

HCB Battery Co., Ltd.

Lithium Primary Battery Leading Manufacturer in China



为您的科技提供动力 We Power Your Technology







➢ PART 1. About Us

► PART 2. Our Products

➢ PART 3. Our Advantages

➢ PART 4. Our Clients

About Us

为您的科技提供动力 We Power Your Technology

About Us

HAOCHENG Group was founded in 1995, it is a group company specializing in R&D, production, sales and service of backup power sources, and providing professional solutions for customers.

HAOCHENG operates 3 branch companies in China: BEIJING CHENXUNDA TELECOMMUNICATION EQUIPEMT CO., LTD. BEIJING NANDU HAOCHENG POWER EQUIPMENTS CO., LTD. HCB BATTERY CO., LTD.







HCB Branches in CHINA





`

+

Group History & Highlight projects







+

Our Vision

The World Will See China

Through HCB

Development Concept





Service Concept

Cherish what customer entrusted, take it as our own business

Product Concept

Satisfy customers and achieve ourselves

Environment Concept

Protect the environment and be a good example of our children

+

Development Concept



Show Originality Continuously Keep Indigenous Innovation Improvement and Strive for Perfection.

FAITHFULNESSSINCERITYPRACTICABILITYEXCELLENCE

Specialize Focus Serve



HCB Team Building





Trainings Quality month activities Annual Spring Festival Party

(+)

Charity



Since 2010, Haocheng Group has donated the 东西湖区"春蔷班"捐资助学仪式 project of "Spring Bud Class" in Wuhan Dongxihu District into the long-term donation plan, and we will do our best to help children to achieve their dreams! Haocheng employees donate to he people in the disaster area 专望组励 錢航夜江 机喷油器 相關減甚 为生的中国红中学人道 为来的中国位于中人道 NETS STATE LOBERT BURNER **** 19.88 * . Letter 乘以13亿,都会变成爱的海洋; + enter 都会变得微不足道.



+



Haocheng Devoted to Sichuan Jiqing Middle School

Our Products

为您的科技提供动力 We Power Your Technology

Basic Concept

A battery is a device that converts chemical energy into electrical energy.

• 锂-亚硫酰氯

柱式电池(ER)

- According to whether the battery can be recharged for classification, the battery is divided into
 Primary battery
 - (Non-rechargeable battery) Rechargeable battery (Secondary battery).



• 电池电容器(UPC)

+

Primary Battery Performance Comparison





FIG. 1 Performance curves of primary cell in various electrochemical systems



FIG. 2 Storage characteristics of primary cells in various electrochemical systems

(+)

Our Products

HCB Battery was founded in 2001, As a leading primary lithium battery manufacturer in China, HCB is concentrating on R&D and manufacturing of primary lithium batteries, and provide customers with solutions and quality services.



- **Li-SOCl₂ cylindrical batteries**
- **Li-MnO**² cylindrical batteries
- **ER+ Solutions: Battery + Capacitor UPC**
- Li-MnO₂ battery star products Super capacity series battery



Li-SOCl₂ Cylindrical Batteries





Bobbin





Higher capacity	Specific energy density up to 590Wh/kg	High voltage	Nominal voltage up to 3.6V. Has a stable discharge platform
Long storage	Low self-discharge rate	Wide temperatu	re
life	Low passivation effect	range	-55°C to +85°C;



Li-MnO₂ Cylindrical Batteries







High energy \cdot

No internal pressure under normal temperature

Multiple security design

Low self-discharge rate and long storage life

No passivation • Wide temperature range , -40℃ to+85℃

• Nominal voltage up to 3.0 V



ER+ Series Solutions: Battery Capacitor - UPC





The HCB ER+ power solution is a preferred combination of lithium-thionyl chloride battery (ER) and battery capacitor (UPC). It is technically characterized by high capacity requirements for IoT applications and high pulse output capability. In this combination, the ER battery charges the UPC as an energy storage device, and the UPC acts as a power amplifier that provides a large current pulse output.

Model	Capacity (As)	Maximum continuous current(A)	Maximum pulse current (A)	Internal resistance(mΩ)
UPC1520	140	0.5	2	≤200
UPC1525	190	1	3	≤150
UPC1550	560	2	5	≤100

Significant advantages::

+ The combined product inherits the capacity and safety advantages of bobbin batteries;

- + Compared with ER spiral batteries, the discharge capacity has a significant advantage;
- + Multiple combinations are available;
- + No passivation;
- Compared with a single battery, the cost has increased and the volume has increased;



ER+ Series Solutions: Battery Capacitor - UPC



Solve your application problems at low temperatures -The second generation ER+ solutions



At very low temperatures -40 °C, UPC1520 can provide **350mA** pulse current, UPC1550 can provide **1000mA** pulse current;

> HCB ER+ battery solution has obvious low temperature performance advantages compared with its competitors. It is recommended to test the discharge performance at temperature of -20°C, -30°C and -40°C.

ER+ Series Solutions: Battery Capacitor - UPC



Compared to traditional primary lithium batteries, the HCB ER+ solution has the following four advantages:

Wide temperature range	-40°C to +85°C operating temperature range for high current load pulses in extremely low temperature environments of -40 °C		
High output power	The maximum pulse current is 5000mA, and the instantaneous power reaches 15W.		
High capacity	Compared with the same type of Bobbin battery, its capacity increased more than 30%.		
	The welter we were institute offerst slears wet a source during the diffetive s		

No passivation The voltage passivation effect does not occur during the lifetime.

Li-MnO₂ Soft Battery



HCB is the **Inventor** of Li-MnO₂ Soft Battery Structure.





HCB Innovative CP Battery Solution



An application example of the door and window anti-theft alarm sensor for a foreign customer



HCB Innovative CP Battery Solution





Regular version;

The nominal voltage is 3V, annual self-discharge rate under normal temperature conditions does not exceed 2%; no passivation;

High pulse, high rated version;



High temperature version;

It can work between -40°C and +70°C; Some high temperature models can work between -40 °C and +80°C;



Super capacity version;

Higher energy density than Li-MnO2 Cylindrical batteries;



Ultra thin version

The thinnest thickness is 0.4mm, which is suitable for the light weight requirements of modern electronic products.



Super Capacity Li-MnO₂ Cylindrical Cell



World class product The largest capacity of the same size battery Intrinsic Safety - T6

Main parameters:

Battery performance advantages:

- Super Capacity
 - High Capacity Utilization 🔶
- Intrinsic Safety
 - No Voltage Delay Effect

Model	DIM (mm)	Height (mm)	Capacity (mAh)	Max continuous current (mA)	Max pulse current (mA)	Capacity discharge with 10mA at room temperature (mAh)
CR123ASC	17.0	33.5	2100	20	100	1900
CR14250SC	14.5	25.2	1050	20	100	850
CR14505SC	14.5	50.5	2350	50	200	2200

 \blacklozenge



Li-MnO2 Cylindrical Battery – Super capacity CR123ASC



	HCB CR123ASC	Typical Bobbin CR2/3A
Nominal Capacity	2100mAh	1900mAh
Standard Discharge Current	1mA	0.5mA
Max. Continuous Current	25mA	5mA
Max. Pulse Current	100mA	20mA
Short Circuit Temperature	≤60°C	≤80°C

The CR123ASC battery is a battery of the Intrinsically Safe T6 (Exia IICT6). When the battery is short-circuited at room temperature, the maximum temperature of the battery surface does not exceed 85 °C. Ex----International Electrotechnical Commission IEC explosion-proof public sign, indicating that the product is explosion-proof ia----Explosion-proof form is intrinsically safe and is suitable for Zones 0, 1, and 2.

 $\ensuremath{\mathbbmm{IC}}\xspace$ ----Allowed to involve Class IIC explosive gases

T6----Equipment surface temperature does not exceed 85 ° C



The CR123ASC battery adopts a semi-sealed structure, and its safety is further guaranteed. In the actual detection process, the maximum temperature of the battery surface will not exceed 60 ° C, and the battery can even be sold in the civilian market.



Performance Comparison of HCB Batteries



	Li-MnO ₂ Cylindrical Battery (CR)	Li-SOCl ₂ Cylindrical Battery (ER)	Li-MnO ₂ Soft Battery (CP)	
Energy Density (Wh/kg)	180~330	480~590	360~450	
Features	High security, green energy, suitable for continuous large current output in a low voltage platform.	High specific energy, high and stable working voltage, wide operating temperature range.	The safest primary lithium battery personalized design without dimension limitation.	
Temperature Range	-40°C~+85℃	-55℃~+85℃	-40°C~+70°C (80°C)	
Typical Discharge Curves	Typical Discharge Profiles at 25 C (CR123A)	Typical Discharge Profiles at 25 C (ER)26500)	Typical Discharge Profiles at 28 C (CP7839108)	
Optional Structure	Spiral, Bobbin	Spiral, Bobbin	Spiral	
Spiral Structure Diagram	Positive Terminal Anode Cathode	Positive Terminal PTC Electrolyte Separator Anode Cell Can Cathode	Positive Terminal Aluminum Laminated Film Separator Anode Cathode	
Bobbin Structure Diagram	Positive Cell Cap Separator Anode Cathode	Positive Terminal Glass-to-metal seal Electrolyte Cathode Anode Cell Can	/	



Summary of Preferred Battery Solutions





In the field of primary lithium battery applications, the application scenario is divided into four dimensions according to the power consumption and power demand of the product application. These are: low power consumption solution, low power consumption large-capacity solution, high power consumption solution and high power consumption large-capacity solution. The following is load/capacity consumption analysis and industry application statistics for these four dimensions.

Capacity / mA

为您的科技提供动力 We Power Your Technology

Our Advantages

为您的科技提供动力 We Power Your Technology

Know-How

Unique combination of Chinese and foreign R&D team

Unique coating technology for Li-MnO2 battery Higher consistency Flexible dimension Good performance with high current discharge

Inventor of lithium Li-MnO2 CP battery

Independent dehumidification system

Automatic electrolyte preparation process for Li-SOCI2 battery

/IOC

World-class SC (super capacity) series battery

High automation level of lithium thionyl chloride battery Full process self-test Two sets of CCD detection Positive height detection Negative height detection



Through cooperation with foreign advanced research institutions and experts, HCB continuously improves the technical level and product quality of the company.





Innovation \cdot An inexhaustible driving force for enterprise development





Michael Senior Technical Adviser

• Possess a Bachelor's degree in chemistry and a Master's degree in business management.

• Obtained 13 US patents in the field of lithium battery design, and published more than 20 papers in the field of electrochemistry and mechanical engineering.

Christopher Senior Researcher

• Obtained a bachelor's degree in chemistry from Massachusetts Institute of Technology and a PhD degree from Ohio State University. After obtaining a postdoctoral degree from Clemson University, he joined the research team of St. Jude's Medical College.

• Published many papers in the field of solid materials and obtained 13 patents.



Innovation · An inexhaustible driving force for enterprise development

RN CTO



Name and Photo are kept as confidential

• Over 40 years of experience, dedicated to product design, research and development of lithium primary batteries, lithium ion batteries and lithium polymer batteries.

• Experienced in battery technology, including material selection, structural design and battery pack design;

• Electrochemical cell design: primary lithium battery Li/SO2, Li/MnO2, Li/MnO2:CFx, Li/SOCl2 and secondary Lithium battery: LCO, NCA, NMC, LMO, LiFePO4;

• Electrochemical formulation research and development, primary and secondary battery.

• Research and development of cathode mixing and coating processes for lithium primary and secondary battery.

• Dry & wet mixing process-lithium primary and lithium secondary cathode and anode assembly research and development, performance improvement and failure analysis.

Quality Management -- International Standard



Chris Quality Director

- Over 28 years of Manufacturing and Quality experience.
- Held position of Quality Supervisor, Quality Engineer and Quality
- Manager in the manufacturing industry.
- Worked for SAFT batteries for **over 7 years** as Production Supervisor.



Automatic Coating Machine

Unique Coating technology for Li-MnO₂ battery

Higher consistency Flexible dimension Good performance with high current discharge

Advantages

Slurry particles are finer;

Material dispersion is more uniform, Higher mixing;

The use of aluminum foil, the current collection effect is significantly better than the traditional aluminum mesh;

The load capacity of the battery produced by the coated cathode sheet is significantly improved.

Quality Control — Automatic production lines





Since 2017 HCB has continued to introduce several advanced automated production lines. Improve product quality and ensure product consistency.



Quality Control — Automatic production lines





Li-SOCl₂ cylindrical Li-MnO₂ cylindrical Li-MnO₂ soft battery

Automatic production line

+

Automatic Production Lines -Li-SOCl₂ Cylindrical





(+)

Automatic Production Lines – Li-MnO2 Cylindrical







Soft Battery Automatic Production Lines



From raw materials to finished products, each process is strictly controlled.







particle size analyzer



Quality Control

152

...............

- 1/ Battery Drop Testing Machine
- 2/ Battery Impact Testing Machine
- 3/ Battery Crush/A penetration Testing Machine

Impact Testin HCS 4/ Battery Burning Testing Machine

5/ Battery Thermal Shock Testing Machine

6/ Weight Loss Testing Machin



该环境管理体系适用于:

锂电池系列产品的设计开发和生产

颁证日期:2019年07 右黄期 07 初次颁证 013年07月10日

主京市朝阳区樱花东街5号新化信大厦4楼

D D

n

总经理 北京三星九千认证中心

法:在一个认证用现内裁正规规定规模,在常常相互分格后此证书保持有效,可扫描二维码获取当前状态 本证书信息可在本教的用题 nauring9000.com)及国家认证认可监督管理委员会省方网站(www.cnca.gov.cn)上登询



Date of Issue Date of Expir Date of Initia Notice: The orean

Beiling Sanxing 9000 Certification Body

CERTIFICATE OF CONFORMITY OF ENVIRONMENT

MANAGEMENT SYSTEM CERTIFICATION

Certificate 03119E20108R2M This is to certify the environment management system of

HCB BATTERY CO.,LTD

Unified social credit code: 914201127612022561 Add: No.1 Special Taizhong Avenue, Gaoqiao Industrial Park,

Wujiashan Economic Development Zone, Wuhan City, Hubei Province, China

is in conformity with

GB/T 24001-2016/ISO 14001:2015 standard

This certificate is valid to the following product(s)/service

Design development and production of lithium battery series products

w cycle. Upon qualified, the certificate would be valid and OR code can e information can be queried on the beijing naming 9000 certification body's website by a administration of the P.R.C. website by wescence goten.



be scanned to obtain it





General Manager

No.5 Yinchue East al. Cheovano District Belling P.R.C.



颁证日期:7018年05

202

初次颁证:2003年 09月 22日

有效期至

北京市新阳区樱花东街5号新化信大厦4楼

+



System Certifications

锂电池系列产品的设计开发和生产

注:在一个认证成熟的药菜做枳皮都使文成各审使且合善后此证书保持有效,可扫描二维码获取当前代态

本证书信息可在本农和网站《manuting9000.com) 及国家认证认可监管管理委员会省方所站 (www.cncs.gov.cn) 上查询

总经理

北京三星九千认证中心

MANAGEMENT SYSTEM

国认可 読石は 管理体系

CNAS C031-M

System Certifications





三星九千认证 050

职业健康安全管理体系认证证书

注册号: 03119S10100R3M

兹证明: 武汉吴诚能源科技有限公司

统一社会信用代码: 914201127612022561

地址:湖北省武汉市东西湖区吴家山经济开发区高桥产业园台中大道特1号

职业健康安全管理体系符合

GB/T 28001-2011/OHSAS 18001:2007 标准

该职业健康安全管理体系适用于:

锂电池系列产品的设计开发和生产

頒证日期

初次颁订

土京市期间区樱花东街5号新化信大厦4楼

总经理

2007 标准失效 (2021年3月12日) 而失效 北京三星九千认证中心 本证书题 OHSAS 注:在一个认证周期内的证据积实规划,在常审核卫合格后此证书保持有效,可扫描二维码获取当前状态 本证书推荐可当本机构网站 (www.sanzing9000.com)及图象以证以可监查管理委员会官方网站 (www.cnca.gov.cn)上量调



CERTIFICATE OF CONFORMITY OF OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM CERTIFICATION

Certificate 03119S10100R3M This is to certify the occupational health and safety management system of HCB BATTERY CO.,LTD Unified social credit code: 914201127612022561 Add: No.1 Special Taizhong Avenue, Gaoqiao Industrial Park, Wujiashan Economic Development Zone, Wuhan City, Hubei Province, China is in conformity with

GB/T 28001-2011/OHSAS 18001:2007 standard This certificate is valid to the following product(s)/service

Design development and production of lithium battery series products

Date of Issue: Date of Expire Jul 7th,2022 Date of Initia This certificate

OHSAS 18001:

General Manage Beijing Sanxing 9000 Certification Body ane certification cycle. Upon qualified, the certificate would be valid and QR code can

Marian The or ate information can be queried on the beijing soming \$000 centification body's website by he searned to obtain its cu reditation administration of the P.R.C. website by www.cnca.gov.cn. www.sanaine9900.com or cente

e invalidation (



dard (Marth 12 2021)



Products Certificates





(+)

Our Clients

为您的科技提供动力 We Power Your Technology Large number of cooperative customers | 1000+ Wide service industry coverage | 100+ Long customer service life | 10+

Specialize Focus Serve Satisfy Customers and Achieve Ourselves

Clients





+

Applications







Smart gas meter | FIO **Bike sharing | DiDi**



Polaroid

ò



Magnetic door lock sensor | Sensitive







Pipeline corrosion monitoring



ETC vehicle unit

Security | FireAngel

FireAngel. Smart Home Lösunger

(+)

HCB Industrial Park

HCB Industrial Park: It is located in a National-level Economic Development Zone, covering 32,000 m² (344,416 sq.ft)

「田田」

the

Development Timetable (Area of Structure): 2012 Phase I: 13,600 m² 2017 Phase II: 10,000 m² 2021 Phase III: 15,000 m²



~ Thank you ~

With Experience of 25 Years

And Wisdom of 600 Persons

We Do only One Thing

HAOCHENG Group

Add: 801#, 1+1 Mansion, No.10 Caihefang Rd, Z-park West, Haidian District, Beijing, China P.O.: 100080 Tel: +86 (0)10 6261 8891/92/95/96 Fax: +86 (0)10 6261 0808 www.haochengpower.com

HCB BATTERY Co., Ltd.

Add:No.1 Special Taizhong Avenue, Gaoqiao Industrial Park, Wujiashan Economical Development Zone, Wuhan, China P.O.: 430040 Tel: +86 (0)27 8324 8452 Fax: +86 (0)27 8324 8455 Email: sales@cnhcb.com www.cnhcb.com