南屋科技
NANWU TECHNOLOGY

匠芯定智 能启未来

CRAFTING INTELLIGENCE POWERING THE FUTURE

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Nanwu Technology

NNC-1194170A 30Ah 锂离子单体电池

Lithium-ion NNC-1194170A 30Ah

产品规格书

Product Specification

产品型号

Product Model：NNC-1194170A 30Ah

制表 Prepared by	审核 Checked by	批准 Approved by

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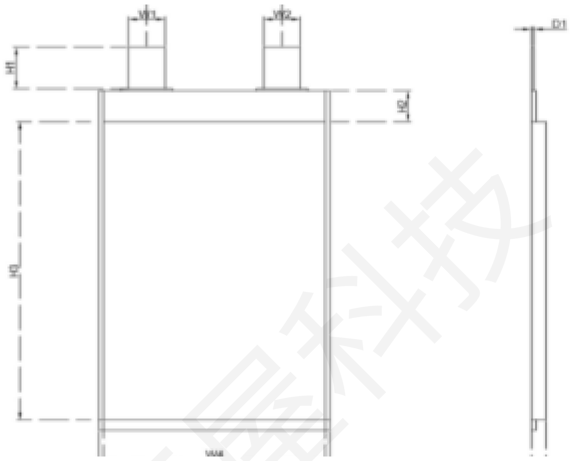
1. 适用范围 Application Scope

本产品规格书描述了 NNC-1194170A 型号锂离子电池产品性能指标。

This product specification describes the performance of NNC-1194170A Lithium-ion Batteries.

2. 产品型号 Product Model

NNC-1194170A-30Ah



3. 产品尺寸 Product Size

项目 (Item)	描述 (Description)	尺寸 (Dimension)
D1	极耳厚度(Tab thickness)	0.2±0.02 mm
D2	电芯厚度（50%DOD）(Cell thickness (50% DOD))	10.4±0.3 mm
H1	极耳外露长度(Tab exposed length)	15±1.0 mm
H2	顶封边宽度(Top sealing edge width)	14±0.2 mm
H3	电芯主体长度(Cell body length)	170±1 mm
W1	铝转铜镀镍极耳宽度(Aluminum to copper-plated nickel tab width)	25±0.1 mm
W2	铜镀镍极耳宽度(Copper-plated nickel tab width)	25±0.1 mm
W3	极耳中心距(Tab center distance)	45±1 mm

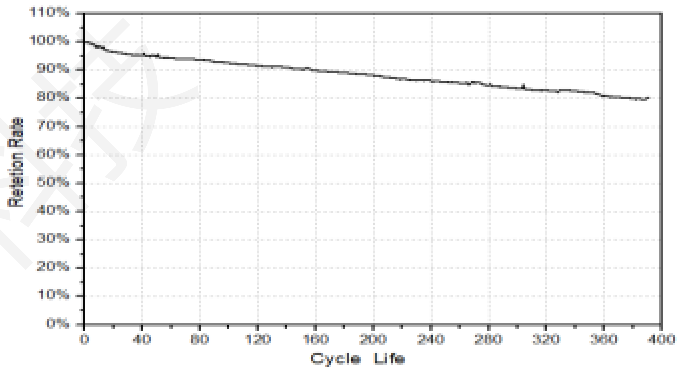
W4	宽度(Width)	92.5±1 mm
W5	宽度(Width)	93±1 mm

4. 产品规格 Product Specification

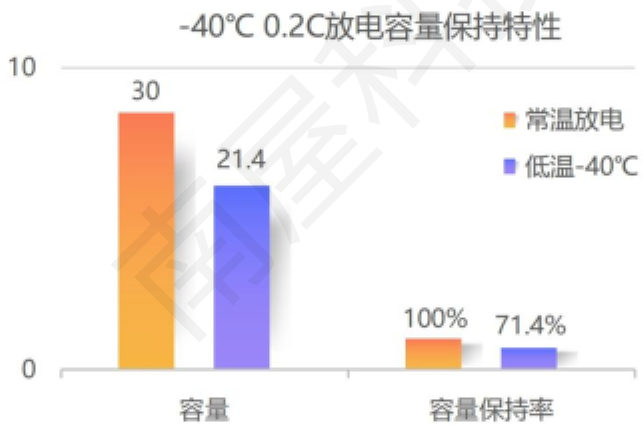
序号 NO.	项目 Items	技术指标 Specifications	
1	典型容量 Typical Capacity	29.5Ah	0.2C 充电至 4.35V，0.2C 放电至 2.75V 0.2C charge to 4.35V, 0.2C discharge to 2.75V
	标称容量 Nominal Capacity	30.0Ah	
2	标称电压 Nominal Voltage	3.65V	
3	标准充电方法 Standard Charging Mode	25±2℃ 0.2C 恒流充电至 4.35V, 转 4.35V 恒压充电至截止电流 0.03C 25±2℃ 0.2C constant current charge to 4.35V, then constant voltage 4.35V charge until charged current reduced to 0.03C	
4	充电电流 Charge Current	标准充电：0.2C Standard charge: 0.2C	
		快速充电：0.5C Rapid charge: 0.5C	
5	充电时间 Charge Time	标准充电：300min Standard charge: 300min	
		快速充电：120min Rapid charge: 120min	
6	充电截止电压 Charge Ending Voltage	4.35V	
7	放电截止电压 Discharge Ending Voltage	2.75V	
8	工作环境&最大充电电流 Max. Charging Current & Operating Environment	0℃~15℃	0.2C 充电到 4.35V 0.2C charge to 4.35V
		15℃~35℃	0.5C 充电到 4.35V 0.5C charge to 4.35V
		35℃~45℃	0.2C 充电到 4.35V 0.2C charge to 4.35V
9	标准放电方式 Standard Discharge Mode	25±2℃ 1C 恒流放电至 2.75V 25±2℃ 1C constant current discharge to 2.75V	

10	最大持续放电电流 Max. Continuous Discharge Current	3C	
11	最大脉冲放电电流 Max. Pulse Discharge Current	5C(≤10S)	
12	工作环境 Operating Environment	0℃~45℃，max.90%RH	充电 Charging
		-40℃~55℃，max.90%RH	放电 Discharging
13	贮存温度 Storage Temperature	-20℃~45℃，max.85%RH	小于一个月 Less than one month
		-20℃~35℃，max.85%RH	小于六个月 Less than six month
14	内阻 Internal Impedance	≤2.0mΩ	标准充电后 AC 1KHz 测试 AC 1KHz after standard charge
15	电芯重量 Cell Weight	359±3g	
16	能量密度 Energy Density	300Wh/Kg(approx)	
17	循环寿命 Cycle Life	0.5C 充 1C 放 300 周≥80% 0.5C charge 1C discharge Cycle Life 300 times ≥80%	

5. 循环放电特性 Cycle discharge characteristics



6. 超低温容量保持性 Cycle discharge characteristics



7. 电池性能 Battery Performance

7.1 电化学性能 Electrochemical Characteristics

序号 NO.	项目 Items	标准 Criteria	测试方法 Test Methods
1	常温放电性能 Normal Temperature Discharge Performance	放电容量/典型容量*100% 0.5C≥99% 1C≥97% 2C≥95% 3C≥92% Discharge Capacity / Typical Capacity * 100% 0.5C ≥ 99% 1C ≥ 97% 2C ≥ 95% 3C ≥ 92%	在标准大气压，环境温度 25±2℃，相对湿度为 75%RH 的条件下，电池 0.2C 标准恒流恒压充电后分别以 0.5C、1C、2C、3C 电流放电，直到放电终止电压 2.7V。允许循环三次，当有一次达到标准，即达到要求。 Under standard atmospheric pressure, an ambient temperature of 25±2°C, and a relative humidity of 75%RH, the battery, after being charged at a standard 0.2C constant current constant voltage (CCCV), is discharged at currents of 0.5C, 1C, 2C, and 3C respectively, until the discharge cut-off voltage of 2.7V is reached. A maximum of three cycles are allowed; the requirement is met if the standard is achieved in any one cycle.
2	常温荷电保持能力 Normal Temperature Charge Retention Capability	剩余容量≥标称容量*90% 恢复容量≥标称容量*95% Remaining Capacity ≥ Nominal Capacity * 90% Recovery Capacity ≥ Nominal Capacity * 95%	0.2C 标准恒流恒压充电后，开路放置 28 天，以 1C 放电至 2.7V，测量剩余容量；0.2C 充 1C 放测量电池的恢复容量。可循环三次，当有一次达到标准，即达到要求。 After a standard 0.2C constant current constant voltage (CCCV) charge, the battery is left in an open circuit state for 28 days. Then, it is discharged at 1C to 2.7V to measure the remaining capacity. The battery's recovery capacity is measured by charging at 0.2C and discharging at 1C. A maximum of three cycles are allowed; the requirement is met if the standard is achieved in any one cycle.
3	贮存性能 Storage Performance	放电容量/典型容量*100% 贮存 3 个月≥90% 贮存 6 个月≥85% 贮存 12 个月≥80% Discharge Capacity / Typical Capacity * 100% Storage for 3 months ≥ 90% Storage for 6 months ≥ 85% Storage for 12 months ≥ 80%	测量电池初始容量，并标准充电后，记录贮存前的初始状态，分别在室温贮存 3 个月、6 个月、12 个月后，测量电池的最终态，然后 0.2C 充 1C 放循环 3 次记录电池放电容量。 Measure the initial capacity of the battery. After standard charging, record the initial state before storage. After storing at room temperature for 3 months, 6 months, and 12 months respectively, measure the final state of the battery. Then, cycle the battery 3 times by charging at 0.2C and discharging at 1C, and record the battery's discharge capacity.

7.2 安全性能 Safety performance

序号 NO.	项目 Items	标准 Criteria	测试方法 Test Methods
1	过充电 Overcharge	不起火、不爆炸 No fire No explosion	1：OCV、IR、重量测试； 2：接上热电偶，并连接过充电夹具； 3：在室温环境下，先以 0.5C 电流恒流充电至 4.35V，然后再转 4.35V 恒压充电，至充电电流降至 0.03C 时停止充电，静置 10 分钟； 4：电池以 1C 电流充电至 5.0V，时间设定 60min； 5：观察 1H。 1: OCV, IR, weight test; 2: Connect thermocouple and overcharge fixture; 3: At room temperature, first charge with 0.5C constant current to 4.35V, then switch to 4.35V constant voltage charging until the charging current drops to 0.03C, then stop charging and let it rest for 10 minutes; 4: Charge the battery with 1C current to 5.0V, time set to 60min; 5: Observe for 1H.
2	短路 Shorts	不起火、不爆炸 No fire No explosion	1：OCV、IR、重量测试； 2：在室温环境下，先以 0.5C 电流恒流充电至 4.35V，然后再转 4.35V 恒压充电，至充电电流降至 0.03C 时停止充电，静置 10 分钟； 3：接上电热偶，正负极接上短路夹子（线路总电阻 5mΩ 以内），短路 10min； 4：观察 1H。 1: OCV, IR, weight test; 2: At room temperature, first charge with 0.5C constant current to 4.35V, then switch to 4.35V constant voltage charging until the charging current drops to 0.03C, then stop charging and let it rest for 10 minutes; 3: Connect thermocouple, connect positive and negative electrodes to short-circuit clamps (total circuit resistance within 5mΩ), short circuit for 10min; 4: Observe for 1H.
3	加热 Thermal stability	不起火、不爆炸 No fire, No explosion	1：OCV、IR、重量测试； 2：在室温环境下，先以 0.5C 电流恒流充电至 4.35V，然后再转 4.35V 恒压充电，至充电电流降至 0.03C 时停止充电，静置 10 分钟； 3：将电池放入温度箱，5℃/min 的速率由室温上升至 130±2℃，并保存此温度 30min； 4：观察 1H。 1: OCV, IR, weight test; 2: At room temperature, first charge with 0.5C constant current to 4.35V, then switch to 4.35V constant voltage charging until the charging current drops to 0.03C, then stop charging and let it rest for 10 minutes; 3: Place the battery in a temperature chamber, raise the

			temperature from room temperature to 130±2°C at a rate of 5°C/min, and maintain this temperature for 30min; 4: Observe for 1H.
4	挤压 Crushing	不起火、不爆炸 No fire No explosion	1：OCV、IR、重量测试； 2：在室温环境下，先以 0.5C 电流恒流充电至 4.35V， 然后再转 4.35V 恒压充电，至充电电流降至 0.03C 时停止充电，静置 10 分钟； 3：a.电池置于平台表面； b.将直径为 15.8mm±0.2mm 的金属棒横置在电池几何中心上表面； c.采用质量为 9.1±0.1kg 的重物从 610mm±25mm 的高处自由落体状态撞击放有金属棒的电池表面； 4：观察 1H。 1: OCV, IR, weight test; 2: At room temperature, first charge with 0.5C constant current to 4.35V, then switch to 4.35V constant voltage charging until the charging current drops to 0.03C, then stop charging and let it rest for 10 minutes; 3: a. Place the battery on a flat surface; b. Place a metal rod with a diameter of 15.8mm±0.2mm horizontally on the geometric center of the battery's upper surface; c. Use a weight of 9.1±0.1kg to impact the battery surface with the metal rod from a free fall height of 610mm±25mm; 4: Observe for 1H.
5	低气压 Low pressure	不起火、不爆炸 No fire No explosion	1：OCV、IR、重量测试； 2：在室温环境下，先以 0.5C 电流恒流充电至 4.35V， 然后再转 4.35V 恒压充电，至充电电流降至 0.03C 时停止充电，静置 10 分钟； 3：电池放入低气压箱中，调节试验箱气压为 11.6kPa，温度为 25±2°C，静置 6h； 4：观察 1H。 1: OCV, IR, weight test; 2: At room temperature, first charge with 0.5C constant current to 4.35V, then switch to 4.35V constant voltage charging until the charging current drops to 0.03C, then stop charging and let it rest for 10 minutes; 3: Place the battery in a low-pressure chamber, adjust the chamber pressure to 11.6kPa, temperature to 25±2°C, and let it rest for 6h; 4: Observe for 1H.
6	低温放电 low temperature discharge	放电容量不低于常温 1C 放电容量 70% Discharge capacity is not lower than 70% of the normal temperature 1C	1：以 0.5C 电流充电至电压达到 4.35V，然后 4.35V 恒压充电，电流降为 0.03C 时充电结束； 2：搁置 10min 后，测试样品的内阻、电压、尺寸； 3：将产品放入高低温测试箱中，连接好分容夹具，检查正常后，设置低温箱温度-40°C； 4：当温度达到测试条件后，设置分容工步，静置 24H 后转 1C 放电至下限电压 2.0V（80%企业规定下限电压）；

		discharge capacity	5：取出产品，在室温环境下静置 2 小时。 1: Charge with 0.5C current until the voltage reaches 4.35V, then charge with 4.35V constant voltage until the current drops to 0.03C, then charging ends; 2: After resting for 10min, test the internal resistance, voltage, and dimensions of the sample; 3: Place the product into a high and low-temperature test chamber, connect the capacity grading fixture, check that it is normal, then set the low-temperature chamber temperature to -40℃; 4: When the temperature reaches the test conditions, set the capacity grading work step, let it rest for 24H, then discharge at 1C to the lower limit voltage of 2.0V (80% of enterprises stipulate this lower limit voltage); 5: Take out the product and let it rest at room temperature for 2 hours.
7	高温放电 High temperature discharge	外观应无爆炸、无破裂； 放电时间不少于初始容量 90% The appearance should have no explosion and no rupture.The discharge time should be no less than 90% of the initial capacity.	1：以 0.5C 电流充电至电压达到 4.35V，然后 4.35V 恒压充电，电流降为 0.03C 时充电结束； 2：搁置 10min 后，测试样品的内阻、电压、尺寸； 3：将产品放入恒温恒湿箱中，连接好分容夹具，检查正常后，设置恒温恒湿箱温度 55℃； 4：当温度达到测试条件后，设置分容工步，静置 5H 后转 1.0C 放电； 5：取出产品，在室温环境下静置 30 分钟； 6：观察记录试验后产品外观情况，测量记录试验后产品的内阻、电压。 1: Charge with 0.5C current until the voltage reaches 4.35V, then charge with 4.35V constant voltage until the current drops to 0.03C, then charging ends; 2: After resting for 10min, test the internal resistance, voltage, and dimensions of the sample; 3: Place the product into a constant temperature and humidity chamber, connect the capacity grading fixture, check that it is normal, then set the constant temperature and humidity chamber temperature to 55℃; 4: When the temperature reaches the test conditions, set the capacity grading work step, let it rest for 5H, then discharge at 1.0C; 5: Take out the product and let it rest at room temperature for 30 minutes; 6: Observe and record the appearance of the product after the test, measure and record the product's internal resistance and voltage after the test.
8	高温荷电 high temperature charge	容量保持能≥85%； 容量恢复能≥85%。 Capacity retention ≥ 85% Capacity recovery ≥ 85%	1：以 0.5C 电流充电至 4.35V，然后 4.35V 恒压充电，电流降为 0.03C 时充电结束； 2：搁置 10min 后，测试样品的内阻、电压、尺寸； 3：将产品放入高温箱中，待高温箱温度升到 60±2℃时，在此温度条件下存贮 7 天； 4：当试验时间到后，戴上高温手套取出电池，静置 5H

			后连接好分容柜，以 1C 放电，记录放电容量，OCV 和内阻，计算容量保持能力； 5：在室温环境下静置 30 分钟，然后以 0.5C 充电至满电电压，1C 放电，记录放电容量，计算容量恢复能力； 6：观察记录试验后产品外观情况，测量记录试验后产品的内阻，OCV 数据。 1: Charge with 0.5C current to 4.35V, then charge with 4.35V constant voltage, until the current drops to 0.03C, then charging ends; 2: After resting for 10min, test the internal resistance, voltage, and dimensions of the sample; 3: Place the product into a high-temperature chamber, wait until the high-temperature chamber temperature rises to 60±2°C, and store it at this temperature for 7 days; 4: When the test time is up, wear high-temperature gloves to take out the battery, let it rest for 5H, then connect it to the capacity grading cabinet, discharge at 1C, record the discharge capacity, OCV, and internal resistance, and calculate the capacity retention capability; 5: Let it rest at room temperature for 30 minutes, then charge at 0.5C to full voltage, discharge at 1C, record the discharge capacity, and calculate the capacity recovery capability; 6: Observe and record the appearance of the product after the test, measure and record the product's internal resistance and OCV data after the test.
9	倍率放电 electric discharge rate	5C 倍率放电时电芯表面温度<50°C During 5C rate discharge, the cell surface temperature < 50°C.	1：在室温环境下，将电池恒流恒压充电至 4.35V，电流降为 0.03C 时充电结束； 2：充电结束后，在相同的温度条件下放置 0.5 小时； 3：在室温环境下，以 0.5C、1C、2C、3C、4C、5C 放电至终止电压 2.7V，并监控表面温度。 1: At room temperature, charge the battery with constant current and constant voltage to 4.35V, until the current drops to 0.03C, then charging ends; 2: After charging, place it under the same temperature conditions for 0.5 hours; 3: At room temperature, discharge at 0.5C, 1C, 2C, 3C, 4C, 5C to a cut-off voltage of 2.7V, and monitor the surface temperature.
10	循环 Cycle	常温 300 周循环保持率≥80%。 After 300 cycles at normal temperature, the capacity retention ≥ 80%.	1：以 0.5C 电流充电至电压达到 4.35V，然后 4.35V 恒压充电，电流降为 0.03C 时充电结束； 2：搁置 10min； 3：1C 恒流放电至 2.7V； 4：1~3 循环 300 周。 1: Charge with 0.5C current until the voltage reaches 4.35V, then charge with 4.35V constant voltage until the current drops to 0.03C, then charging ends; 2: Rest for 10min; 3: Discharge at 1C constant current to 2.7V; 4: Cycle steps 1-3 for 300 cycles.

8. 外观检查 Visual Inspection

不允许有任何影响电池性能的外观缺陷，如裂纹、裂缝、泄漏等。

There shall be no such defects as scratch, flaw, crack, and leakage, which may adversely affect the commercial value of the cell.

9. 标准测试环境 Standard Test Conditions

除非特别说明，本规格书中所有测试均在以下环境条件下进行：

Unless otherwise specified, all tests in this Product Specification are conducted at below conditions:

温度 Temperature: 25±3℃

湿度 Humidity: ≤75

大气压 Atmosphere: 1 个标准大气压

10.标识 Identification

10.1 单体电池产品上应有下列标识：

Cell product shall have the following marks:

极性符号+、- Polar symbol: +/-

产品条码(信息包含产品型号、批号、生产日期信息)

Product barcode (information including product model, batch number and date of production)

9.2 包装箱外壁应有下列标志：

Each packing case shall be marked with:

产品名称(锂离子电池)、产品型号、产品批号、产品等级、数量、物料编码

Product name (solid lithium ion cell), product model, product batch number, product grade, quantity, material code

标明防潮、不准倒置、轻放等标志

Moisture-proof, no upside-down and other signs

11.存储及其他事项 Storage and Others

11.1 长期储存 Long Time Storage: 长期储存的电池(超过 3 个月)须置于干燥、凉爽处，每 6 个月对电池进行一次充放电，储存电压为 3.8V。

If the cell is to be stored for a long time (over 3 months), the cell should be stored in dry and cool place. The cell should be charged and discharged every six month. The cell's storage voltage should be 3.8V.

11.2 其他事项 Others: 任何本规格书中未提及的事项，须经双方协商确定。

Any matters which have not been covered in this specification should be conferred between the customer and Nanwu Technology (Guangzhou) Co., Ltd..

12.保质期及产品责任 Warranty Period and Product Liability

12.1 保质期 Warranty

保质期是从生产日期（喷码批次）开始起 12 个月。

The shelf life is 12 months from the production date (indicated by the spray-coded batch number)

12.2 产品责任 Product Liability

对因没有按本规格书规定操作而导致的意外不负责任，当本规格书有些变动时，本公司会通知购买方。

Nanwu Technology (Guangzhou) Co., Ltd. is not responsible for the troubles caused by mishandling of the cell which is clearly against the instructions in this specification. Nanwu Technology (Guangzhou) Co., Ltd. will notify our customers if there are any changes of the product specification.

13.文件有效期 Validity Period of Documents

本文件自发布之日至下次修正日止。

The validaiton for this document is from the issue date to the date of the next revision.

14.保密 Confidentiality

本产品规格书在没有得到南屋科技(广州)有限公司的许可时，不能向第三方泄露，禁止复印或转载。

This product specification shall not be disclosed to any third party without the permission of Nanwu Technology (Guangzhou) Co., Ltd.; nor shall it be copied or reproduced.

15.警告及注意事项 Warnings and Cautions

15.1 不要将电池投入火中或加热;

Do not put the cell into the fire or a heater;

15.2 不要将电池分解拆散;

Do not dismantle the cell;

15.3 严禁将电池浸入海水或水中，保存不用时，应放置于阴凉干燥的环境中;

Do not immerse the cell in water or seawater, keep the cell in a cool dry environment if it stands by;

15.4 禁止将电池放在热源旁，如火、加热器等;

Do not use or leave the cell near sources of heat such as a fire or heater;

15.5 充电时请选用锂离子电池专用充电器;

Use the charger specifically for lithium-ion cell when recharging;

15.6 严禁颠倒正负极使用电池;

Do not reverse the position and negative terminals;

15.7 严禁将电池直接插入电源插座

Do not connect the cell directly to an electrical outlet;

15.8 禁止用金属直接连接电池正负极短路;

Do not short-circuit the cell by directly connecting the positive and negative terminals with metal objects;

15.9 禁止将电池与金属(如发夹、项链等)一起运输或贮存;

Do not transport or store the cell together with metal objects such as hairpins, necklaces, etc;

15.10 禁止敲击或抛掷、踩踏电池等;

Do not strike, trample or throw the cell, etc;

15.11 禁止直接焊接电池和用钉子或其它利器刺穿电池;

Do not directly solder the cell and pierce the cell with a nail or other sharp objects;

15.12 禁止在高温下(炙热的阳光下或很热的汽车中)使用或放置电池，否则可能会引起电池过热、起火或功能失效、寿命减短;

Do not use or leave the cell at high temperature (for example, under the hot sunlight or in a hot vehicle). Otherwise, it can overheat, catch fire, or suffer from performance and life degradation;

15.13 禁止在强静电和强磁场的地方使用，否则易破坏电池安全保护装置，带来不安全的隐患；

Do not use the cell in a location with strong electrostatic field or magnetic field. Otherwise, the safety protective device may be damaged, causing safety hazard;

15.14 如果电池发生泄露，电解液进入眼睛，请不要揉擦，应用清水冲洗眼睛，并立即送医治疗；

If the cell leaks and the electrolyte gets into the eyes, do not rub the eyes, instead, rinse the eyes with clean water, and immediately seek medical attention so as not to cause more injury to your eyes;

15.15 如果电池发出异味、发热、变色、变形或使用、贮存、充电过程中出现任何异常，立即将电池从装置或充电器中移离并停用；

If the cell gives off an odor, generates heat, becomes discolored or deformed, or in any way appear abnormal during use, recharging or storage, immediately remove it from the device or cell charger and stop using it;

15.16 废弃之电池应用绝缘纸包住电极以防起火、爆炸；

Be aware that abandoned batteries may cause fire or explosion, tape the cell terminals to insulate them;

15.17 如果电池极柱弄脏，使用前应用干布抹净，否则可能会导致接触不良功能失效。

If the cell terminals are stained, clean the terminals with a dry cloth before use. Otherwise performance degredation may be caused due to the poor connection.

15.18 废弃电池应交予专业回收处理公司进行无害化处理；

Waste batteries should be handed over to professional recycling companies for harmless treatment.

15. 19 电池在使用过程中应遵循所在地的法律法规。

During battery usage, the local laws and regulations should be followed.