圆柱形锂离子电芯产品规格书

SPECIFICATION OF PRODUCT

Cylindrical Lithium Ion Rechargeable Cell

电芯型号：IFR32700-6000mAh

Model：IFR32700-6000 mAh

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1 Scope 适用范围

This specification of product describes technical characteristics, testing procedure, warnings and cautions of the lithium ion rechargeable cell or battery pack. The battery pack defined in this documentation is an assembly which include battery, PCB, wire and other parts. The specification only applies to IFR32700 6000mAh cell manufactured by Wuhan Sunmoon Battery Co., Ltd.

本规格书规定了锂离子聚合物可充电电池或者电池组的基本性能、技术要求、测试方法以及注意事项。电池组的定义是包括电芯、保护板、连接线以及其他部件的组合。本规格书只适用于武汉中原长江科技发展有限公司所生产 IFR32700 6000mAh 型产品。

2 Details of Product 产品基本特性

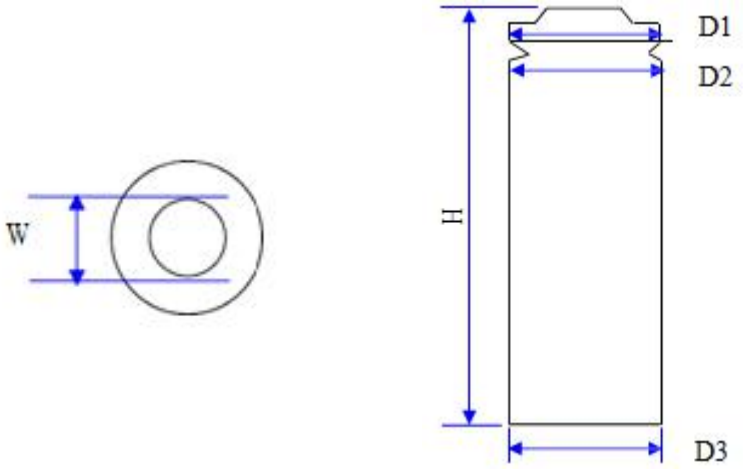
Table 1 表 1

Item 项目	Condition 条件	Specification 参数	Remark 备注
2.1 Category 产品类型		Cylindrical Lithium Ion Rechargeable Cell 圆柱形锂离子可充电电芯	
2.2 Model 电池型号		IFR32700	
2.3 Nominal Voltage 标称电压		3.2V	
2.4 Nominal Capacity 标称容量	1C 放电容量 1C Discharge	6000 mAh	
2.5 Cell Size 电芯尺寸		Cell Diameter: 32.2± 0.3mm Max 32.5mm 电池直径 Cell Height:70.5±0.3mm Max 70.8mm 电池高度	
2.6 Cell Weight 电芯重量	Bare Cell	140±5g	
2.7 Charge Limited Voltage 充电限制电压	CC model 恒流充电	3.65V	0℃~60℃
2.8 Charge Limited Current 充电截止电流	CV Model 恒压充电	0.3A	
2.9 Charging Method 充电方式	Standard Charging 标准充电	1C at CC/CV	60 min
	Rapid Charging 快速充电	3C at CC/CV	20min
2.10 Discharge end-off voltage 放电截止电压	CC model 恒流充电	2.0V	
2.11 Max. Discharge Current 最大放电电流		3C	终止电压 2.0V Limited Voltage 2.0V
2.12 最大脉冲放电电流(瞬时 ms)(Max. Pulse Discharge Current)		6C	瞬时10s

Item 项目	Condition 条件	Specification 参数	Remark 备注
2.13 Cycle Life 循环性能	1C 100% DOD	≥2000 Cycles	
2.14 AC Impedance 交流内阻	At AC1000Hz 在 1000Hz 下测量	≤7.5mΩ	交流内阻
2.15 Operating Temperature Range 操作温度范围	Charging Temperature 充电温度		0~60 ℃
	Discharging Temperature 放电温度		-20~60 ℃
	Storage Temperature 储存温度	1 Year	-20~45 ℃
2.16 Appearance 外观	Without break, scratch, distortion, contamination, leakage etc..无破裂、划痕、变形、污渍、电解液泄露等		

3 Outline Drawing 外形图

Drawing 1 **图 1**



项目 Items	尺寸 Size(mm)	公差 Tolerance (mm)
铆钉宽度 Width	15.92	±0.1
电池高度 Height	70.5	0.4
		-0.2
头部直径 Diameter 1	32.2	±0.05
滚槽位直径 Diameter 2	32.5	±0.3
底部直径 Diameter 3	32.4	±0.05

4 Performance and Testing Procedure 性能及测试方法

4.1 Appearance and Dimensions 外观和尺寸

Table 2 表 2

Test Item 测试项目	Testing Method 测试方法	Standard 检验标准
Appearance 外观	Examine with naked eyes. 用眼睛目视检测电池。	There shall be no such defects like deep scratch, flaw, crack, rust or leakage. 外观整洁，标志清晰，无划伤变形，无生锈、漏液等现象。
Dimensions 尺寸	Use vernier caliper (measurement error ≤ ± 0.02mm) to measure while avoiding short-circuit, there should attach a layer of insulation material on the external jaws. 用测量误差不大于 0.02mm 的游标卡尺进行测试，为了防止电池短路，卡尺的卡头上应贴上一层绝缘材料。	As per 3 outline Drawing

4.2 Electrical Performance 电性能

Table 3 表 3

项目 Items	测试方法 TestConditions	标准 Specification
标准充电 Standard Charge	标准充电是指电池芯在环境温度 25±2℃下，以 0.5C 恒电流充电至电压 3.65V，恒电压 3.65V 充电至截止电流 0.01C5（用锂离子电池芯专用充电 器，电压精度±0.05V），停止充电，总充电时间不超过 3 个小时。 The "Standard Charge" means charging with constant current 0.5C5to3.65V, then charging with constant voltage 3.65V to 0.01C 5 under 25± 2 ,℃ charging time will not more than 3h. (Use Lithium-ion battery charger,which with an accuracy±0.05V.)	

项目 Items	测试方法 TestConditions	标准 Specification
标称容量 Nominal Capacity	电池芯以标准充电后，在 25±2℃环境下，以 0.5C 电流放电至终止电压 2.0V，停止放电。如果没有特别说明，电池芯充放电间隔时间为 30 分钟。 The capacity means the discharge capacity of the cell, which is measuredwith dischargecurrent0.5Cto cut-offvoltageat2.0Vat25±2℃restfor30minutesafter the StandardCharge.	标称容量≥6000mAh (NominalCapacity ≥6000mAh)
循环寿命 Cycle Life	在 25±2℃环境下，电池以 1C 充电至 3.45V，以 1C 的电流放电至 2.5V ,循环 2000 次后 ,再以 1C 的电流放电至 2.5V 终止电压，测量其放电容量。At 25 ±2℃, 1C charge to 3.45V and discharge to 2.5V with 1 C dischargecurrent, after 2000 cycles the discharge capacity is measured with 1Cdischarge current and 2.5V cut-offvoltage.	≥80%标称容量 ≥ 80%NominalCapacity
贮存特性 Storage Characteristic	1 用 0.5C 电流测量电池芯在 25±2℃的环境下的初始容量并记录，充入 45%的电量，测量电池芯存储前的初始状态，分别 25 ±2℃、相对湿度 0%~75%的环境下贮存 3 个月、6 个月、12 个月后 测量电池芯的最终状态 然后在 25±2℃的环境温度下以 0.5C 充放电，循环 5 次并记录电池芯的放电容量；5 周循环的最大放电容量作为判断标准。Test the cell initial capacity using 0.5C 5 current at 25±2℃and record,then charge the cells with 45% capacity, then storage for 3,6, 12 months respectively at 25 ±2℃and relative humidity of 0%~75%, then the cell is cycled for 5 times with charge with 0.5Canddischarge with 0.5C at 25±2℃, The maximum dischargecapacity(longest discharge capacity) isrecorded.	0.5C 放电时间 :贮存 3 个月的电池芯≥5.7Ah；贮存 6 个月的电池芯≥5.46Ah；贮存 12 个月的电池芯≥5.16Ah。0.5C discharge time: After 3months storage≥5.7Ah; After 6 months storage ≥ 5.46Ah; After12months storage ≥5.16Ah
	2 电池芯在 25±2℃环境下按 0.5C 充放电，放电容量为 C1，满电电池芯在 25±2℃的温度下储存 28 天后 ,在 25±2℃环境下使用 0.5 C 电流放电，容量为 C2。 (The cell is charged and discharged using 0.5C at 25±2℃. The discharge capacityisC1.The cell is stored for28 days in 20±5℃ afterfullycharged and then is discharged using 0.5C at 25±2℃. The capacity is defined asC2.)	容量保持率 C2/C1≥85% CapacityRetention C2/C1≥85%
	3 进行完 C2 测试的电池芯在 25±2℃环境下按照 0.5C 测试恢复容量（放电容量 C3）。 (AfterthetestasC2,Thecellischargedanddischargedusing0.5C at25± 2℃, The discharge capacity isC3.)	容量恢复率 C3/C1≥95% Capacity Recoverable Ratio C3/C1≥95%
倍率性能 (RateCapacity)	1.在充饱电后 1 小时内，在 25±2℃环境下，以 0.5C 电流连续放电至 2.0V 终止电压。Under the temperature of 25±2℃，the discharge capacity is measured with0.5 C discharge current and 2.0V cut-off voltage after fullcharged.	≥100%标称容量 ≥100% Nominal Capacity

项目 Items	测试方法 TestConditions	标准 Specification
	2. 在充饱电后 1 小时内，在 25±2℃环境下，以 1C 电流连续放电至 2.0V 终止电压。Under the temperature of 25±2℃，the discharge capacity is measured with 1C discharge current and 2.0V cut-off voltage after fullcharged.	≥98%标称容量 ≥ 98%NominalCapacity
	3. 在充饱电后 1 小时内，在 25±2℃环境下，以 3C 电流连续放电至 2.0V 终止电压。 Under the temperature of 25±2℃ ,the discharge capacity is measured with 3C discharge current and 2.0V cut-off voltage after fullcharged.	≥96%标称容量 ≥96% Nominal Capacity

4.3 Environmental Adaptability Test 环境适应性

Table 4 表 4

项目 Items	测试方法 Test Conditions	标准 Specification
温度性能 Temperature Performance	电池充满电后，按 0.5C 的电流放电至 2.0V。电池芯必需先在不同的试验温 度中放置 4 个小时后放电，百分比按放电容量比最小容量计算。 (Cells shall be charged according to 5.1 and discharged at 0.5C to 2.0 V after full charged. Cells shall be stored for 4 hours at the test temperature prior to discharging and then shall be discharged at the test temperature, The percentage shall be calculated using discharging capacity compared to the minimum capacity.	不泄漏、无外观不良 No leakage, No Appearance defect -10℃/25℃≥50%（to1.8V） 0℃/25℃≥75% 25℃/25℃≥100% 60℃/25℃≥98%
恒定湿热 Constant Temperatureand Humidity	在 25±2℃条件下，电池芯按 0.5C 充电结束后，放入 40±2℃ ,湿度 90～95%的 恒温恒湿箱内 48h,取出电池芯常温搁置 2h，以 0.5C 放电至 2.0V。(Under the temperature of 25±2℃, after charging the cell with 0.5C ,then put the cell into the constant temperature and humidity oven with 40±2℃and 90～95%for 48h，then store the cells at RT for 2hrs, and discharge the cells with 0.5C to 2.0 volts.	电池芯应无变形、无泄漏、 无锈蚀、无起火、无爆炸， 放电容量≥98%标称容量 The cell should be no deformation, no rust, no leakage, no fire, no smoking and no explosion. Discharge ≥98%Nominal Capacity
自由跌落测试 Free Fall Test	将满充电的电池芯重复 3 次由高度为 1200mm（电池芯最低点）的位置自由跌落到混凝土板上；在跌落时应在随机的方向都有一个冲击力，测试完成后 电池芯放置 1h，然后目视检查；The fully charged cell is dropped three times from a height of 1200 mm(the lowest point of the cell) onto a concrete floor. The cells or batteries are dropped so as to	不爆炸、不起火、不冒烟， 开路电压应不低于 90%的 初始电压 No explosion, No fire, No smoke. The OCV after the test no less than 90%before free-fall test.

项目 Items	测试方法 Test Conditions	标准 Specification
	obtain impacts in random orientations. After the test, the cell shall be put on rest for a minimum of one hour and then a visual inspection shall be performed.	
振动测试 Vibration Test	将满充电后的电池芯固定在振动台上，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 后电池芯回复到原位。样品在测试结束后观察 6 小时，并检查测试前后电 池芯的重量变化 。A full-charged cell is to be subjected to simple harmonic motion with amplitude of 0.8mm total maximum excursion. The frequency is to be varied at the rate of1 hertz per minute between 10 and 55 hertz. After the test is completed, And the cell returned to the starting position. The cell shall be vibrated for90~100 minutes per axis of XYZ axes. The samples should be observed for 6 hours after the test，and also check the weight loss of cells before and after the test.	不爆炸、不起火、不冒烟、 不泄漏，重量损失≤0.1% Not explosion, No fire, No leakage, Mass loss ≤0.1%
挤压测试 Crush Test	将满充电的池芯放在可移动的平面间进行挤压，其压力通过一个液压缸进行 施压，施加的压力为 13±1KN ,一旦达到压力后或电芯电压下降至 0V 或与原尺寸相比发生了 30%的变形，即可释放压（无论哪种情况发生）。A 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 13±1KN. Once the maximum force has been applied, or an abrupt voltage drop of 0 voltage, or30% of deformation has occurred compared to the initial dimension, the force isreleased	不爆炸、不起火 No explosion, No fire

项目 Items	测试方法 Test Conditions	标准 Specification
机械冲击测试 Shock Test	将满充电的电池芯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 毫秒内最小的平均加速度为 735m/s²，峰值加速度介于 1225m/s² 和 1715m/s²之间。样品在测试结束后需观察 6 小时，并检查测试前后电池芯 的重量变化。测试温度在 25±2℃。 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 is735m/s². The peak acceleration shall be between 1225m/s² and 1715m/s². The samples should be observed for 6 hours after the test，and also check the weight loss of cells before and after the test. Cellsshallbetestedatatemperatureof25±2℃.	不爆炸、不起火、不泄漏，No explosion, No fire, No leakage
高空低压模拟 测试 Altitude Simulation Test	将充满电的电池芯放入真空箱中，逐渐抽真空至气压小于或等于 11.6KPa， 并在此气压下保存 6H，测试温度为 20±3℃。The full-charged cells are to be stored for 6 hours at an absolute pressure of11.6 KPa and a temperature of 20±3.	不爆炸、不起火、不泄漏， No explosion, No fire, No leakage.

4.4 Safety Performance 安全性能

Table 5 表 5

项目 Items	测试方法 TestConditions	标准 Specification
外部短路 Short Circuit	分别在 25±2℃和 55±5℃的环境温度下依次用内阻为 80±20mΩ 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 0.2V，电池芯表面温度回复到环境温度±10℃以内。电池芯要求：充满电的新电池芯。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 of80 ± 20m Ω .The sample is to discharge until a fire or exposition is obtained, or until it has reached a completely discharge state oflessthan0.2Vandthesamplecasetemperaturehasreturnedto ± 10of the ambient temperature. Tests are to ℃ be conducted at 25±2℃and 55±5℃. Cell Condition: Fresh, Fully	电池应不起火、不爆炸；温度 < 150℃。No fire，No explosion；Max. Temp, of battery surface should not exceed 150℃

项目 Items	测试方法 TestConditions	标准 Specification
	charged cell.	
过充电 Over-charge Characteristics	充饱电后的电池 ,用 3C 电流和 4.8V 的恒定电压充电 8 小时。The battery is charged at a 3 C constant current with a voltage limit of 4.8V for 8 hours after fully charged	电池应不起火、不爆炸；温度＜150℃。 No fire，No explosion；Max. Temp. of battery surface should not exceed 150℃.
过放电 Over Discharge	标准充电后，电池芯以 0.5C 恒电流放电至 2.0V，用一根内阻小于 30 Ω的导线连接电池芯正负极 24 小时。After standard charge. Cells are discharged at constant Current of 0.2C to 2.0V, and the positive and negative terminal is connected by a 30Ω wire for 24 hours. Cell Condition: Fresh, Fully charged cell.	不爆炸、不起火 No explosion, No fire
热冲击 Hot oven Characteristics	将电池充饱电后，放置于热箱中，温度以（5℃±2℃）/min 的速率升 至 130℃±2℃并保温 30min。The fully charged battery is placed the battery in the hot box，then rose to 130℃±2℃in the temperature to 5℃±2℃/min rate , insulation30min.	电池应不起火、不爆炸。No fire，No explosion
高温储存 High Temperature Storage Test	将电池芯放置在 80±2℃自然对流烘箱中 7 小时后，取出待返回到室 温，目测电池芯要求：充满电的新电池芯。Putcellintothe80℃ boxandkeepthecellintheboxfor7hoursafterit be charged according to 6.1, and then take it out. Cell Condition: Fresh, Fully charged cell.	不爆炸、不起火。No explosion, No fire
冷热循环性 能测试 Thermal-cold Cycling Performance Test	电池芯在标准充电后 ,在环境温度 75±2℃条件下开路放置 6 小时,然后-40℃条件下开路放置 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, 观察电池芯外观变化。(The full-chargedcellisplacedin75±2℃ for6h,andthenputtheCellin-40 ℃for6h;change temperature time＜30min,thenrepeatitfor10 cycles. Finally the cell is placed in room temperature for 24h. Watch the appearance of cell.	不起火、不爆炸、不冒烟,试验后开路电压应不低于试验前的 90 %,质量 损失≤0.1% 。No explosion, No fire, No smoke, Open circuit voltage changed not less than 90%, mass loss limit: ≤0.1%
重物撞击 Impact Test	用一条直径为 15.8±0.1mm 的圆棒放置在电池芯中央，将重量为 9.1 ±0.46Kg 的重锤从 610±25mm 的高度垂直落下在电池芯长度的中 心位置。电池芯要求：充满电的新电池芯。A test sample cell is to be placed on a flat surface. A 15.8 ± 0.1mm diameterbaristobeplacedacrossthecenterofthesample.A9.1Kg± 0.46Kg mass is to be dropped from the height of 610 ± 25mm to the center of the cell vertically. Cell Condition: Fresh, Fully charged cell.	不爆炸、不起火 No explosion, No fire

5 Test Conditions 实验条件

5.1 标准测试条件和要求 Standard Testing Conditions and Requirements

测试的电池芯是出厂时间不超过 3 个月的新电池芯，在 0-35℃以及 5-10%带电量下储存，且电池芯 未进

行过五次以上充放电循环。除非其它特殊要求，本产品规格书规定的测试条件为：温度 25±2℃。

Test should be conducted with new cells within three months after shipment from our factory and cells shall not be cycled more than five times and Storage at 0-35 ℃ and 5-10% charge before test. Unless there is special requirement, test shall be done under temperature of25±2℃.

5.2 Testing Instruments 试验设备

5.2.1 Size Measurement Instrument 尺寸测量仪器：Vernier caliper with measurement error of no more than ± 0.02mm or other size measurement instrument with equivalent accuracy.

测量误差不大于±0.02mm 的游标卡尺或具有同等精度的量具。

5.2.2 Voltmeter 电压表:The DC voltmeter with an accuracy of no more than 0.5%, and its internal resistance is no less than 10 MΩ.

精度不低于 0.5%的直流电压表，其内阻应不小于 10MΩ。

5.2.3 Ammeter 安培表：The Ammeter with an accuracy of no more than 0.5%.

精度不低于 0.5%的安培表。

5.2.4 Temperature Measuring Instrument 温度测量设备：The accuracy of the temperature measurement instrument should be no more than ± 0.5℃.

测量温度的仪器精度范围应小于或等于 0.5℃。

5.2.5 Impedance Meter 内阻测试仪：The impedance shall be measured with the sinusoidal alternating current method (AC 1kHz LCR).

内阻测试仪的测试方法为交流阻抗法（AC 1kHz LCR）。

5.2.6 Electrical Constant-Temperature Drying Machine 电热恒温干燥箱：The absolute error is less than ±2℃.

绝对误差小于±2℃。

6 Nameplate and Symbol 铭牌和标志

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

电池的铭牌和标志应保持清晰，不脱落、无明显色差。

6.1 Nameplate 铭牌

The nameplate should include battery model, rated voltage, code of production date, warning symbol and so on.

电池的铭牌(商标)包括电池型号、额定电压、生产日期代码、警示标识等内容。

6.2 Composition of Code 代码编写

The code of production date is a 6-digit figure. The first two digits stand for year, the middle two digits stand for month, the last two digits stand for day.

电池生产日期代码用六位数字表示。头两位数字表示年份，中间两位表示月份。后两位数表示日期。

For example, the code “140220” stands for the production date of the battery which is February 2nd, 2014.

6.3 Polarity marking 极端标记

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

标记在电池侧面，用“+”、“-”分别表示其所指的正负极端。

7 Transportation 运输

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

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。

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

运输和装卸中的冲击、震动应限制在最小程度。

The stacking height of cartons should not exceed 1.5 meters.

对于纸质的包装箱堆放高度不得超过 1.5 米。

When batteries 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.

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。

8 Packing

Carton Size 纸箱尺寸	Quantity Each Carton 每箱数量	Net Weight 净重	Gross Weight 毛重
375*375*90mm	100PCS	14.5KGS	15KGS

9 Safety Precautions 安全注意事项

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.

因为本产品在运输、贮存、使用过程中存在一些危险性，操作不正确时都可能发生泄漏，甚至爆炸，在您使用本产品前，请仔细阅读本产品规格书，并请妥善保存以备查阅。

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

电池严禁过放电、挤压、焚烧。

Do not short circuit the battery.

严禁将电池短路。

Do not disassemble the battery.

严禁用户自行拆卸电池。

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

严禁在允许的温度范围之外使用或加热。

It is forbidden to solder directly on the surface of the battery.

严禁直接在电池表面焊接。

Do not use batteries with deep scratches or deformation.

严禁使用带有严重伤痕或变形的电池。

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

严禁把电池同干电池或其他原电池一起使用，也不要把不同包装、不同型号或不同品牌的电池一起使用。

It is forbidden to mix up old and new batteries and use them together.

严禁把新旧电池混用。

When installing the batteries into the device, pay attention to the positive polarity and negative polarity of the battery.

在装入设备时注意电池的正负极不要反装。

When the battery is used up to the cut-off voltage, it should be taken out from the instrument in time.

电池使用至终止电压时，应及时从仪器中取出。

When the battery is not in use for a long time, it should be taken out from the device and stored in a low-temperature and low-humidity environment.

当长期不用时，要将电池从设备中取出并放在低温低湿的环境中保存。

For series and parallel connection of the batteries, please contact us.

对电池进行串并联应与我公司联系。

Used batteries should be disposed in accordance with local environment regulations.

使用过的电池应按照当地环保规定处理。

If there is any heating, odor, discoloration, deformation, or other abnormality of the battery during usage or storage, stop using it.

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请停止使用。

10 Storage 储存

10.1 贮存温度与湿度 Storage temperature and humidity

The cell shall be storied at temperature range of 0 ℃~ 35 ℃，relative humidity of 0%~75%，clearing，drying，ventilated，and kept away from corrosive substances and fire.

电池应贮存在环境温度范围为 0℃～35℃，相对湿度在 0%~75%的清洁、干燥、通风的室内， 应避免与腐蚀性物质接触，应远离火源及热源。

10.2 长时间储存 Long Time Storage

If the battery is stored for a long time, the battery should be conducted a cycle of charge and discharge, and the voltage should be about 3.0-3.2V and the battery is to be stored at temperature range of 0℃~35℃andRH0%~75%，low moisture and corrosive gases environment.

如果要长时间贮存，电池应在温度范围 0℃～35℃、相对湿度在 0%~75%和无腐蚀性气体环境 中贮存。超过三个月时，应对电池进行一次完全充放电循环，再将电池充电约 3.0-3.2V/电池的条件下贮存。

11 保质期限 Guarantee Period of Quality

The guarantee period of quality extend for one year after code. Wuhan Sunmoon Battery Co.,Ltd. would replace battery which due to the manufacturing problems and it is not abnormal use,if the battery appears during the abnormal situation.

电池保质期为打码出厂后的 1 年。若电池在此期间内出现异常情况，但必须是由于明显的制造工 艺方面的问题，且在电池没有被异常使用的情况下,武汉中原长江科技发展有限公司才免费更换新电池。

12 Declaration 声明

If you have any question about this specification of product, please contact us. Wuhan Sunmoon Battery Co., Ltd reserves the right to modify this specification of product.

若对本产品规格书有疑问，请与武汉中原长江科技发展有限公司联系。武汉中原长江科技发展有限公司保留对本产品规格书更改的权利。