Battery Fabricating machineries

The following ten items should be supplied together such that they are compatible with each other supporting complete fabrication of pouch cells.

1. Planetary Ball Mill Machine

A variable frequency planetary ball mill should have four ball grinding tanks installed on one turntable. The size of ground powder should be posssible to reduce to as small as 0.1 micrometer.

Specifications:

- Grinding tank volume (L): 0.1 L x 4 Nos.
- Grinding tank material: Zirconia – 2 Nos, SS – 2 Nos
- Grinding media: Zirconia (40 balls) and SS
- Maximum loading per tank: Material and grinding medium do not exceed two-thirds of the volume
- Feeding material size: Soft and Crispy material ≤10 mm, Other materials ≤3 mm.
- Discharge material size: Minimum Granularity can be reached to 0.1 µm
- Rotating speed: Revolution 35 – 335 r/ min, Rotation 70 – 670 r/ min
- Speed ratio (revolution: rotation): 1:2
- Speed mode: Frequency, programmable stepless speed regulation, manual, automatic timing forward and reverse
- Transfer method: Gear drive
- Working Voltage: AC 220 V/ 110 V, 50 HZ/ 60 HZ
- Motor power and variable frequency power: 0.75 KW
- Way of working: Two or four cans work at the same time
- Maximum continuous operating time: 72 Hours

- Machine Dimensions (L x W x H): 750 x 470 x 590 in mm
- Weight (not include Jars and Ball): 80 Kg
- Programmable control (electronic monitoring): Ball mill using high-tech microcomputer chip control, can be set to forward and reverse alternately run (0 – 999 min) and forward, pause, reverse, pause, forward (0 – 999 min) alternate operation according to the procedure. Particularly suitable for cooling or intermittent operation.

2. Planetary Vacuum Mixer for Mixing Electrode Powders

A compact dual-shaft planetary vacuum mixer is required with three segments programmable mixing speed from 0 - 600 rpm, which provides more uniform slurry mixing. Should have built-in pump for removing gas bubble, which can vacuum the mixing container to 0.08 MPa. It should be a high-quality mixer tool for preparing battery electrode paste and various ceramic materials in a research lab. (heating container is optional up to 200 °C).

Specifications:

- Power supply: AC 100 – 240 V, frequency: 50/ 60 Hz
- Power: 200 W
- Rotating Speed: Max. 600 rpm
- Vacuum: internal vacuum pump, vacuum degree ≤ 0.08 Mpa
- Mixing time: 0 – 600 min can be set
- Multistage Function: three stages, can be set
- Mixing tank: SS304 Stainless Steel tank of 150 ml, 500 ml
- Operation Mode: Electrically operable; Both Forward and Reverse Rotating Mixing functions
- Programmable: Graphical user interface for changing mixing parameters is available

3. Small Roll to Roll Battery Electrode Continuous Coating Machine

A desktop continuous roll to roll coating machine is required, it should be assembled by high high precision coating device for pilot scale battery research work.

Specifications:

- Source voltage: AC 220 V/ 110 V, 50 HZ/ 60 HZ
- Power: 400 W
- Suitable material Thickness: Aluminium foil: 0.01-0.03 mm; Copper foil: 0.006-0.020 mm
- Max electrode width: 50-180 mm or more
- Coating speed: 0-2 m/min, adjustable
- Max baking Temperature: 100 ℃, PID control mode
- Coating thickness: 0.01mm-2mm
- Coating thickness Accuracy: 0.01mm
- Dimension: L 800 x W 350 x H 580 mm
- Weight: About 50 kg

4. Electrode Die Cutter For Pouch Cell Electrode Sheet

Specifications:

- Working Table Area: < or = 300 mm (L) x 250 mm (W)
- Die Set Dimensions: 81 mm (L) x 49 mm (W) with current collect included
- Working Voltage: AC 220 V/ 110 V, 50 HZ/ 60 HZ, single phase
- Max. Power Consumption: 10 W
- Safety Sensor: Built in IR sensor (Safety Curtain) to protect against hand injuires during electrode feeding
- Cutting Accuracy: ±0.1mm

- Air Cylinder: 3 tons Max. pressure
- Tensile Cylinder: 0.15 tons pressure
- Feeding: Manually
- Production Yield: 800 - 2000 pieces of electrodes per hour
- Product Dimensions: < or = 550 mm (L) x 450 mm (W) x 900 mm (H)

5. Battery Electrode Stacking Machine for Pouch Cell Electrodes

Z shaped stacking of the positive and negative electrodes and the separator. The air cylinder should drive the separator to move left and right to realize Z-fashion stacking.

Specifications:

- Stacking size (including tab length):

a) Min. L 44 mm x W 44 mm;

b) Max. L 200 mm x W 150 mm;

c) Max. thickness: 30 mm

- Coil diameter of separator: Max. 220 mm
- Installation dimensions: < or = L 512 mm x W 820 mm x H 580 mm
- Power Supply: 220 VAC/ 110 VAC, 50 Hz/ 60 Hz
- Power: 200 W
- Air source: 0.4 ~ 0.6 MPa compressed air
- Stacking accuracy: ≤±0.5 mm
- Slidable fixture: Two slidable fixtures ensure a compact, tight electrode stacking
- Electrode tongs: One electrode tongs are included for easy electrode pick-up

6. Ultrasonic Tab Welding Machine for Pouch Cells

Ultrasonic metal welder with touch-screen controller suitable for welding stacked electrode foils/sheets and tabs onto current collectors to prepare Li-ion pouch cells & cylindrical cells.

The 2000 W battery welder capable of welding stacked electrode with 10-35 layers aluminum foil or copper foil with Al tab and Nickel tab.

Specifications:

- Features: Pre-set welding programs selectable for Al and Cu (Note: Welding power can be readjusted to fit the needs for welding other types of metals such as Au, Fe, Ni, Ag...).
- Input Voltage: AC 110 V or 220 V +/-10%, 50/ 60 Hz
- Max. Power Consumption: 2200 W
- Welding Area: 4 mm (L) x 4 mm (W)
- Welding Head: The welding heads and welding base are included for welding both aluminium & copper current collectors from 2 to 25 layers
- Ultrasonic Frequency: 40K Hz
- Product Dimensions
    1. Controller: < or = 360 mm (L) x 480 mm (W) x 200 mm (H)
    2. Welder: < or = 200 mm (L) x 460 mm (W) x 270 mm (H)

7. Pouch Cell Case Forming Machine for Aluminium-Laminated Films

It is used to prepare polymer cases made of Aluminum Laminated Films.

Specifications:

- Source voltage: AC 220 V/ 110 V, 50/ 60 Hz
- Power: 100 W
- Suitable aluminium film thickness: 0.1-0.2mm
- Suitable mold size: Customized as customer's request, with punching depth ≤24mm
- Max. Cup Depth: Single pit punching depth ≤24mm
- Output: 200-400 EA/H

- Output pressure: 5T
- Air source: 0.5-0.7 MPa
- Mold materials: SS136 Die steel
- Dimension (L x W x H): 460 x 320 x 925 mm

8. Battery Testing System – 60V36A-2Channel

Specifications:

- AC Input: AC 220 V ±10% 50 Hz
- Power 6278 W
- Resolution AD: 16bit; DA: 16bit
- Input Impedance ≥1MΩ
- Voltage: Measuring Range 300 mV ~ 60 V
- Discharge Min Voltage: 3 V
- Current Range: 100 mA ~ 36 A
- Accuracy ± 0.1% of FS
- Stability ± 0.1% of FS
- Output Power Per Channel: 1200 W
- Rise Time: 20ms (10% ~ 90% FS)
- Step Time ≤ (365*24) hour/step
- Charge Mode of Operation: CCC, CVC, CC & CVC, CPC; End Conditions Voltage, Current, Test Time, Capacity
- Discharge Mode of Operation: CCD, CPD, CRD; End Conditions Voltage, Current, Test Time, Capacity
- Pulse mode: Charge CCC; Discharge CCD; End Condition Voltage, Test Time, Current, Capacity
- Min pulse width: 500 ms
- Automated Switch Automated switch from charge to discharge for each pulse
- Cycles 65535; Steps 254; Nested Function Max three levels of loops
- Channel Features: Independent pairs of closed loop for constant current source and constant voltage source
- Channels: Independent control
- Detection and Sampling: 4-wire Connecting
- Noise Density: <85dB
- Data Management: MYSQL Database

- Communication Means: TCP/IP Protocol
- Export Formats: EXCEL, TXT, Graph
- Communication Interface: Ethernet Port
- Number of Channels Per Cabinet: 2
- Operating Temperature: 0 ℃ ~ 40 ℃
- Storage Temperature: -10 ℃ ~ 50 ℃
- Operating Humidity: ≤70% RH
- Storage Humidity: ≤80% RH

9. Top/ Side Heat Sealing Machine for Pouch Cells

It is a compact heating sealer for sealing aluminum-laminated films during pouch cell (polymer Li-Ion cell) case preparation. It can prepare the pouch cell for the injection of an electrolyte by sealing the side and top of the pouch cell with the tab.

Specifications:

- Maximum seal length: 200 mm ~ 400 mm or more
- Seal width: 5 mm ± 0.4
- Side sealing thickness: 60 ～ 300 μm
- Thickness of top tab edge sealing: 200 ～ 700 μm
- Heat sealing temperature: RT ～ 250 ℃ adjustable
- Temperature accuracy: ±2 ℃
- Sealing time: 0-99 s adjustable
- Seal thickness accuracy (mm): The thickness difference between any two points is less than 15 μm
- Safety device: Equipped with protective device to prevent high temperature scald.
- Operation mode: The equipment has the function of automatic and manual operation.
- Flexibility: The equipment is easy to clean and replace the copper mold.
- compressed air: 5 ～ 8 kg/cm^2

10. Pouch Cell Hot Machine for Battery Core Formation

This equipment is mainly suitable for hot pressing after winding or stacking of battery core, which is convenient to enter the shell.

Specifications:

- Maximum seal length: 200 mm ~ 400 mm or more
- Power Supply: AC220 V/50 Hz ;
- Air source: 0.5 Mpa～0.8 Mpa
- Hot pressing area: 200 x 200 mm ;
- Pressure: 1t pressure is adjustable;
- Control accuracy: ± 2 ℃ ;
- Heating temperature: Adjustable from normal temperature to 250 ℃;
- Plane parallelism of two pressing plates: Within 0.05 mm

Terms and conditions:

- Previous installations: Vendor should have supplied similar systems either in full or part of fabrication line in the last 2 years to IITs and Central Laboratories. List of such 5 latest users and copy of their installation report should be enclosed.

- A detailed compliance certificate against each specification needs to be provided by the vendor

- Warranty: Minimum 3 years and 1 year non-comprehensive free service, Company must take responsibility to replace the consumables if needed during the three years of warranty Period.

- Service facility and down-time call attendance:

  Supplier should clearly mention about their service set up in India (preferably in South part of India) for prompt service support along with contact details of service engineers specially trained on the offered system. Service should be provided within 24 hrs from the report of technical problem so that machine down time is minimized.

  In case the Equipment / System remains non-operational for more than 5 days then warranty period will be extended for the equivalent period for which Equipment / System remained non-operational. Warranty extension in such case shall be done without prejudice to any other Term & condition of the contract.

- Spares: Supplier should confirm the availability of spares for next 10 years from the date of installation. All essential spares for day-to-day operation needs should be provided as standard supply.

- Pre-Installation Requirement: Necessary pre-installation advice should be sent immediately after the placement of the order.

- Delivery Condition: The instrument should be delivered within 10-12 weeks.

- Installations and training at customer site is required.