



SZH Group and Production Introduction

2019-04



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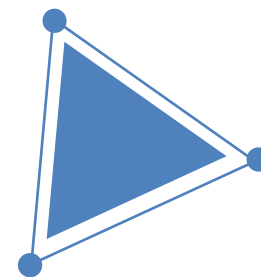
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01

Part One

Group Introduction





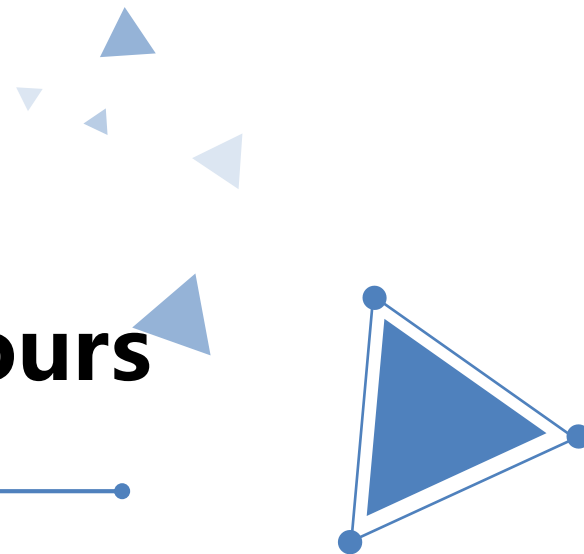
- Henan Shunzhihang Energy Technology Co.,Ltd. is a high-tech enterprise controlled by state-owned company and private shareholders. Shunzhihang Energy has grown its annual production capacity 1.3GWh and will be 3GWh by the end of 2019.
- After the first released -40°C charging and discharging EV battery system in 2017 over the world. We released the new EV system, that can be charging and discharging from -40°C to 80°C in 2019. It is a new revolution in the EV system, can resolve the a lot of EV safety and environment limitations. It is a foundation for the next developing of EV and battery industry.
- By 2020, Shunzhihang Energy will increase power battery production capacity to 13GWh





02

Part One **Corporate Honours and Certificates**





Patent Certificate





System Certificate





Testing Report and Announcement



开瑞纯电动多用途货车 SQ6440BEVK6

项目	要求	实测	判定
整车质量	≤2000kg	1980kg	合格
额定载质量	≤1000kg	1000kg	合格
额定乘员	≤5人	5人	合格
额定功率	≤30kW	30kW	合格
最高车速	≥100km/h	100km/h	合格
加速性能	0-100km/h ≤15s	12s	合格
制动性能	制动距离 ≤20m	18m	合格
转向性能	转向半径 ≤10m	10m	合格
噪声	≤85dB(A)	82dB(A)	合格
排放	符合GB18352.3-2005	符合	合格

东风纯电动微型厢式运输车 ZN6021KXY1V86V

项目	要求	实测	判定
整车质量	≤2000kg	1980kg	合格
额定载质量	≤1000kg	1000kg	合格
额定乘员	≤5人	5人	合格
额定功率	≤30kW	30kW	合格
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开瑞纯电动微型厢式运输车 SQ6320KXY86EV

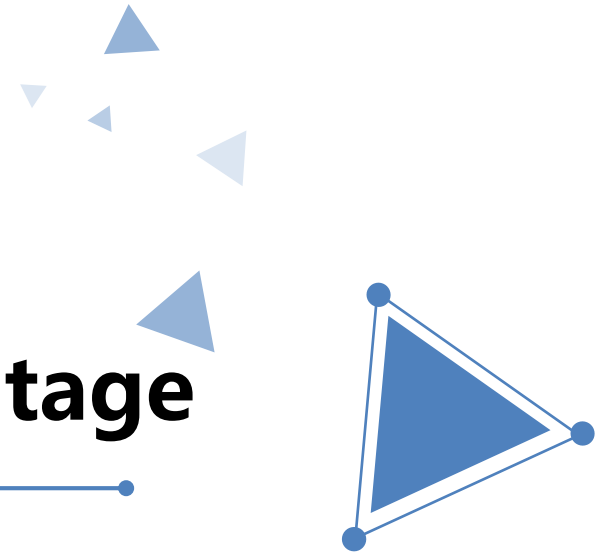
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03

Part One

Product Advantage





① High capacity density and high power density

The 26650 cell has a capacity of 5500mAh, energy density of 220Wh/Kg, 590Wh/L and power density of 1070W/Kg, which solves the requirement of volume and weight for electric vehicles.

	Panasonic (Tesla)	SDI、LG	China 1	China 2	SZH
energy density (Wh/kg)	260	210	210	110	220
energy density (Wh/L)	671	540	540	280	590

② High temperature cycle life and safety

Batteries circulate more than 1000 cycles at 70°C and more than 2000 cycles at 23°C, which meets the needs of electric vehicles in high temperature environment in summer.



③ Ultra-low temperature performance

The low temperature performance of batteries is the highlight of our products. The battery system we independently developed can charge and discharge below $-40\text{ }^{\circ}\text{C}$. It is the first commercialized EV in the world to promise to work in ultra-low temperature environment.

Under the condition of $-40\text{ }^{\circ}\text{C}$, the batteries are in production without external heating. The problems caused by auxiliary heating of liquid electrolyte batteries at low temperature are solved and the driving of electric vehicles in low temperature area is guaranteed.

	Panasonic (Tesla)	SDI、LG	China 1	China 2	SZH
Charge	$-10\text{ }^{\circ}\text{C}$	$-10\text{ }^{\circ}\text{C}$	$0\text{ }^{\circ}\text{C}$	$0\text{ }^{\circ}\text{C}$	$-20\text{ }^{\circ}\text{C}$
Discharge	$-20\text{ }^{\circ}\text{C}$	$-20\text{ }^{\circ}\text{C}$	$0\text{ }^{\circ}\text{C}$	$0\text{ }^{\circ}\text{C}$	$-40\text{ }^{\circ}\text{C}$



④ **High Current and High Rate Discharge Performance**

The instantaneous maximum output weight-power ratio of batteries is 1470W/kg, and the instantaneous maximum output weight-power ratio of batteries is 1070W/Kg, which solves the problem that the instantaneous starting of electric vehicles requires high power.

⑤ **High consistency**

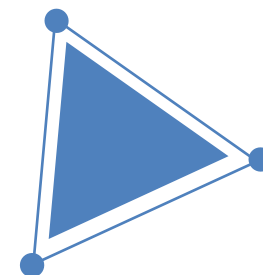
It solves the practical problems of low battery life of small electric vehicles, and promotes the development and industrialization of electric vehicles.

⑥ **Full automation, digitalization, intelligent equipment and automatic sorting system greatly ensure the consistent reliability of electric vehicle batteries.**

⑦ **Using the latest production technology to reduce the cost of electric vehicles .**



04 *Part One* Product Application





Products are mainly applied to electric vehicle, electric bicycles, electric motorcycles, electric submersibles , power tool and other fields, And provide new energy solution for mobile power, smart grid, and other related industries.

IMR26650



Capacity:	5500mAh
Energy:	20.35Wh
Energy Density:	220Wh/Kg 605Wh/L
Power Density:	1070W/Kg
Low Temperature :	-40°C Discharge
Cycle Life:	≥2000 cycle



➤ Power Tool Battery Pack

This watch is a manufacturer of power tools and the Netherlands jointly developed a product for power tools.

Features: Product is smaller than the capacity of the large volume, light weight, easy to carry and replacement; intelligent management interface, a perfect match with the device, give full play to the high-power battery powerful advantages; advanced power lithium battery technology, with professional metal tools You can play in a variety of stable complex situations.



Power tool battery pack parameters		
NO.	The nominal voltage	Technical Parameters
1	Rated Capacity	36
2	Continuous Current	7Ah
3	Motor Power	45A
4	Overcharge protection voltage	1500W
5	Discharge protection voltage	42V
6	Charging Temperature	27.5V
7	Discharge temperature	0-45°C
8	Storage Temperature	-20-55°C
9	Cycle life	-20-55°C
10	Size	≥500times
11	Weight	15×13×10cm
12	The nominal voltage	2.5Kg





➤ Electric submersible battery pack

This product is used for electric submersible models.

Features: Product specific capacity, small size, light weight, easy to carry and replacement; intelligent management diving booster circuit design and perfect fit, give full play to the advantages of powerful batteries; good low temperature performance, diving depth of 12 meters or less temperature under sharp decline in cases, you can still normal discharge, a world leading level.



Electric submersible battery pack parameters		
NO.	Project	Technical Parameters
1	The nominal voltage	22V
2	Rated Capacity	12Ah/8Ah/4Ah
3	Continuous Current	20A/15A/10A
4	Motor Power	350W
5	Overcharge protection voltage	25.2V
6	Discharge protection voltage	15V
7	Charging Temperature	0~45°C
8	Discharge temperature	-20~55°C
9	Storage Temperature	-20~55°C
10	Cycle life	≥500times
11	Size	Φ91cm×20cm
12	Weight	2.33kg





➤ Canadian police used electric bike battery pack

The product to be used with an electric bicycle police patrols.

Product Features: small size, light weight, long cycle life; particularly strong large current discharge performance, instantaneous starting current, strong climbing performance, a world leading level.



Canadian police used electric bike battery pack parameters		
No.	Project	Technical Parameters
1	The nominal voltage	48V
2	Rated Capacity	12Ah
3	Continuous Current	12A
4	Motor Power	≤7500W
5	Overcharge protection voltage	54.6V
6	Discharge protection voltage	32.5V
7	Charging Temperature	0~45°C
8	Discharge temperature	-20~55°C
9	Storage Temperature	-20~55°C
10	Cycle life	≥500times
11	Size	268×143×70mm
12	Weight	Approximately4.5kg





ELECTRIC MOTORCYCLE

电动摩托车

Solution Example: E-motorcycle battery 60V 20AH

Continued driving distance: 90 km
 Vehicle weight: 115 kg
 Loading weight: 200 kg
 Max speed: 60km/h
 Electricity used per 100 km: ≤ 1.5 kw · h
 Rated voltage: 60V
 Battery: Lithium, 2 x 60V/20AH
 Electric engine: High efficient, magnetic rare earth, brushless,3000W



ELECTRIC BICYCLE

电动自行车



Battery for Bicycle



E-Bike Solutions

IMR26650 lithium power cells are good at the performance of high-current and low self-discharging rate. For our high-quality Cylindrical Cells, the shape is easy for the assembly of different shapes and structures. It can meet the E-bike battery pack requirements very much.

Advantages: for the same battery pack of 36V10AH, the weight is only 1/3 of the Lead-acid battery pack, while the volume is about 1/2 of the Lead-acid battery pack.

We have developed six different standard E-Bike battery pack series, which can be easier and more convenient for your E-Bike solutions.

For example, E-Bikes Battery is on the rear track:

Model: MNKE07 36V10AH
 Max Working current: 20A
 Suitable controller: e.g. 36V controller, max limited current 15A
 Application: E-bike, scooter
 Size: 36 x 15 x 8.5cm
 Weight: 4.5 kg

Remark: This battery packs is suitable motor power 200-500W.



可以放到书包里的电动自行车



➤ Energy storage power supply



Compatibility:
provide the matching
battery according to the
specific requirements
of the equipments



➤ UPS

- Rated capacity of battery packs $> 17\text{Ah}$
- Rated voltage 48V
- Instantaneous discharge current $\leq 150\text{A}, 0.3\text{S}$
- Maximum continuous discharge current $\leq 65\text{A}$
- Maximum charge current (25°C) $\leq 10\text{A}$
- Operating temperature range ($-20^\circ\text{C} \sim 35^\circ\text{C}$)
- Monthly self-discharge rate (25°C) $< 2.5\%$





➤ Portable power supply



Flashlight

- Small volume and exquisite design, portability, high-brightness, long working hours (up to 10 hours continuous)
- Using high performance LED, Li-ion rechargeable cell of IMR26650, a long cycle life.



Multifunction lamp

- Exquisite appearance, portability, can be used as flashlight(handheld), lantern (in tents), desk lamp (lay aside), hands-free emergency light (attracted by magnets).
- High-brightness, long working hours (up to 8 hours continuous).
- Using high performance LED, high-capacity Li-ion rechargeable cell of IMR26650, a long cycle life.



USB charger

- Small volume and exquisite design, portability.
- Output using USB, able to charge small appliance including mobile, MP3, MP4, digital camera, etc.
- Using high-capacity Li-ion rechargeable cell of IMR26650, a long cycle life.



➤ Haima M1E EV Project (2010 year)

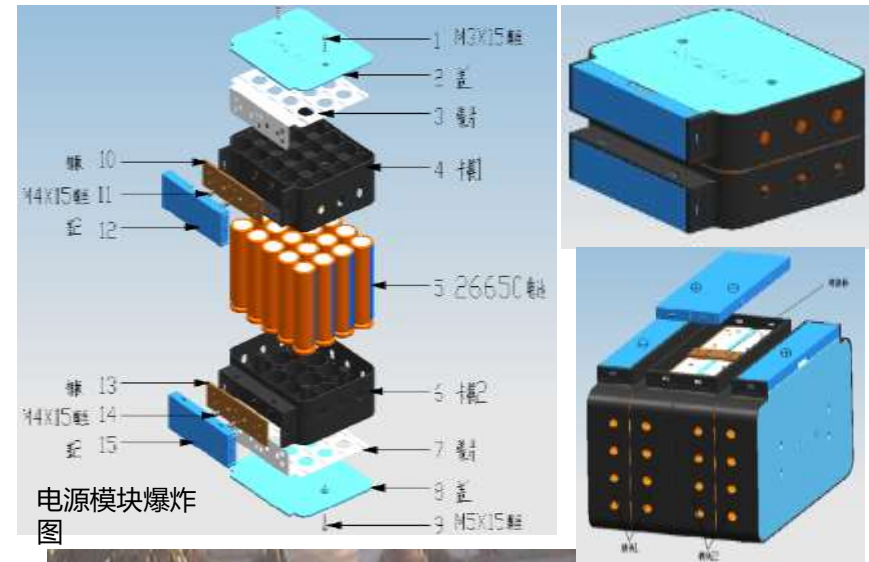
- In 2010, the R&D team cooperated with Haima Company to develop the M1E EV project. The batch supply of 100 units was facing the market, and the response was very good without any safety problems.





Haima M1E EV Parameters

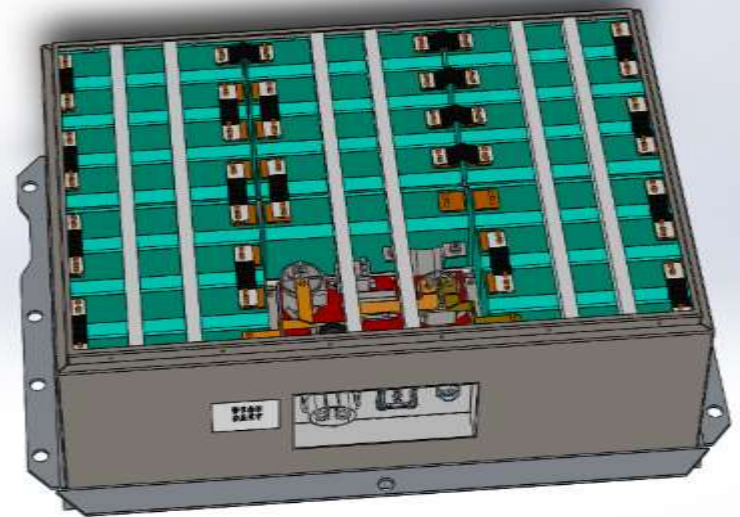
Parameters	M1E
Vehicle weight (T)	1.47
Battery rated energy (KWh)	20.25
Continued mileage (\geq km)	160
Maximum speed (\geq km/h)	85
Miles of electricity consumption (kWh/100km)	11.9
Engine power (KW)	11
Peak (KW)	27







➤ Karry K50 EV Project (2015 year)

- The company has completed the national announcement and has already produced and sold it in batches.

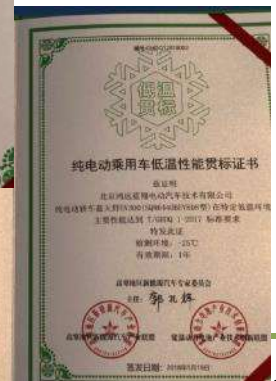




Karry K50 EV

 	national bulletin:	SQR6440BEVK08	Body structure:	5-door 7-seat MPV; 2 / 4 logistics vehicles
	NO.:	Batch 280	Maximum speed:	125Km/h
	Batch of National Tax-free Catalogue:	Batch 8	0-50Km acceleration time:	5.5s
	Continued mileage (≥km)	Isometric speed 310km, working condition 256km	Maximum grade:	≥25%
	Battery energy density	Weight 300kg, 45kWh	Motor Power:	42Kw
	Battery quality assurance:	8 years/150000 km	Exclusive highlights:	No need for auxiliary heating, normal charge and discharge at -40 °C, suitable for all areas in the north and south
	Charging mode:	Fast Filling, Slow Filling and Fast Replacement		







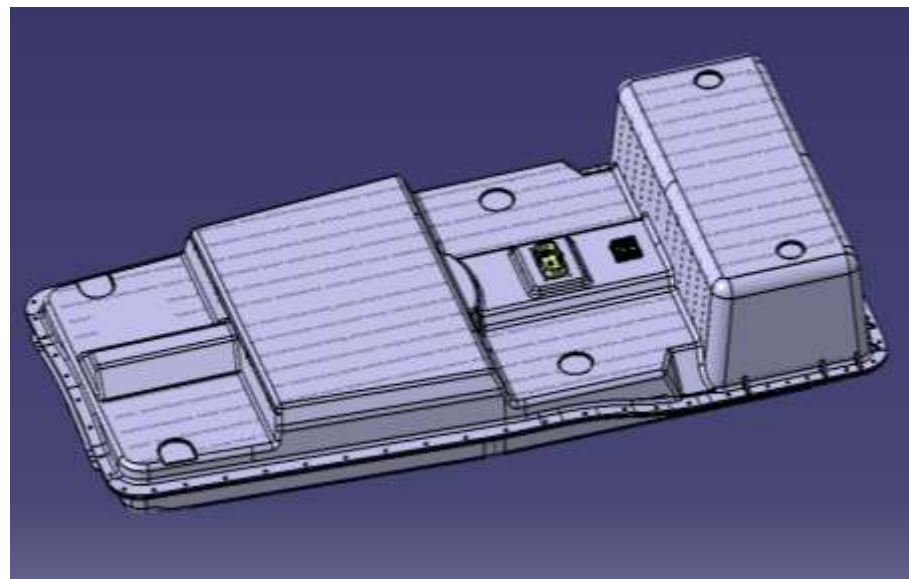
➤ Haima E3 EV Project (2017 year)

顺之航能源科技有限公司
Shunzhihang Energy Technology Co., Ltd.

海马E3纯电动轿车



国家公告型号	HMA7002S302BEV
车身结构	4门5座
车身尺寸	4553mm (L) *1737mm (W) *1510mm (H)
轴距	2600mm
超强续航	315km
电池能量密度	142Wh/kg
最高车速	130Km/h
电机功率	70Kw
超长电池质保	8年/15万公里
独有能量补充方式	快充、慢充、快换
独家亮点	无需辅助加热，低温-40℃到高温80℃可正常充放电，适用于南北方所有地区

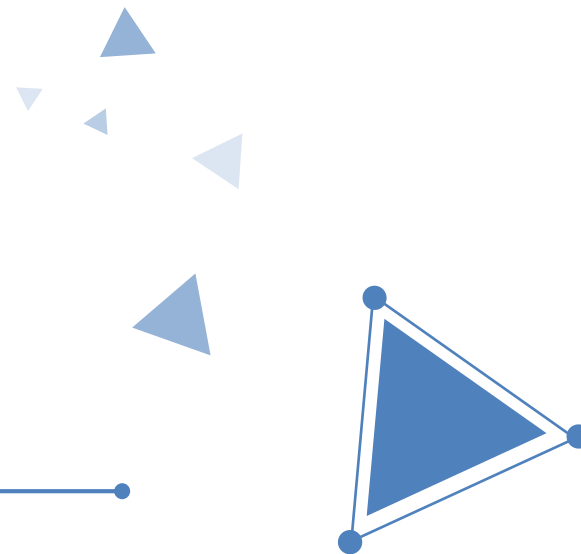




05

Part One

R&D Team





The company has about 100 employees, including 4 doctors, 2 masters, 60 undergraduate degrees, and 35 managers with intermediate titles or above. It is a production with high academic qualifications, strong professional skills and excellent personnel quality. management team. Among them, there are 23 R&D personnel, accounting for 17% of the total number of companies. At the same time, the company has also hired experts from related fields at home and abroad.





R&D Leader

- Dr. Pan Qinghai :**

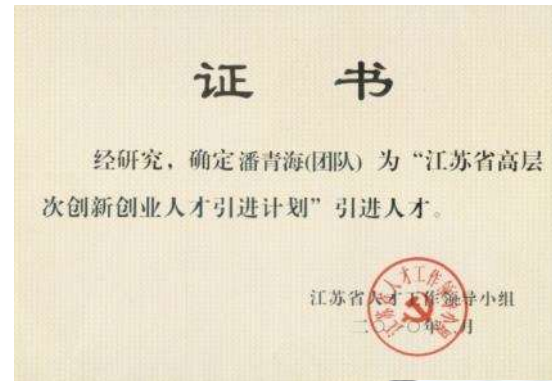
Graduated from the Department of Chemistry of Nankai University and received a Ph.D. from Tohoku University.

In 2000, he worked for the world lithium battery cradle Canada E-ONEMOLI ENERGY (CANADA) LTD.,.

In 2007, he returned to China to establish a business in Changzhou, Jiangsu Province, and won the honor of “Jiangsu Province High-level Innovation and Entrepreneurship Talent Award” and “Jiangsu Province Labor Model”.

In 2012, Dr. Pan Qinghai returned to Tianjin to start a business, and developed a new generation of manganese-based composite lithium-ion battery with high energy density and high power density. It is widely used in electric vehicles, electric bicycles, etc., and its products are sold to Europe, the United States, Canada and other markets. In 2013, he was selected as one of the “Thousand Talents Plan” in Tianjin.

In 2015, Dr. Pan Qinghai joined Shunzhihang Energy Technology Co., Ltd. with a mature technology research and development team and production team.



天津市人才工作领导小组办公室

入选天津市“千人计划”通知书

潘青海先生：
经专家评审和市人才工作领导小组审批，您已入选第七批天津市“千人计划（创新人才长期项目）”。
特此通知。

天津市人才工作领导小组办公室
2012年12月14日





- **Dr. Chao Liu :**

Dr. Chao Liu graduated from the Department of Electronic Engineering of Tsinghua University, and studied in the United States. He received his Ph.D. from Tufts University in the United States. From 2012 to 2014, he served as a scientist in the US iQLP innovation laboratory and a scientist in Bridge12 Technologies in the United States. He returned to China in 2014 and is mainly engaged in the research of solid electrolyte materials. The research and application of solid-state lithium batteries has published more than 21 academic articles and more than 5 domestic and foreign invention patents at home and abroad. They have been selected into the “Thousand Talents Plan” in Tianjin due to their outstanding performance and contribution to society.

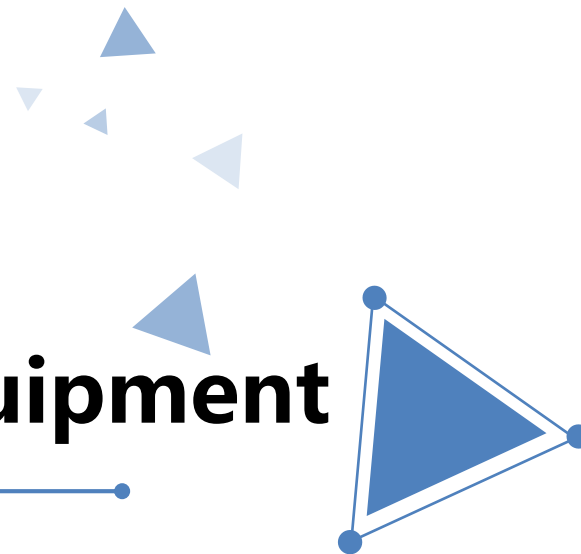




06

Part One

Production Equipment





Intelligent Digital Factory Management





The Most Advanced Double Screw Mixer



Double Sides Coating



Fully Automatic Thickness Detector



Slitting Machine-CCD Monitoring



Digital, Intelligent Battery Manufacturing Plant



Welding Winding Machine



Automatic Line



Automatic Filling Machine



Intelligent Charging and Discharging Equipment Plant



Charging and Discharging Equipment

Battery Sorting Equipment



Battery Pack Assembly Plant



Loading and Feeding Machine

Automatic Welding Machine



Battery Charge and Discharge Detection Equipment





R&D of Testing Equipment





R & D Center

创新平台

PART ONE

创新平台简介

公司研发平台由多个研发平台组成，包括材料研发平台、工艺研发平台、应用研发平台、检测研发平台、中试研发平台、产业化研发平台等。研发平台是公司技术创新的核心，是公司实现可持续发展的关键。公司研发平台由多个研发平台组成，包括材料研发平台、工艺研发平台、应用研发平台、检测研发平台、中试研发平台、产业化研发平台等。研发平台是公司技术创新的核心，是公司实现可持续发展的关键。

PART TWO

组织架构



PART THREE

成员介绍

PART FOUR

联合合作单位

公司研发平台由多个研发平台组成，包括材料研发平台、工艺研发平台、应用研发平台、检测研发平台、中试研发平台、产业化研发平台等。研发平台是公司技术创新的核心，是公司实现可持续发展的关键。公司研发平台由多个研发平台组成，包括材料研发平台、工艺研发平台、应用研发平台、检测研发平台、中试研发平台、产业化研发平台等。研发平台是公司技术创新的核心，是公司实现可持续发展的关键。





新能源动力电池领航者

Thank You!

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