





# UN38.3 Test Report UN38.3 检测报告

Report No.:

P23120623601

报告编号:

Name of Products: Rechargeable Li-ion Cell

产品名称: 锂离子电芯

Model and Spec.:

26650, 3.7V 5000mAh 18.5Wh

型号规格:

Applicant: Jiangxi Canhui New Energy Science And Technology Co., Ltd

委托单位: 江西省灿辉新能源科技有限公司

Manufacturer: Jiangxi Canhui New Energy Science And Technology Co., Ltd

生产厂商: 江西省灿辉新能源科技有限公司

Date of issue:

2024-01-05

签发日期:

### Shenzhen NTEK New Energy Technology Co., Ltd.

深圳市北测新能源技术有限公司



| Applicant                    | Jiangxi Canhui New Energy Science And Technology Co., Ltd             |
|------------------------------|---|
| 委托单位                         | 江西省灿辉新能源科技有限公司  |
| Address of Applicant         | Guangchang Industrial Park, Fuzhou City, Jiangxi Province, P.R. China |
| 委托单位地址                       | 江西省抚州市广昌县工业园区   |
| Manufacturer                 | Jiangxi Canhui New Energy Science And Technology Co., Ltd             |
| 生产厂商                         | 江西省灿辉新能源科技有限公司  |
| Address of manufacturer      | Guangchang Industrial Park, Fuzhou City, Jiangxi Province, P.R. China |
| 生产厂商地址                       | 江西省抚州市广昌县工业园区   |
| Name of Products             | Rechargeable Li-ion Cell  |
| 产品名称                         | 锂离子电芯   |
| Model/Type                   | 26650   |
| 型号                           | 20000   |
| Ratings                      | 3.7V 5000mAh 18.5Wh   |
| 额定参数                         | 3.7 V 5000HATI 16:5WH   |
| Date of receipt of test item | 2023-12-21  |
| 接收日期                         | 2023-12-21  |
| Completion Date              | 2024-01-02  |
| 完成日期                         | 2024-01-02  |

### Tested according to 测试依据:

United Nations Manual of Tests and Criteria, PART III, section 38.3 Lithium metal and lithium ion batteries, the seventh revised edition amendment 1(ST/SG/AC.10/11/Rev.7/Amend.1).

联合国《试验和标准手册》,第三部分,38.3 节锂金属和锂离子电池要求,第七修订版修正 1 (ST/SG/AC.10/11/Rev.7/Amend.1)

### Tests performed 测试项目:

Test T.1: Altitude simulation 试验 T.1: 高度模拟 Test T.5: E

Test T.5: External short circuit 试验 T.5: 外部短路

Test T.2: Thermal Test 试验 T.2: 温度试验

Test T.6: Impact 试验 T.6: 撞击

Test T.3: Vibration 试验 T.3: 振动

Test T.8: Forced discharge 试验 T.8: 强制放电

Test T.4: Shock 试验 T.4: 冲击

#### Test Conclusion 试验结论:

The Rechargeable Li-ion Cell submitted by Jiangxi Canhui New Energy Science And Technology Co., Ltd is tested according to the United Nations Manual of Tests and Criteria, PART III, section 38.3 Lithium metal and lithium ion batteries, the seventh revised edition *amendment 1* 

(ST/SG/AC.10/11/Rev.7/Amend.1).

Test results: PASS

由江西省灿辉新能源科技有限公司提交的锂离子电芯按照联合国《试验和标准手册》,第三部分,38.3 节锂金属和锂离子电芯要求,第七修订版修正 1(ST/SG/AC.10/11/Rev.7/Amend.1)进行测试。

测试结果: 合格

| Tested by:   | Jeremy Wu   | V /2 ±    |              |
|--------------|-------------|-----------|--------------|
| 主检人:         | 吴定杰         | 条件ない      |              |
| Reviewed by: | Mumu Huang  | - J 2 Y   |              |
| 审核人:         | 黄天生         | - M. 7, 2 |              |
| Approved by: | Jesse Zhang | 7×+x      | 报告单位(盖章)     |
| 批准人:         | 张士杰         | Ja in     | Seal of NTEK |



| General product information 通用产品信息: |                         |                        |                           |  |  |  |
|-------------------------------------|-------------------------|------------------------|---------------------------|--|--|--|
| Model/Type                          | 26650                   | Rated Rating           | 3.7V 5000mAh 18.5Wh       |  |  |  |
| 型号                                  | 20000                   | 额定值                    | 3.7 V 5000IIIAII 16.5VVII |  |  |  |
| Standard Charging Current           | 1000mA                  | Max. Charging Current  | 2500mA                    |  |  |  |
| 标准充电电流                              | TOOOMA                  | 最大充电电流                 | 2500MA                    |  |  |  |
| Standard Discharge Current          | 1000mA                  | Max. Discharge Current | 10000m A                  |  |  |  |
| 标准放电电流                              | TOOOMA                  | 最大放电电流                 | 10000mA                   |  |  |  |
| Limited Charging Voltage            | 4.2V                    | Cut-off Voltage        | 2.75V                     |  |  |  |
| 充电限制电压                              | 4.20                    | 放电截止电压                 | 2.750                     |  |  |  |
| Appearance                          | Green, Cylindrical      | Dimension (DxH)        | 26.6×66.3                 |  |  |  |
| 外观                                  | 绿色、圆柱形                  | 尺寸(mm)                 | 20.0x00.3                 |  |  |  |
| Classification                      | Small Lithium ion Cells |                        |                           |  |  |  |
| 类别                                  | 小型锂离子电芯                 |                        |                           |  |  |  |

| Sample descrip | otion 样品说明        |                |   |
|----------------|-------------------|----------------|---|
| Туре           | Sample No.        | Sample Sub-No. | State of samples                          |
| 类型             | 样品编号              | 样品子编号          | 样品状态                                      |
|                |                   | 001~005        | Fully charged at first cycle              |
|                |                   | 001~005        | 首次循环满电状态                                  |
|                |                   | 006~010        | Fully charged after 25 cycles             |
|                |                   | 000~010        | 25 次循环后满电状态                               |
|                |                   | 011~015        | 50% of the design rated capacity at first |
| Cell           | NE231206120001-X* | 011-015        | cycle 首次循环 50%电荷状态                        |
| 电池芯            | 14L201200120001 X | 016~020        | 50% of the design rated capacity after 25 |
|                |                   | 010 020        | cycles 25 次循环后 50%电荷状态                    |
|                |                   | 021~030        | Fully discharged at first cycle           |
|                |                   | 021 000        | 首次循环完全放电状态                                |
|                |                   | 031~040        | Fully discharged after 25 cycles          |
|                |                   | 001-040        | 25 次循环后完全放电状态                             |

<sup>\* &</sup>quot;X" contained in Sample No. represents Sample Sub-No., it consists of three digit. 包含在样品编号中的"X"表示样品子编号,由 3 位数字组成。



Test environment condition: Room temperature: 15°C-25°C; Room humidity: 40-70%

试验环境条件: 环境温度: 15°C-25°C; 环境湿度: 40-70%

Remark 备注: None 无

Summaries of testing 测试摘要:

All cell types are subjected to tests T.1 to T.6 and T.8. Tests T.1 to T.5 are conducted in sequence on the same cells. Tests T.6 and T.8 are conducted using not otherwise tested cells.

所有类型的电芯均应进行T.1至T.6和T.8项试验。电芯必须按顺序在相同的一组电芯上进行试验T.1至T.5。试验T.6和T.8应使用另外未试验过的电芯。

In order to quantify the mass loss, the following procedure is provided:

Mass loss(%)= $(M_1-M_2)/M_1\times 100$ 

为了量化质量损失,可用以下公式计算:

质量损失(%)=(M<sub>1</sub>-M<sub>2</sub>)/M<sub>1</sub>×100

Where M<sub>1</sub> is the mass before the test and M<sub>2</sub> is the mass after the test. When mass loss does not exceed the values in Table below, it is considered as "no mass loss".

式中: M<sub>1</sub>是试验前的质量, M<sub>2</sub>是试验后的质量。如果质量损失不超过下表所列的数值, 应视为"无质量损失"。

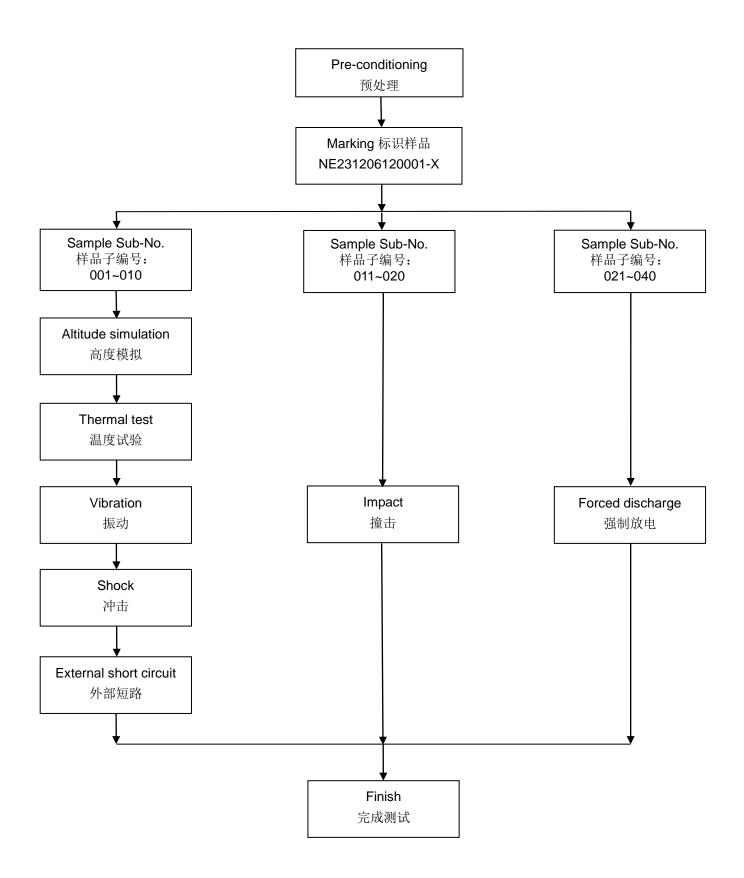
| Mass M of cell or battery | Mass loss limit |
|---------------------------|-----------------|
| 电芯或电池的质量                  | 质量损失限值          |
| M<1g                      | 0.5%            |
| 1g≤M≤75g                  | 0.2%            |
| M>75g                     | 0.1%            |

In tests T.1 to T.4, cells meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell after testing is not less than 90% of its voltage immediately prior to this procedure.

在T.1至T.4的试验中,电芯须满足无渗漏、无泄气、无解体、无破裂和无起火,并且每个试验电芯在试验后的开路电压不小于其在进行这一试验前电压的90%。



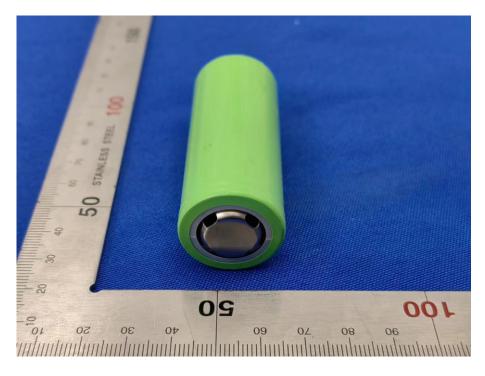
# Test Procedure 测试程序





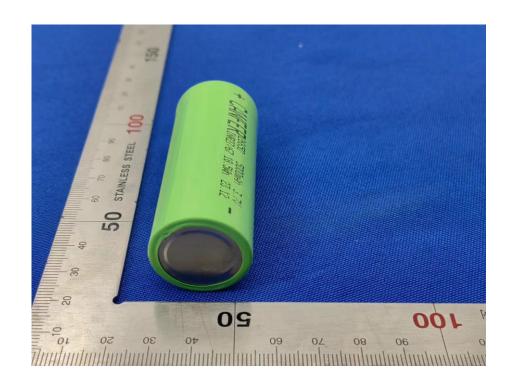
## Photos of sample 样品照片







# Photos of sample 样品照片





### Test results 测试结果:

#### Test T.1: Altitude simulation 试验T.1: 高度模拟

Test method 测试方法

Cells are stored at a pressure of 11.6 kPa or less for at least six hours at ambient temperature (20 ± 5°C). 试验电芯被放置在压力等于或低于11.6 kPa和环境温度(20±5°C)下存放至少6小时。

Requirement 要求

Cells meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell after testing is not less than 90% of its voltage immediately prior to this procedure.

电芯须无渗漏、无泄气、无解体、无破裂和无起火,并且每个试验电芯在试验后的开路电压不小于其在进行这一试验前电压的**90%**。

#### Test Data showed in table below 测试数据见下表

| Sample           | Prior to te       | st 试验前               | After tes         | t 试验后                | Mass loss   | Voltage after test/ voltage         | Results |
|------------------|-------------------|----------------------|-------------------|----------------------|-------------|-------------------------------------|---------|
| Sub-No.<br>样品子编号 | Mass<br>质量<br>(g) | Voltage<br>电压<br>(V) | Mass<br>质量<br>(g) | Voltage<br>电压<br>(V) | 质量损失<br>(%) | prior to test<br>试验后电压/试<br>验前电压(%) | 结果      |
| 001              | 91.458            | 4.175                | 91.458            | 4.173                | 0.000       | 99.95                               | PASS 合格 |
| 002              | 92.684            | 4.176                | 92.684            | 4.173                | 0.000       | 99.93                               | PASS 合格 |
| 003              | 91.720            | 4.175                | 91.713            | 4.174                | 0.008       | 99.98                               | PASS 合格 |
| 004              | 92.060            | 4.178                | 92.060            | 4.175                | 0.000       | 99.93                               | PASS 合格 |
| 005              | 92.239            | 4.177                | 92.239            | 4.175                | 0.000       | 99.95                               | PASS 合格 |
| 006              | 91.947            | 4.176                | 91.947            | 4.173                | 0.000       | 99.93                               | PASS 合格 |
| 007              | 91.773            | 4.175                | 91.773            | 4.172                | 0.000       | 99.93                               | PASS 合格 |
| 008              | 91.754            | 4.177                | 91.747            | 4.174                | 0.008       | 99.93                               | PASS 合格 |
| 009              | 92.434            | 4.175                | 92.434            | 4.173                | 0.000       | 99.95                               | PASS 合格 |
| 010              | 91.912            | 4.176                | 91.912            | 4.173                | 0.000       | 99.93                               | PASS 合格 |

Notes 注释:

After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.

测试后, 电芯未渗漏、未泄气、未解体、未破裂和未起火。

Room temperature 环境温度: 21.5°C



#### Test T.2: Thermal test 试验T.2: 温度试验

#### Test method 测试方法

Cells are to be stored for at least six hours at a test temperature equal to  $72 \pm 2^{\circ}$ C, followed by storage for at least six hours at a test temperature equal to  $-40 \pm 2^{\circ}$ C. The maximum time interval between test temperature extremes is 30 minutes. This procedure is to be repeated 10 times, after which all test cells are to be stored for 24 hours at ambient temperature ( $20 \pm 5^{\circ}$ C).

电芯放置在试验温度等于72±2℃的条件下存放至少6小时,接着再在试验温度等于-40±2℃的条件下存放至少6小时。两个极端试验温度之间的最大时间间隔为30分钟。此程序重复进行,共完成10次,接着将所有试验电芯在环境温度(20±5°C)下存放24小时。

#### Requirement 要求

Cells meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell after testing is not less than 90% of its voltage immediately prior to this procedure.

电芯须无渗漏、无泄气、无解体、无破裂和无起火,并且每个试验电芯在试验后的开路电压不小于其在进行这一试验前电压的**90%**。

Test Data showed in table below 测试数据见下表

| Sample           | Prior to te       | st 试验前               | After tes         | t 试验后                | Mass loss   | Voltage after test/ voltage | Results |
|------------------|-------------------|----------------------|-------------------|----------------------|-------------|-----------------------------|---------|
| Sub-No.<br>样品子编号 | Mass<br>质量<br>(g) | Voltage<br>电压<br>(V) | Mass<br>质量<br>(g) | Voltage<br>电压<br>(V) | 质量损失<br>(%) | 质重损失 prior to test          | 结果      |
| 001              | 91.458            | 4.175                | 91.458            | 4.173                | 0.000       | 99.95                       | PASS 合格 |
| 002              | 92.684            | 4.176                | 92.684            | 4.173                | 0.000       | 99.93                       | PASS 合格 |
| 003              | 91.720            | 4.175                | 91.713            | 4.174                | 0.008       | 99.98                       | PASS 合格 |
| 004              | 92.060            | 4.178                | 92.060            | 4.175                | 0.000       | 99.93                       | PASS 合格 |
| 005              | 92.239            | 4.177                | 92.239            | 4.175                | 0.000       | 99.95                       | PASS 合格 |
| 006              | 91.947            | 4.176                | 91.947            | 4.173                | 0.000       | 99.93                       | PASS 合格 |
| 007              | 91.773            | 4.175                | 91.773            | 4.172                | 0.000       | 99.93                       | PASS 合格 |
| 008              | 91.754            | 4.177                | 91.747            | 4.174                | 0.008       | 99.93                       | PASS 合格 |
| 009              | 92.434            | 4.175                | 92.434            | 4.173                | 0.000       | 99.95                       | PASS 合格 |
| 010              | 91.912            | 4.176                | 91.912            | 4.173                | 0.000       | 99.93                       | PASS 合格 |

#### Notes 注释:

After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.

测试后, 电芯未渗漏、未泄气、未解体、未破裂和未起火。

Room temperature 环境温度: 20.9°C



Test T.3: Vibration 试验T.3: 振动

#### Test method 测试方法

Cells are firmly secured to the platform of the vibration machine without distorting the cells in such a manner as to faithfully transmit the vibration. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes. This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting positions of the cell. One of the directions of vibration must be perpendicular to the terminal face.

The logarithmic frequency sweep is as follows: from 7 Hz a peak acceleration of 1  $g_n$  is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 8  $g_n$  occurs (approximately 50 Hz). A peak acceleration of 8  $g_n$  is then maintained until the frequency is increased to 200 Hz.

电芯紧固于振动台台面,但不得造成电芯变形,并能准确可靠地传播振动。振动应是正弦波形,对数扫描频率 在7 Hz和200 Hz之间,再回到7 Hz,1次循环时间为15分钟。这一振动过程须对三个互相垂直的电芯安装方位 的每一方向重复进行12次,总共为时3小时。其中一个振动方向必须与端面垂直。

对数扫频方式:从7 Hz开始,保持1 gn的最大加速度,直到频率达到18 Hz。然后将振幅保持在0.8mm(总位移 1.6mm),并增加频率直到峰值加速度达到8 gn(频率约为50 Hz)。将峰值加速度保持在8 gn直到频率增加到 200 Hz。

#### Requirement 要求

Cells meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire during the test and after the test and if the open circuit voltage of each test cell directly after testing in its third perpendicular mounting position is not less than 90% of its voltage immediately prior to this procedure. 测试中和测试后电芯须无渗漏、无泄气、无解体、无破裂和无起火,并且每个试验电芯在第三个垂直安装方位上的试验后立即测得的开路电压不小于在进行这一试验前电压的90%。

Test Data showed in table below 测试数据见下表

| Sample           | Prior to te       | st 试验前               | After tes         | t 试验后                | Mass loss   | Voltage after test/ voltage         | Dogulto       |
|------------------|-------------------|----------------------|-------------------|----------------------|-------------|-------------------------------------|---------------|
| Sub-No.<br>样品子编号 | Mass<br>质量<br>(g) | Voltage<br>电压<br>(V) | Mass<br>质量<br>(g) | Voltage<br>电压<br>(V) | 质量损失<br>(%) | prior to test<br>试验后电压/试<br>验前电压(%) | Results<br>结果 |
| 001              | 91.430            | 4.128                | 91.430            | 4.127                | 0.000       | 99.98                               | PASS 合格       |
| 002              | 92.656            | 4.127                | 92.656            | 4.125                | 0.000       | 99.95                               | PASS 合格       |
| 003              | 91.687            | 4.126                | 91.687            | 4.125                | 0.000       | 99.98                               | PASS 合格       |
| 004              | 92.025            | 4.125                | 92.018            | 4.124                | 0.008       | 99.98                               | PASS 合格       |
| 005              | 92.213            | 4.126                | 92.213            | 4.124                | 0.000       | 99.95                               | PASS 合格       |
| 006              | 91.921            | 4.128                | 91.921            | 4.126                | 0.000       | 99.95                               | PASS 合格       |
| 007              | 91.745            | 4.124                | 91.745            | 4.123                | 0.000       | 99.98                               | PASS 合格       |
| 800              | 91.721            | 4.126                | 91.721            | 4.125                | 0.000       | 99.98                               | PASS 合格       |
| 009              | 92.412            | 4.128                | 92.412            | 4.126                | 0.000       | 99.95                               | PASS 合格       |
| 010              | 91.880            | 4.126                | 91.873            | 4.125                | 0.008       | 99.98                               | PASS 合格       |

Notes 注释:

During and after the test, there is no leakage, no venting, no disassembly, no rupture and no fire.

测试中和测试后, 电芯未渗漏、未泄气、未解体、未破裂和未起火。

Room temperature 环境温度:21.3°C



#### Test T.4: Shock 试验 T.4: 冲击

#### Test method 测试方法

Cells are secured to the testing machine by means of a rigid mount which will support all mounting surfaces of each test cell. Each cell is subjected to a half-sine shock of peak acceleration of 150 gn and pulse duration of 6 milliseconds. Each cell is subjected to three shocks in the positive direction followed by three shocks in the negative direction of three mutually perpendicular mounting positions of the cell for a total of 18 shocks. 试验电芯用刚性支架紧固在试验装置上,支架支撑着每个试验电芯的所有安装面。每个电芯须经受峰值加速度 150 gn和脉冲持续时间6 ms的半正弦波冲击。每个电芯须在三个互相垂直的电芯安装方位的正方向经受三次冲击,接着在反方向经受三次冲击,总共经受18次冲击。

### Requirement 要求

Cells meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell after testing is not less than 90% of its voltage immediately prior to this procedure.

电芯须无渗漏、无泄气、无解体、无破裂和无起火,并且每个试验电芯在试验后的开路电压不小于其在进行这一试验前电压的**90%**。

Test Data showed in table below 测试数据见下表

| Sample           | Prior to te       | st 试验前               | After tes         | t 试验后                | Mass loss   | Voltage after test/ voltage | Results |
|------------------|-------------------|----------------------|-------------------|----------------------|-------------|-----------------------------|---------|
| Sub-No.<br>样品子编号 | Mass<br>质量<br>(g) | Voltage<br>电压<br>(V) | Mass<br>质量<br>(g) | Voltage<br>电压<br>(V) | 质量损失<br>(%) | •                           | 结果      |
| 001              | 91.430            | 4.127                | 91.423            | 4.126                | 0.008       | 99.98                       | PASS 合格 |
| 002              | 92.656            | 4.125                | 92.656            | 4.125                | 0.000       | 100.0                       | PASS 合格 |
| 003              | 91.687            | 4.125                | 91.687            | 4.125                | 0.000       | 100.0                       | PASS 合格 |
| 004              | 92.018            | 4.124                | 92.018            | 4.124                | 0.000       | 100.0                       | PASS 合格 |
| 005              | 92.213            | 4.124                | 92.213            | 4.124                | 0.000       | 100.0                       | PASS 合格 |
| 006              | 91.921            | 4.126                | 91.921            | 4.125                | 0.000       | 99.98                       | PASS 合格 |
| 007              | 91.745            | 4.123                | 91.738            | 4.123                | 0.008       | 100.0                       | PASS 合格 |
| 008              | 91.721            | 4.125                | 91.721            | 4.124                | 0.000       | 99.98                       | PASS 合格 |
| 009              | 92.412            | 4.126                | 92.412            | 4.124                | 0.000       | 99.95                       | PASS 合格 |
| 010              | 91.873            | 4.125                | 91.866            | 4.125                | 0.008       | 100.0                       | PASS 合格 |

#### Notes 注释:

After the test, there is no leakage, no venting, no disassembly, no rupture and no fire.

测试后, 电芯未渗漏、未泄气、未解体、未破裂和未起火。

Room temperature 环境温度: 22.3°C



#### Test T.5: External short circuit 试验T.5: 外部短路

#### Test method 测试方法

Cells to be tested are heated for a period of time necessary to reach a homogeneous stabilized temperature of  $57 \pm 4$  °C, measured on the external case. This period of time depends on the size and design of the cell and is assessed and documented. Then the cell at  $57 \pm 4$  °C is subjected to one short circuit condition with a total external resistance of less than 0.1 ohm.

This short circuit condition is continued for at least one hour after the cell external case temperature has returned to  $57 \pm 4$  °C.

The short circuit and cooling down phases are conducted at least at ambient temperature.

试验电芯首先被加热或恒定一段时间,使其达到57±4°C并使其外表面温度均匀恒定在57±4°C。该加热时间或热恒定时间的长短取决于该电芯的尺寸和设计,并同时加以评估及提供文件证明。然后该电芯在57±4°C的条件下承受一个外部总阻抗小于0.1 $\Omega$ 的短路条件。

该短路测试持续到电芯外表面温度返回至57±4℃后再保持至少1小时。

该短路和冷却阶段均被执行在57±4°C的环境温度下。

#### Requirement 要求

Cells meet this requirement if their external temperature does not exceed 170°C and there is no disassembly, no rupture and no fire during the test and within six hours after test.

电芯外壳温度不超过170°C,并且在试验过程中及试验后6小时内无解体、无破裂,无起火。

#### Test data showed in table below 测试数据见下表

| Sample Sub-No. | Maximum outer casing temperature | Results |
|----------------|----------------------------------|---------|
| 样品子编号          | 电池表面最高温度 (°C)                    | 结果      |
| 001            | 115.5                            | PASS 合格 |
| 002            | 116.0                            | PASS 合格 |
| 003            | 116.4                            | PASS 合格 |
| 004            | 115.9                            | PASS 合格 |
| 005            | 116.2                            | PASS 合格 |
| 006            | 114.4                            | PASS 合格 |
| 007            | 114.7                            | PASS 合格 |
| 008            | 115.2                            | PASS 合格 |
| 009            | 114.7                            | PASS 合格 |
| 010            | 116.8                            | PASS 合格 |

#### Notes 注释:

There is no disassembly, no rupture and no fire during the test and within six hours after test.

电芯在测试中和测试后6小时内未解体、未破裂,未起火。

Room temperature 环境温度: 22.4°C



Test T.6: Impact 试验T.6: 撞击

#### Test method 测试方法

Each cell is to be placed on a flat smooth surface. A 15.8 mm  $\pm 0.1$  mm diameter, at least 6 cm long, or the longest dimension of the cell, whichever is greater, Type 316 stainless steel bar is to be placed across the centre of the sample. A 9.1 kg  $\pm$  0.1 kg mass is to be dropped from a height of 61  $\pm$  2.5 cm at the intersection of the bar and sample in a controlled manner using a near frictionless, vertical sliding track or channel with minimal drag on the falling mass. The vertical track or channel used to guide the falling mass shall be oriented 90 degrees from the horizontal supporting surface.

The test sample is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8 mm  $\pm$  0.1mm diameter curved surface lying across the centre of the test sample. Each sample is to be subjected to only a single impact.

每个电芯放在平坦光滑的表面上。一根 316 型不锈钢棒横放在试样中心,钢棒直径 15.8±0.1 毫米,长度至少 6 厘米,或电芯的最长尺度,取二者中较大者。将一块 9.1±0.1 kg 的重锤从 61±2.5 厘米高处跌落到钢棒和试样交叉点,使用一个几乎没有摩擦的、对落体重锤阻力很小的垂直导轨或管道加以控制。垂直导轨或管道用于引导落锤沿与水平支撑表面呈 90 度落下。

接受撞击的试样,纵轴应与测试平面平行并与横放在试样中心的直径 15.8±0.1 毫米弯曲表面的纵轴垂直。每一试样只经受一次撞击。

#### Requirement 要求

Cells meet this requirement if their external temperature does not exceed 170°C and there is no disassembly and no fire during the test and within six hours after the test.

电芯外壳温度不超过170°C,并且在试验过程中及试验后6小时内无解体,无起火。

#### Test data showed in table below 测试数据见下表

| Sample Sub-No. | Maximum outer casing temperature | Results |
|----------------|----------------------------------|---------|
| 样品子编号          | 电池芯表面最高温度 (°C)                   | 结果      |
| 011            | 22.3                             | PASS 合格 |
| 012            | 22.7                             | PASS 合格 |
| 013            | 22.9                             | PASS 合格 |
| 014            | 22.5                             | PASS 合格 |
| 015            | 23.8                             | PASS 合格 |
| 016            | 23.6                             | PASS 合格 |
| 017            | 23.4                             | PASS 合格 |
| 018            | 22.5                             | PASS 合格 |
| 019            | 23.7                             | PASS 合格 |
| 020            | 22.9                             | PASS 合格 |

#### Notes 注释:

There is no disassembly, no rupture and no fire during the test and within six hours after the test. 电芯在测试中和测试后 6 小时内未解体、未起火。

Room temperature 环境温度: 21.9°C



#### Test T.8: Forced discharge 试验 T.8: 强制放电

#### Test method 测试方法

Each cell is forced discharged at ambient temperature by connecting it in series with a 12V D.C. power supply at an initial current equal to the maximum discharge current specified by the manufacturer.

The specified discharge current is to be obtained by connecting a resistive load of the appropriate size and rating in series with the test cell. Each cell is forced discharged for a time interval (in hours) equal to its rated capacity divided by the initial test current (in ampere).

每个电芯在环境温度下与 12V 直流电电源串联在起始电流等于制造商给定的最大放电电流的条件下强制放电。

电芯与一个适当大小的电阻负载串联以调节到规定大小的放电电流。每块电芯的放电时间(单位为 h)等于电芯的额定容量除以试验初始放电电流(单位 A)。

### Requirement 要求

Cells meet this requirement if there is no disassembly and no fire during the test and within seven days after the test.

电芯在试验过程中和试验后7天内无解体,无起火。

#### Test data showed in table below 测试数据见下表

| Initial current 初始电流(m/ | A)         | : 10000mA               |            |  |
|-------------------------|------------|-------------------------|------------|--|
| Supply voltage 试验电压(\   | /dc):      | 12Vdc                   |            |  |
| Time interval 试验时间(Min  | nutes):    | 30 Minutes              |            |  |
| Sample Sub-No.<br>样品子编号 | Results 结果 | Sample Sub-No.<br>样品子编号 | Results 结果 |  |
| 021                     | PASS 合格    | 031                     | PASS 合格    |  |
| 022                     | PASS 合格    | 032                     | PASS 合格    |  |
| 023                     | PASS 合格    | 033                     | PASS 合格    |  |
| 024                     | PASS 合格    | 034                     | PASS 合格    |  |
| 025                     | PASS 合格    | 035                     | PASS 合格    |  |
| 026                     | PASS 合格    | 036                     | PASS 合格    |  |
| 027                     | PASS 合格    | 037                     | PASS 合格    |  |
| 028                     | PASS 合格    | 038                     | PASS 合格    |  |
| 029                     | PASS 合格    | 039                     | PASS 合格    |  |
| 030                     | PASS 合格    | 040                     | PASS 合格    |  |

#### Notes 注释:

There is no disassembly and no fire during the test and within seven days after the test.

电芯在测试中和测试后7天内未解体,未着火。

Room temperature 环境温度: 21.5°C

\*\*\*\*\*\*End of Test Report 检测报告结束\*\*\*\*\*\*

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