stopped due to power outage. • Emergency Stop Push button shall be provided. • Machine shall be designed to run 24X7. • Heavy duty castor wheels with locking for easy movement. • All necessary safety interlocks & proper earthing shall be provided.	
16	Web cleaning system	• Web cleaning system shall be provided after the slitter head to remove debris/slivers from the web. • Non-contact web cleaning system consisting of double sided cleaning manifold and ionizing Bars with power supply (both mounted on machine) and one Air handling unit with HEPA (0.3 micron). • The system shall be provided with positive air flow at the middle and vacuum air flow at the entrance and exit to produce a slightly negative atmosphere at the vacuum head. • Width of the web cleaning system: ~350 mm. The unit shall be mounted with entry and exit idlers to control web disturbances	

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17	Spares	Vendor has to give details of essential spares required for two years of trouble free operation and same shall be quoted separately.	
18	Essential Documents	• Operating Manuals (2sets hard copy & 1 set soft copy) • Over all lay-out drawings of the machine • Service/ maintenance manuals • PLC program back-up. • Calibration certificate & process for calibration	

PRE-DISPATCH INSPECTION (PDI):

BHEL shall carry out Pre-dispatch inspection of equipment at Vendor's work. Vendor shall demonstrate proper functioning of equipment and also demonstrate equipment meeting all the specifications. After satisfactory PDI, BHEL shall give a go-ahead for dispatch of equipment.

Vendor has to inform at least 1 month in advance to BHEL for PDI, so that all necessary arrangements can be made.

Installation & Commissioning/ Training:

Vendor has to do installation of Machine at BHEL-ESD, Electronic City Phase 1, Bangalore-560100. Vendor shall depute requisite manpower at BHEL premises to complete the installation of machine. The machine shall be installed inside a Dry-room conditions of RH<0.5% and cleanroom of class 10000.

After completion of installation, the vendor shall demonstrate the performance of equipment to BHEL's satisfaction as per the specifications.

Vendor shall arrange to train BHEL's personnel in operation of the Slitting Machine for required number of days at BHEL's premises free of cost.

Warranty & AMC

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The vendor shall provide a warranty of the Slitting Machine for a period of 24 months from date of successful commissioning or 30 months from date of delivery at BHEL ESD whichever is earlier.

Vendor shall quote separately with this tender for AMC (Annual maintenance contract) for a period of at least 3 years after the expiry of warranty. The AMC prices shall also be considered during evaluation of vendor. The ordering of AMC shall be at the discretion of BHEL. The quote shall also contain list and price of essential spares & accessories.

General

- a. **The Vendor shall enclose a point to point compliance / deviation matrix with respect to each of the specifications as mentioned above along with the offer without which the offer will not be considered.**
- b. The equipment quoted shall meet all applicable safety requirements/standards. (Vendor to explicitly mention that in technical offer).
- c. Vendor to ensure suitable packing of the equipment.
- d. The Vendor shall clearly indicate the power requirement (kW) and compressed air requirement (CFM) of the equipment. (BHEL shall provide Compressed air at 6 bar pressure for the equipment).
- e. Vendor shall provide the dimensions, weight, electrical requirements and civil requirements along with offer.
- f. Vendor shall provide general arrangement drawing of the equipment along with the offer.
- g. Vendor shall be ready to accommodate any minor modifications in equipment if needed.

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