

UN38.3 测试报告

UN38.3 Test Report

Sample Name

磷酸铁锂动力电池

Lithium iron phosphate power battery

Model

60v120

Consignor

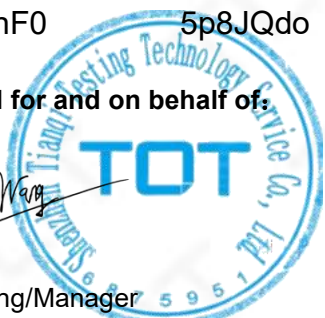
广州瑞启新能源有限公司

Guangzhou Ruiqi New Energy Co., Ltd



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5p8JQdo

Signed for and on behalf of:

Liw wang/Manager

Date of issue : 2026-08-04

Shenzhen Tianqi Testing Technology Service Co.,
Ltd.

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样品名称 Sample Name	磷酸铁锂动力电池 Lithium iron phosphate power battery		样品型号 Sample Model	60v120	
委托单位 Consignor	广州瑞启新能源有限公司 Guangzhou Ruiqi New Energy Co., Ltd.				
地址 Address	广州市天河区天源路963号2楼1077房 Room 1077, 2nd Floor, No. 963 Tianyuan Road, Tianhe District, Guangzhou City				
生产单位 Manufacturer	广州瑞启新能源有限公司 Guangzhou Ruiqi New Energy Co., Ltd.				
地址 Address	广州市天河区天源路963号2楼1077房 Room 1077, 2nd Floor, No. 963 Tianyuan Road, Tianhe District, Guangzhou City				
用途 Use	---				
电池类型	磷酸铁锂电池 Lithium Iron Phosphate Battery		组成方式 Composing Mode	串联 Series connection	
标称电压 Normal Voltage	64V	额定容量 Rated Capacity	120Ah	充电上限电压 Limited Charge Voltage	73V
瓦时 Watt-hour	7200Wh	形状 Form	方形铝壳 Square aluminum shell	充电截止电压 Charging Cut-off Voltage	67V
充电电流 Charge Current	100A	最大连续充电电流 Max Continuous Charge Current	20A	电池单体正极材料 Cell cathode material	磷酸铁锂 Lithium iron phosphate
放电终止电压 Discharge Cut-off Voltage	56V	电芯额定容量Cell Rated Capacity	120Ah	电池单体负极材料 Cell anode material	人造石墨 Artificial graphite
内含电芯个数 Cells Number	20 PCS	电芯型号 Cell Model	—	商标 Trademark	裕驰 YUCHI
测试方法和判定标准 Test method and criterion	联合国《关于危险货物运输的建议书 试验和标准手册》 ST/SG/AC.10/11/Rev.8/Amend.1 38.3 UNITED NATIONS “Recommendations in the TRANSPORT OF DANGEROUS GOODS” Manual of Tests and Criteria ST/SG/AC.10/11/Rev.8/Amend.1 38.3				
样品接收日期 Accepted date	2026-07-28		测试起讫日期 Test date	2026-07-28~2026-08-04	
测试项目 Test items	高度模拟、温度试验、振动、冲击、外部短路、撞击、过度充电、强制放电。 Altitude simulation, Thermal test, Vibration, Shock, External short circuit, Impact, Overcharge, Forced discharge.				

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测试项目 Item		测试样品编号 Samples Number
高度模拟 Altitude simulation		Z1~Z2 X1~X2
温度试验 Thermal test		
振动 Vibration		
冲击 Shock		
外部短路 External Short Circuit		
挤压 Crush		Z3~Z7 X3~X7
过度充电 Overcharge		Z8~Z9 X8~X9
强制放电 Forced discharge		Z10~Z19 X10~X19
测试结论 Conclusion	经测试，样品符合联合国《关于危险货物运输的建议书 试验和标准手册》ST/SG/AC.10/11/Rev.8/Amend.1 38.3 标准要求。 The sample has passed the test items of UNITED NATIONS “Recommendations in the TRANSPORT OF DANGEROUS GOODS” Manual of Tests and Criteria ST/SG/AC.10/11/Rev.8/Amend.1 38.3. 签发日期(Issue date): 2026-08-04	

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样品编号 Sample No	样品描述及说明 Description of the sample
Z1~Z2, Z3~Z7	第 1 个交替充电放电周期完全充电状态的电池; Batteries at first cycle in fully charged states;
X1~X2, X3~X7	第 25 个交替充电放电周期结束后完全充电状态的电池; Batteries after 25 cycles ending in fully charged states;
Z8~Z9	第 1 个交替充电放电周期完全充电状态电芯容量设计值 50%的电芯; Cells at first cycle at 50% of the design rated capacity;
X8~X9	第 25 个交替充电放电周期完全充电状态电芯容量设计值 50%的电芯; The 25th cycle of charging and discharging 50% of the battery cell in rated capacity state;
Z10~Z19	第一个充放电周期完全放电状态的电芯; Cells at first cycle in fully discharged states;
X10~X19	第 25 个交替充电放电周期结束后完全放电状态的电芯; Cells after 25 cycles ending in fully discharge states.
可能的试验情况判定 Test case verdicts: —要求不适用本产品 Test case does not apply to the test object----- N/A(Not applicable) —试验结果符合要求 Test item does meet the requirement----- P(ass) —试验结果不符合要求 Test item does not meet the requirement----- F(ail)	

-----测试方法及判定 Test Method And Verdict-----

章节 Clause	标准要求 Requirements	测试结果 Result	判定 Verdict
38.3.4.1	测试 1：高度模拟 Test 1: Altitude simulation	见表 1 See Table 1	P
	试验电池和电池组应压力不大于 11.6kpa 和环境温度为 20±5℃的条件下贮存不少于 6 个小时。 Test cells and batteries shall be stored at a pressure of 11.6kPa or less for at least six hour 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试验电池和电池组。 Cells and batteries meet this requirement if there is no leakage, no venting, no disassemble, 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，无破裂和无起火。 No leakage, no venting, no disassemble, no rupture and no fire.	P

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38.3.4.2	测试 2 : 温度试验 Test 2: Thermal test	见表 2 See Table 2	P
	试验电池和电池组先在试验温度等于 $72^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 的条件下存放至少 6 小时, 接着再在试验温度等于 $-40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 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, 接着将所有试验电池和电池组在环境温度 ($20^{\circ}\text{C} \pm 5^{\circ}\text{C}$) 下存放 24 小时。对于大型电池和电池组, 暴露于极端温度的时间至少应为 12 小时。 Test cells and batteries are to be stored for at least six hours at a test temperature equal to $72 \pm 2^{\circ}\text{C}$, followed by storage for at least six hours at a test temperature equal to $-40 \pm 2^{\circ}\text{C}$. 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 ($20 \pm 5^{\circ}\text{C}$). For large cells and batteries the duration of exposure to the test temperature extremes should be at least 12 hours.	无渗漏, 无排气, 无解体, 无破裂和无起火。 No leakage, no venting, no disassemble, no rupture and no fire.	P

章节 Clause	标准要求 Requirements	测试结果 Result	判定 Verdict
38.3.4.3	测试3: 振动 Test 3: Vibration	见表 3 See Table 3	P
	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 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. 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 12 kg (cells and small batteries), and for batteries with a gross mass of more than 12 kg (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 50 Hz). A peak acceleration of 8gn is then maintained until the frequency is increased to 200 Hz.	无渗漏, 无排气, 无解体, 无破裂和无起火。 No leakage, no venting, no disassemble, no rupture and no fire.	P

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章节 Clause	标准要求 Requirements	测试结果 Result	判定 Verdict
	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。 For large batteries: from 7 Hz to 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 2gn occurs (approximately 25 Hz). A peak acceleration of 2gn is then maintained until the frequency is increased to 200 Hz. 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 disassemble, 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.		

38.3.4.4	测试4：冲击 Test 4: Shock	见表 4 See Table 4	P
	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。 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. 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。 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。	无渗漏，无排气，无解体，无破裂和无起火。 No leakage, no venting, no disassemble, no rupture and no fire.	P

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38.3.4.5	测试 5 : 外部短路 Test 5: External Short Circuit		见表 5 See Table 5	P									
	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 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 battery and should be assessed and documented. If this assessment is not feasible, the exposure time shall be		无解体, 无破裂, 无起火。 No disassemble , no rupture and no fire.	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 $\text{Acceleration (g}_n\text{)}=\sqrt{\left(\frac{100850}{\text{mass}^*}\right)}$ 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 $\text{Acceleration (g}_n\text{)}=\sqrt{\left(\frac{3000}{\text{mass}^*}\right)}$ 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.	电池 Battery	最小峰值加速度 Minimum peak acceleration	脉冲持续时间 Pulse duration	小型电池 Small batteries	150g _n 或公式结果中的较小值 150g _n or result of formula $\text{Acceleration (g}_n\text{)}=\sqrt{\left(\frac{100850}{\text{mass}^*}\right)}$ whichever is smaller	6毫秒 6ms	大型电池 Large batteries	50g _n 或公式结果中的较小值 50g _n or result of formula $\text{Acceleration (g}_n\text{)}=\sqrt{\left(\frac{3000}{\text{mass}^*}\right)}$ whichever is smaller	11毫秒 11ms			
电池 Battery	最小峰值加速度 Minimum peak acceleration	脉冲持续时间 Pulse duration											
小型电池 Small batteries	150g _n 或公式结果中的较小值 150g _n or result of formula $\text{Acceleration (g}_n\text{)}=\sqrt{\left(\frac{100850}{\text{mass}^*}\right)}$ whichever is smaller	6毫秒 6ms											
大型电池 Large batteries	50g _n 或公式结果中的较小值 50g _n or result of formula $\text{Acceleration (g}_n\text{)}=\sqrt{\left(\frac{3000}{\text{mass}^*}\right)}$ whichever is smaller	11毫秒 11ms											
	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. 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 disassemble, 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.												

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	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 $57\pm4^{\circ}\text{C}$ shall be subjected to one short circuit condition with a total external resistance of less than 0.1 ohm. 这一短路条件应在电池或电池组的外壳温度回到 $57\pm4^{\circ}\text{C}$ 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 $57 \pm 4^{\circ}\text{C}$, 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. The short circuit and cooling down phases shall be conducted at least at ambient temperature. 要求电池和电池组外壳温度不超过 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。 Cells and batteries meet this requirement if their external temperature does not exceed 170°C and there is no disassemble, no rupture and no fire within six hours of this test.		
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38.3.4.6	测试 6: 撞击/挤压 Test 6: Impact / Crush	见表 6 See Table 6	P
	撞击 (适用于直径大于等于 18 毫米的圆柱形电池) Impact (applicable to cylindrical cells not less than 18mm in diameter) 试样电池或元件电池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 $15.8 \text{ mm} \pm 0.1 \text{ mm}$, 长度至少 6 厘米, 或电池最长端的尺度, 取二者之长者。将一块 $9.1 \text{ kg} \pm 0.1 \text{ kg}$ 的重锤 61 ± 2.5 厘米高处跌落到钢棒和试样交叉处, 使用一个几乎没有摩擦的、对落体重锤阻力最小的垂直轨道或管道加以控制。垂直轨道或管道用于引导落锤沿与水平支撑表面呈 90° 度落下。 The test sample cell or component cell is to be placed on a flat smooth surface. A $15.8 \text{ mm} \pm 0.1 \text{ mm}$ 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 $9.1 \text{ kg} \pm 0.1 \text{ kg}$ mass is to be dropped from a height of $61 \pm 2.5 \text{ cm}$ at the intersection of the bar and sample in a controlled manner using a near friction less, 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. 接受撞击的试样, 纵轴应与平坦表面平行并与横放在试样中心的直径 $15.8 \pm 0.1 \text{ mm}$ 弯曲表面的纵轴垂直。每一试样只经受一次撞击。 The test samples is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the $15.8 \text{ mm} \pm 0.1 \text{ mm}$ diameter curved surface lying across the centre of the test samples. Each sample is to be subjected to only a single impact. 要求电池和电池组外壳温度不超过 170°C, 并且在试验过程中及试验后 6	N/A	N/A

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38.3.4.6	测试 6: 撞击/挤压 Test 6: Impact / Crush	见表 6 See Table 6	P
	小时内无解体, 无起火。 Cells and component cells meet this requirement if their external temperature does not exceed 170°C and there is no disassemble and no fire during the test and within six hours after this test.		
	挤压 (适用于棱柱形、袋装、硬币/纽扣电池和直径小于 18 毫米的圆柱形电池) Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells less 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) 施加的力量达到 13 千牛±0.78 千牛; (b) 电池的电压下降至少 100 毫伏; 或 (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 1.5cm/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; or (c) The cell is deformed by 50% or more of its original thickness. 一旦达到最大压力、电压下降 100 毫伏或更多, 或电池变形至少达原厚度的	无解体, 无破裂, 无起火。 No disassemble, no rupture and no fire.	P
	的 50%, 即可解除压力。 Once the maximum pressure has been obtained, the voltage drops by 100mV or more, or the cell is deformed by at least 50% of its original thickness, the pressure shall be released. 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 Samples 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 tests. 要求电池和电池组外壳温度不超过 170°C, 并且在试验过程中及试验后 6 小时内无解体, 无起火。 Cells and component cells meet this requirement if their external temperature does not exceed 170°C and there is no disassemble and no fire during the test and within six hours after this test.		

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38.3.4.7	测试 7: 过充电 Test 7: Overcharge	见表 7 See Table 7	P
	充电电流必须是制造商建议的最大持续充电电流的两倍。试验的最小电压如下: (a) 制造商建议的充电电压不大于 18 伏时, 试验的最小电压应是电池组最大充电电压的两倍或 22 伏两者中的较小者; (b) 制造商建议的充电电压大于 18 伏时, 试验的最小电压应为最大充电电压的 1.2 倍。 (c) 试验应在环境温度下进行, 进行试验的时间应为 24 小时。 The charge current shall be twice the manufacturer's recommended maximum continuous charge current. 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. (c) Tests are to be conducted at ambient temperature; the duration of the test shall be 24 hours	无分解, 无起火。 No disassemble and no fire.	P
	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。 Rechargeable batteries meet this requirement if there is no disassemble and no fire during the test and within seven days after the test.		

38.3.4.8	测试 8: 强制放电 Test 8: Forced discharge	见表 8 See Table 8	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).	无分解, 无起火。 No disassemble and no fire.	P
	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。 Primary or rechargeable cells meet this requirement if there is no disassemble and no fire during the test and within seven days after the test.		

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-----测试数据 Test Data-----

表 1 Table 1	高度模拟 Altitude simulation						P
样品编号 Sample No.	质量 Mass (kg)		质量 亏损 Mass loss (%)	电压 Voltage (V)		电压 亏损 Voltage loss (%)	有无渗漏, 排气, 解体, 破裂和起火 Whether leakage, venting, disassemble, rupture, fire (Y/N)
	测试前 Pre-test	测试后 After test		测试前 Pre-test	测试后 After test		
Z1	20.000	19.989	0.055	220.20	220.20	0.000	N
Z2	20.000	19.910	0.450	220.20	220.20	0.000	N
X1	20.000	20.000	0.001	220.20	220.20	0.000	N
X2	20.000	19.992	0.040	220.20	220.20	0.000	N

表 2 Table 2	温度试验 Thermal test						P
样品编号 Sample No.	质量 Mass (kg)		质量 亏损 Mass loss (%)	电压 Voltage (V)		电压 亏损 Voltage loss (%)	有无渗漏, 排气, 解体, 破裂和起火 Whether leakage, venting, disassemble, rupture, fire (Y/N)
	测试前 Pre-test	测试后 After test		测试前 Pre-test	测试后 After test		
Z1	19.989	19.986	0.0002	220.20	220.20	0.000	N
Z2	19.910	19.898	0.0006	220.20	220.19	0.000	N
X1	20.000	19.991	0.0005	220.20	220.20	0.000	N
X2	19.992	19.979	0.0007	220.20	220.18	0.000	N

*表 3 Table 3	振动 Vibration						P
样品编号 Sample No.	质量 Mass (kg)		质量 亏损 Mass loss (%)	电压 Voltage (V)		电压 亏损 Voltage loss (%)	有无渗漏, 排气, 解体, 破裂和起火 Whether leakage, venting, disassemble, rupture, fire (Y/N)
	测试前 Pre-test	测试后 After test		测试前 Pre-test	测试后 After test		
Z1	19.986	19.967	0.0010	220.20	220.20	0.000	N
Z2	19.898	19.876	0.0011	220.19	220.19	0.000	N
X1	19.991	19.986	0.0003	220.20	220.20	0.000	N
X2	19.979	19.944	0.0018	220.18	220.18	0.000	N

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*表 4 Table 4	冲击 Shock						P
样品编号 Sample No.	质量 Mass (kg)		质量亏 损 Mass loss (%)	电压 Voltage (V)		电 压 亏 损 Voltage loss (%)	有无渗漏, 排气, 解体, 破裂 和 起 火 Whether leakage, venting,disassemble,rupture, fire (Y/N)
	测试前 Pre-test	测试后 After test		测试前 Pre- test	测 试 后 After test		
Z1	19.967	19.952	0.0008	220.20	220.18	0.000	N
Z2	19.876	19.866	0.0005	220.19	220.17	0.000	N
X1	19.986	19.975	0.0006	220.20	220.18	0.000	N
X2	19.944	19.933	0.0006	220.18	220.16	0.000	N

表 5 Table 5	外短路 External short circuit	P
样品编号 Sample No.	最高温度 Peak temperature (°C)	有无解体, 破裂, 起火 Whether disassemble, rupture, fire (Y/N)
Z1	57.5	N
Z2	57.5	N
X1	57.2	N
X2	57.2	N

表 6 Table 6	挤压 Crush	P
样品编号 Sample No.	最高温度 Peak temperature (°C)	有无解体, 起火 Whether disassemble, fire (Y/N)
Z3	23.1	N
Z4	24	N
Z5	23.8	N
Z6	24.3	N
Z7	23.9	N
X3	22.5	N
X4	23.1	N
X5	23.3	N
X6	23.2	N
X7	24	N

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*表 7 Table 7	过度充电 Overcharge	P
样品编号 Sample No.	有无解体, 起火 Whether disassemble, fire (Y/N)	
Z8	N	
Z9	N	
X8	N	
X9	N	

*表 8 Table 8	强制放电 Forced discharge	P
样品编号 Sample No.	有无解体, 起火 Whether disassemble, fire (Y/N)	
Z10	N	
Z11	N	
Z12	N	
Z13	N	
Z14	N	
Z15	N	
Z16	N	
Z17	N	
Z18	N	
Z19	N	
X10	N	
X11	N	
X12	N	
X13	N	
X14	N	
X15	N	
X16	N	
X17	N	
X18	N	
X19	N	

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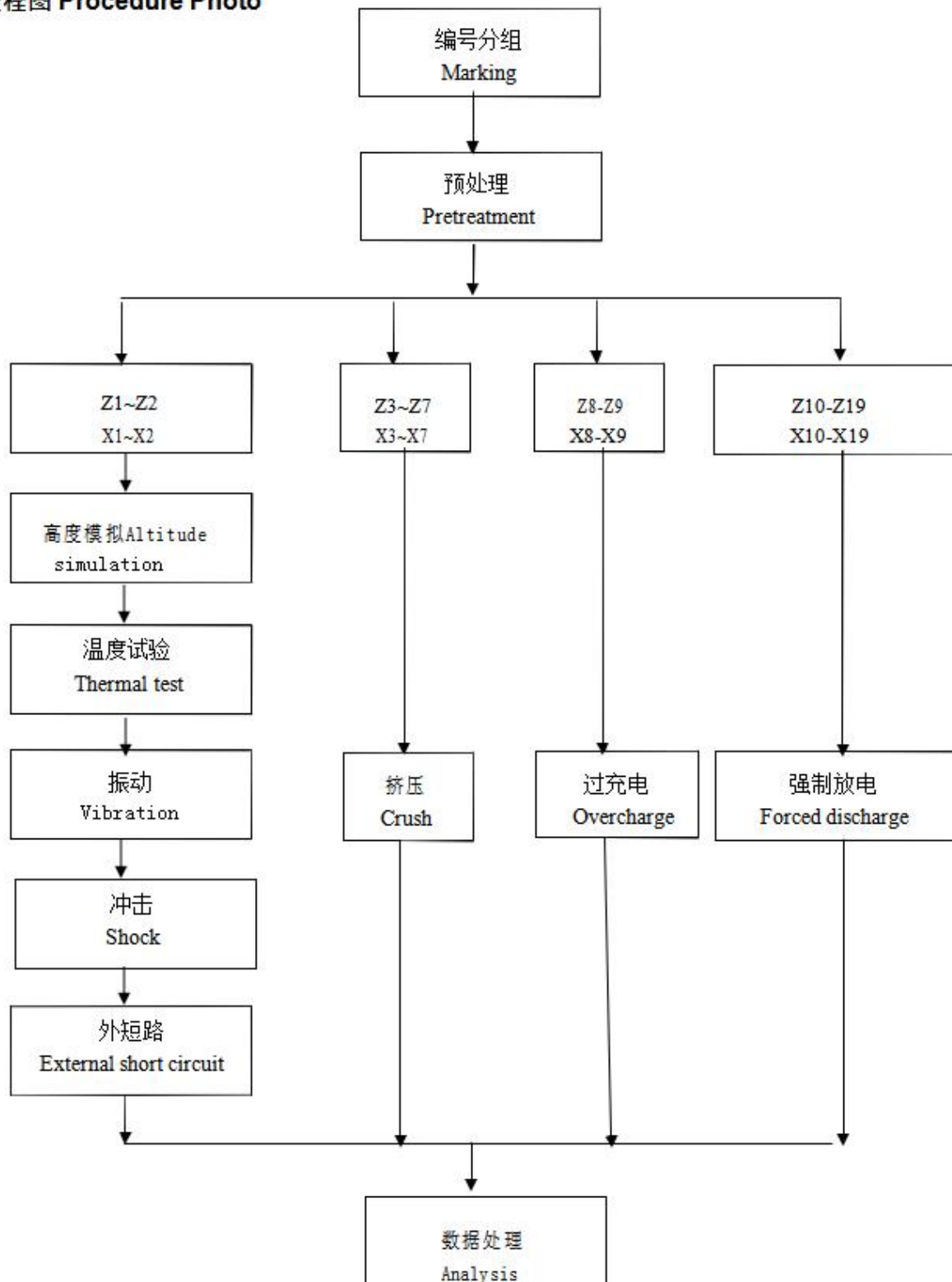
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流程图 Procedure Photo



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