PJTEC

PENG JIN TECHNOLOGY

新能源锂电池智能制造装备整体解决方案制造商

MANUFACTURER OF OVERALL SOLUTION FOR INTELLIGENT MANUFACTURING EQUIPMENT OF NEW ENERGY LITHIUM BATTERIES

CONTENTS

01 COMPANY PROFILE

DONGGUAN PENGJIN MACHINERY TECHNOLOGY CO., LTD

Our company was found in 2011, which is a high-tech enterprise focused on “technology to drive the development of new energy intelligent manufacturing and circular economy”. Pengjin technology production bases are located in Dongguan (Guangdong province), Huizhou (Guangdong province) and Jiaxing (Zhejiang province), with offices based in Malaysia, HongKong, India, Thailand and South Korea.

Pengjin Technology mainly specializes in intelligent manufacturing solutions for lithium ion battery, sodium-ion battery, solid state battery and primary lithium battery. The solutions include the technical service such as lithium-ion battery manufacturing turnkey solutions, intelligent factory and digital factory solutions. We also provide the production and recovery equipment including NMP recovery system, coating machine, rolling and slitting machine, NMP distillation system, coating and recovery all-in-one machine, battery module pack automatic line, etc.

PRODUCTION BASE

DONGGUAN PENGJIN MACHINERY TECHNOLOGY CO., LTD

ZHEJIANG KUNXIU TECHNOLOGY CO., LTD

HUIZHOU PENGJIN INTELLIGENT EQUIPMENT CO., LTD

GUANGDONG PENGDAO TECHNOLOGY CO., LTD

ZHEJIANG KUNXIU TECHNOLOGY CO., LTD

GUANGDONG PENGDAO TECHNOLOGY CO., LTD

HUIZHOU PENGJIN INTELLIGENT EQUIPMENT CO., LTD

COMPANY PHOTO

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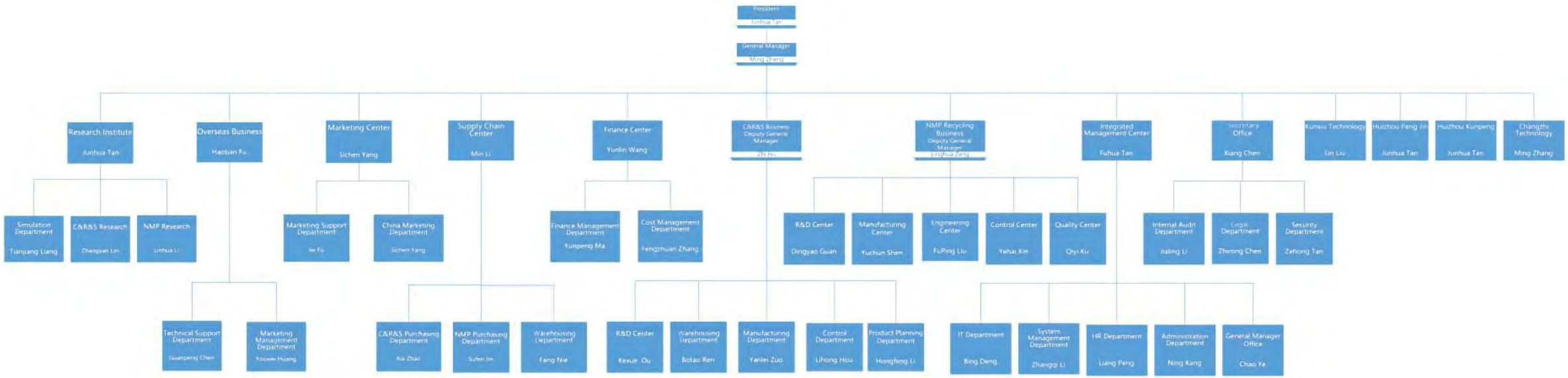
ORGANIZATIONAL STRUCTURE



CURRENT CAPACITY PROFILE

Staff

Total: 550

R&D: 203

Overseas sales: 20

After-sales: 60

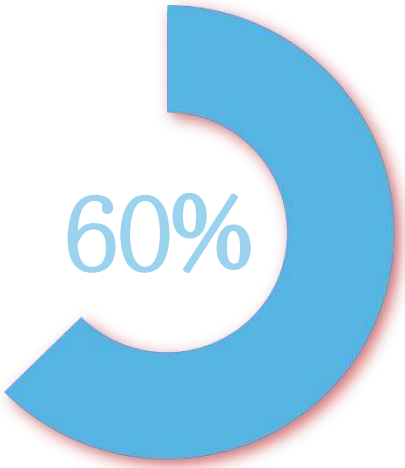
Factory

Dongguan, Guangdong
30,000 m²

Huizhou, Guangdong
82,000 m²

Jiaxing, Zhejiang
21,000 m²

Mechanization Rate



Annual Sales

2023: 1.2 billion

2022: 0.9 billion

2021: 0.7 billion

RECIEVED HONOUR

- National High-tech Enterprise
- National Little Giant Enterprise
- Guangdong AAA Credit Enterprise
- 2023 Safety Manufacturing License
- 2024 Guangdong Doctor Workstation
- Guangdong Top 100 Innovative Enterprise
- 2023 Dongguan Listed Reserve Enterprise
- 2023 Guangdong Engineering Technology Research Center

PATENTED TECHNOLOGY

No.	Category	Name	Patent No.	Public (Announcement) Day	Status
1	Patent for Invention	A method, system and medium for recycling waste lithium battery cathode materials	CN114453383B	2022-07-15	Authorised
2	Patent for Invention	An efficient NMP recycling method, system and computer readable storage medium	CN114254714B	2022-04-29	Authorised
3	Patent for Invention	A lithium battery production exhaust gas treatment method, system and readable storage medium	CN114191949B	2022-04-29	Authorised
4	Patent for Invention	Pipe orifice position detection device and detection method	CN116336984B	2023-07-25	Authorised
5	Patent for Invention	High-efficiency mutual solubility device for waste gas and waste gas treatment method	CN116492836A	2023-07-28	Authorised
6	Patent for Invention	A lithium battery wafer/diaphragm coating equipment and process	CN113751283A	2021-12-07	Authorised
7	Patent for Invention	A method, system and readable storage medium for the stepwise utilisation of decommissioned lithium batteries	CN114497775B	2022-07-15	Authorised
8	Patent for Invention	A specific water-absorbing composite material and its preparation method and application in high moisture low NMP content exhaust gas treatment	CN114288999B	2024-06-07	Authorised
9	Patent for Invention	Improved NMP recycling system	CN112665429A	2021-04-16	Substantive review
10	Patent for Invention	An NMP waste liquid purification system and process	CN 116409839 B	2023-08-08	Authorised
11	Patent for Invention	An engineering project management system based on machine vision	CN 116645069 B	2023-12-22	Authorised
12	Patent for Invention	An adaptive water quantity energy saving control method based on meter cooler	CN 116642365 B	2023-9-26	Authorised
13	Patent for Invention	A waste lithium battery electrolyte recycling system and process	CN 116531851 B	2023-9-26	Authorised
14	Patent for Invention	Calculation of optimal operating conditions for an NMP exhaust gas recovery system	CN 116933681 B	2024-1-26	Authorised
15	Patent for Invention	Method, apparatus and storage medium for monitoring and controlling a coater oven heat recovery device	CN 117313403 B	2024-4-26	Authorised
16	Patent for Invention	Area positioning method for dry electrode self-supporting membrane fibrillation and its area adjustment device	CN 117612653 B	2024-5-14	Authorised

- Note: The above is only part of the company's current patent situation, the company currently has more than 80 patents, including more than 30 patents of invention, more than 60 utility model patents, software copyrights.
- The company in the coating equipment and coating process has been related to the patent layout, the follow-up will be launched as a new business depending on the development situation.

PATENTED TECHNOLOGY

No.	Category	Name	Patent No.	Public (Announcement) Day	Status
17	Invention patents	A plate-fin heat exchanger heat transfer calculation method	CN 116680838 B	2024-04-26	Authorised
18	Invention patents	An inspection device and inspection method for Teflon sealing strips	CN 117091766 B	2024-03-08	Authorised
19	Softwriting	Efficient control software for roll press slitting machine equipment	2024SR0127850	2023-10-9	Authorised
20	Softwriting	Intelligent control system software for coating machine equipment	2024SR0131136	2023-08-16	Authorised
21	Utility model	A kind of pulp recycling device	CN 220195400 U	2023-12-19	Authorised
22	Utility model	A kind of foldback walking belt drying device	CN 220380172 U	2024-01-23	Authorised
23	Utility model	A kind of pole piece transverse spreading device	CN 220562219 U	2024-03-08	Authorised
24	Utility model	A kind of roll surface cleaning scraper device	CN 220373980 U	2024-01-23	Authorised
25	Utility model	A kind of polar film preparation equipment	CN 220627850 U	2024-03-19	Authorised
26	Utility model	A kind of uninterrupted press feeding device	CN 220372028 U	2024-01-23	Authorised
27	Utility model	A kind of high efficiency conversion countercurrent heat exchanger	CN214666245U	2021-11-09	Authorised
28	Utility model	An NMP recycling system	CN214181861U	2021-09-14	Authorised
29	Utility model	Heat exchanger with good heat transfer effect	CN214120886U	2021-09-03	Authorised
30	Utility model	Heat exchanger structure for NMP recovery system	CN214039689U	2021-08-24	Authorised
31	Utility model	Improved NMP recycling system	CN214039691U	2021-08-24	Authorised

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CORE PARTNER

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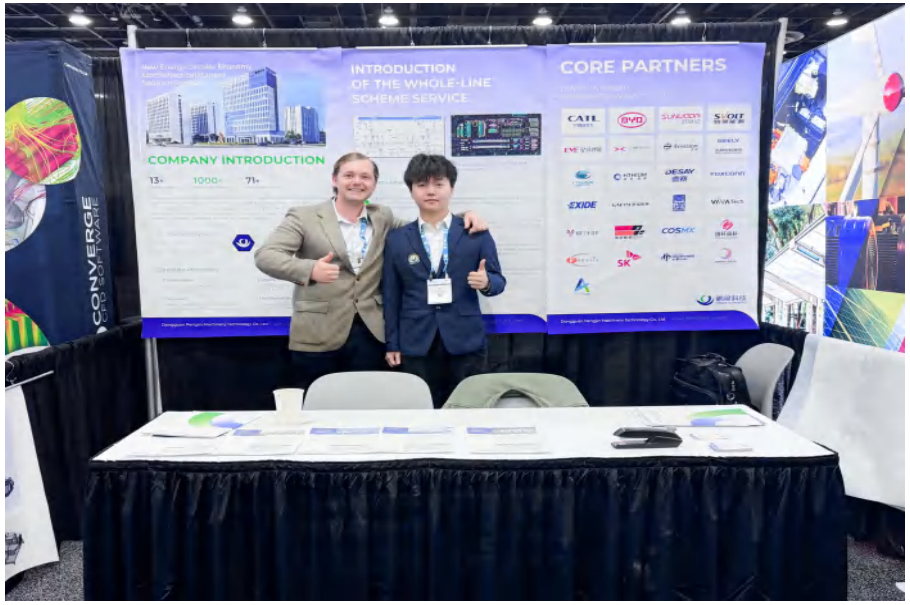
PENGJINTECHNOLOGY

Manufacturer of Overall Solutions for Intelligent Manufacturing Equipment of New Energy Lithium Batteries

EXHIBITION EXPERIENCE

- BATTERY JAPAN 2024 (Tokyo, Japan)
- CIBF 2024 (Chongqing, China)
- The Smarter E Europe 2024 (Munich, Germany)
- Thailand EV Energy Show 2024 (Bangkok, Thailand)
- The Smarter E America 2024 (Anaheim, U.S.)
- The Battery Show and Electric & Hybrid Vehicle Technology Expo North America 2024 (Detroit, U.S.)
- The Battery Show India 2024 (New Delhi)



CONTENTS

PENGJIN
新能源锂电池智能制造装备整体解决方案制造商

SOLUTIONS FOR NEW ENERGY BATTERY MANUFACTURING

- Focusing on project technical services and support for new energy prismatic power batteries, pouch type power batteries, prismatic energy storage batteries, consumer batteries, cylindrical batteries, etc., services and research cooperation for solid-state batteries and LF628Ah batteries;
- The main business is battery manufacturing planning, from product planning to plant planning to equipment introduction, commissioning and production.

Project preparation services

- Market research
- Product definition
- Feasibility study
- Site selection
- Preliminary factory planning
- Cost estimation

Product technical service

- Product route planning
- Product design
- Process design
- Process guidance and training
- Raw material selection
- Product development and certification support
- Product trial production
- Solid-state battery cooperation
- LF628Ah battery cooperation

Engineering technical service

- Factory planning
- Production line layout planning
- Equipment selection
- Equipment bidding management
- Equipment manufacturing
- Equipment delivery and commissioning support
- Production line OEE improvement

SOLUTIONS FOR NEW ENERGY BATTERY MANUFACTURING

Business Scope

Prismatic aluminum shell battery cells

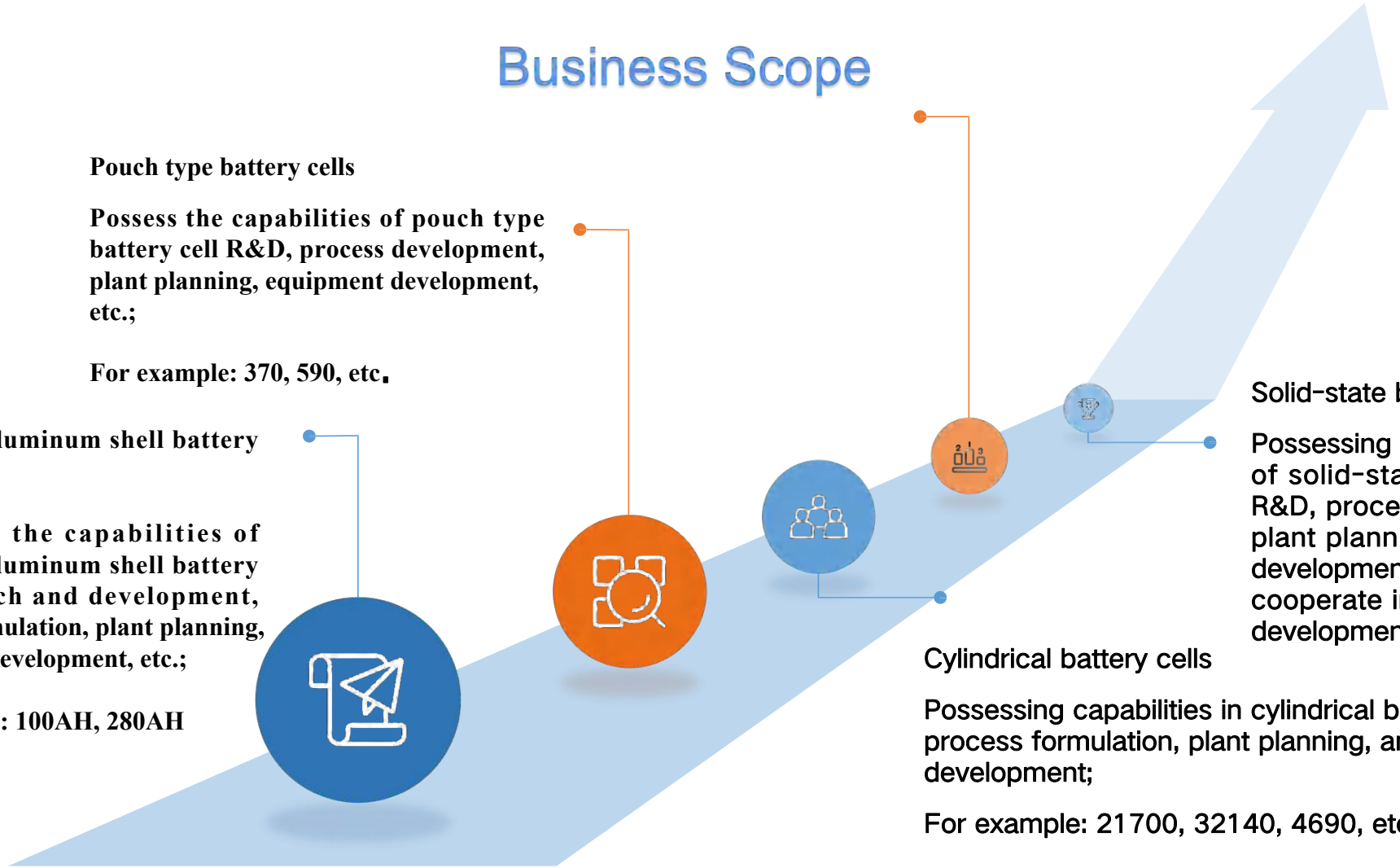
Possessing the capabilities of prismatic aluminum shell battery cell research and development, process formulation, plant planning, equipment development, etc.;

For example: 100AH, 280AH etc.

Pouch type battery cells

Possess the capabilities of pouch type battery cell R&D, process development, plant planning, equipment development, etc.;

For example: 370, 590, etc.



Cylindrical battery cells

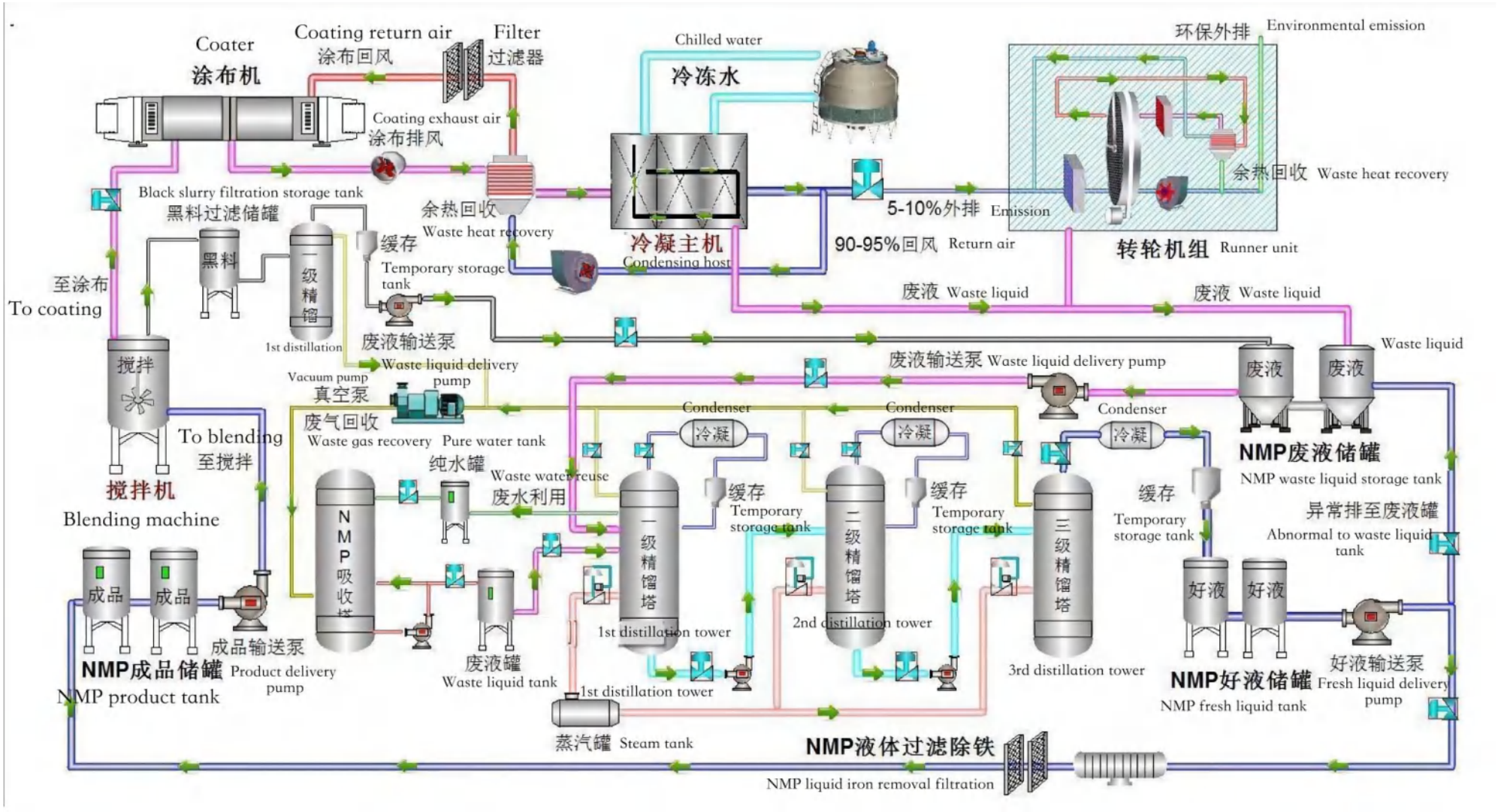
Possessing capabilities in cylindrical battery cell R&D, process formulation, plant planning, and equipment development;

For example: 21700, 32140, 4690, etc.

Solid-state battery cells

Possessing the capabilities of solid-state battery cell R&D, process formulation, plant planning, equipment development, etc., and can cooperate in research and development;

PLANT NMP RECYCLING SOLUTION



NMP RECOVERY SYSTEM

Eco Benefit

■ Significance

- Recovery efficiency exceeding 99%, significantly reducing NMP consumption costs.
- Energy-efficient technology (heat exchange efficiency up to 85% with 95% return air design) for lower operating costs.
- High automation level, easy operation, and reduced labor costs. (PLC/DCS control)
- Environmentally compliant, meeting international standards. (VOCs emission can be ≦1 mg/Nm³.

■ Process Flow

01

- Cathode processing technology: waste heat recovery + condensation with 95% return air + 5% emission with water absorption tower treatment

02

- Cathode processing technology: waste heat recovery + condensation with 95% return air + 5% emission with adsorption rotor treatment

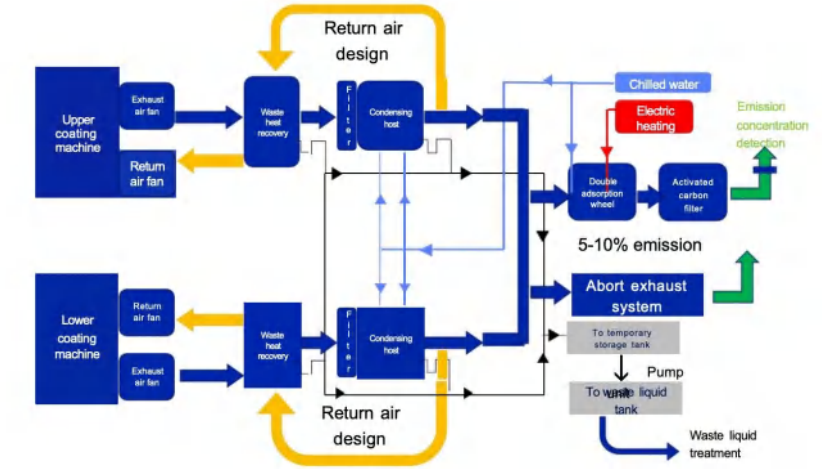
03

- Anode processing technology: waste heat recovery + condensation with 95% return air + 5% emission

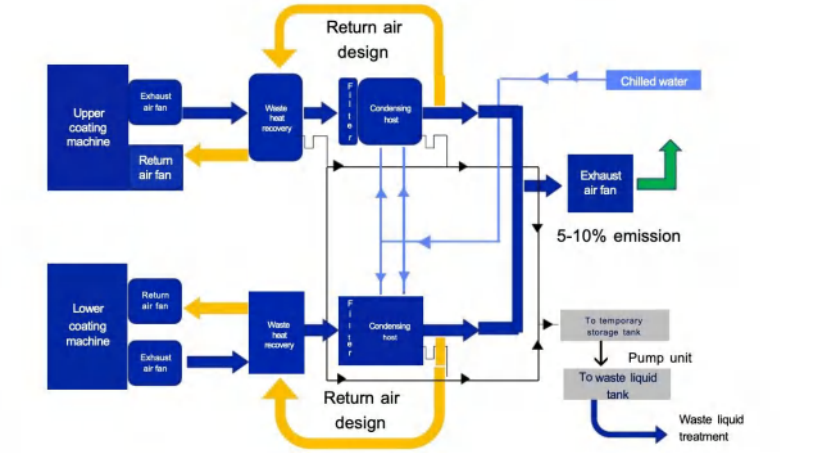
04

- Anode processing technology: waste heat recovery + condensation + 100% emission

NMP RECOVERY SYSTEM

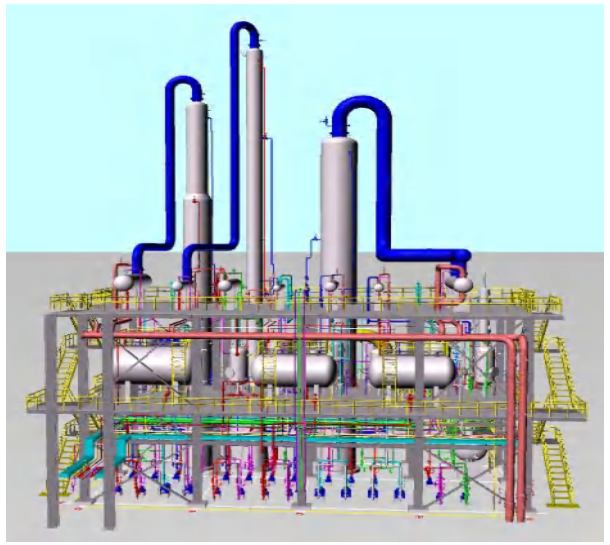


CATHODE



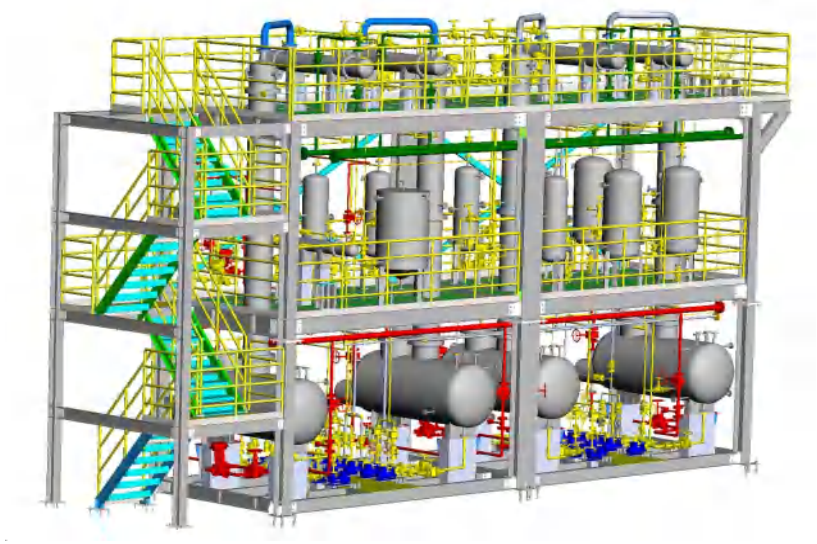
ANODE

NMP DISTILLATION SYSTEM



- Distillation purity exceeding 99.9%, meeting high-end lithium battery production requirements.
- Operational flexibility: The distillation system takes about 12 hours from start-up to steady state, and about 4 hours for normal shutdown; tthe feeding amount can vary between 60% and 120% of the design amount.
- Stable operation: Use DCS automatic control system with PID parameters set reasonably; set upper and lower limit alarm values for important temperatures and liquid levels to ensure smooth operation of the production process.
- Low operating cost: The operating cost of distillation in plant is 50% less than the external processing cost.

NMP DISTILLATION SYSTEM



- Smaller Footprint - 15000*4000*10000 mm
- Much Lower Height - 10 m highest
- Compact Layout - Saving more space
- Faster Delivery Cycle - only 4 months
- Convenient Installation - Skid-mount type
- Lower Equipment Cost - Applicable to more application cases

TANK FARM

Easy operation

Long service life

Durable

Product Introduction

Large-scaled storage tank is applicable to store large volume of liquid medium, such as raw materials (ethanol, n-butyl alcohol, octanol, etc.), product (acrylic acid, EA, EMC, etc.), Lithium ion battery field (NMP, electrolyte, etc.). Adopting 304 or 316 stainless steel material, high temperature resistant and anti-aging polyurethane foam is used as container insulation material; The interface adopts the internationally recognized standard quick release chuck type, which can be designed and manufactured according to the actual needs of customers.

Application Area

Commonly used as finished oil tanks, fire protection tanks, water storage tanks, liquid storage tanks, temporary storage tanks, and material storage tanks. Suitable for dairy products, fruit juice beverages, pharmaceuticals Fields such as petrochemicals or bioengineering.

ELECTRODE SINGLE/DOUBLE LAYER HIGH SPEED EXTRUSION COATING MACHINE

Technical Parameter	Advantage
Roll surface parameters	Max.1000-1600
Coating speed (m/min)	Running Speed：100-120m/min
Density accuracy on one side	±1.2%
Density accuracy on both sides	±1.0%
Unwind diameter	Max.1000mm
Winding diameter	Max.1200mm
CPK	>1.67

ROLLING-SLITTING INTEGRATED MACHINE

Technical Parameter	Advantage
Roll specifications (mm)	Equipment size：Φ900*（950-1200-1300-1500）
Maximum linear speed	Roller operation speed：120m/min，mechanical speed：150m/min
Roll material	9Cr3Mo
Roller surface hardness	⩾HRC66
Roller processing accuracy	Round fluctuation⩽1.0 μm，Straightness⩽2.0 um
Synchronization accuracy	⩽0.3‰
Roll bending device	8 roll bending cylinders, roll bending force 100 t, control accuracy ±0.5 T
Pole wrinkle removal process	Tensile tension 1300 N, closed loop control, accuracy ±5 N
Extremely independent blade in use	The upper blade is independently driven, the bite amount and side pressure are digitally adjusted, and the blade deflection angle is adaptively adjusted.
Equipment noise	⩽75Db

SEPARATOR HIGH SPEED COATING MACHINE

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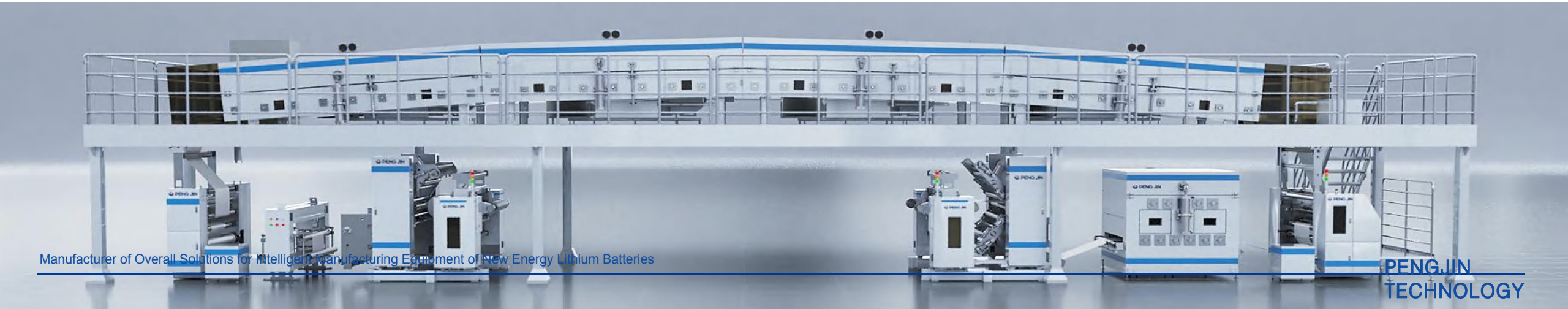
Product characteristics of separator coating micro gravure equipment	Technical Parameter	Advantage
Suitable for coating water-based slurry of membranes: materials such as alumina, boehmite, PVDF, etc	Coating speed	100m/min-200m/min，Customizable
Coating method: Micro gravure reverse coating method	Adapt to substrate/separator thickness	PE/PP / 5-16μm
Intelligent temperature control, fully automatic air-cap type oven drying system, closed-loop mode and constant temperature control	Feeding roll diameter	⩽500mm（6-inch core roll）
Dual station non-stop automatic winding and unwinding	Solid content of slurry	5%-45%
Can be coated on both sides A+B	Effective coating width	700-1400mm，Customizable
Vertical and horizontal automatic alignment	Roll diameter	⩽500mm（6-inch core roll）
Closed type material box blade structure	Coating thickness range control	Single sided dry thickness±0.5μm
Coating appearance requirements	Coating appearance	No wrinkles, no omissions, no bulging edges, no bursting ribs, no drying defects, no edge protrusions



GRAVURE ELECTRODE PRIMING COATING MACHINE

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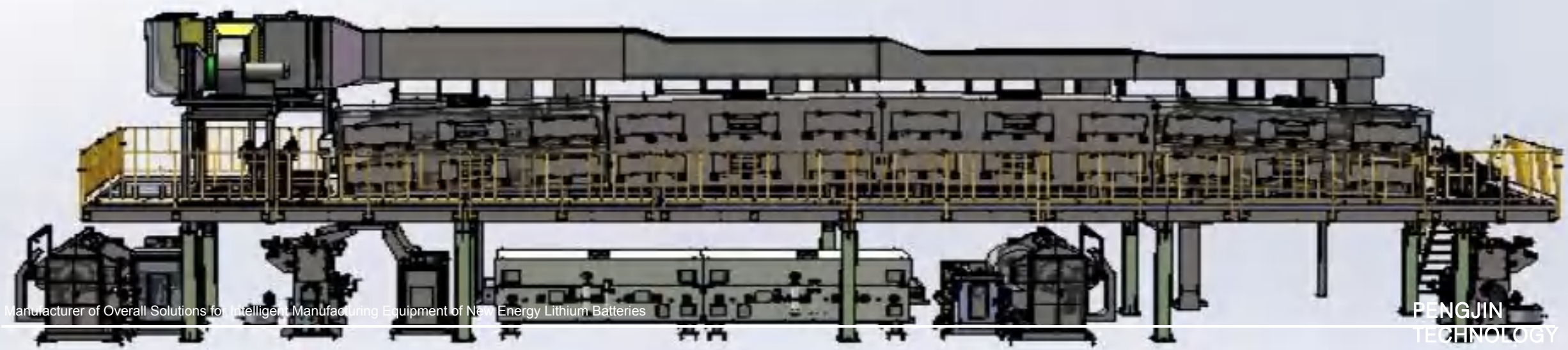
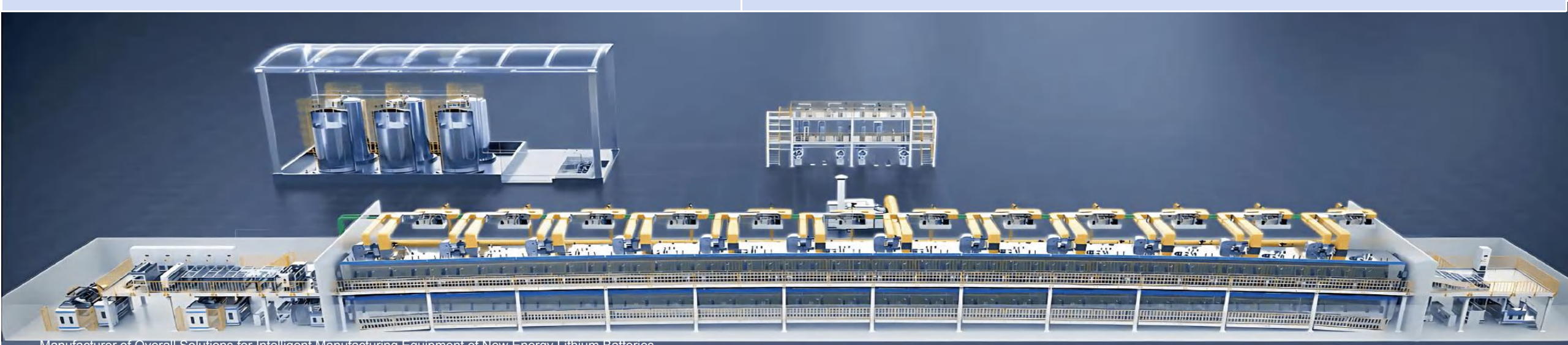
Technical Parameter	Advantage
Mainly used for lithium battery substrate primer coating	Mechanical speed 250m/min
Gravure transfer coating method	Coating speed 150-200m/min
Synchronized double-sided coating, automatic overprinting in vertical and horizontal directions	Substrate width 500-1600mm
Fully automatic oven drying system, closed-loop mode constant temperature control	Coating width Max 1600mm
Longitudinal printing alignment error 0.2mm	Diameter of winding/unwinding Max 1100mm
Horizontal printing alignment error 0.5mm	Coating dry thickness 1-10μm
Coated substrate copper foil 4.5~14um aluminum foil 9~16um	Tolerance of winding edge neatness ±0.5mm

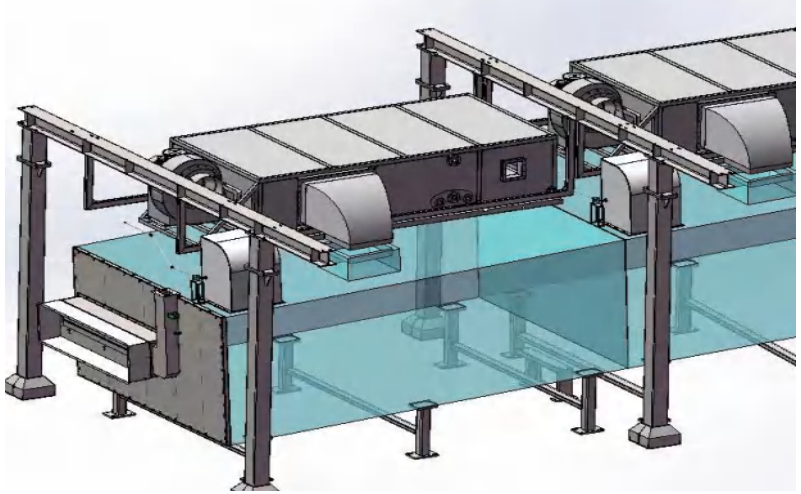


COATING AND NMP RECOVERY ALL-IN-ONE MACHINE

Technical Parameter	Advantage
Roll surface parameters	Max.1000-1600
Coating speed (m/min)	Speed of operation：120m/min
Density accuracy on one side	±1.2%
Density accuracy on both sides	±1.0%
Unwind diameter	Max.1000mm
Winding diameter	Max.1200mm
CPK	>1.67



COATING AND NMP RECOVERY ALL-IN-ONE MACHINE



- Saving Space - Arranged above the oven of coating machine
- Removing connection chambers between equipment and coating machine
- Reducing air duct installation work and resistance.
- More efficient heat recovery - One on one recovery mode.
- More fluent liquid drainage - No support for base plate required

SPECIAL-SHAPED EXTRUSION COATING MACHINE

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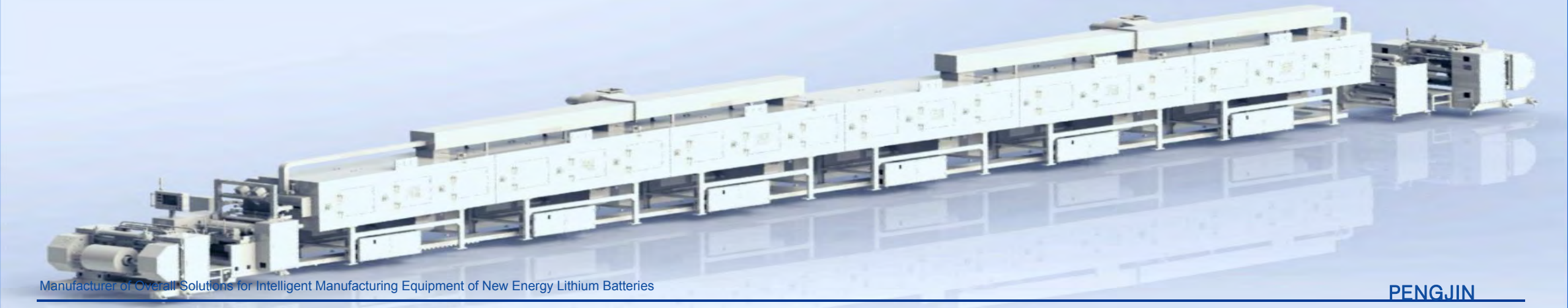
Technical Parameter	Advantage
Roll surface width	450/550/750/850/1000/
Die head	Customizable
Coating speed	Coating speed: MAX:50m/min; (10mm gap)
Roller runout	≤1.2um (Keens laser meter)
Misalignment of front and back side	≤±0.5mm
Coating precision	Single-side surface density: ≤±1.5%; Double-side surface density: ≤±1.2
Head and tail thinning	-10~0um
Unwinding diameter	MAX：800mm
Winding roll diameter	MAX: 1200mm (realize automatic tape splicing without stopping and speed reduction)
Oven Configuration	2/3/4/5m/section, full main drive oven
Heating method	Electric heating/steam heating/thermal oil heating (infrared)

Technical Parameter	Standard
D (edge effect region)	≤2mm(-5～0μm)
A (trailing edge)	≤1mm (depending on slurry properties)
F (width error)	≤±0.5mm
E (paint length error)	≤±0.5mm
H (white-out error)	≤±0.5mm
I (head and tail alignment error)	≤±0.5mm
B (head thinning) 2~5mm	-5～0μm
C (Tail thinning) 2~5mm	-5～0μm
J (one-sided surface density) (remove areas B, C, D)	≤±1.5%
Double-sided surface density error (remove areas B, C, D)	≤±1.2%



SPECIAL-SHAPED EXTRUSION COATING MACHINE

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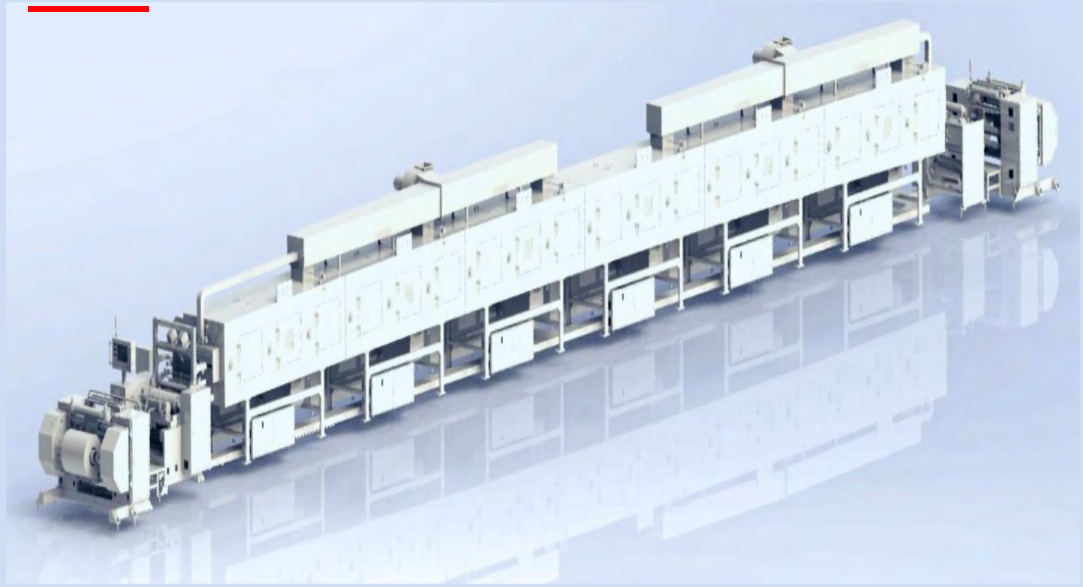
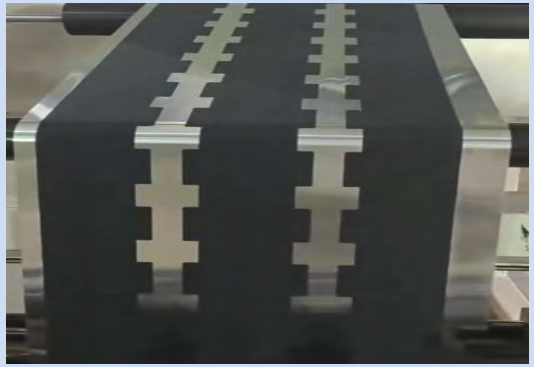


- New coating technology with high precision, reliability and stability, achieving continous coating, intermittent coating, L-shaped coating, multi-tab coating, etc.
- Customizable special material gasket.
- Double-chamber and double-valve control mode.
- Imported servomotor.
- Saving 20% raw materials - L-shaped coating.
- Saving manufacturing cost - Multi-tab coating with no laser cleaning and taping.

➢ **Coating effect picture:**



CELL MODULE PACK AUTOMATIC PRODUCTION LINE

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» Module PACK Equipment

New energy lithium battery PACK generally refers to packaging, encapsulation and assembly. As a key step in the production, design, and application of new energy lithium battery power battery systems, PACK is the core link that connects upstream battery cell production with downstream vehicle application.

» Proposal Advantage

- High Automation
- High Reliability Design
- Flexible Design
- Stability Design
- MES System

» All types of Module PACK Process Offer

We provide our customers with system solutions covering processes such as cell sorting, module assembly, laser cleaning, Bus-barr welding, module testing, PACK assembly, and various forms of transportation logistics, achieving efficient and high-quality production of various types and structures of battery modules.

Square PACK

Square battery module

Soft pack battery module

Cylindrical battery module

CONTENTS

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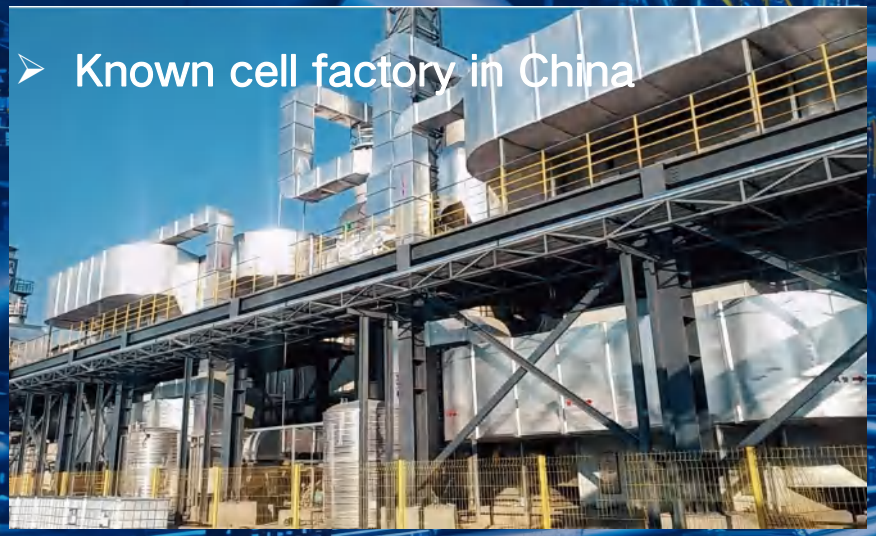
新能源锂电池智能制造装备整体解决方案制造商

NMP RECOVERY SYSTEM

➢ Known cell factory in China



➢ Known battery factory in India

➢ Known cell factory in China

➢ Known battery factory in Turkey

NMP DISTILLATION SYSTEM

➢Known cell factory in China

TANK FARM

➢ Known cell factory in China

COATING MACHINE

➢ Known cell factory in China, Korea and France

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Thanks for watching

Web：http://www.pengjintech.com

➢ Innovating Science and technology to improve production efficiency

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