Introduction to the overall solution of lithium-ion batteries

Xingtai Zhaoyang Machinery Manufacturing Co., Ltd. Xingtai Shuoding Trading Co., Ltd.

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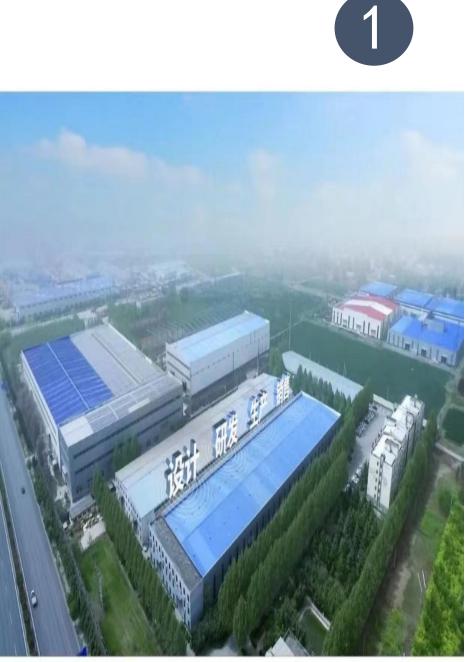
Company Overview

Lithium battery complete line equipment description

Introduction of square O3 lithium battery whole line process equipment

04 Main auxiliary facilities

05 PACK and its application areas



## **Company Overview**

### $\star \star \star \star \star$

Founded: 2006

Focus: Lithium-ion battery production line equipment

Status: Leading high-tech enterprise

Key Strengths:

Leading Technology:

Full process expertise: coating, calendaring, slitting, winding, assembly

Formation & grading, module, and PACK

Advanced Equipment:

High-speed, high-precision calendering and slitting machines Automatic continuous rolling lines

Industry Leadership

Experience: 17 years

Position: Industry leader in lithium battery equipment

## Company Qualifications





# Company Patents



Invention patents:

A cooling and dust removal device for the cutting wheel of a conductive fabric slitting machine

A pole piece pressing device for lithium battery production

A lithium battery pole piece automatic material replacement and tape splicing device and tape splicing method

A green and environmentally friendly polishing machine and its use method

A metal surface grinding treatment device for equipment manufacturing

A roller cleaning mechanism for a lithium battery pole piece rolling machine





## Lithium battery production line description

## **Production process**

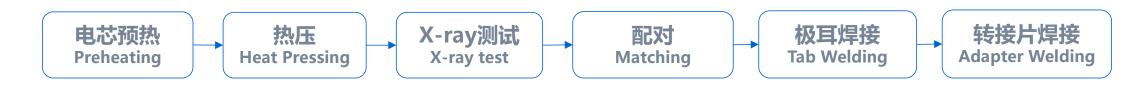
### $\star \star \star \star \star$

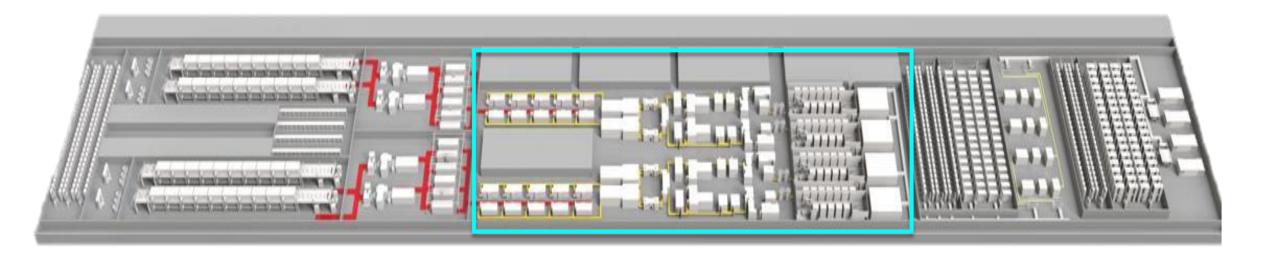
We have basically achieved comprehensive leadership in equipment technology and services in each process segment. Our slurry, coating, rolling, slitting, die-cutting, winding/stacking, assembly, chemical componentization, as well as module and PACK equipment have reached the world's leading level.



## Square shell battery assembly line

### $\star\star\star\star\star\star$

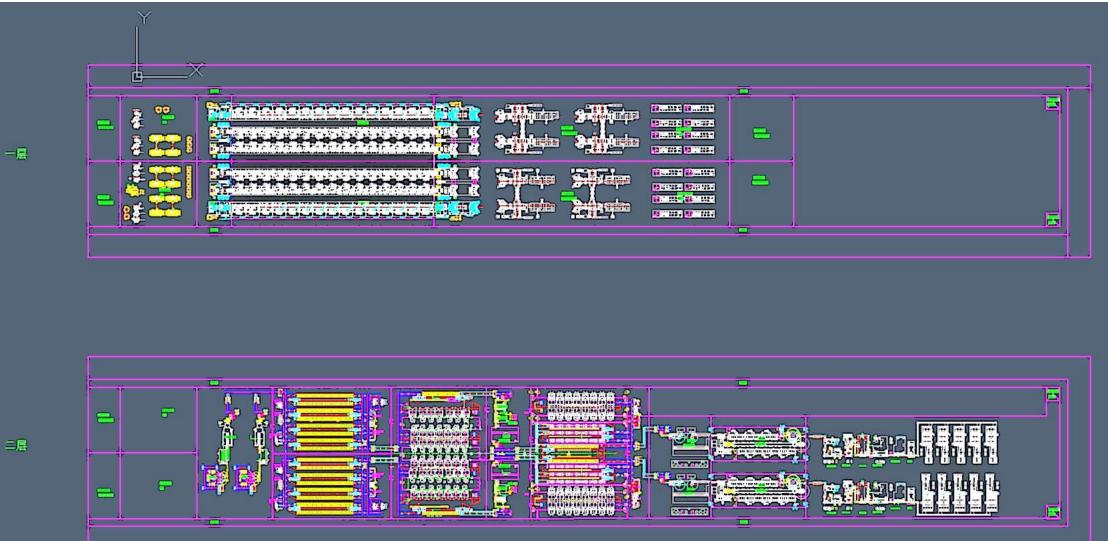






## 5GWH280AHBattery cell line case layout diagram

### $\star \star \star \star \star$



三层

## Introduction of square lithium battery whole line process equipment

3

# Square lithium battery process flow

### $\star\star\star\star\star\star$



Exploded diagram of battery cell structure

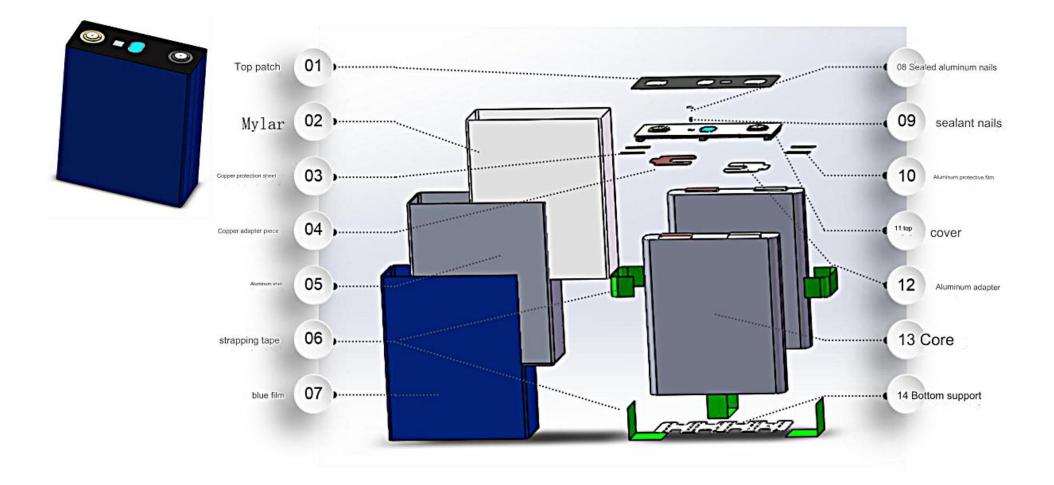


Process Introduction

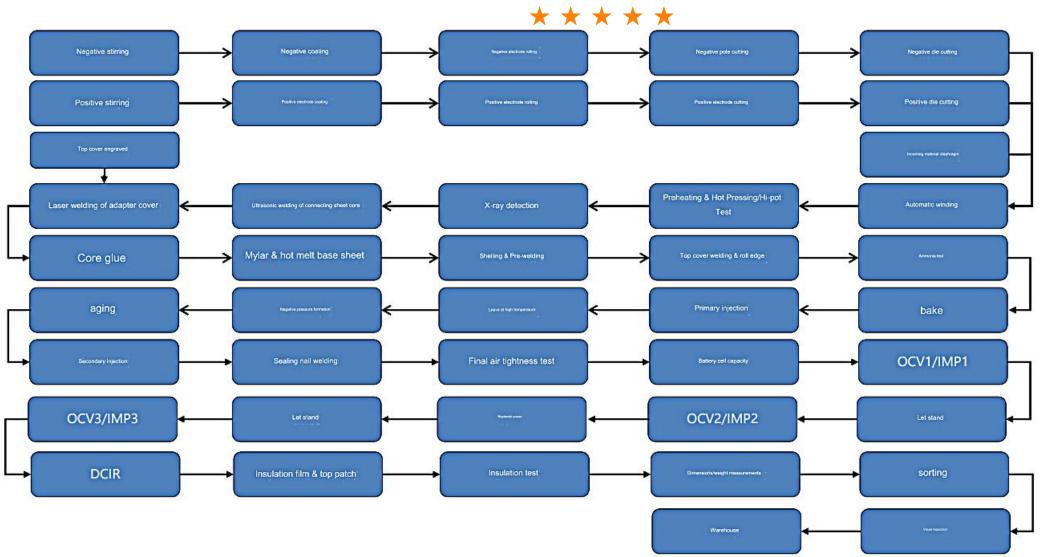


Production process

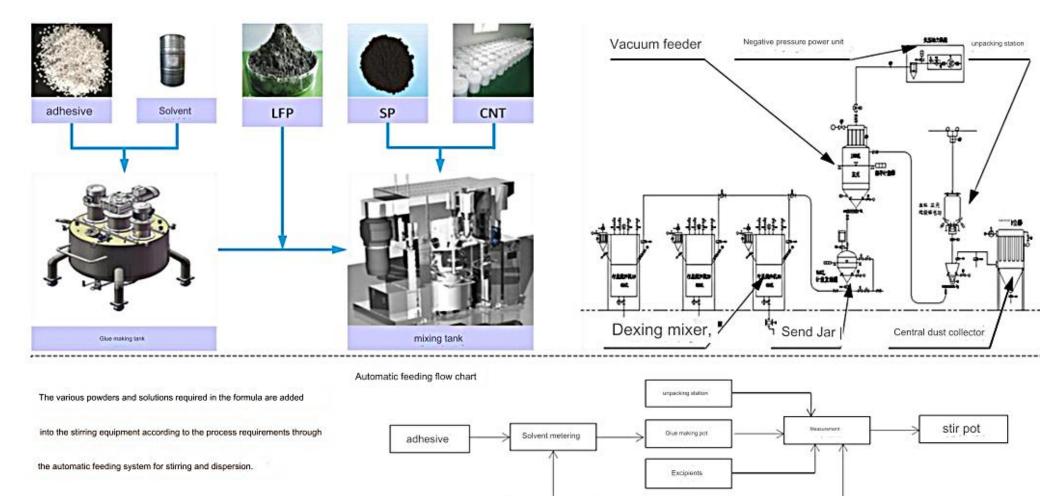
## Exploded view of square aluminum shell battery structure $\star \star \star \star \star$



## **Brief Introduction of Battery Process**



# Battery cell production process - feeding



solvent tank

# Production process - mixing $\star \star \star \star \star$

Various powders and liquids are kneaded, stirred, mixed and dispersed by a dual planetary power mixer to obtain uniform

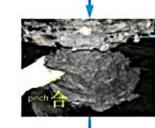
Cathode slurry process flow chart

battery slurry. A slurry conveying system with screening and iron removal is used to transfer the slurry

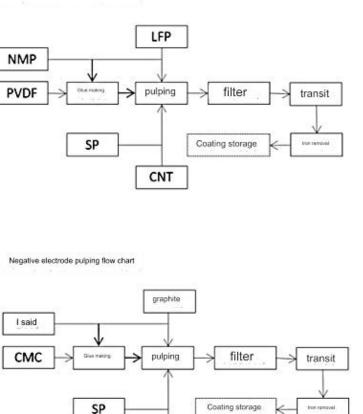
to storage tanks and coater transfer tanks for coating.





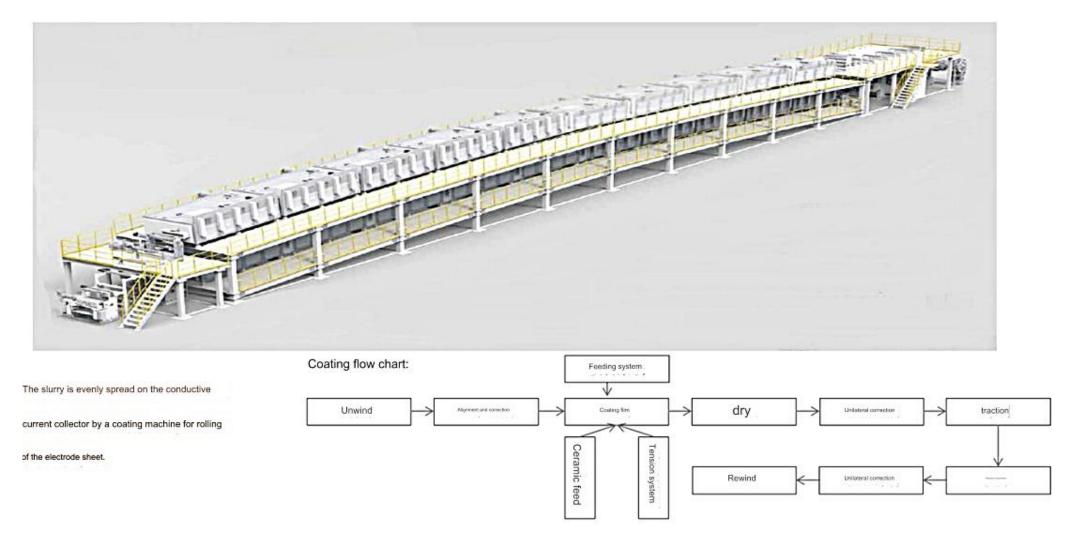




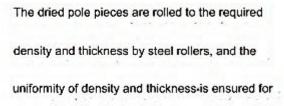


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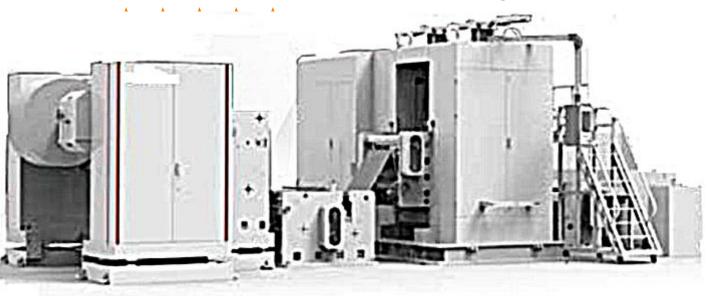
# Production process - coating



## Production process - roller pressing

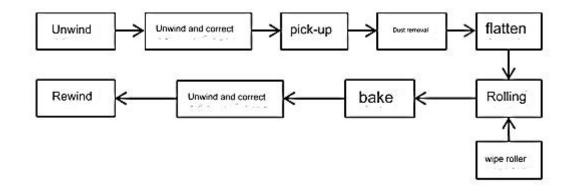


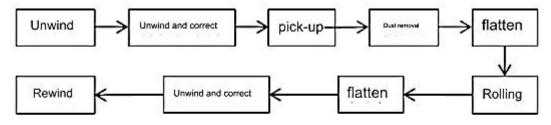
pole piece slitting.



Negative electrode roller pressing flow chart

Positive electrode roller pressing flow chart





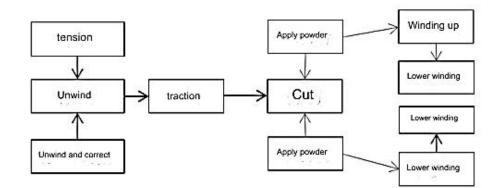
# Production process - slitting $\star \star \star \star \star$

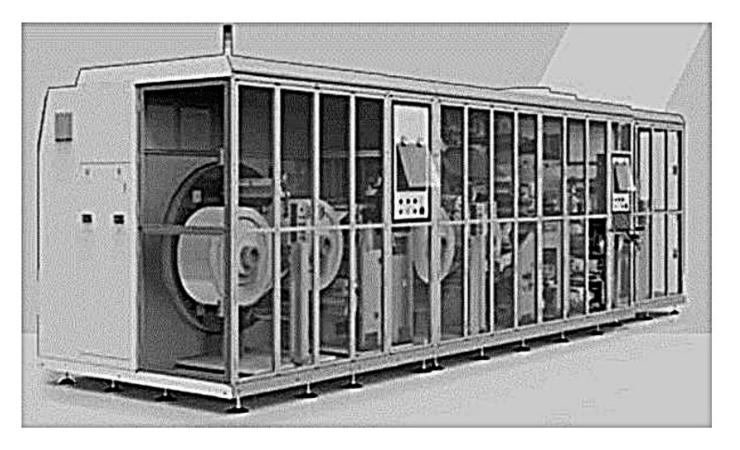
The rolled pole pieces are continuously cut into coils with process

specifications, dimensions and quality requirements by a cutter to provide the

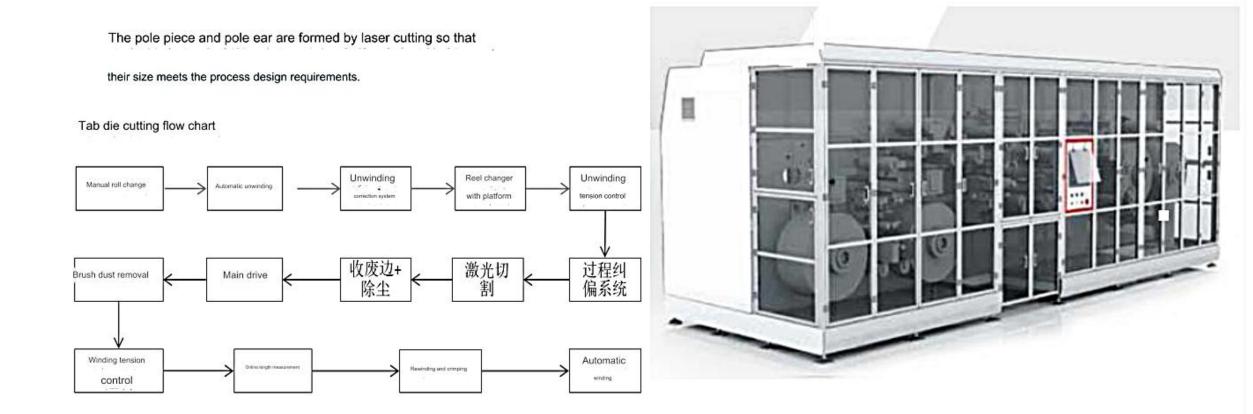
pole pieces with pole lugs.

Pre-slitting flow chart

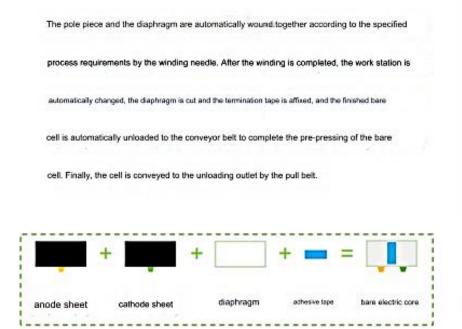


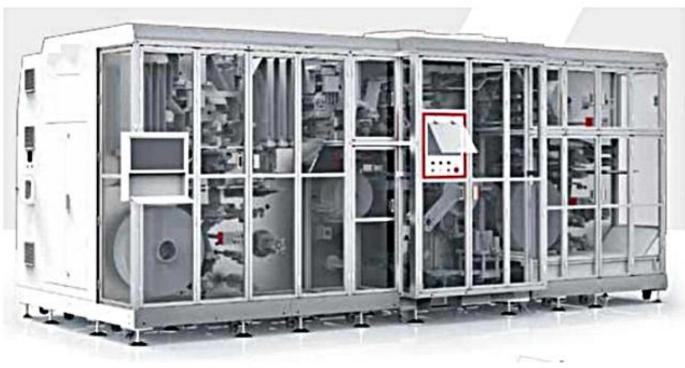


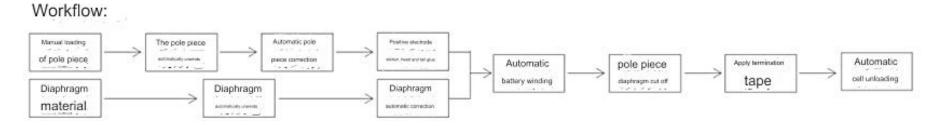
## Production process - ear die cutting



## Production process - winding or lamination

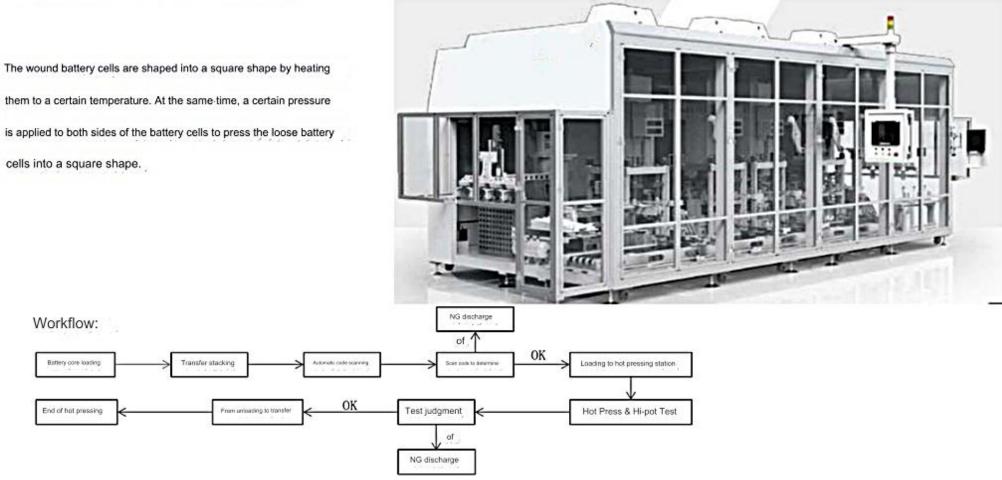




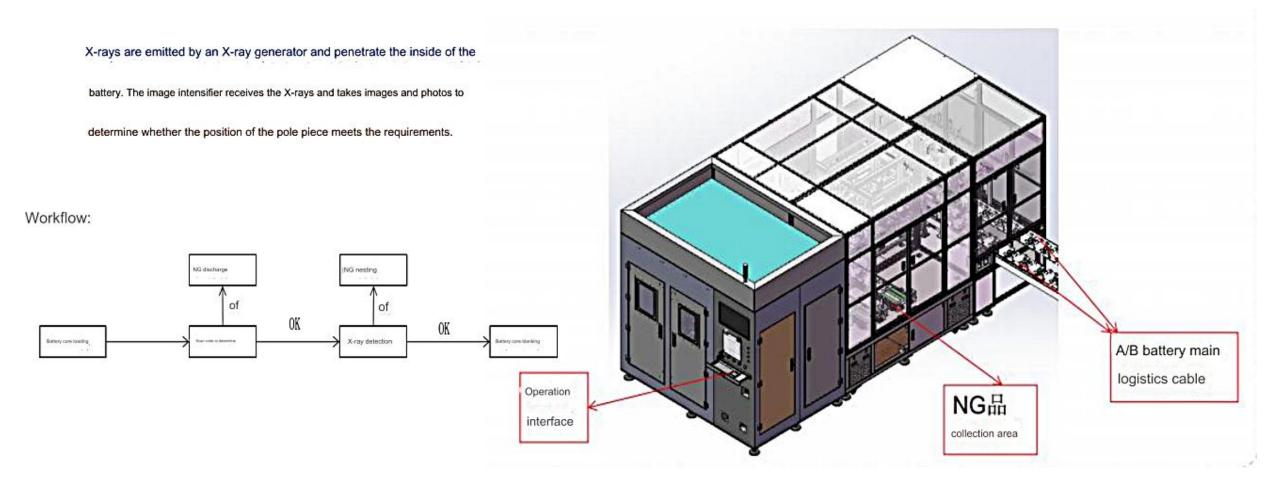


## Production process - hot pressing/testing \* \* \* \* \*

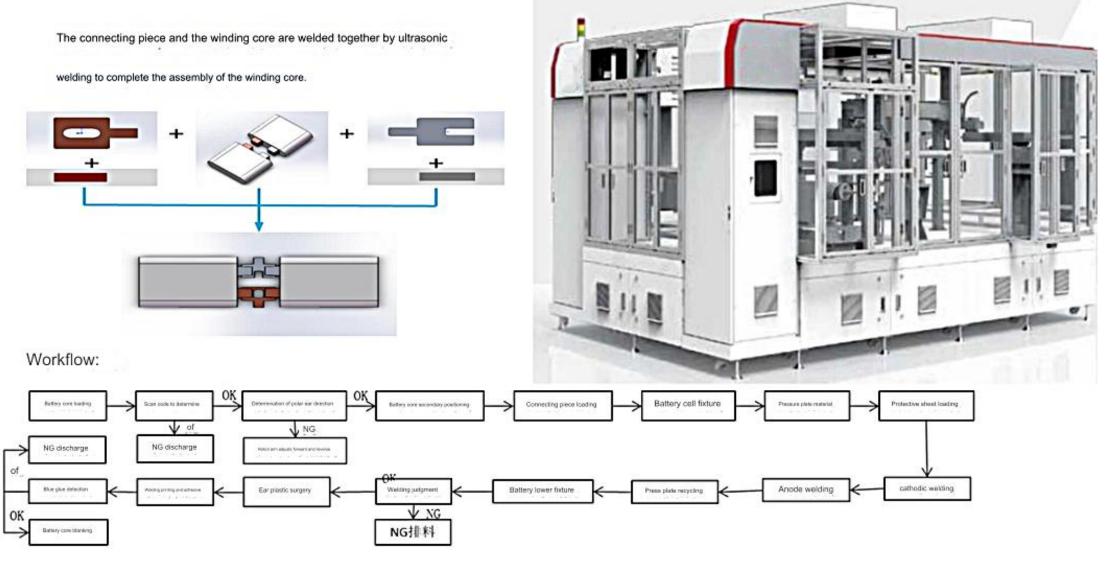
### Preheating & Hot Pressing/Hi-pot Test



## Production process - X-Ray test \* \* \* \* \*



# Production process - ultrasonic welding of connecting sheet core $\star \star \star \star \star$



## Production process - laser welding of adapter cover & core gluing

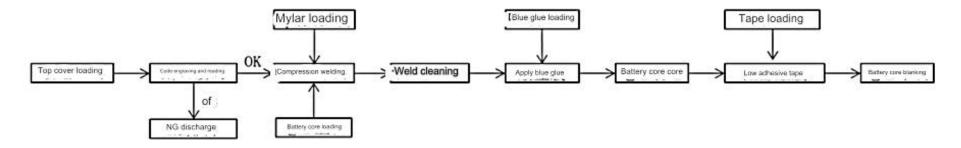
The connecting piece and the top cover are welded together by laser welding, the

welding area is affixed with blue glue, the battery cell is folded, and the two sides are

wrapped with glue and bundled before automatic unloading.

10.1 10 Contraction of the

Workflow:



## Production process - shelling & pre-welding

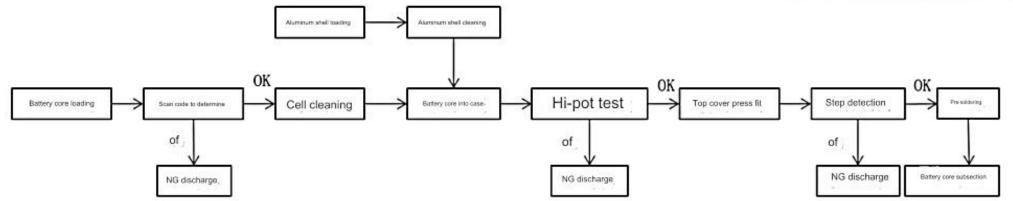


The bare battery cell is placed into the aluminum shell, pressed and leveled, and the top cover

of the battery cell and the shell opening of the aluminum shell are pre-welded and finally welded

by laser.





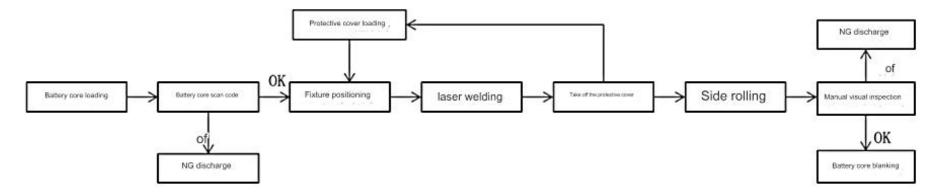
## Production process - top cover welding & roller edge

The pre-welded top cover and aluminum shell are finally welded and

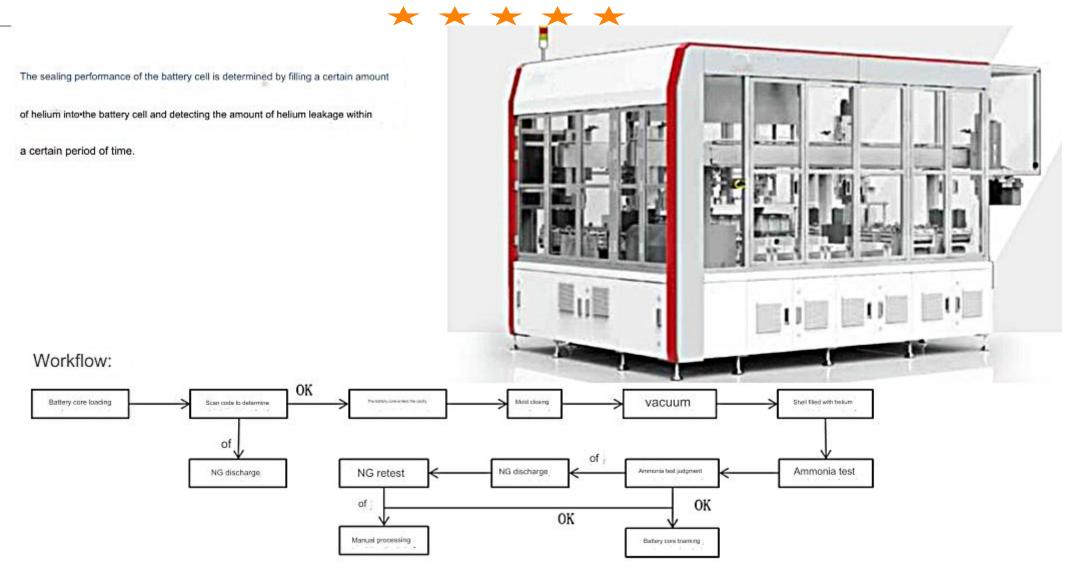
sealed by laser.



Workflow:

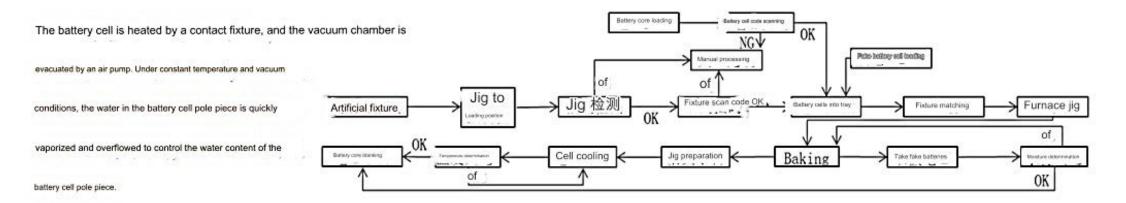


## Production process - helium inspection

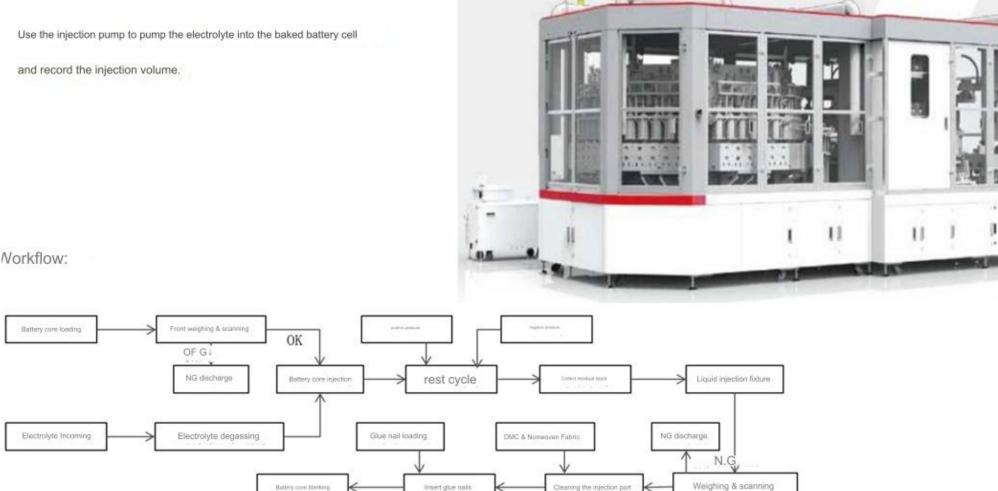


# Production process - baking





## Production process - one-time injection $\star \star \star \star \star$

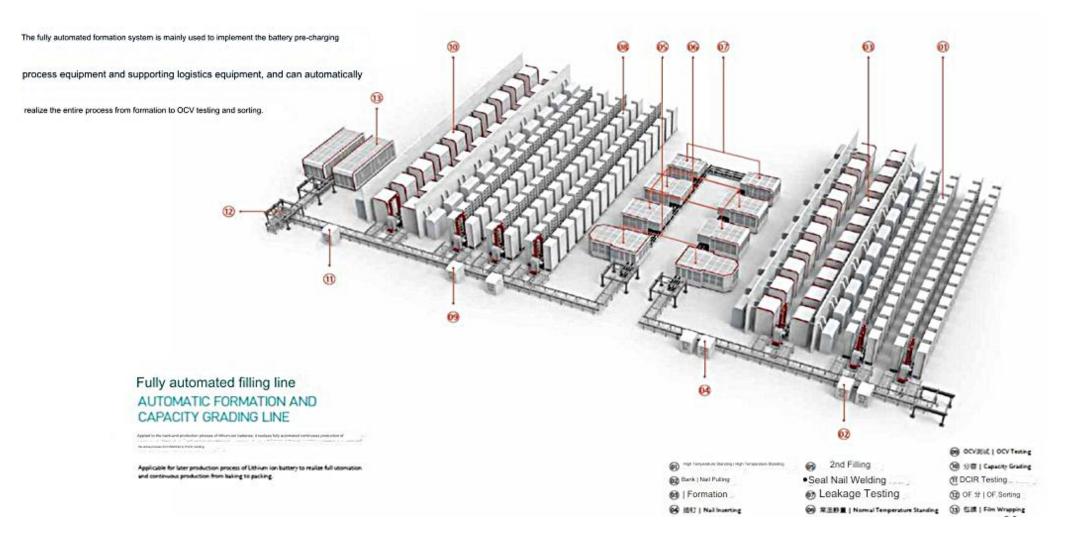


insert glue nails

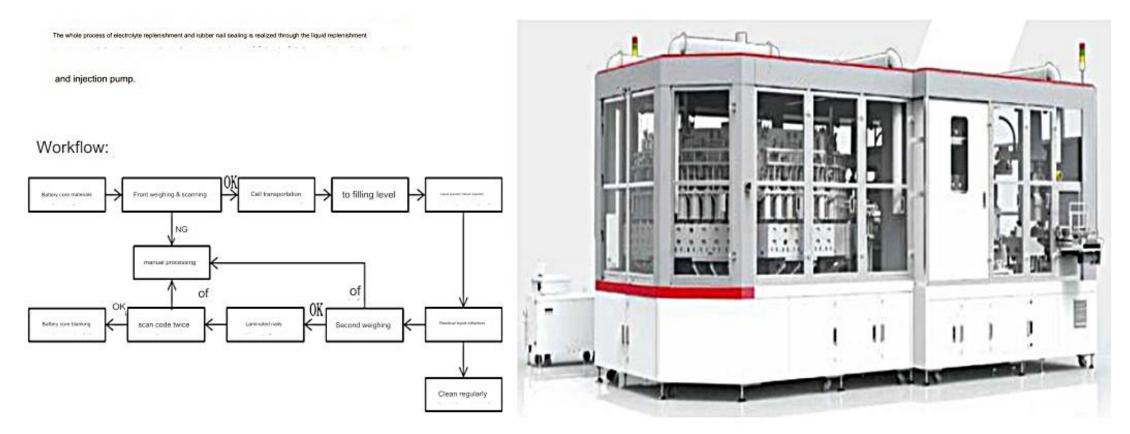
Battery core blanking

Norkflow:

# Production process - chemical composition and filling system $\star \star \star \star \star$



# Production process - secondary injection $\star \star \star \star \star$



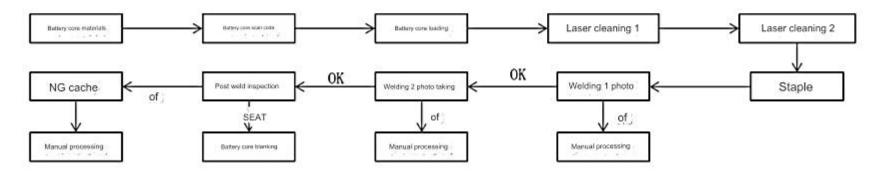
# Production process - sealing nail welding

The injection hole is cleaned by laser welding and then

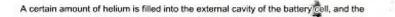
sealed with aluminum nails.



Workflow:



## Production process - final air tightness test

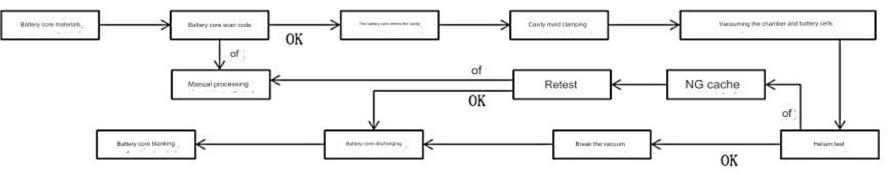


sealing of the battery cell is determined by detecting the amount of helium leakage

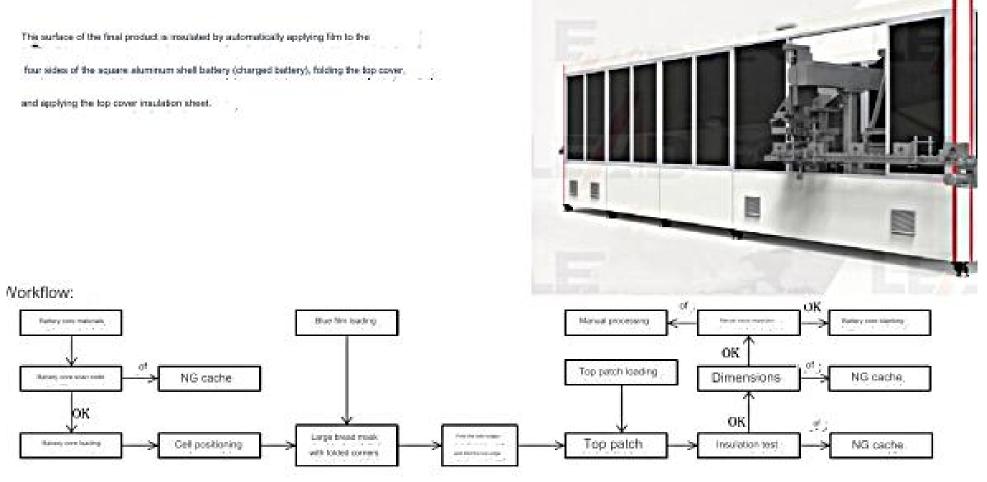
within a certain period of time.



Workflow:



# Production process - coating & insulation testing & dimensional



The final process: sorting-visual inspection-warehousing

## Charge and discharge test equipment

### 回馈型充放电测试设备系列

FEEDBACK TYPE CHARGE AND DISCHARGE TEST EQUIPMENT SERIES

#### 产品介绍 Product Introduction

该设备主要应用于各种不同的电池(如锂离子电池、铅酸电池、超级电容和燃料电池等)生产或老化测试。测 试项目主 要有电池循环寿命试验、容量测试、充放电特性测试和电池包温度测试等。

The devices are used in a variety of battery applications such as lithium-ion battery, lead-acid batteries, supercapacitors and fuel cells. The main test items include battery cycle life test, capacity test, charge and discharge characteristics test and battery pack temperature test.

costs.

#### 设备优势 Equipment Advantages

A.外观美观大方,节能环保降低生产成本。 B.测试功能稳定精准,保证电池出厂品质。 C.单模块可测试最大电流是100A,最大功率12KW。 D.可根据客户具体需求定制。

A. Beautiful appearance, energy saving and environmental protection to reduce production

B. The test function is stable and accurate, ensuring the quality of the battery. C. Single module can test the maximum current is 100A, the maximum power 12 kw. D. Can be customized according to the specific needs of customers.

回馈型老化柜选型 Selection of feedback aging cabinet				回馈型老化柜选型 Selection of feedback aging cabinet			
(寸/Size: (L) 960X600 (W) X1105HMM	型号 Models	单柜通道 Single cabinet acces	单CH功率(W)	尺寸/Size: (L) 960X600 (W) X1473HMM	型号 Models	单柜通道 Single cabinet access	单CH功率 (W Single CH Power (W
	30V40A	16	1200W		30V40A	24	1200W
	30V50A	16	1500W		30V50A	24	1500W
	30V60A	16	1800W		30V60A	24	1800W
	40V30A	16	1200W	100-00 C	40V30A	24	1200W
	40V40A	16	1600W		40V40A	24	1600W
hour diffe	40V50A	16	2000W		40V50A	24	2000W
	40V60A	16	2400W		40V60A	24	2400W
	60V20A	16	1200W		60V20A	24	1200W
	60V30A	16	1800W		60V30A	24	1800W
	60V40A	16	2400W		60V40A	24	2400W
	60V50A	16	3000W		60V50A	24	3000W
	60V60A	16	3600W		60V60A	24	3600W
	110V20A	16	2000W		100V20A	24	2000W
000	110V30A	16	3000W	5 60	100V30A	24	3000W
	100V40A	8	4000W		100V40A	12	4000W
	100V50A	8	5000W	1	100V50A	12	5000W
	100V60A	8	6000W		100V60A	12	6000W

#### 回馈型老化柜选型 Selection of feedback aging cabinet 单柜通道 单CH功率 (W 30V40A 32 1200W 30V50A 32 1500W 30V60A 32 1800W 40V30A 32 1200W 40V40A 32 1600W 40V50A 32 2000W 40V60A 32 2400W 32 1200W 60V20A 60V30A 32 1800W 32 2400W 60V40A 60V50A 32 3000W 60V60A 32 3600W 100V20A 32 2000W 100V30A 32 3000W 100V40A 16 4000W 100V50A 5000W 16 100V60A 16 6000W

### 回馈型充放电测试设备系列

FEEDBACK TYPE CHARGE AND DISCHARGE TEST EQUIPMENT SERIES



#### 技术亮点 Technology Feature

A.能量双向流动,放电能量回馈电网效率高于93%。 B.输出电流转换快、电流无超调,对电池组无冲击。 C.精密机构件链接, 抗阻更低、发热量好。 D.全系列采用模块设计,全铜排链接稳定性强,方便调试和维护。 E.数据自动储存数据库,便于后期追溯。

A. The efficiency of discharge energy feeding back to the gri	id is
higher than 93% .	
B. Fast output current conversion, no overshoot current, no imp	pact
on the battery pack.	
C. Precision mechanism links, lower resistance, good heat.	
D. All series use module design, all copper bar link stab convenient debugging and maintenance.	ility,
E. The data is automatically stored in a database for e post-traceability.	asy

#### 技术参数 Technical Parameters

产能: 单通道3.5~5H/组

重量: 200KG

电压: 220V±10%

CAPACITY: Single channel 3.5 ~ 5h/group

WEIGHT: 200KG

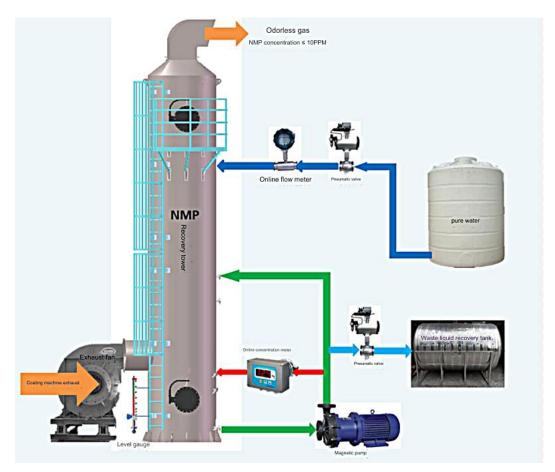
VOLTAGE: 220V±10%



## Main auxiliary facilities for lithium-ion battery production

# Main auxiliary facilities for lithium-ion battery production $\star\star\star\star\star$

The NMP recovery system precisely controls temperature, cleanliness, NMP concentration, and pressure to prevent leakage and achieve energy savings and gas purification through heat recovery and filtration.



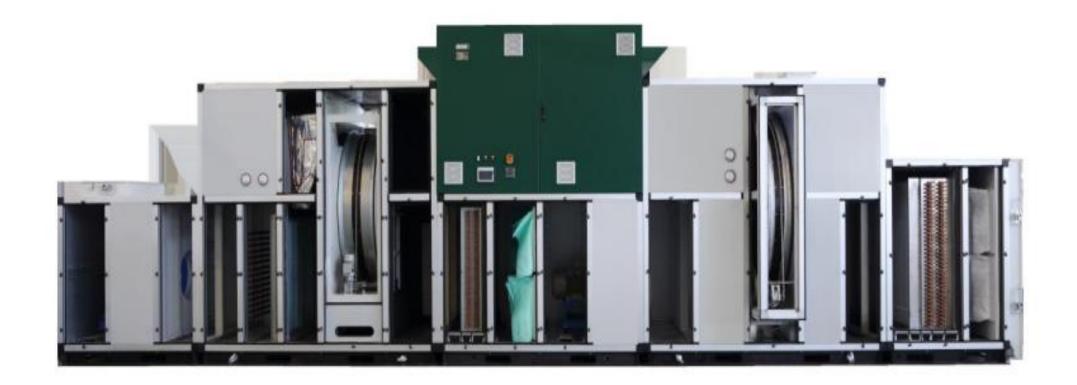
# Main auxiliary facilities for lithium-ion battery production $\star \star \star \star \star$

The clean room controls temperature, humidity, and cleanliness to ensure product quality and reliability while preventing environmental pollution during battery production.



# Main auxiliary facilities for lithium-ion battery production $\star \star \star \star \star$

The rotary dehumidifier controls temperature, humidity, and cleanliness in the clean room to ensure product quality and reliability while preventing environmental pollution during battery production.



# Main auxiliary facilities for lithium-ion battery production $\star \star \star \star \star$

Deionized water machine: supplies water for electrode production. Air compressor: provides compressed air for production equipment. Vacuum pump: used for vacuuming in the production process. Nitrogen generator: supplies nitrogen for production equipment. Central air conditioner: provides cold water and controls the working area's temperature.

Industrial boiler: supplies steam heating for coating and dehumidification (not needed for electric heating).







Deionized water machine

Air compressor

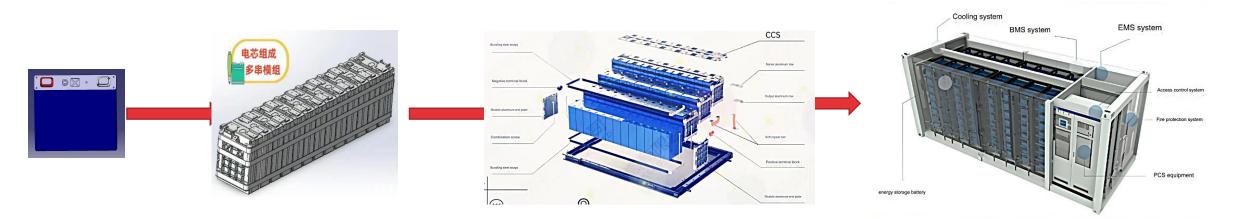
Nitrogen Generator



## Lithium-ion battery PACK equipment

## Lithium-ion battery PACK application: energy storage system

The energy storage system PACK consists of multiple battery cells and units connected in series or parallel, combined with a BMS to form a battery pack. It integrates an energy storage converter (PCS), energy management system (EMS), and auxiliary systems (fire protection, thermal management, monitoring, etc.). Its main function is to store and release electrical energy as needed.



### Lithium-ion battery PACK energy storage system module production line

### 方型铝壳电池半自动激光产线方案

SEMI-AUTOMATIC LASER PRODUCTION LINE OF PRISMATIC ALUMINUM SHELL BATTERY

#### 产品介绍 Product Introduction

该产线主要用于方型铝壳电池后段应用制程,对电芯分选、AI智能极性检测、自动清洗、自动激光、AI智能焊疤检测、绝缘耐压 测试、电压差、内阻差测试、人工装配和综合检测。前段线体通过模块集成和倍速链完成模组PACK的焊接及之前工序制作,并 通过联动式移载实现自动移载与后段线体实现联动,线体后段主要采用人工操作倍速链。

The production line is mainly used in the application process of the rear part of the Prismatic aluminum shell battery, for cell sorting, Al intelligent polarity detection, automatic cleaning, automatic laser, Al intelligent welding scar detection, insulation withstand voltage test, voltage difference, resistance difference test, artificial assembly and comprehensive detection. The front line body completes the module PACK welding and the previous process making through the module integration and the double-speed chain, and realizes the automatic moving load and the back line body realizes the linkage through the linkage type moving load, the back part of the line body is mainly operated by manual double speed chain.

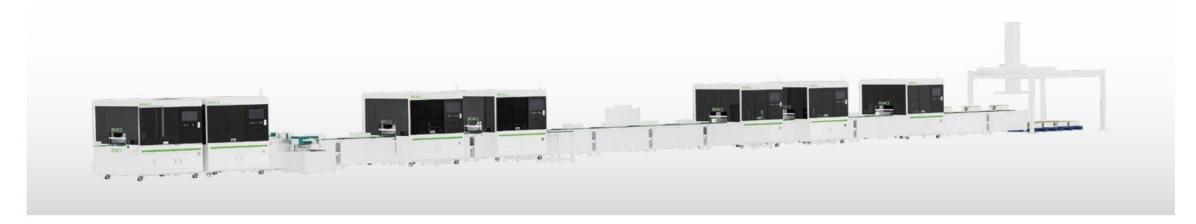
### 方型铝壳电池半自动激光产线方案

SEMI-AUTOMATIC LASER PRODUCTION LINE OF PRISMATIC ALUMINUM SHELL BATTERY

#### 标准配置 Standard Configuration

方型铝壳电池OCV分选机/AI智能外观检测/电芯涂胶工位/内阻差测试仪/激光清洗机/ 连续激光焊接机/AI智能焊疤检测/龙门吊装设备/综合测试设备。

Square aluminum shell battery OCV sorting machine/AI intelligent appearance detection/cell coating station/internal resistance tester/laser cleaning machine/continuous laser welding machine/AI intelligent welding scar detection/gantry crane/integrated testing equipment.



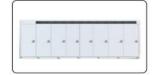
#### 适用产品 Applicable Products





方形储能电池模组 Prismatic Energy Storage Battery module





方形储能集装箱 Prismatic energy storage container

#### 技术亮点 Technology Feature

A.具备MES 数据采集处理、追溯、处理功能,在线管控产品质量。
 B.实现自动化生产,减少设置人工位,整线生产效率高。
 C.可根据客户需要订制自动化产线方案。
 D.可根据客户具体需求定制。

A. With MES data acquisition and processing, tracing, processing functions, on-line control of product quality.
B. Realize automatic production, reduce the setting of man-station, the whole line production efficiency.
C. Can be customized according to customer needs of automatic production line program
D. Can be customized according to the specific needs of customers.

### Lithium-ion battery PACK for two-wheel and three-wheel vehicle production line

### 小圆柱锂电池自动化通用产线方案

### SMALL CYLINDRICAL LITHIUM BATTERY AUTOMATION GENERAL PRODUCTION LINE SOLUTION

#### 产品介绍 Product Introduction

此产线方案主要用于18650/21700/26700/32700等圆柱电芯PACK制程。生产工艺流程:首先通过整合皮带上料,贴面垫后 再扫码及检查内阻、电压等参数的测试分选,加长料道储存电芯,进行二次扫码绑定组成相关项目数据,每个电池包做到 数据精准查询追溯。随后由人工或机器人装入电芯支架,进行AI智能外观检测,检测完成后流入装镍片工位,再进行双面 自动点焊,最后由人工操作台拆分焊接治具。

This production line is mainly used for 18650/21700/26700/32700 and other cylindrical cell PACK process. Production Process: first through the integration of belt feeding, surface pad and then scan code and check the internal resistance, voltage and other parameters of the test sorting, lengthening the channel storage cell, the second scan code binding composition of relevant project data, each battery pack achieves data precision query traceability. Then it is put into the bracket by man or robot to carry out Al intelligent appearance detection, and then it flows into the nickel plate loading station, and then carries on double-sided automatic spot welding, and finally disassembles the welding fixture by the manual operating table.

### 小圆柱锂电池自动化通用产线方案

SMALL CYLINDRICAL LITHIUM BATTERY AUTOMATION GENERAL PRODUCTION LINE SOLUTION

#### 标准配置 Standard Configuration

贴纸扫码分选一体机/二次扫码成组设备/人工或机器人入支架设备/AI智能外观检测设备/人工装镍片设备/双面自动焊接。

Sticker code-sweep sorting machine/double-sweep code-sweep group equipment/manual or robot into the bracket equipment/AI intelligent appearance detection equipment/manual nickel plate equipment/double-sided automatic welding.



#### 适用产品 Applicable Products



Two-wheel power battery pack

 二轮动力电池组
 三轮车动力电池组

Trike power battery pack



无人机电池组 UAV battery pack

#### 技术亮点 Technology Feature

A.整线包含多个工位,实现自动化生产。 B.多通道精确分选,全程数据可追溯。 C.广泛适用于大中规模动力电池生产厂家的电池组制程。 D.可根据客户具体需求定制。

A. The whole line includes many workstations to realize automatic production.
B. Multi-channel accurate sorting, full data traceability.
C. Widely used in large and medium-scale power battery manufacturers of the battery pack process.
D. Can be customized according to the specific needs of customers.

## Power battery comprehensive performance test equipment

### 动力电池组综合性能测试设备系列

POWER BATTERY PACK COMPREHENSIVE PERFORMANCE TEST EQUIPMENT SERIES

#### 产品介绍 Product Introduction

该设备是一款针对各种锂电池组、动力电池组进行综合性能检测的专业设备,可快速检测电池组的多种功能。测试项目包括单串 静态压差、单串动态压差、单串内阻差、充电激活、充电电压、充电电流、充电 △V、充电DCR、充电过流保护、交流内阻、直 流内阻、放电电压、放电电流、放电 △V、放电过流保护、放电过流恢复、短路保护功能、短路激活充电等。

The device is a professional equipment for comphrehensive performance festing of various lithium batteries and power battery packs, can quickly detect a variety of battery functions. The test items include single-string static pressure difference, single-string dynamic pressure difference, single-string internal resistance difference, charging activation, charging voltage, charging current, charging  $\triangle$  V, charging DCR, charging over-current protection, AC internal resistance, DC internal resistance, discharge voltage, discharge current, discharge  $\triangle$  V, discharge over-current protection, discharge over-current recovery, short-circuit protection, short-circuit activation and charging, etc.

#### 设备优势 Equipment Advantages

A.测试速度快,精度高操作方便。B.测试功能齐全,适应不同的需求。

A. Fast testing speed, high precision and convenient operation.B. The test function is complete, adapts to the different needs.

#### 技术亮点 Technology Feature

A.电流测试范围广,放电电流最高可达600A,短路电流最高可达8000A。
B.上位机软件功能丰富,支持条码录入、数据库查询追溯。
C.采用PC工控组合,数据方便储存调用。
D.可快速测试电池组多项功能,支持在线升级检测项目、校准功能。
E.整机模块化设计,利于后期升级。
F.数据自动储存数据库,便于后期追溯。
G.可根据客户具体需求定制。

A. Current testing range, discharge current up to 600A, short-circuit current up to 8000A.
B. The software of PC is rich in functions, supporting bar code input and database query tracing.
C. PC industrial control combination, convenient data storage and call.
D. Can quickly test multiple functions of the battery pack, support online upgrade detection items, calibration functions.
E. Full Modular design for later upgrades.
F. The data is automatically stored in a database for easy traceability.
G. It can be customized according to the specific needs of customers.

#### 技术参数 Technical Parameters

E

产能: 20PCS/H	CAPACITY: 20PCS/H
重量: 100KG	WEIGHT: 100KG
电压: 220V±10%	VOLTAGE: 220V±10%
外形尺寸(L×W×H): 801×612×1291 (MM)	SIZE(L×W×H): 801×612×1291 (MM)
外形尺寸(L×W×H): 801×612×1435 (MM)	SIZE(L×W×H): 801×612×1435 (MM)
外形尺寸(L×W×H): 801×612×1584 (MM)	SIZE(L×W×H): 801×612×1584 (MM)

动力电池组综合性能测试设备系列

#### POWER BATTERY PACK COMPREHENSIVE PERFORMANCE TEST EQUIPMENT SERIES

	新款综合测	试仪选型	Selection of	the new co	mprehensive	e tester	
型号 Models 项目 Project	BTS-0610 (60V100A)	BTS-1110 (110V100A)	BTS-1120 (110V200A)	BTS-1130 (110V300A)	BTS-1140 (110V400A)	BTS-1150 (110V500A)	BTS-1160 (110V600A)
产品图片 Product Pictures							
	技才	《参数以及	指标 Techn	ical parame	eters and indi	icators	•
测试项目 Test items	流内阻(放电D 路激活充电 Charging active voltage, chargi DCR), discharg	OCR)、放电电的 ation, single-str ng current, chai ge voltage, disch	玉、放电电流、 ing voltage differ ging △ V, chargir	放电△V、放电 ence/single-strin ng DCR, AC intern charge △ V, disch	电流、充电△V、 B过流保护、放电 g internal resistanc al resistance (ACR) harge over-current harging	过流恢复、短路 ce difference (opti , DC internal resist	保护功能、短 onal) , charging ance (discharge
压差/内阻差 (选配) Pressure Difference/ internal resistance difference (optional)			选	配 Matching			
设备供电 Power supply to the equipment	AC220V, 最大 功率2000W AC220V, 最大功率3000W						
充电电压 Charging voltage	0~60v 0~110v						
充电电流 Charging current	0~20A						
放电电压 Discharge voltage	0~60v	0~110v					
放电电流 Discharge current	100A	100A	200A	300A	400A	500A	600A
过流测试最大电流 Overcurrent test maximum current	100A	100A	200A	300A	400A	500A	600A
交流内阻(ACR) AC internal resistance (ACR)	1~3000mΩ						
直流内阻(DCR) DC internal resistance (DCR)	1~3000mΩ						
短路保护时间 Shart Circuit Protection Time	1~20000uS						

### Charge and discharge test equipment

### 回馈型充放电测试设备系列

FEEDBACK TYPE CHARGE AND DISCHARGE TEST EQUIPMENT SERIES

#### 产品介绍 Product Introduction

该设备主要应用于各种不同的电池(如锂离子电池、铅酸电池、超级电容和燃料电池等)生产或老化测试。测 试项目主 要有电池循环寿命试验、容量测试、充放电特性测试和电池包温度测试等。

The devices are used in a variety of battery applications such as lithium-ion battery, lead-acid batteries, supercapacitors and fuel cells. The main test items include battery cycle life test, capacity test, charge and discharge characteristics test and battery pack temperature test.

costs.

#### 设备优势 Equipment Advantages

A.外观美观大方,节能环保降低生产成本。 B.测试功能稳定精准,保证电池出厂品质。 C.单模块可测试最大电流是100A,最大功率12KW。 D.可根据客户具体需求定制。

A. Beautiful appearance, energy saving and environmental protection to reduce production

B. The test function is stable and accurate, ensuring the quality of the battery. C. Single module can test the maximum current is 100A, the maximum power 12 kw. D. Can be customized according to the specific needs of customers.

回馈型老化柜选型 Selection of feedback aging cabinet				回馈型老化柜选型 Selection of feedback aging cabinet			
寸/Size: (L) 960X600 (W) X1105HMM	型号 Historia	单柜通道 Sengle calchertacces	单CH功率 (W) Single CH Power (W)	尺寸/Size: (L) 960X600 (W) X1473HMM	型号 Modula	单柜通道 Setuple cabinet account	单CH功率 (W
	30V40A	16	1200W		30V40A	24	1200W
	30V50A	16	1500W		30V50A	24	1500W
	30V60A	16	1800W		30V60A	24	1800W
	40V30A	16	1200W		40V30A	24	1200W
	40V40A	16	1600W		40V40A	24	1600W
	40V50A	16	2000W		40V50A	24	2000W
	40V60A	16	2400W		40V60A	24	2400W
	60V20A	16	1200W		60V20A	24	1200W
	60V30A	16	1800W		60V30A	24	1800W
	60V40A	16	2400W		60V40A	24	2400W
A REAL PROPERTY AND A REAL	60V50A	16	3000W		60V50A	24	3000W
	60V60A	16	3600W		60V60A	24	3600W
A DESCRIPTION OF	110V20A	16	2000W		100V20A	24	2000W
000	110V30A	16	3000W	5 6 5	100V30A	24	3000W
	100V40A	8	4000W		100V40A	12	4000W
	100V50A	8	5000W		100V50A	12	5000W
	100V60A	8	6000W		100V60A	12	6000W

### 回馈型充放电测试设备系列

FEEDBACK TYPE CHARGE AND DISCHARGE TEST EQUIPMENT SERIES



#### 技术亮点 Technology Feature

A.能量双向流动,放电能量回馈电网效率高于93%。 B.输出电流转换快、电流无超调,对电池组无冲击。 C.精密机构件链接, 抗阻更低、发热量好。 D.全系列采用模块设计,全铜排链接稳定性强,方便调试和维护, E.数据自动储存数据库,便于后期追溯。



A. The efficiency of discharge energy feeding back to the grid is higher than 93% .

B. Fast output current conversion, no overshoot current, no impact on the battery pack.

C. Precision mechanism links, lower resistance, good heat. D. All series use module design, all copper bar link stability, convenient debugging and maintenance. E. The data is automatically stored in a database for easy post-traceability.

#### 技术参数 Technical Parameters

产能:	单通道3.5~5H/组
重量:	200KG
电压:	220V±10%
CAPAG	CITY: Single channel 3.5 ~ 5h/group
WEIGH	HT: 200KG
VOLTA	GE: 220V±10%

