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Better Technology Group Limited

WellPack

Communication & Energy Storage Lead-Carbon Battery Solutions and Manufacturing

Better Technology Group Limited

www.better-tech.net

Industry Outlook

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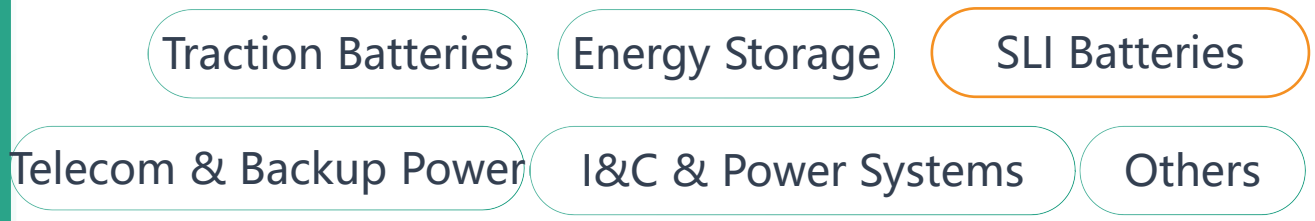
Lead Acid Battery

Global Market & Forecast

According to StraitsResearch, the global lead-acid battery market size was $53.3 billion in 2024 and is projected to reach $55.95 billion in 2025, with an expected market size of $82.78 billion by 2032, representing a compound annual growth rate (CAGR) of 5.02% during the forecast period.

Down-stream Market

Downstream Segments of Lead-Acid Batteries



Among the downstream segments of lead-acid batteries, automotive lead-acid batteries hold a dominant position. The global automotive lead-acid battery market size was $28.5 billion in 2024 and is expected to reach $47 billion by 2032.

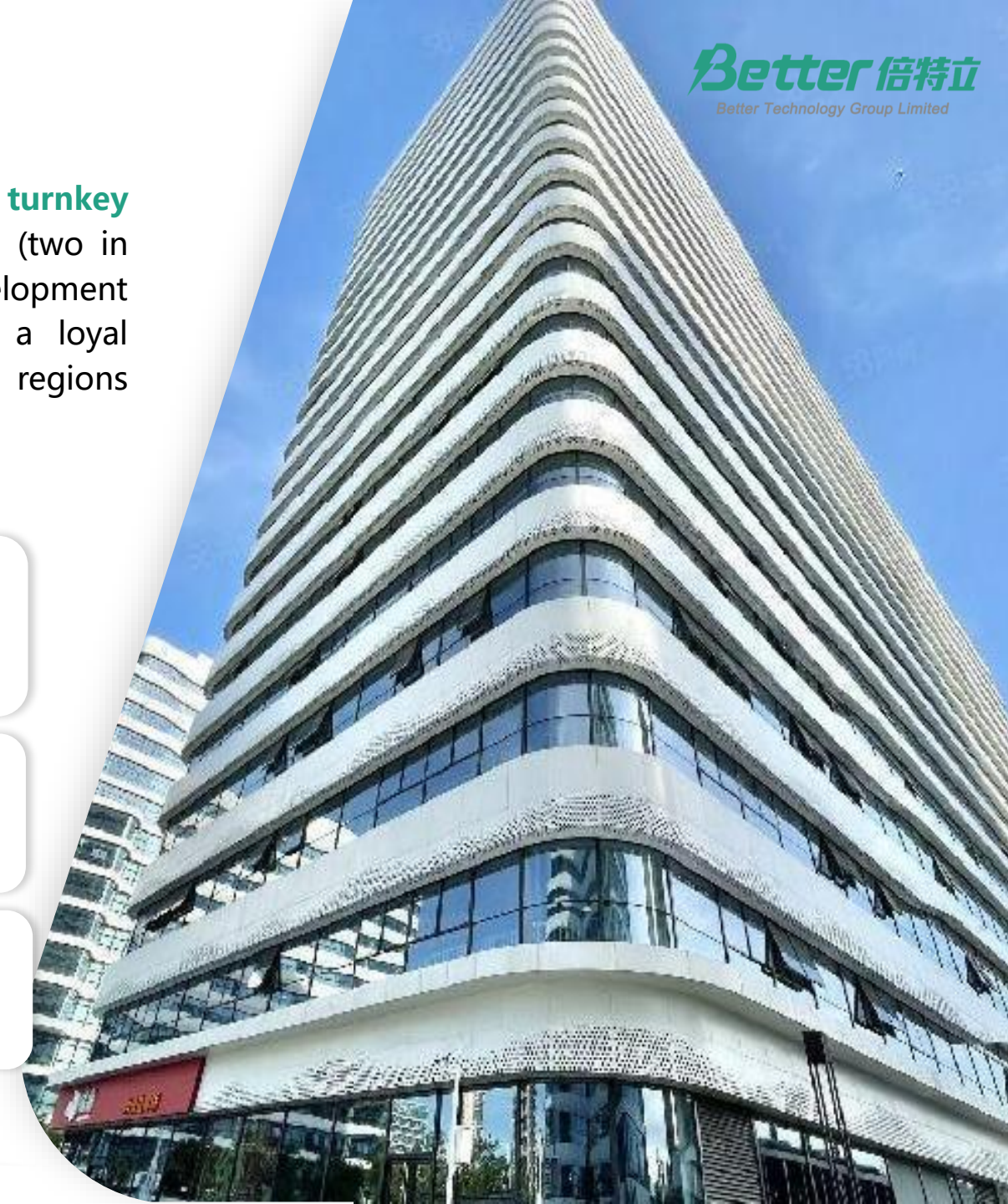
01

Company Introduction

- 1.1 Company Profile
- 1.2 Factory display

1.1 Company Profile

Better Technology Group Limited. is a well-known **global operator of turnkey battery manufacturing solutions**. It has three manufacturing plants (two in China, one in Zambia) and one technology research and development innovation center.Quality and professional service has earned us a loyal customer base, with operations spanning nearly 120 countries and regions worldwide.



Main business:

Battery manufacturing Equipment Turnkey solution	➢ R&D and manufacturing of battery equipment ➢ Battery manufacturing Tech services ➢ Battery factory plan, build and operation
Lithium battery	➢ Portable/Home/I&C energy storage systems ➢ PV storage and charging solutions ➢ New energy zero-carbon solutions
Lead-acid battery	➢ Starting battery ➢ Energy storage batteries ➢ Power battery

1.1 Company Profile

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20 years
Focused on battery industry

380+
Staff

70+
National patents

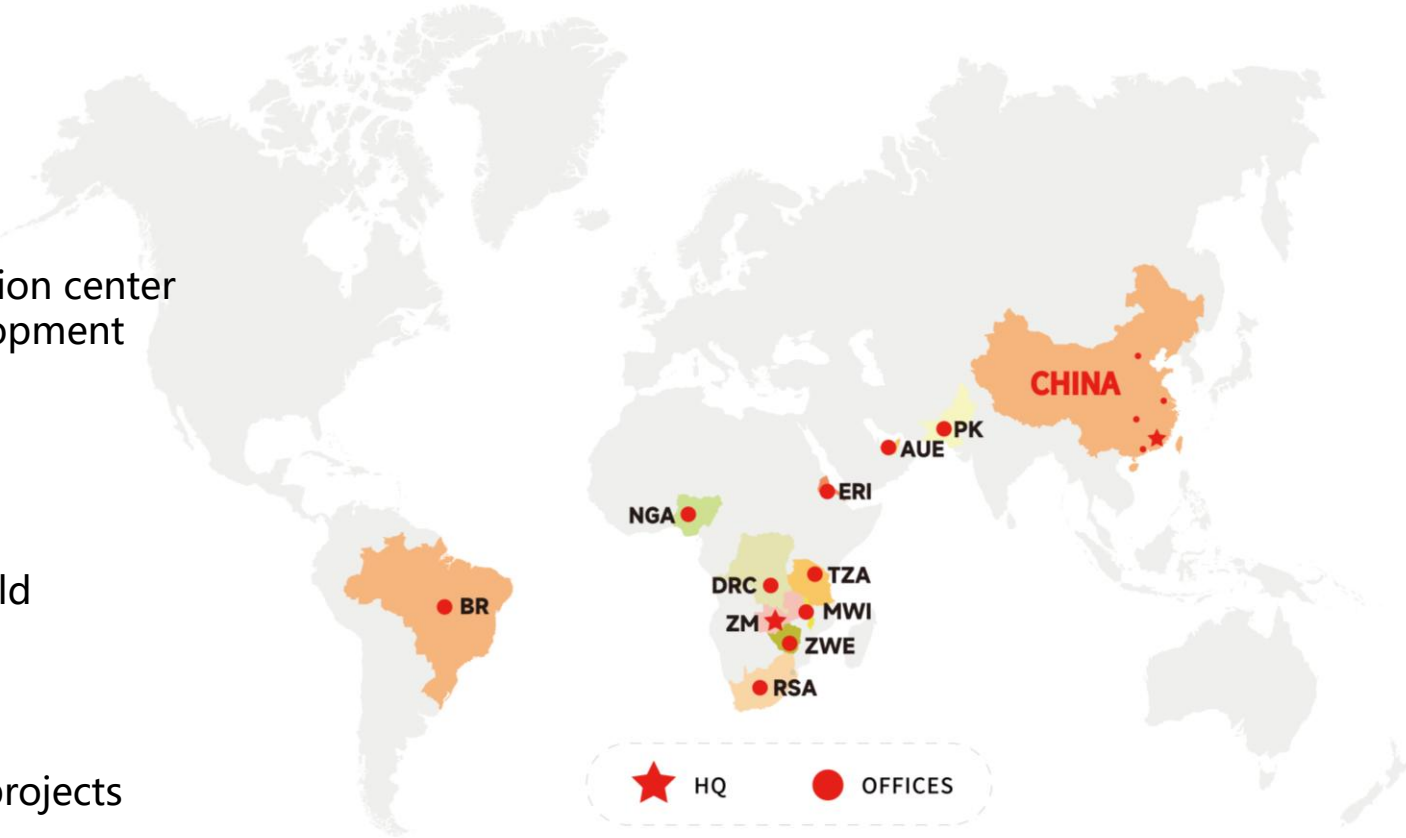
2
Tech innovation center
Talent development center

8000 +㎡
Factory cover

10+
Branches all over the world

120+
Service countries and regions

580+
Completed projects



1.2 Factory display

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▼ Lead-acid battery manufacturing equipment factory



▼ Lithium battery energy storage R&D and manufacturing factory




1.2 Factory display

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全球电池制造一体化解决方案运营商

Airumi New Energy, a subsidiary of Better Tech Group in Zambia, covers 15 hectares. Its brand SUNVOLT develops and produces lead-acid batteries for vehicles, transportation, energy storage, and aviation. The products are cost-effective, reliable, shock-resistant, overcharge-tolerant, and leak-proof.

3,000+
employment

3 million+
Annual battery production

1.4 Technology R&D Innovation Center

1.4 Technology R&D Innovation Center

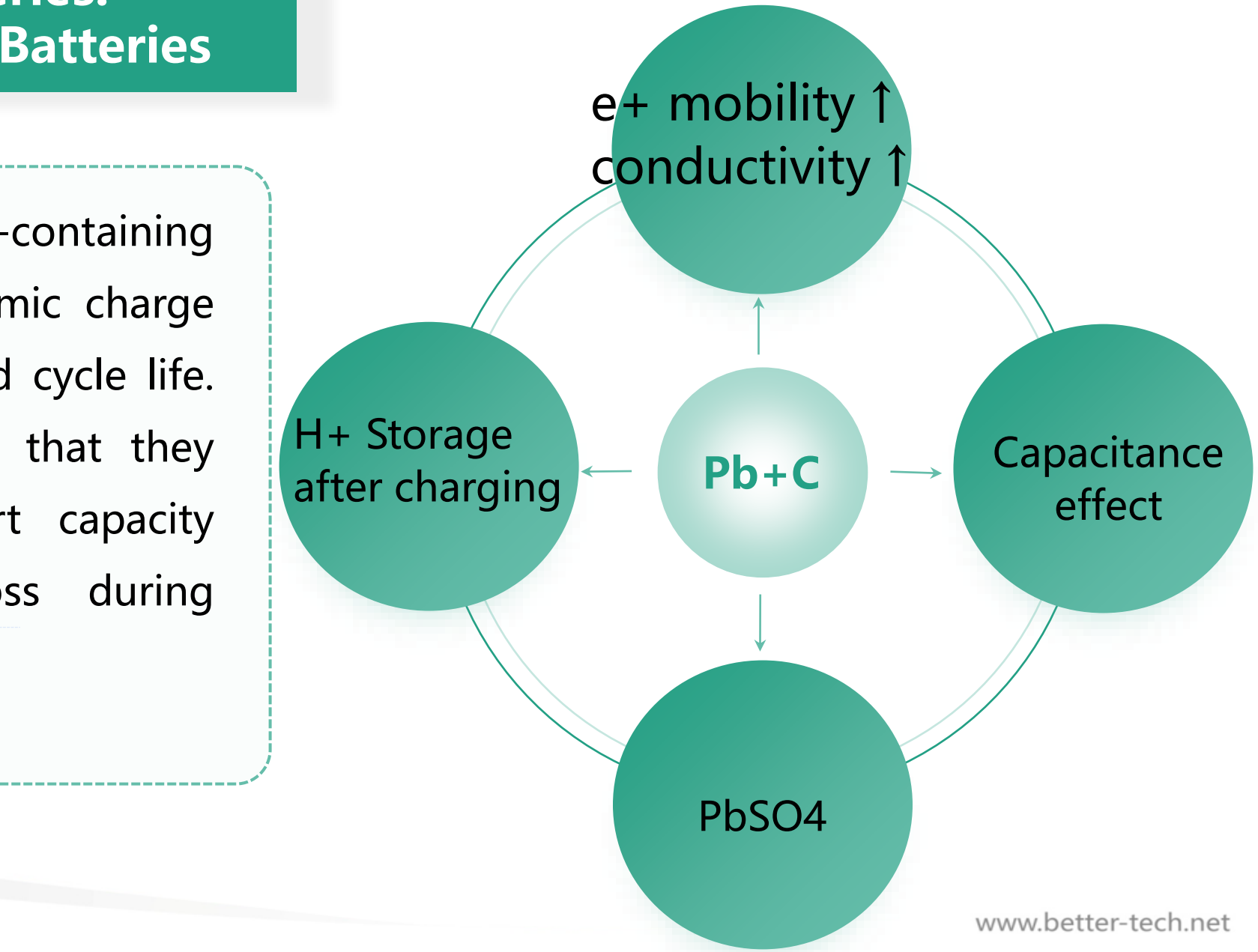
02

High-performance lead-carbon battery solution

- 2.1 Carbon Impact on Batteries
- 2.2 Carbon Material Properties
- 2.3 Lead-Carbon P+ Electrode Selection
- 2.4 Better Tech Group Pb-C battery technology solution

2.1 Lead-carbon batteries: Carbon Impact on Batteries

High surface area carbon-containing materials can improve dynamic charge reception capacity (DCA) and cycle life. However, the side effect is that they harmfully reduce cold start capacity and/or increase water loss during overcharging.



2.2 Lead-carbon batteries: Carbon Material Properties

Modifying carbon electrodes for preferential discharge and suppressed hydrogen evolution

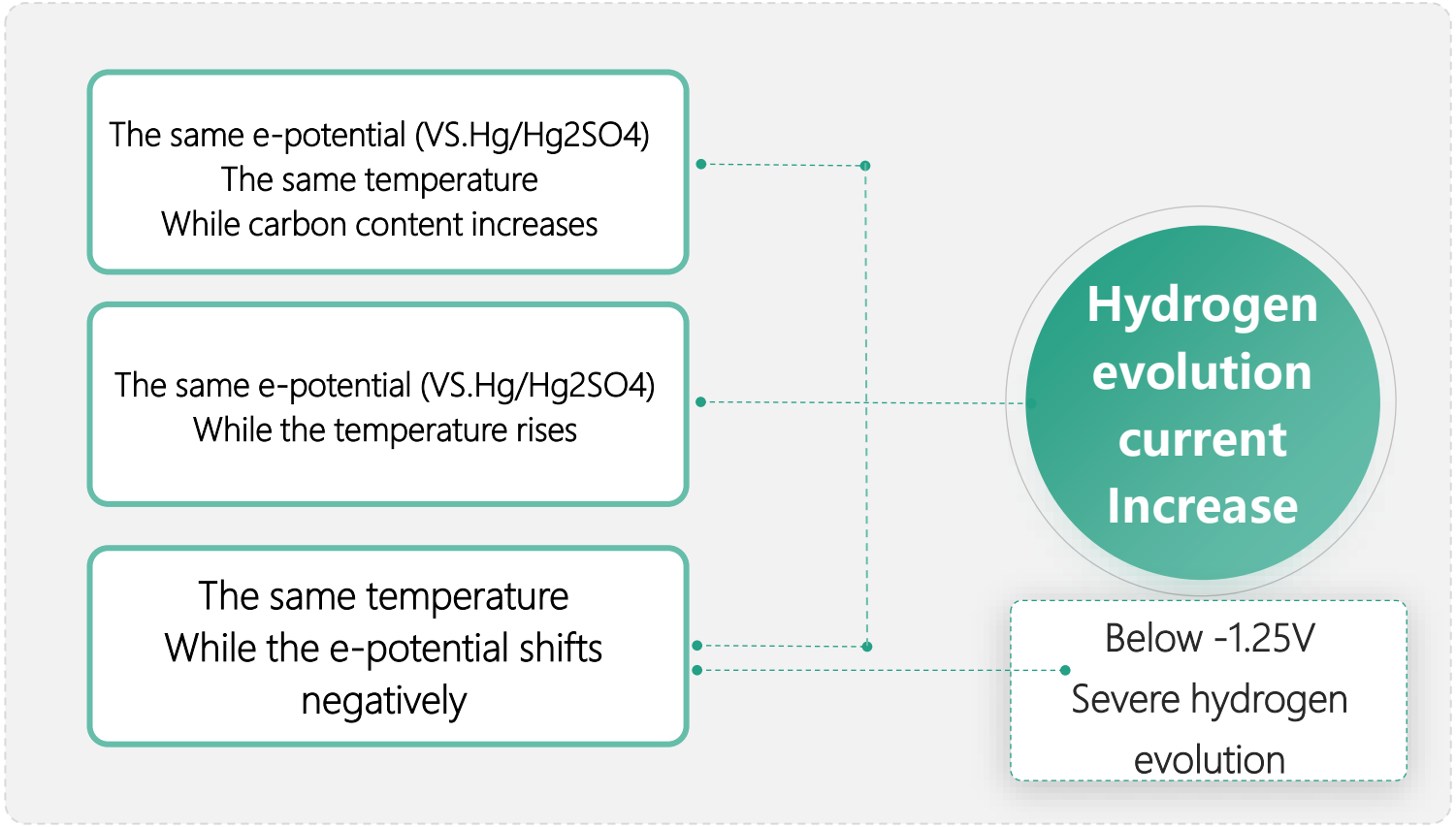
Carbon's lower hydrogen evolution overpotential than lead promotes releasing hydrogen gas during charge, accelerating water loss.

Under float charging conditions
Water loss of energy storage and backup batteries

Property requirements

- **Capacitive behavior**
- **High electrical conductivity**
- **Match Lead-acid battery Electric potential**
- **Good compatibility with lead**
- **Hydrogen evolution overpotential ↑**

2.3 Impact of Temp/E-Potential on Lead-Carbon Battery Hydrogen Evolution



Lead-Carbon Battery: Optimal Hydrogen Control Metrics

Temperature

Under 40 ℃

Electric potential

-1.25 V above

2.4 Impact of Carbon Specific Surface Area on Battery Performance.

High specific surface area

Higher H_2 evolution potential increases water loss

Medium specific surface area

Idea for batteries requiring both high charge acceptance and long life

Low specific surface area

Idea for batteries requiring both high charge acceptance and long life

Select high-surface-area carbon by optimizing dosage, avoiding extreme surface areas, and suppressing hydrogen

2.5 Carbon Selection for Lead-Carbon Battery N- Electrode

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Factors Affecting N-Electrode Active Materials by Carbon Additives

- Electrical conductivity
- Specific surface area
- functional group
- Defect type
- Shape

It diversely affects the N-electrode material's morphology, conductivity, pore structure, and capacitance

Selection method: Adopt a mixed use

Different carbon types and forms vary significantly in effect. Using a single carbon type shows limited improvement, so blending multiple carbons is recommended for optimal performance.

High-surface-area carbon increases reaction surface, while conductive carbon enhances electrical conductivity.

Thus, lead-carbon N- electrode typically use mixed carbons rather than single type, combining their advantages while mitigating limitations.

2.6 Selection schemes for the P+ electrode of lead-carbon batteries

Grid/alloy

Positive plate

Active substance

- Alloy anti-corrosion upgrade
- Grid structure upgrade
- Improved Grid/Plate Ratio
- Active substances structure
- Curing

The process of improving the positive plate

Ignore the improvement of the positive plate

Restrict

Improved N-electrode deep-discharge life

Improved P+ electrode deep-discharge life

Higher Performance Lead-Carbon Battery

PbC Batteries

The overall performance of the battery cannot be improved.

2.7 Our Pb-C battery technology solution

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Lead-Carbon P+ Electrode Production Methods

Boost grid ratio by 1.2xproportion

Redesign grid gibs structure

Optimize alloy (Sn-Ca/Corrosion/Grain)

Adjust paste & curing (Acid/Temperature/Adhesion/PbO_2)

Lead-Carbon N- Electrode Production Methods

Combination of carbon additives

According to the different types and properties of active carbon, carbon black, graphene, and carbon nanotubes for enhanced electrode performance

High specific surface area

Fabricated high specific surface area carbon composite materials under vacuum conditions

Material premixing

Wetting or pre-mixing carbon materials with other additives ensures uniform blending with lead powder, optimizing N-electrode performance

2.8 Pb-C Battery Technology Data

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PbC-12V100AH试验 A#

检验项目		样品及试验项目分配					
		1	2	3	4	5	6
电压(V)		12.94	12.94	12.94	12.94	12.95	12.95
重量（kg）		29.66	29.82	29.78	29.7	29.76	29.76
内阻(mΩ)		4.25	4.27	4.26	4.25	4.31	4.3
容量	首次10小时率容量（10A放到10.8V）	9h44' -97.434Ah	9h44' -97.403Ah	9h50' -98.366Ah	9h48' -98.069Ah	9h46' -97.797Ah	9h47' -97.858Ah
	二次10小时率容量（10A放到10.8V）	9h53' -98.833Ah	9h51' -98.551Ah	9h54' -99.127Ah	9h54' -99.093Ah	9h54' -99.132Ah	9h55' -99.212Ah
	三次10小时率容量（10A放到10.8V）	9h55' -99.159Ah	9h42' -97.109Ah	9h52' -98.762Ah	9h52' -98.809Ah	9h42' -97.086Ah	9h45' --97.604Ah
	3小时率容量（25A放到10.8V）	3h19' -83.150Ah	3h19' -83.150Ah	3h20' -83.627Ah	3h20' -83.462Ah	3h17' -82.127Ah	3h16' -81.720Ah

PbC-12V100AH试验 A#

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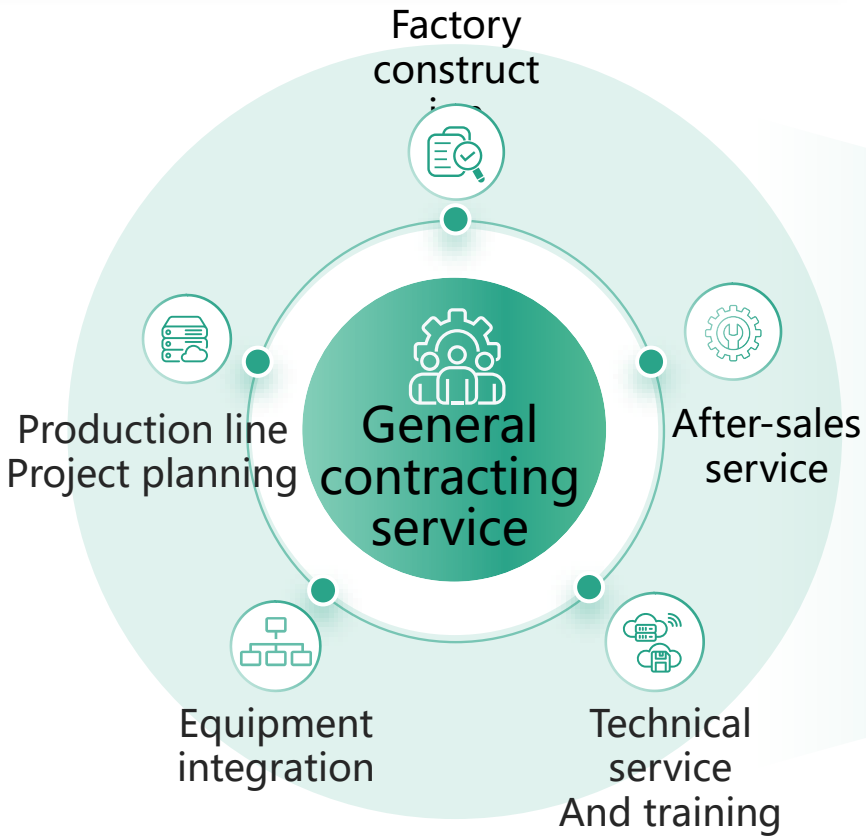
重量（kg）	29.66	29.82	29.78	29.7	29.76	29.76
内阻(mΩ)	4.25	4.27	4.26	4.25	4.31	4.3
容量保存率	9h51' 98.648Ah 99.5%					
低温容量	8h02' -80.328Ah					
充电接受能力	5h00'12.123V -49.981Ah 恒压充电：电压14.398V电流27.681A 容量 4.705Ah					
低温敏感性	10h07' -100.481Ah限流充电168h 10h48' -108.95Ah外观无异常					
高温浮充寿命	A2:第八次高温浮充末期电流：1.213，电压： 13.646V，容量：688.944; 电压（V）：13.03 内阻(mΩ):4.88 重量（kg):29.64 3hr:3h35'					

03

Automated manufacturing of storage batteries

- 1.1 Construction of factory
- 1.2 Automated production line
- 1.3 Plate production line
- 1.4 Continuous plate production line

3.1 Construction of factory



Eco-friendly、Safe、environmental compliance（VOC treatment, zero discharge of wastewater）

Safety & compliance

Factory intelligently upgrading & Production capacity expanding

Upgrade Expand production

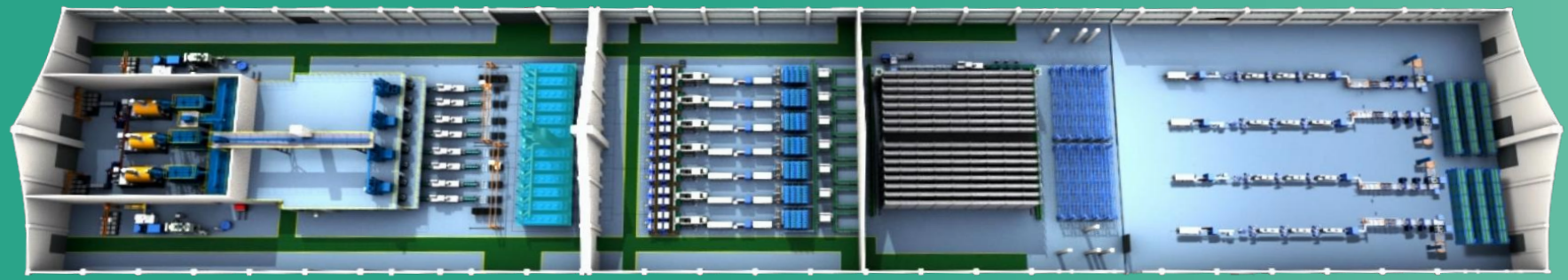
Battery manufacturing one-stop operation

Low cost High efficiency

Reduce the operating costs of the factory

Conversion value

Start production quickly



3.2 Automated production line

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This production line produces 12V 36-200AH automotive starting batteries.

Key stations use high-precision servo motors for automatic model changeovers, reducing setup time.

Automated

Remote monitoring

Digital control

Easy to maintain

Main parameters:

1, Producing 3~4 pcs/min (12V 60AH), speed is adjustable;

2, The compressed air: 0.5-0.7Mpa; Three-phase AC380V±20V、50Hz power supply.

3.3 Plate production line

Core equipment: 1.Lead powder machine; 2.Paste mixing machine; 3.Grid continuous casting and rolling or punching line; 4. Curing room

Lead powder machine

Built-in water spray cooling ensures stable, efficient, and energy-saving operation with precise control.

Capacity: 20t/day. Oxidation: 68–80%. Density: 1.2–1.5g/cm^3.

Air pressure: 0.5–0.7Mpa. Power: 3-phase AC380V±20V, 50Hz.

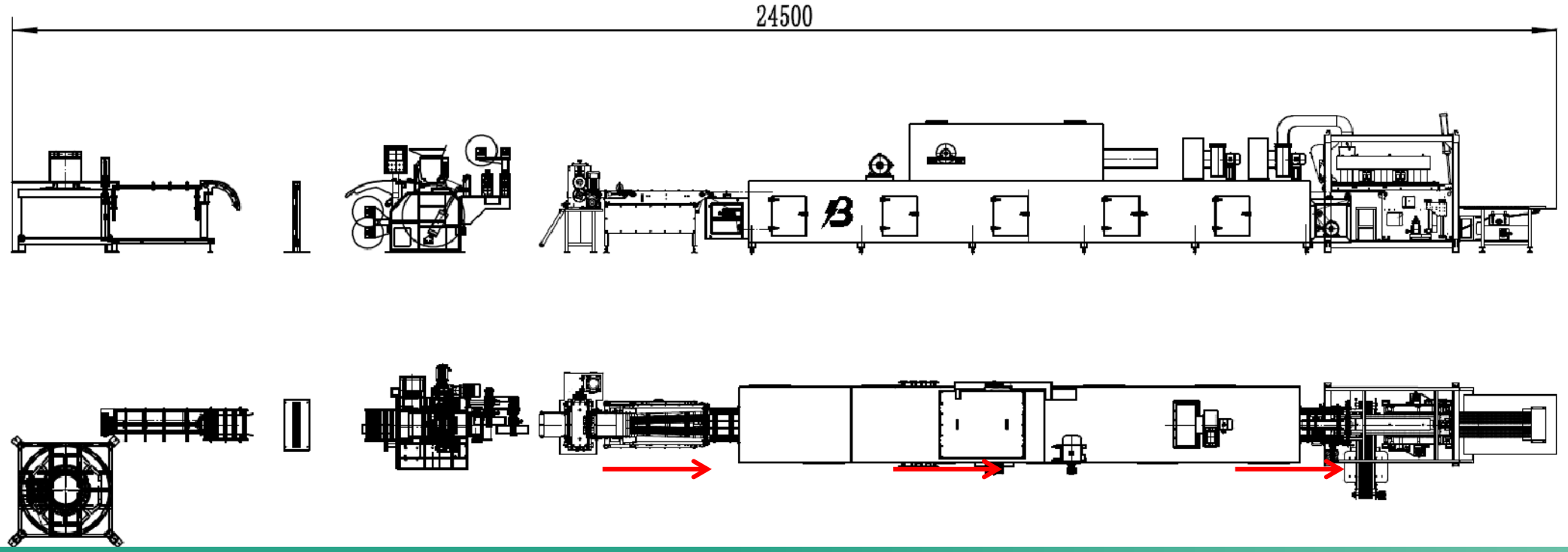
Paste mixing machine

Adopts imported PLC and industrial touchscreen for thorough, stable, uniform mixing.

Capacity: 500kg or 1T per batch. Mixing time: 25-40min.

Compressed air: 0.5-0.7Mpa. Power: 3-phase AC380V±20V, 50Hz.

3.4 Continuous plate production line



This line handles continuous coating, paper covering, plate separation, drying, and collection for both punched and cast/rolled grids.

Speed: 20–35m/min (adjustable), acceptance rate ≥20m/min.

Air pressure: 0.5–0.7Mpa. Power: 3-phase AC380V±20V, 50Hz.

04

Advantages

- 4.1 Service standards
- 4.2 Service Process
- 4.3 Project Presentation
- 4.4 Global Strategic Partners

4.1 Pioneer of 4P Service Standard

Performance — Nice Performance

Price — Nice Price

Planning — Free Planing

Pleasant — Never Say " NO"

4P STANDARD

Battery Manufacturing
4P Service Standard Pioneer

4.2 Service Advantages

Product whole process service

Free planning → Review and analysis → Production tracking → Logistics preparation

Installation & commissioning → Training and guidance → Acceptance → After-sales service

4.3 Overseas battery manufacturing on-site service

















4.4 International Cooperation and Communication





▲ International exhibition interaction
▼ Foreign customers visit and exchange


Participate in domestic and foreign industry exhibitions and forums **20+** times every year

Exchange with foreign customers **30+** times every year

4.5 Partial Global Strategic Partners

Continue to create values for customers,

the business scope covers nearly **120+** countries and regions around the world

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Thank you for your watching!

Better Technology Group Limited

Service/ Innovation/ Endeavour/ Reciprocity

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