UN38.3 测试报告
UN38.3 Test Report

委托单位名称: Applicant's Name:	赣州拓远新能源有限公司 Ganzhou Tuoyuan New Energy Co., Ltd.
物品名称: Name of Goods:	聚合物锂离子电池 1160100 3.7V 10000mAh 37Wh Polymer Li-ion Battery 1160100 3.7V 10000mAh 37Wh
测试机构: Testing By:	深圳市元素检测有限公司 Shenzhen Element Testing Co., Ltd.
测试机构地址: Testing Institution Address:	深圳市龙岗区坪地街道坪西社区龙岭北路 76 号 2 号厂房 401、4 号厂房 101 邮编 518117 101 of Plant 4, & 401 of Plant 2, No.76, Longling North Road, Pingxi, Pingdi Subdistrict, Longgang District, Shenzhen, Guangdong, China/518117
签发日期: Issue Date:	2025-12-08

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报告单位（盖章）
Stamp

深圳市元素检测有限公司 检验检测专用章

样品名称 Sample Name	聚合物锂离子电池 Polymer Li-ion Battery	样品型号 Sample Model	1160100
商标 Brand		检测类别 Test Classification	委托测试 Commission Test
委托单位名称 Applicant's Name	赣州拓远新能源有限公司 Ganzhou Tuoyuan New Energy Co., Ltd.		
委托单位地址 Applicant's Address	江西省赣州市信丰县迎宾大道 5G 科技产业园北区 7、8 号厂房 Building No.8, No.7, 5G Technology North Park, Xinfeng High-tech Industrial Park, Ganzhou, Jiangxi, China		
制造商名称 Manufacturer's Name	赣州拓远新能源有限公司 Ganzhou Tuoyuan New Energy Co., Ltd.		
制造商地址 Manufacturer's Address	江西省赣州市信丰县迎宾大道 5G 科技产业园北区 7、8 号厂房 Building No.8, No.7, 5G Technology North Park, Xinfeng High-tech Industrial Park, Ganzhou, Jiangxi, China		

电话 Telephone	+86-13418874839	邮箱 Email	eva_kangmin@126.com	网址 Website	www.topfar-battery.com
样品接收日期 Sample Receiving Date	2025-11-07				
测试日期 Testing Date	2025-11-07~2025-11-21				
测试标准 Test Standard	联合国《试验和标准手册》（第八修订版）38.3 节。 UN "Manual of Tests and Criteria" ST/SG/AC.10/11/Rev.8/Subsection 38.3.				
测试结论 Test Conclusion	该电池符合联合国《试验和标准手册》（第八修订版）38.3 节标准要求。 The samples have passed the test items of UN "Manual of Tests and Criteria" ST/SG/AC.10/11/Rev.8/Subsection 38.3.				

I、样品描述 Sample Description			
样品型号 Sample Model	1160100	标称电压 Nominal Voltage	3.7V
额定容量 Rated Capacity	10000mAh	额定能量 Rated Energy	37Wh
标准充电电流 Standard Charge Current	2000mA	标准放电电流 Standard Discharge Current	2000mA
最大充电电流 Max. Charge Current	10000mA	最大放电电流 Max. Discharge Current	10000mA
充电电压 Charge Voltage	4.2V	充电截止电流 End Charge Current	200mA
放电截止电压 Discharge Cut-off Voltage	2.75V	外观形状 Appearance	银色近长方体 Approximate Silver Cuboid
样品尺寸 Sample Size (L×W×T)	(100.0×60.0×11.0)mm	样品质量 Sample Mass	140.267g

II、测试程序 Test Procedure

1. 每一种类型的电池均应进行 T.1 至 T.8 项试验。电池必须按顺序在相同的一组电池上进行试验 T.1 至 T.5。试验 T.6 和 T.8 应使用未另外试验过的电池。试验 T.7 可以使用先前在试验 T.1 至 T.5 中使用过的未损坏电池进行，以便测试进行在循环过的电池上。

Each battery type is subjected to tests T.1 to T.8. Tests T.1 to T.5 are conducted in sequence on the same battery. Tests 6 and 8 are conducted using not otherwise tested batteries. Test T.7 may be conducted using undamaged batteries previously used in Tests T.1 to T.5 for purposes of testing on cycled batteries.

2. 为了量化质量损失，可用以下公式计算：质量损失(%)=(M1-M2)/M1×100

In order to quantify the mass loss, the following procedure is provided: Mass loss(%)=(M1-M2)/M1×100

式中：M1 是试验前的质量，M2 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”。

Where M1 is the mass before the test and M2 is the mass after the test. When mass loss does not exceed the values in Table below, it is considered as "no mass loss".

表格 38.3.1：质量损失限制

Table 38.3.1: Mass loss limit

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

3. 在测试 T.1 至 T.4 中，电池须满足无渗漏、无排气、无解体、无破裂和无起火，并且每个试验电池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%。

In test T.1 to T.4, batteries 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 battery after testing is not less than 90% of its voltage immediately prior to this procedure.

渗漏是指可以看到的电解液或者其他物质从电池或电池组中漏出，或电池、电池组中的物质损失（不包括电池外壳、搬运装置、或标签），质量损失超过表格 38.3.1 所列的数值。

Leakage means the visible escape of electrolyte or other material from a cell or battery or the loss of material (except battery casing, handling devices or labels) from a cell or battery such that the loss of mass exceeds the values in Table 38.3.1

排气是指按设计方式释放电池或电池组内部过高的压力，防止其破裂或解体。

Venting means the release of excessive internal pressure from a cell or battery in a manner intended by design to preclude rupture or disassembly

解体是指排气或破裂使电池或电池组任何部分的固体物质穿过放在离电池或电池 25cm 处的丝网筛（直径 0.25mm 的软铝丝，网格密度每厘米 6 至 7 条铝丝）

Disassembly means a vent or rupture where solid matter from any part of a cell or battery penetrates a wire mesh screen (annealed aluminium wire with a diameter of 0.25 mm and grid density of 6 to 7 wires per cm) placed 25 cm away from the cell or battery.

破裂是指内部或外部原因引起的电池容器或电池组外壳机械损坏，造成内装物暴露或溢出，但无固体喷射。

Rupture means the mechanical failure of a cell container or battery case induced by an internal or external cause, resulting in exposure or spillage but not ejection of solid materials

起火是指试验电池或电池组有火焰冒出。

Fire means that flames are emitted from the test cell or battery

III、一般说明 General description

本报告出现的试验结果仅与试验样品有关。

The test results presented in this report relate only to the object tested.

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可能的试验情况判定 Possible test case verdicts	
－试验情况不适用本试验产品 －Test case does not apply to the test object	不适用 N/A (Not applicable)
－试验样品满足要求 －Test object does meet the requirement	通过 P (Passed)
－试验样品不满足要求 －Test object does not meet the requirement	失败 F (Fail)

IV、测试项目及样品编号描述 Test items description and number of the sample

测试项目 Test items	样品编号 Sample Number
T.1: 高度模拟 Altitude simulation	电池/cells: C01~C10
T.2: 温度测试 Thermal test	
T.3: 振动 Vibration	
T.4: 冲击 Shock	
T.5: 外部短路 External short circuit	
T.6: □撞击 Impact / ☒挤压 Crush	电池/cells: C11~C20
T.7: 过度充电 Overcharge	不适用 N/A
T.8: 强制放电 Forced discharge	电池/cells: C21~C40

V、样品预处理状态描述说明 Pre-treatment status description and illustration of sample

测试项目 Test item	样品编号 Sample No.	预处理状态 Pre-treatment state	备注 Remark
T.1~T.5	C01~C05	在第一次循环完全充电状态。 At first cycle, in fully charged states.	--
	C06~C10	在 25 次循环结束后完全充电状态。 After 25 cycles ending in fully charged states.	--
T.6	C11~C15	在第一次循环 50%额定容量的荷电状态。 At first cycle at 50% of the design rated capacity.	--
	C16~C20	在 25 次循环结束后 50%额定容量的荷电状态。 After 25 cycles ending at 50% of the design rated capacity.	--
T.7	不适用 N/A	不适用 N/A	--
	不适用 N/A	不适用 N/A	--
T.8	C21~C30	在第一次循环完全放电状态。 At first cycle, in fully discharged states.	--
	C31~C40	在 25 次循环结束后完全放电状态。 After 25 cycles ending in fully discharged states.	--

备注：送检样品符合联合国《试验和标准手册》（第八修订版）38.3 节的要求。

Remark: The samples submitted for inspection meet the requirements of the UN "Manual of Tests and Criteria" ST/SG/AC.10/11/Rev.8/Subsection 38.3.

VI、测试方法 Test methods

章节 Clause	标准要求 Requirement	测试结果 Result	判定 Verdict
38.3.4.1	Test T.1: 高度模拟 Altitude simulation 试验电池和电池组应在压力等于或低于 11.6 千帕和环境温度 20±5℃下存放至少 6 小时。 Test cells and batteries shall be stored at a pressure of 11.6kPa or less for at least six hours at ambient temperature 20±5℃. 要求电池和电池组无渗漏、无排气、无解体、无破裂和无起火，并且每个试验电池或电池组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%。有关电压的要求不适用于完全放电状态的电池和电池组。 Cells and batteries 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 or battery after testing is not less than 90 % of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.	无渗漏、无排气、无解体、无破裂、 无起火，且测试后开路电压大于测试前开路电压的 90%。测试数据见表格 T.1 No leakage, no venting, no disassembly, no rupture and no fire, also open circuit voltage after testing is more than 90% of its initial voltage. Test data see table T.1	P
38.3.4.2	Test T.2: 温度试验 Thermal test 首先将样品放在 72±2℃的环境中放置至少 6 个小时，然后放在-40±2℃的环境中放置至少 6 个小时。温度转换的最大间隔时间为 30 分钟。如此循环 10 次，最后将样品放在 20±5℃的环境中静置 24 小时。 Test cells and batteries are to be stored for at least six hours at a test temperature equal to 72±2℃, followed by storage for at least six hours at a test temperature equal to -40±2℃. The maximum time interval between test temperature extremes is 30 minutes. This procedure is to be repeated until 10 total cycles are complete, after which all test cells and batteries are to be stored for 24 hours at ambient temperature 20±5℃. 对于大型电池和电池组,暴露于极端试验温度的时间至少应为 12 小时。 For large cells and batteries the duration of exposure to the test temperature extremes should be at least 12 hours. 要求电池和电池组无渗漏、无排气、无解体、无破裂和无起火，并且每个试验电池或电池组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%。有关电压的要求不适用于完全	无渗漏、无排气、无解体、无破裂、 无起火，且测试后开路电压大于测试前开路电压的 90%。测试数据见表格 T.2	P

	放电状态的试验电池和电池组。 Cells and batteries 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 or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.	No leakage, no venting, no disassembly, no rupture and no fire, also open circuit voltage after testing is more than 90% of its initial voltage. Test data see table T.2	
38.3.4.3	Test T.3: 振动 Vibration 电池和电池组紧固于振动机平台,但不得造成电池变形,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 赫兹和 200 赫兹之间，再回到 7 赫兹，跨度为 15 分钟。这一振动过程须对三个互相垂直的电池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。 Cells and batteries 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 7Hz and 200Hz and back to 7Hz 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. 作对数式频率扫描,对总质量不足 12 千克的电池和电池组(电池和小型电池组），和对 12 千克及更大的电池组（大型电池组）有所不同。 The logarithmic frequency sweep shall differ for cells and batteries with a gross mass of not more than 12kg (cells and small batteries), and for batteries with a gross mass of more than 12kg (large batteries). 对电池和小型电池组：从 7 赫兹开始,保持 1gn 的最大加速度,直到频率达到 18 赫兹。然后将振幅保持在 0.8 毫米（总偏移 1.6 毫米）,并增加频率直到最大加速度达到 8gn（频率约为 50 赫兹）。将最大加速度保持在 8gn 直到频率增加到 200 赫兹。 For cells and small batteries: from 7 Hz a peak acceleration of 1gn 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 8gn occurs (approximately 50Hz). A peak acceleration of 8gn is then maintained until the frequency is increased to 200 Hz. 对大型电池组：从 7 赫兹开始,保持 1gn 的最大加速度，直到频率达到 18 赫兹。然后将振幅保持在 0.8 毫米（总偏移 1.6 毫米），并增加频率直到最大加速度达到 2gn（频率约为 25 赫兹）。将最大加速度保持在 2gn 直到频率增加到 200 赫兹。	P

	For large batteries: from 7Hz to a peak acceleration of 1gn is maintained until 18Hz is reached. The amplitude is then maintained at 0.8mm (1.6mm total excursion) and the frequency increased until a peak acceleration of 2gn occurs (approximately 25Hz). A peak acceleration of 2gn is then maintained until the frequency is increased to 200Hz.		
	要求电池和电池组试验中和试验后无渗漏、无排气、无解体、无破裂和无起火，并且每个试验电池或电池组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%。有关电压的要求不适用于完全放电状态的试验电池和电池组。 Cells and batteries 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 or battery directly after testing in its third perpendicular mounting position is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.	无渗漏、无排气、无解体、无破裂、 无起火，且测试后开路电压大于测试前开路电压的 90%。测试数据见表格 T.3 No leakage, no venting, no disassembly, no rupture and no fire, also open circuit voltage after testing is more than 90% of its initial voltage. Test data see table T.3	
38.3.4.4	Test T.4: 冲击 Shock 试验电池和电池组用坚硬支架紧固在试验装置上，支架支撑着每个试验电池组的所有安装面。每个电池需经受最大加速度 150gn 和脉冲持续时间 6 毫秒的半正弦波冲击。针对大型电池需经受最大加速度 50gn 和脉冲持续时间 11 毫秒的半正弦波冲击。 Test cells and batteries shall be secured to the testing machine by means of a rigid mount which will support all mounting surfaces of each test battery. Each cell shall be subjected to a half-sine shock of peak acceleration of 150gn and pulse duration of 6 milliseconds. Alternatively, large cells may be subjected to a half-sine shock of peak acceleration of 50gn, and pulse duration of 11 milliseconds. 每个电池组应根据电池组的质量而受到峰值加速度的半正弦波冲击。对于小型电池组的脉冲持续时间应 6 毫秒，对于大型电池组的脉冲持续时间应为 11 毫秒，下面的公式用于计算适当的最小峰值加速度。 Each battery shall be subjected to a half-sine shock of peak acceleration depending on the mass of the battery. The pulse duration shall be 6 milliseconds for small batteries and 11 milliseconds for large batteries. The formulas below are provided to calculate the appropriate minimum peak accelerations.		P

	<table><tr><th>电池 Battery</th><th>最小峰值加速度 Minimum peak acceleration</th><th>脉冲持续时间 Pulse duration</th></tr><tr><td>小型电池 Small batteries</td><td>$150g_n$ 或公式结果中的较小值 $150g_n$ or result of formula Acceleration $(g_n)=\sqrt{\left(\frac{100850}{mass^*}\right)}$ whichever is smaller</td><td>6毫秒 6ms</td></tr><tr><td>大型电池 Large batteries</td><td>$50g_n$ 或公式结果中的较小值 $50g_n$ or result of formula Acceleration $(g_n)=\sqrt{\left(\frac{3000}{mass^*}\right)}$ whichever is smaller</td><td>11毫秒 11ms</td></tr></table> * 质量单位用千克计算 Mass is expressed in kilograms. 每个电池或电池组需在三个互相垂直的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。 Each cell or battery is subjected to three shocks in the positive direction followed by three shocks in the negative direction of each of three mutually perpendicular mounting positions of the cell for a total of 18 shocks.		
	要求电池和电池组无渗漏、无排气、无解体、无破裂和无起火，并且每个试验电池或电池组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%。有关电压的要求不适用于完全放电状态的试验电池和电池组。 Cells and batteries 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 or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.	无渗漏、无排气、无解体、无破裂、 无起火，且测试后开路电压大于测试前开路电压的 90%。测试数据见表格 T.4 No leakage, no venting, no disassembly, no rupture and no fire, also open circuit voltage after testing is more than 90% of its initial voltage. Test data see table T.4	
38.3.4.5	Test T.5: 外部短路 External short circuit 待测试的电池或电池组应加热一段时间，以使其外表面温度达到均匀稳定的 57±4℃的温度。加热时间取决于电池或电池组的大小和设计，并应进行评估和记录。如果这种评估是不可行的，对于小型电池和小型电池组至少在 57±4℃的环境下存放 6 小时，对于大型电池和大型电池组至少在 57±4℃的环境下存放 12 小时。然后电池或电池组在 57±4℃的环境中，应接受一个外部总阻值小于 0.1 欧姆的短路条件。 The cell or battery to be tested shall be heated for a period of time necessary to reach a homogeneous stabilized temperature of 57±4 ℃, measured on the external case. This period of time depends on the size and design of the cell or		P

	battery and should be assessed and documented. If this assessment is not feasible, the exposure time shall be at least 6 hours for small cells and small batteries, and 12 hours for large cells and large batteries. Then the cell or battery at 57±4℃ shall be subjected to one short circuit condition with a total external resistance of less than 0.1ohm. 这一短路条件应在电池或电池组的外壳温度回到 57±4℃后继续短路 1 小时，或对于大型电池组其外壳温度已下降了一半的最大升温，并保持低于该值。短路和冷却过程至少在环境温度中进行。 This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to 57±4℃, or in the case of the large batteries, has decreased by half of the maximum temperature increase observed during the test and remains below that value.		
	要求电池和电池组外壳温度不超过 170℃，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。 Cells and batteries 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 the test.	外表温度小于 170°C，在测试中及之后 6 小时内，无解体、无破裂、无起火。测试数据见表格 T.5 External temperature is less than 170°C, also no disassembly, no rupture and no fire during the test and within six hours after the test. Test data see table T.5	
	Test T.6: ☐撞击 Impact ☒挤压 Crush		P
38.3.4.6	撞击（适合于直径大于或等于 18mm 的圆柱形电池） Impact (applicable to cylindrical cells greater than or equal to 18mm in diameter)		N/A
	将样品放在一个平坦的光滑平面上。将一直径为 15.8mm±0.1mm，长度不小于 6cm 的 316 不锈钢棒横过样品中部放置后，将一质量为 9.1kg±0.1kg 的重物从 61±2.5cm 的高度落向样品。 The sample cell or component cell is to be placed on a flat smooth surface. A 15.8mm±0.1mm diameter, at least 6cm 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 9.1kg±0.1kg mass is to be dropped from a height of 61±2.5cm 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. 接受撞击的样品，纵轴应与平坦的表面平行并与横放在样品中心的直径 15.8mm±0.1mm 弯曲表面的纵轴垂直。每一个样品只接受一次撞击。 The test sample is to be impacted with its longitudinal axis parallel to the flat		

	surface and perpendicular to the longitudinal axis of the 15.8mm±0.1mm diameter curved surface lying across the centre of the test sample. Each sample is to be subjected to only a single impact.	
	要求电池和原件电池外壳温度不超过 170℃，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。 Cells and component 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 this test.	电池外表温度小于 170°C，在测试中及之后 6 小时内无解体、无破裂、无起火。测试数据见表格 T.6 External temperature of cells is less than 170°C, also no disassembly, no rupture and no fire during the test and within six hours after the test. Test data see table T.6
	挤压（适用于棱柱形、袋状、硬币/纽扣电池和直径不超过 18mm 的圆柱形电池）。 Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells not more than 18mm in diameter).	
	将电池或元件电池放在两个平面之间挤压，挤压力度逐渐加大，在第一个接触点上的速度大约为 1.5 厘米/秒。挤压持续进行，直到出现以下三种情况之一： (a) 施加力达到 13kN±0.78kN； (b) 电池的电压下降至少 100mV； (c) 电池变形达原始厚度的 50%或以上。 A cell or component cell is to be crushed between two flat surfaces. The crushing is to be gradual with a speed of approximately 1.5 cm/s at the first point of contact. The crushing is to be continued until the first of the three options below is reached: (a) The applied force reaches 13kN±0.78Kn; (b) The voltage of the cell drops by at least 100mV; (c) The cell is deformed by 50% or more of its original thickness. 棱柱形或袋装电池应从最宽的一面施压。纽扣/硬币形电池应从其平坦表面施压。圆柱形电池应从与纵轴垂直的方向施压。 A prismatic or pouch cell shall be crushed by applying the force to the widest side. A button/coin cell shall be crushed by applying the force on its flat surfaces. For cylindrical cells, the crush force shall be applied perpendicular to the longitudinal axis. 每个试样电池或元件电池只做一次挤压试验。试样应继续观察 6 小时。试验应使用之前未做过其他试验的电池或元件电池进行。 Each test cell or component cell is to be subjected to one crush only. The test sample shall be observed for a further 6 h. The test shall be conducted using test cells or component cells that have not previously been subjected to other	P

	tests.		
	要求电池和原件电池外壳温度不超过 170℃，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。 Cells and component 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 this test.	电池外表温度小于 170°C，在测试中及之后 6 小时内无解体、无破裂、无起火。测试数据见表格 T.6 External temperature of cells is less than 170°C, also no disassembly, no rupture and no fire during the test and within six hours after the test. Test data see table T.6	
38.3.4.7	Test T.7: 过度充电 Overcharge		N/A
	在室温下，以 2 倍的制造商宣称的最大持续充电电流对样品充电，测试时间为 24 小时。测试的最小电压如下： (a) 如果制造商宣称的充电电压不超过 18V，本测试的最小充电电压应是制造商宣称的最大充电电压的两倍或者是 22V 之中的较小者； (b) 如果制造商宣称的充电电压超过 18V，本测试的最小充电电压应该是制造商宣称的最大充电电压的 1.2 倍； The charge current shall be twice the manufacturer's recommended maximum continuous charge current. Tests are to be conducted at ambient temperature. The duration of the test shall be 24 hours. The minimum voltage of the test shall be as follows: (a) When the manufacturer's recommended charge voltage is not more than 18V, the minimum voltage of the test shall be the lesser of two times the maximum charge voltage of the battery or 22V; (b) When the manufacturer's recommended charge voltage is more than 18V, the minimum voltage of the test shall be 1.2 times the maximum charge voltage.		
	要求充电电池组在试验过程中和试验后 7 天内无解体、无起火。 There is no disassembly and no fire during the test and within seven days after the test.	在测试中和测试完成后 7 天内无解体、无起火。测试数据见表格 T.7 No disassembly and no fire during the test and within seven days after the test. Test data see table T.7	
38.3.4.8	Test T.8: 强制放电 Forced discharge		P
	每个电池应在环境温度下与 12V 直流电源上进行强制放电,此直流电源串联在起始电流等于制造商给定的最大放电电流条件下强制放电。 Each cell shall be 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.		

	将适当大小和额定值的电阻负荷与试验电池串联，计算得出给定的放电电流。对每个电池进行强制放电，放电时间（小时）应等于其额定容量除以初始试验电流（安培）。 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 shall be forced discharged for a time interval (in hours) equal to its rated capacity divided by the initial test current (in ampere).		
	要求原电池或充电电池在试验过程中和试验后 7 天内无解体、无起火。 There is no disassembly and no fire during the test and within seven days after the test.	电池在测试中和测试完成后 7 天内无解体、无起火。测试数据见表格 T.8 Cells have no disassembly and no fire during the test and within seven days after the test. Test data see table T.8	

VI、测试数据 Test Data

表格 T.1 高度模拟 Table T.1 Altitude simulation

样品状态 The state of samples	编号 No.	试验前 Pre-test		试验后 After test		质量损失 Mass loss (%)	电压比 Voltage ratio (%)	测试结果 Test result
		质量 Mass (g)	电压 Voltage (V)	质量 Mass (g)	电压 Voltage (V)			
在第一次循环完全充电状态 At first cycle, in fully charged states	C01	138.291	4.176	138.291	4.175	0.000	99.976	P
	C02	138.913	4.183	138.913	4.183	0.000	100.000	P
	C03	139.610	4.174	139.610	4.174	0.000	100.000	P
	C04	139.979	4.172	139.979	4.172	0.000	100.000	P
	C05	140.109	4.174	140.109	4.174	0.000	100.000	P
在 25 次循环结束后完全充电状态 After 25 cycles ending in fully charged states	C06	139.409	4.179	139.409	4.179	0.000	100.000	P
	C07	139.470	4.185	139.470	4.185	0.000	100.000	P
	C08	140.267	4.176	140.267	4.176	0.000	100.000	P
	C09	139.486	4.188	139.486	4.188	0.000	100.000	P
	C10	139.184	4.172	139.184	4.172	0.000	100.000	P

注释 Notes :

测试后，样品无渗漏、无排气、无解体、无破裂和无起火，电压比不小于 90%。After the test, there is no leakage, no venting, no disassembly, no rupture and no fire. And voltage ratio is not less than 90%.

表格 T.2 温度试验 Table T.2 Thermal test

样品状态 The state of samples	编号 No.	试验前 Pre-test		试验后 After test		质量损失 Mass loss (%)	电压比 Voltage ratio (%)	测试结果 Test result
		质量 Mass (g)	电压 Voltage (V)	质量 Mass (g)	电压 Voltage (V)			
在第一次循环完全充电状态 At first cycle, in fully charged states	C01	138.291	4.175	138.277	4.169	0.010	99.856	P
	C02	138.913	4.183	138.895	4.175	0.013	99.809	P
	C03	139.610	4.174	139.596	4.170	0.010	99.904	P
	C04	139.979	4.172	139.966	4.166	0.009	99.856	P
	C05	140.109	4.174	140.094	4.168	0.011	99.856	P
在 25 次循环结束后完全充电状态 After 25 cycles ending in fully charged states	C06	139.409	4.179	139.392	4.171	0.012	99.809	P
	C07	139.470	4.185	139.456	4.177	0.010	99.809	P
	C08	140.267	4.176	140.255	4.172	0.009	99.904	P
	C09	139.486	4.188	139.471	4.180	0.011	99.809	P
	C10	139.184	4.172	139.164	4.168	0.014	99.904	P

注释 Notes :

测试后，样品无渗漏、无排气、无解体、无破裂和无起火，电压比不小于 90%。After the test, there is no leakage, no venting, no disassembly, no rupture and no fire. And voltage ratio is not less than 90%.

表格 T.3 振动 Table T.3 Vibration

样品状态 The state of samples	编号 No.	试验前 Pre-test		试验后 After test		质量损失 Mass loss (%)	电压比 Voltage ratio (%)	测试结果 Test result
		质量 Mass (g)	电压 Voltage (V)	质量 Mass (g)	电压 Voltage (V)			
在第一次循环完全充电状态 At first cycle, in fully charged states	C01	138.277	4.169	138.277	4.168	0.000	99.976	P
	C02	138.895	4.175	138.895	4.175	0.000	100.000	P
	C03	139.596	4.170	139.596	4.170	0.000	100.000	P
	C04	139.966	4.166	139.962	4.166	0.003	100.000	P
	C05	140.094	4.168	140.094	4.168	0.000	100.000	P
在 25 次循环结束后完全充电状态 After 25 cycles ending in fully charged states	C06	139.392	4.171	139.392	4.171	0.000	100.000	P
	C07	139.456	4.177	139.456	4.177	0.000	100.000	P
	C08	140.255	4.172	140.255	4.172	0.000	100.000	P
	C09	139.471	4.180	139.471	4.180	0.000	100.000	P
	C10	139.164	4.168	139.164	4.168	0.000	100.000	P

注释 Notes :

测试后，样品无渗漏、无排气、无解体、无破裂和无起火，电压比不小于 90%。After the test, there is no leakage, no venting, no disassembly, no rupture and no fire. And voltage ratio is not less than 90%.

表格 T.4 冲击 Table T.4 Shock

样品状态 The state of samples	编号 No.	试验前 Pre-test		试验后 After test		质量损失 Mass loss (%)	电压比 Voltage ratio (%)	测试结果 Test result
		质量 Mass (g)	电压 Voltage (V)	质量 Mass (g)	电压 Voltage (V)			
在第一次循环完全充电状态 At first cycle, in fully charged states	C01	138.277	4.168	138.277	4.168	0.000	100.000	P
	C02	138.895	4.175	138.895	4.175	0.000	100.000	P
	C03	139.596	4.170	139.596	4.170	0.000	100.000	P
	C04	139.962	4.166	139.962	4.166	0.000	100.000	P
	C05	140.094	4.168	140.094	4.168	0.000	100.000	P
在 25 次循环结束后完全充电状态 After 25 cycles ending in fully charged states	C06	139.392	4.171	139.392	4.171	0.000	100.000	P
	C07	139.456	4.177	139.456	4.177	0.000	100.000	P
	C08	140.255	4.172	140.255	4.172	0.000	100.000	P
	C09	139.471	4.180	139.471	4.180	0.000	100.000	P
	C10	139.164	4.168	139.164	4.168	0.000	100.000	P

注释 Notes :

测试后，样品无渗漏、无排气、无解体、无破裂和无起火，电压比不小于 90%。After the test, there is no leakage, no venting, no disassembly, no rupture and no fire. And voltage ratio is not less than 90%.

表格 T.5 外部短路 Table T.5 External short circuit

样品状态 The state of samples	编号 No.	样品表面最高温度 Max. External Temperature (℃)	测试结果 Test result
在第一次循环完全充电状态 At first cycle, in fully charged states	C01	111.6	P
	C02	112.3	P
	C03	110.8	P
	C04	113.3	P
	C05	112.6	P
在 25 次循环结束后完全充电状态 After 25 cycles ending in fully charged states	C06	113.4	P
	C07	110.8	P
	C08	113.3	P
	C09	112.6	P
	C10	113.1	P

注释 Notes :

测试样品表面温度不超过 170℃，测试中与测试后 6 小时内无解体、无破裂、无起火。Test sample external temperature does not exceed 170℃ and there is no disassembly, no rupture and no fire during the test and within six hours after the test.

表格 T.6 □撞击 ☒挤压 Table T.6 □Impact ☒Crush

样品状态 The state of samples	编号 No.	样品表面最高温度 Max. External Temperature (℃)	测试结果 Test result
在第一次循环完全充电状态 At first cycle, in fully charged states	C11	23.6	P
	C12	23.2	P
	C13	23.6	P
	C14	23.6	P
	C15	23.5	P
在 25 次循环结束后完全充电状态 After 25 cycles ending in fully charged states	C16	23.2	P
	C17	23.6	P
	C18	23.8	P
	C19	23.2	P
	C20	23.7	P

注释 Notes :

测试样品表面温度不超过 170℃，测试中与测试后 6 小时内无解体、无破裂、无起火。Test sample external temperature does not exceed 170℃ and there is no disassembly, no rupture and no fire during the test and within six hours after the test.

表格 T.7 过度充电 Table T.7 Overcharge

样品状态 The state of samples	编号 No.	测试结果 Test result
不适用 N/A	不适用 N/A	--
Notes 注释: 样品在测试中和测试后 7 天内无解体、无起火。There is no disassembly and no fire during the test and within seven days after the test.		

表格 T.8 强制放电 Table T.8 Forced discharge

样品状态 The state of samples	编号 No.	测试结果 Test result
At first cycle, in fully discharged states 在第一次循环完全放电状态	C21	P
	C22	P
	C23	P
	C24	P
	C25	P
	C26	P
	C27	P
	C28	P
	C29	P
	C30	P
After 25 cycles ending in fully discharged states 在 25 次循环结束后完全放电状态	C31	P
	C32	P
	C33	P
	C34	P
	C35	P
	C36	P
	C37	P
	C38	P
	C39	P
	C40	P
Notes 注释: 样品在测试中和测试后 7 天内无解体、无起火。There is no disassembly and no fire during the test and within seven days after the test.		

VII、样品图片 Sample Picture

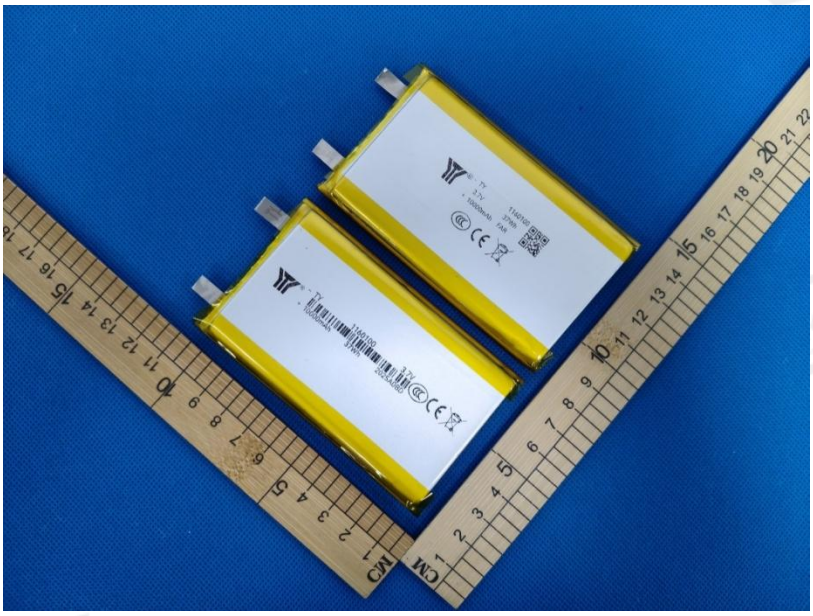

Fig. 1 - 电芯前视图 Front view of cell

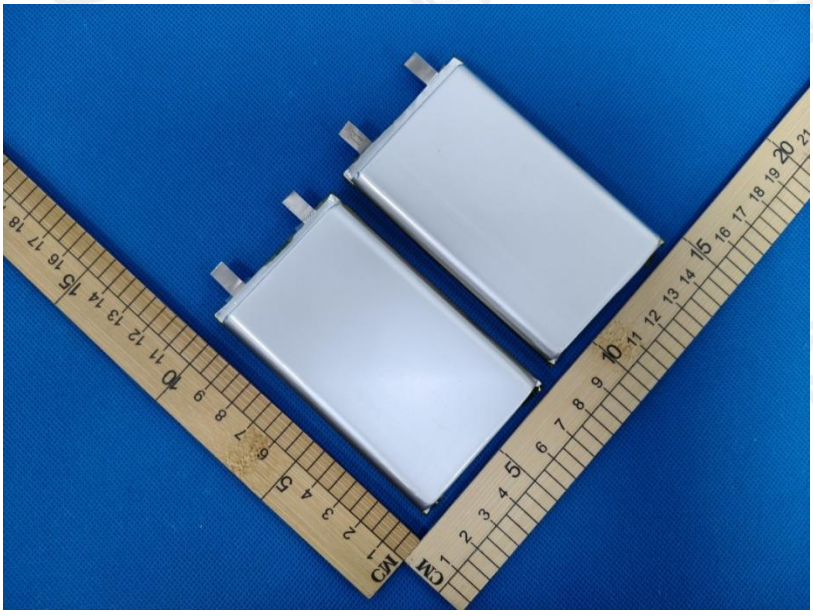

Fig. 2 - 电芯组后视图 Back view of cell

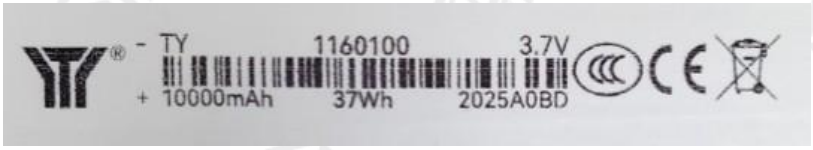

Fig. 3 - 标签视图 Label view

声明

Statement

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This report is invalid without the signature of the approver, reviewer and tester and the special seal for testing of Shenzhen Element Testing Co., Ltd.

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