

# 产品规格书

## Product Specification

### 圆柱形锂离子电池

Cylindrical Lithium-ion Rechargeable Cell

型号 : IFRC32700

Model : IFRC32700

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产品规格书 Product Specification

型号 Model : IFRC32700 版本 Version : A/1

## 变更履历 Change History

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## 1 适用范围 Scope of Application

本产品规格书适用于IFRC32700圆柱形磷酸铁锂锂离子电池的技术要求、测试方法及注意事项。

This product specification describes the technical requirements, test methods and use suggestions for cylindrical lithium-ion rechargeable cell (IFRC32700).

## 2 说明及型号 Product Type and Model

产品名称：圆柱形磷酸铁锂锂离子电池（以下简称电池）；

Product Type: Cylindrical Lithium-ion Phosphate Rechargeable Cell (referred to as:Cell)

型号规格：IFRC32700。

Product Model: IFRC32700.

## 3 产品基本特性 Product Specification

表 1 电池基本特性 Product specification

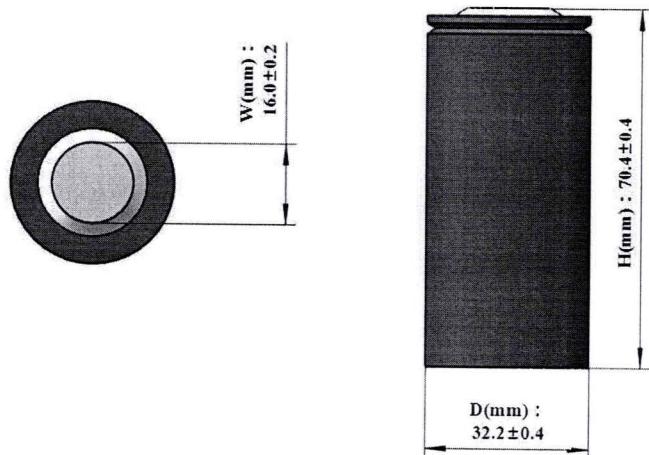
项目 Items	参数 Specifications	备注 Remarks
标称电压 Nominal Voltage	3.2 V	
额定容量 Nominal Capacity	6000mAh	标准充电, 在 25°C±2°C 下, 0.5C 放电至 2.0V Standard charge, 25°C±2°C, 0.5C discharge to 2.0V
内阻 Internal Impedance	≤11mΩ	交流频率 AC 1kHz AC 1KHz
使用温度 Operation Temperature	充电: 0°C~45°C; Charging Temperature: 0°C~45°C; 放电: -20°C~60°C Discharging Temperature: -20°C~60°C	
充电截止电压 Charge Limited Voltage	3.65V	
放电截止电压 Discharge Cut-off Voltage	2.0V	
标准充电 Standard Charge	0.5C	在 25°C±2°C 下, 恒压阶段截止电流 0.05C

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项目 Items	参数 Specifications	备注 Remarks
		25°C±2°C, CV Cut-off 0.05C
快速充电 Rapid Charge	1C	0°C~45°C, 恒压阶段截止电流 0.05C 0°C~45°C, CV Cut-off 0.05C
标准放电 Standard Discharge	0.5C	
快速放电 Rapid Discharge	1C	放电至 2.0V Discharge to 2.0V
最大持续放电 Max. Discharge	3C	放电至 2.0V Discharge to 2.0V
外形尺寸 Dimension	D= (32.2±0.4) mm H= (70.4±0.4) mm	
重量 Weight	≤145g	
储存条件 Storage Conditions	1 个月内 one month: -20 °C~ 45°C; 3 个月内 three months: -20 °C~ 35°C; 12 个月内 one year: 0°C~ 35 °C; 相对湿度 relative humidity: ≤ 70%	30%~50%SOC
出厂电压 Shipping Voltage	3.10V~3.35V	

## 4 外形图 Cell Dimension



## 5 标准测试条件 Standard Testing Conditions

### 5.1 环境测试条件 Environmental Conditions

若无特别要求，此规格书上的产品测试条件均为温度  $25\pm10^{\circ}\text{C}$ ，湿度 15~95%RH，大气气压 86~106kPa。

Unless otherwise specified, the test should be carried out in an environment with a temperature of  $25\pm10^{\circ}\text{C}$ , a relative humidity of 15~95%, and an atmospheric pressure of 86kPa to 106kPa.

### 5.2 测试设备要求 Measuring Instruments

#### (1) 伏特计和安培表 Voltmeter and Ammeter

安培表和伏特计的精度不低于 0.5 级。

The DC voltmeter and ammeter with an accuracy of no more than 0.5%.

#### (2) 尺寸和重量测量设备 Dimension and weight measuring device

测量尺寸、时间和重量的仪器精度范围  $\pm 0.1\%$ 。

The accuracy of the dimensions and weight measuring device should be no more than  $\pm 0.1\%$ .

#### (3) 温度测量设备 Temperature measuring device

测量温度的仪器精度范围  $\pm 0.5^{\circ}\text{C}$ 。

The accuracy of the temperature measuring device should be no more than  $\pm 0.5^{\circ}\text{C}$ .

#### (4) 内阻测试仪 Impedance meter

内阻测试仪的测试方法为交流阻抗法 (AC 1kHz)。

The impedance shall be measured with the sinusoidal alternating current method (AC 1kHz).

## 6 性能及测试方法 Performance and Testing Procedure

### 6.1 外观 Appearance

目视检查电池，外观应清洁、平整，无变形、划痕、生锈和漏液等现象。

Examine with naked eyes. There shall be no such defects like deep scratch, flaw, crack, rust or leakage.

### 6.2 尺寸 Dimension

用游标卡尺测量电池，为了防止电池短路，卡尺的卡头上应贴上一层绝缘材料。

Use vernier caliper to measure while avoiding short-circuit, there should attach a layer of insulation material on the external jaws.

### 6.3 电性能 Electrical Performance

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表 2 电池电性能 Electrical performance

测试项目 Items	测试方法 Test Conditions	检验标准 Specifications
倍率放电 性能 Rate Discharge Performance	<p>在<math>25^{\circ}\text{C}\pm2^{\circ}\text{C}</math>温度条件下, 电池以标准充电方式充电后, 分别以<math>0.5\text{C}</math>、<math>1\text{C}</math>、<math>3\text{C}</math>电流放电至<math>2.0\text{V}</math>, 并记录3种电流条件下的放电容量<math>C1</math>、<math>C2</math>、<math>C3</math>。</p> <p>Under the temperature of <math>25\pm2^{\circ}\text{C}</math>, the discharge capacity is measured with <math>0.5\text{ C}</math>、<math>1\text{C}</math>、<math>3\text{C}</math> discharge current and <math>2.0\text{V}</math> cut-off voltage after standard full-charged. The capacity is defined as <math>C1</math>、<math>C2</math>、<math>C3</math>.</p>	$C1\geq100\%$ 额定容量; $C2\geq99\%$ 额定容量; $C3\geq95\%$ 额定容量。 $C1\geq100\%$ Nominal Capacity; $C2\geq99\%$ Nominal Capacity; $C3\geq95\%$ Nominal Capacity.
高低温放电 性能 Temperature Performance	<p>电池以标准充电方式充电后; 按以下条件放电, 记录放电容量。</p> <p>(1) 在<math>-10^{\circ}\text{C}\pm2^{\circ}\text{C}</math>温度条件下搁置4h, 以<math>0.5\text{C}</math>放电至<math>1.8\text{V}</math>。</p> <p>(2) 在<math>0^{\circ}\text{C}\pm2^{\circ}\text{C}</math>温度条件下搁置4h, 以<math>0.5\text{C}</math>放电至<math>2.0\text{V}</math>。</p> <p>(3) 在<math>60^{\circ}\text{C}\pm2^{\circ}\text{C}</math>温度条件下搁置4h, 以<math>0.5\text{C}</math>放电至<math>2.0\text{V}</math>。</p> <p>After standard full-charged of the cells, According to the following conditions test the capacity and record.</p> <p>(1) Cells shall be stored for 4 hours at <math>-10^{\circ}\text{C}\pm2^{\circ}\text{C}</math>, then discharged at <math>0.5\text{C}</math> to <math>1.8\text{ V}</math> .</p> <p>(2) Cells shall be stored for 4 hours at <math>0^{\circ}\text{C}\pm2^{\circ}\text{C}</math>, then discharged at <math>0.5\text{C}</math> to <math>2.0\text{ V}</math> .</p> <p>(3) Cells shall be stored for 4 hours at <math>60^{\circ}\text{C}\pm2^{\circ}\text{C}</math>, then discharged at <math>0.5\text{C}</math> to <math>2.0\text{ V}</math> .</p>	(1) $-10^{\circ}\text{C}$ 放电容量/额定容量 $\geq50\%$ ; (2) $0^{\circ}\text{C}$ 放电容量/额定容量 $\geq75\%$ ; (3) $60^{\circ}\text{C}$ 放电容量/额定容量 $\geq98\%$ . (1) $-10^{\circ}\text{C}$ Capacity/Nominal Capacity $\geq50\%$ ; (2) $0^{\circ}\text{C}$ Capacity/Nominal Capacity $\geq75\%$ ; (3) $60^{\circ}\text{C}$ Capacity/Nominal Capacity $\geq98\%$ .
循环寿命 Cycle Life	<p>在<math>25^{\circ}\text{C}\pm2^{\circ}\text{C}</math>温度条件下, 电池以<math>1\text{C}</math>恒流恒压充满电至<math>3.45\text{V}</math>, 截止电流<math>0.05\text{C}</math>, 搁置30min, 以<math>1\text{C}</math>放电至<math>2.0\text{V}</math>, 搁置30min, 以此为循环; 当电池第2000次循环完成后, 记录此时的放电容量。</p> <p>At <math>25\pm2^{\circ}\text{C}</math>, <math>1\text{C}</math> full-charged to <math>3.45\text{V}</math>, CV Cut-off <math>0.05\text{C}</math>, and discharge to <math>2.0\text{V}</math> with <math>1\text{ C}</math> discharge current, 30min between charge and discharge, after 2000 cycles the discharge capacity is measured.</p>	2000 次循环后放电容量 $\geq80\%$ 首次放电容量。 2000 cycles, capacity $\geq80\%$ first capacity.

测试项目 Items	测试方法 Test Conditions	检验标准 Specifications
贮存性能 Storage Performance	<p>电池以标准充电方式充入 45% 的电量；分别在 <math>25^{\circ}\text{C} \pm 2^{\circ}\text{C}</math>、相对湿度 <math>\leq 75\%</math> 环境下贮存 3 个月、6 个月、12 个月后，然后在 <math>25^{\circ}\text{C} \pm 2^{\circ}\text{C}</math> 环境下以 0.5C 标准充放电，循环 5 次并记录电池的放电容量；5 周循环的最大放电容量作为判断标准。</p> <p>After standard charged to 45% capacity of the cell, then storage for 3,6,12 months respectively at <math>25^{\circ}\text{C} \pm 2^{\circ}\text{C}</math> and relative humidity of <math>\leq 75\%</math>, and the cell is cycled for 5 times with standard charge and discharge, the maximum discharge capacity is recorded.</p>	<p>贮存 3 个月的电池放电容量 <math>\geq 5.7\text{Ah}</math>； 贮存 6 个月的电池放电容量 <math>\geq 5.6\text{Ah}</math>； 贮存 12 个月的电池放电容量 <math>\geq 5.5\text{Ah}</math>。</p> <p>After 3 months storage <math>\geq 5.7\text{Ah}</math>; After 6 months storage <math>\geq 5.6\text{Ah}</math>; After 12 months storage <math>\geq 5.5\text{Ah}</math>.</p>
	<p>电池以标准充电方式充电后；在环境温度为 <math>25^{\circ}\text{C} \pm 2^{\circ}\text{C}</math> 条件下搁置 28 天；再在环境温度为 <math>25^{\circ}\text{C} \pm 2^{\circ}\text{C}</math> 条件下以 0.5C 放电至 2.0V，放电容量记为 C2；再以标准充电方式充电后，以 0.5C 放电至 2.0V，放电容量记为 C3。</p> <p>The cell is stored for 28 days in <math>25 \pm 2^{\circ}\text{C}</math> after standard full-charged, then discharged to 2.0V with 0.5C at <math>25 \pm 2^{\circ}\text{C}</math>. The capacity is defined as C2.</p> <p>After the test as C2, The cell is standard full-charged and discharged to 2.0V with 0.5C at <math>25 \pm 2^{\circ}\text{C}</math>, The discharge capacity is C3.</p>	<p>容量保持率 <math>\text{C2}/\text{额定容量} \geq 93\%</math>； 容量恢复率 <math>\text{C3}/\text{额定容量} \geq 95\%</math>； Capacity Retention <math>\text{C2}/\text{Nominal Capacity} \geq 93\%</math>； Capacity Recoverable Ratio <math>\text{C3}/\text{Nominal Capacity} \geq 95\%</math>.</p>

#### 6.4 环境适应性 Environmental Characteristics

表 3 电池环境适应性 Environmental characteristics

测试项目 Items	测试方法 Test Conditions	检验标准 Specifications
恒定湿热 Constant Temperature and Humidity	<p>电池以标准充电方式充电后；放入温度 <math>40^{\circ}\text{C} \pm 2^{\circ}\text{C}</math>，湿度 <math>90\% \sim 95\%</math> 的恒温恒湿箱内 48h，取出电池常温搁置 2h，以 0.5C 放电至 2.0V。</p> <p>After standard full-charged of the cell, then put the cell into the constant temperature and humidity oven with <math>40 \pm 2^{\circ}\text{C}</math> and <math>90\% \sim 95\%</math> for 48h, then store the cells at RT for 2h, and discharge the cells with 0.5C to 2.0 volts.</p>	<p>无变形、无泄漏、无锈蚀、无起火、无爆炸等现象，放电容量 <math>\geq 98\%</math> 额定容量。</p> <p>The cell should be no deformation, no rust, no leakage, no fire, no smoking and no explosion.</p> <p>Discharge <math>\geq 98\%</math> nominal capacity.</p>

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测试项目 Items	测试方法 Test Conditions	检验标准 Specifications
跌落 Free Drop	<p>电池以标准充电方式充电后, 在高度 1m 位置处自由跌落于混凝土板上, 两个端面各跌落一次, 圆柱面跌落两次, 共计进行 4 次自由跌落; 测量电池开路电压, 观察 1h。</p> <p>After standard full-charged of the cell,dropped four times from a height of 1m(the lowest point of the cell) onto a concrete floor.. The two end faces fall once and the cylinder falls twice for 4 free drops; measure the battery open circuit voltage and observe for 1h.</p>	<p>不爆炸、不起火、不冒烟, 开路电压不低于 90% 的初始电压。</p> <p>No explosion, no fire, no smoke. The OCV after the test no less than 90% before free-fall test.</p>
挤压 Crush Test	<p>电池以标准充电方式充电后, 放在可移动的平面间, 通过一个液压缸施加 <math>13\pm1\text{kN}</math> 的压力, 一旦达到压力后或电池电压下降至原始电压的 <math>1/3</math> 或与原尺寸相比发生了 10% 的变形, 即可释放压力; 观察 1h。</p> <p>A standard full-charged cell is to be crushed between two flat surfaces. The force for the crushing is applied by a hydraulic ram exerting a force of <math>13\pm1\text{KN}</math>. Once the maximum force has been applied, or an abrupt voltage drop <math>1/3</math> initial voltage, or 10% of deformation has occurred compared to the initial dimension, the force is released; and observed for 1 hour.</p>	<p>不爆炸、不起火</p> <p>No explosion, no fire</p>
振动 Vibration Test	<p>电池以标准充电方式充电后, 将电池固定在振动台上, 沿 X、Y、Z 三个方向各振动 90~100 分钟, 振幅 0.8mm, 振动频率为 10Hz~55Hz, 每分钟变化 1Hz, 在测试完成后电池恢复到原位, 观察 6 小时。</p> <p>A standard full-charged cell is fixed on the vibration table, X、Y and Z for 90~100 minutes, with amplitude of 0.8mm, vibration frequency of 10Hz~55Hz, changing 1Hz per minute. The cell was restored to situ after test completion and observed for 6 hours.</p>	<p>不爆炸, 不起火, 不漏液</p> <p>No explosion, no fire, no leakage</p>
低气压 Altitude Simulation Test	<p>电池以标准充电方式充电后, 将电池放入真空试验箱内, 使其压力为 <math>11.6\text{kPa}</math>, 温度恒定为 <math>20^\circ\text{C}\pm3^\circ\text{C}</math>, 贮存 6 小时, 观察试验结果。</p> <p>The full-charged cells are to be stored for 6 hours at an absolute pressure of <math>11.6\text{ KPa}</math> and the temperature of <math>20\pm3^\circ\text{C}</math>.</p>	<p>不爆炸, 不起火, 不漏液</p> <p>No explosion, no fire, no leakage</p>

测试项目 Items	测试方法 Test Conditions	检验标准 Specifications
机械冲击 Shock Test	<p>电池以标准充电方式充电后,在两个轴向方向进行测试, 每个轴向有正反两个方向。在最初的 3 ms 内最小的平均加速度为 <math>75g_n</math>, 峰值加速度介于 <math>125g_n</math> 和 <math>175g_n</math> 之间, 脉冲持续时间为 <math>6ms\pm1ms</math>; 测试结束后观察 6 小时。</p> <p>The full charged cell has only two axes of symmetry in which case only two directions shall be tested. Each shock is to be applied in a direction normal to the face of the cell. For each shock the cell is to be accelerated in such a manner that during the initial 3 milliseconds the minimum average acceleration is <math>75g_n</math>. The peak acceleration shall be between <math>125g_n</math> and <math>175g_n</math>, shock pulse <math>6ms\pm1ms</math>. The samples should be observed for 6 hours after the test, and also check the weight loss of cells before and after the test.</p>	<p>不爆炸, 不起火, 不漏液 No explosion, no fire, no leakage</p>

## 6.5 安全性 Safety Performance

表 4 电池安全性 Safety performance

测试项目 Items	测试方法 Test Conditions	检验标准 Specifications
外部短路 External Short-Circuit	<p>电池以标准充电方式充电后, 分别在 <math>20\pm5^\circ\text{C}</math> 和 <math>55\pm5^\circ\text{C}</math> 的环境温度下依次用内阻为 <math>80\pm20\text{m}\Omega</math> 的铜线连接电池芯的正负极持续放电直至发生爆炸、起火或至电压小于 <math>0.2\text{V}</math>, 电池芯表面温度恢复到环境温度 <math>\pm10^\circ\text{C}</math> 以内, 观察 1h。</p> <p>After standard full-charged of the cells, each test sample cell is to be short-circuited by connecting the positive and negative terminals of the cell with a Cu wire having a maximum resistance load of <math>80\pm20\text{m}\Omega</math>. The sample is to discharge until a fire or explosion is obtained, or until it has reached a completely discharge state of less than <math>0.2\text{V}</math> and the sample case temperature has returned to <math>\pm10^\circ\text{C}</math> of the ambient temperature. Tests are to be conducted at <math>20\pm5^\circ\text{C}</math> and <math>55\pm5^\circ\text{C}</math>; and</p>	<p>不起火、不爆炸, 温度 <math>&lt; 150^\circ\text{C}</math> No fire, no explosion, Max. Temp. of cell surface should not exceed <math>150^\circ\text{C}</math>.</p>

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测试项目 Items	测试方法 Test Conditions	检验标准 Specifications
	observed for 1 hour.	
过充电 Over-charge	电池以标准充电方式充电后, 用 3C 电流和 4.8V 的恒定电压充电 8h, 观察 1h。 The cell is charged at a 3C constant current with a voltage limit of 4.8V for 8 hours after standard full-charged; and observed for 1 hour.	不起火、不爆炸, 温度<150℃ No fire,no explosion, Max. Temp. of cell surface should not exceed 150℃.
过放电 Over Discharge	电池以标准充电方式充电后, 以 0.5C 恒流放电至 2.0V。用一根内阻小于 30Ω 的导线连接电池正负极 24 小时, 观察 1h。 After standard full-charged of the cells, discharged at constant Current of 0.5C to 2.0V, and the positive and negative terminal is connected by a 30Ω wire for 24 hours; and observed for 1 hour.	不起火、不爆炸 No fire,no explosion
热冲击 Hot oven Characteristics	电池以标准充电方式充电后, 放置于热箱中, 温度以 ( 5±2 ) °C/min 的速率升至 130°C±2°C, 并保持 30min, 观察 1h。 The standard full-charged cells is placed in the hot oven, then rise to 130°C±2°C in the temperature to 5°C±2°C/min rate, insulation 30min; and observed for 1 hour .	不起火、不爆炸 No fire,no explosion
高温储存 High Temperature Storage	电池以标准充电方式充电后, 放置在 80°C±2°C 自然对流烘箱中 7 小时, 取出返回到室温。 The standard full-charged cell is to be placed into the 80 °C±2 °C oven for 7 hours, and then take it out to room temperature.	不起火、不爆炸 No fire,no explosion
重物冲击 Impact Test	电池以标准充电方式充电后, 将电池置于冲击台上, 将一根φ15.8mm±0.2 mm 的钢柱置于电池中心, 钢柱的纵轴垂直于电池的纵轴, 让重量 9.1kg±0.1kg 的重锤自 610mm±25mm 高度垂直落下在电池表面位置, 观察 6 小时。 The standard full-charged cell is to be placed on a flat surface. A φ15.8 ±0.2mm diameter bar is to be placed across the center of the sample. A 9.1Kg±0.1Kg mass is to be dropped from the height of 610 ±25mm to the center of the cell vertically; and observed for 6 hour.	不起火、不爆炸 No fire,no explosion

测试项目 Items	测试方法 Test Conditions	检验标准 Specifications
冷热循环性能测试 Thermal-cold Cycling Performance Test	电池以标准充电方式充电后，在环境温度 $75^{\circ}\text{C}\pm2^{\circ}\text{C}$ 条件下放置 6 小时，然后在 $-40^{\circ}\text{C}\pm2^{\circ}\text{C}$ 条件下放置 6 小时，温度转换时间小于 30 分钟，温度循环 10 次，最后室温条件下放置 24h，观察电池外观变化。 The standard full-charged cells placed in $75\pm2^{\circ}\text{C}$ for 6h, and then put the Cell in $-40^{\circ}\text{C}$ for 6h; change temperature time <30min, then repeat it for 10 cycles. Finally the cell is placed in room temperature for 24h. Watch the appearance of cell.	不起火、不爆炸、不漏液 No fire, no explosion, no leakage

## 7 铭牌和标志 Nameplate and Symbol

电池标志应保持清晰，不脱落、无明显色差。

The nameplates and symbols of the cells should stay clear, attached and have no obvious color difference.

极端标记：标记在电池体上，用“+”、“-”分别表示其所指的正负极端。

The polarity markings are on the side of the cell, “+” and “-” stand for positive tab and negative tab respectively.

## 8 运输 Transportation

●出厂运输的电池荷电量为满容量的 25%~45%。

The cells should be in a 25%~45% state of charge packaging boxes for transport.

●电池在运输过程中，应避免日晒、火烤、雨淋、水浸及与腐蚀性物质放在一起。

During transportation, the cells should not be exposed to direct sunlight, fire, rain, water, or corrosive substances.

●运输和装卸中的冲击、震动应限制在最小程度。

●Impacts and vibrations during the transportation, loading and unloading should be limited to the minimum scale.

●对于纸质的包装箱堆放高度不得超过 10 层。

●The stacking height of cartons should not exceed 10 layers.

●电池长途运输时，如是船运，应放在远离发动机的地方；夏季不应该长期滞留在不通风的环境内。

●When cells transported over a long distance, if they are shipped, they should be kept away from the engine; in the summer, they should not be kept in an unventilated environment for a long period of time.

## 9 安全注意事项 Safety Precautions

本产品在运输、贮存、使用过程中存在一些危险性，操作不正确时可能发生泄漏，甚至爆炸、起火等安全性风险，在您使用本产品前，请仔细阅读本产品规格书，并妥善保存以备查阅。

●The product can be somewhat dangerous during transportation, storage and use. It may leak or even explode when it is operated incorrectly. Before using this product, please read this specification of product carefully and keep it for reference.

●电池严禁过充电、过放电、挤压、焚烧。

●The cells must not be over-discharged, squeezed or incinerated.

●严禁对电池进行短路。

●Do not short circuit the cells.

●严禁用户自行拆解电池。

●Do not disassemble the cells without permission.

●严禁在允许的温度范围之外使用或加热。

●Do not use the cells outside of the working temperature range. Do not heat up the cells above allowable temperature.

●严禁直接在电池表面高温焊接（焊接温度不高于 130℃）。

●It is forbidden to high-temperature solder directly on the surface of the cells (solder temperature not higher than 130℃).

●严禁使用带有严重伤痕或变形的电池。

●Do not use cells with deep scratches or deformation.

●严禁与其他类型电池一起使用，也不要把不同包装、不同型号或不同品牌的电池一起使用。

●Do not use the cells with dry batteries or other kinds of primary batteries together. Do not use batteries with different packaging, different models or different brands together.

- 严禁把新旧电池混用。  
● It is forbidden to mix up old and new batteries and use them together.
- 在装入设备时注意电池的正负极不要反装。  
● When installing the cells into the device, pay attention to the positive polarity and negative polarity of the cell.
- 电池使用至终止电压时，应及时从设备仪器中取出。  
● When the cells is used up to the cut-off voltage, it should be taken out from the instrument in time.
- 当长期不用时，要将电池从设备中取出并放在规定的环境中保存。  
● When not used for a long time, remove the battery from the device and keep it in a specified environment.
- 对电池进行串并联组合时应与我公司联系。  
● For series and parallel connection of the cells, please contact us.
- 使用过的电池应按照当地环保规定处理。  
● Used batteries should be disposed in accordance with local environment regulations.
- 在使用或储存期间如发现电池有发热、散发气味、变色、变形或其他异常之处应及时停止使用。  
● If there is any heating, odor, discoloration, deformation, or other abnormality of the cell during usage or storage, stop using it.

## 10 储存 Storage

- 电池应在远离静电的场所使用和储存。  
● The batteries should be used and stored away from static electricity.
- 电池应当存放在温度为 0°C~30°C、相对湿度不大于 60% 的环境中，同时应确保电池的荷电态为满电态的 30%~50%。如长时间储存，每 3~4 个月充一次电以防止电池过放电。  
● The batteries should be stored at a temperature between 0 °C and 30 °C with a relative humidity of not more than 60%, and batteries should be in a 30%~50% state of charge . If stored for a long time, charge it every 3~4 months to prevent the battery from overdischarge.
- 电池储存时要远离热源，也不能置于阳光直射的地方，保证清洁、凉爽、干燥、通风，

并不受气候影响。

●Batteries should be stored away from the heat source, can not be placed in direct sunlight, to ensure that clean、cool、dry、ventilation, and not affected by the climate.

●电池的堆放高度取决于包装强度，一般规定，纸质包装箱堆放高度不得超过 1.5 米。

●Battery Stacking Height depends on the strength of the packaging, general grovisions, paper packaging box stacking height should not exceed 1.5 meters.

●电池以原包装存放和陈列电池，去掉包装后电池不能乱堆放，易引起电池短路和损坏。

●Battery to the original packaging storage and display batteries, remove the packaging after the battery can not be disorderly stacked, it is easy to cause battery short circuit and damage.

## 11 使用建议 Use suggestions

●电池适合在环境温度相对阴凉的位置使用，当在高温高湿环境下长期使用，使用寿命会下降。

●The battery is suitable for use in a relatively cool environment. When used in a high temperature and high humidity environment for a long time, the service life of the battery will decrease.

●电池用完电，请及时充电。

●Please charge the battery when it discharges out.

●请使用配套或者推荐的专业锂电池充电器。

●Please use the matching or recommended professional lithium battery charger.

●如果电池漏液，接触眼睛或皮肤，请立刻用大量清水冲洗并寻求医生帮助。

●If the battery leaks, contact eyes or skin, immediately flush with plenty of water and seek medical help.

●电池有异味、变色、噪音、漏液、严重变形等异常情形时，应停止使用。

●Battery odor, discoloration, noise, leakage, serious deformation and other abnormal circumstances, should stop using.

●请将电池放置在宠物和儿童接触不到的位置，禁止小孩接触电池。

●Keep batteries out of reach of pets and children. Keep them out of reach of children.

## 12 声明 Disclaimer

使用电池前请仔细阅读规格书表面的警示标志，不当的使用电池可能会引起电池过热损坏，对于未按规格书操作造成的任何意外事故，不负任何责任，为了使电池安全的使用及处理请在使用前认真阅读本产品规格书。

Please read the warning sign on the surface of the specification carefully before using the cell. Improper use of the cell may cause the cell to overheat and damage, does not assume any responsibility, in order to make the safe use and disposal of cells, please read this product specification carefully before use.

附图 1： 产品装箱方式及包装 Figure 1: Packing method

每个内盒 50 只电池，每箱 4 个内盒，共 200 只电池。

每箱电池净重约 28.6kg，毛重约 31kg。

Each inner box contains 50 cells, each outer box contains 4 inner boxes, 200 cells in total.

The net weight and gross weight of the cells are about 28.6 kg and 31kg respectively.

