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检测
TESTING
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广东产品质量监督检验研究院

Guangdong Testing Institute of Product Quality Supervision

锂电池 UN38.3 检测报告

Lithium Battery UN38.3 Test Report

产品名称: 聚合物锂离子电芯
Name of sample: Polymer Li-ion Cell

型号规格: 126090 8000mAh
Specifications:

委托单位:
Client:

生产单位:
Manufacturer:

到样日期及
验收日期: 2025年6月19日~2025年7月2日
Receiving date
& Check date: From Jun. 19, 2025 to Jul. 2, 2025

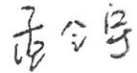
检验依据: 联合国《关于危险货物运输的建议书-试验和标准手册》(第七版)第38.3节
Based on: Section 38.3 of the United Nations Recommendations on the TRANSPORT OF DANGEROUS GOODS Manual of Tests and Criteria Seventh Revised Edition (ST/SG/AC.10/11/Rev.7/38.3)

检验结论: 通过
Test result: Pass

签发日期: 2025年7月2日
Date of issue: Jul. 2, 2025

批准: 
(授权签字人)
Approved by
Authorized signatory

审核: 
(项目工程师)
Checked by (Q1)
Project engineer

主检: 
(检验员)
Tested by
Engineer

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1、样品描述 (SAMPLE DESCRIPTION) :

产品名称 Name of sample	聚合物锂离子电芯 Polymer Li-ion Cell	型号规格 Specifications	126090 8000mAh
委托单位 Client			
委托单位地址 Add. Of Client			
生产工厂 Manufacturer			
商标 Trademark	——	生产日期/批号 PD/ Lot No.	——
样品数量 Quantity of sample	40 个电芯 40 pieces of cells	型号/额定容量 Model/Rated Capacity	126090 8000mAh
标称电压 Nominal Voltage	3.7V	最大连续充电电流 Maximum Continuous Charge Current	16 A
充电电流 Charge Current	1.6 A (0 ~ 10°C) 4 A (10 ~ 45°C) 1.6 A (45 ~ 55°C)	最大放电电流 Maximum Discharge Current	16 A
充电截止电流 End of Charge Current	800 mA (0 ~ 10°C) 160 mA (10 ~ 45°C) 800 mA (45 ~ 55°C)	充电限制电压 Limited Charge Voltage	4.0 V (0-10°C) 4.2 V (10-45°C) 4.0 V (45-55°C)
终止电压 Cut-off Voltage	3.0 V	电芯额定容量 Cell Rated Capacity	8000mAh
电芯能量 Energy capacity of cell	29.6Wh	电芯净重 Cell net weight	133.80 g
样品外观 Appearance	银色, 近长方体 Approximate silver cuboid	尺寸 Size	T×W×L: (11.75×59.5×89.5) mm
检测计划单号 Plan No.	YQG25/000686	检测类别 Test Type	委托检测 Commission test
来样方式 Means of Sampling	送样 Sending		



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2. 测试项目 (TEST ITEM)

1. 高度模拟 (Altitude simulation)

2. 温度试验 (Thermal test)

3. 振动试验 (Vibration)

4. 冲击试验 (Shock)

5. 外部短路 (External short circuit)

6. 挤压 (Crush)

7. 过度充电 (Overcharge)

8. 强制放电 (Forced discharge)

3. 本次检测所使用的设备清单:

Major instruments of measurement used in the test:

序号 NO.	测试项目 Test item	使用的设备 Instruments of measurement used in the test		
		名称 Name of equipment	规格型号 Model	校准有效日期 Due date
1	高度模拟 Altitude simulation	电池单体充放电测试设备 Battery single charge and discharge test equipment	CTS-20V5A	2025.12.23
		低气压试验箱 Low Pressure Test Chamber	BE-8203-10 立方米	2025.09.17
		电子天平 Electronic platform balance	ES4200	2026.05.11
		数字万用表 Digital multimeter	FLUKE-289c	2025.09.26
2	温度试验 Thermal test	电池单体充放电测试设备 Battery single charge and discharge test equipment	CTS-20V5A	2025.12.23
		快速温变防爆试验箱 Rapid Temperature Cycling Explosion-Proof Test Chamber	BTKS5-4000D	2026.06.12
		电子天平 Electronic platform balance	ES4200	2026.05.11
		数字万用表 Digital multimeter	FLUKE-289c	2025.09.26

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序号 NO.	测试项目 Test item	使用的设备 Instruments of measurement used in the test		
		名称 Name of equipment	规格型号 Model	校准有效日期 Due date
3	振动试验 Vibration	电池单体充放电测试设备 Battery single charge and discharge test equipment	CTS-20V5A	2025.12.23
		电动振动台 Vibration Machine	FD-EV-300	2025.09.26
		电子天平 Electronic platform balance	ES4200	2026.05.11
		数字万用表 Digital multimeter	FLUKE-289c	2025.09.26
4	冲击试验 Shock	电池单体充放电测试设备 Battery single charge and discharge test equipment	CTS-20V5A	2025.12.23
		冲击台 Impact tester	BS-IS500	2026.04.08
		电子天平 Electronic platform balance	ES4200	2026.05.11
		数字万用表 Digital multimeter	FLUKE-289c	2025.09.26
5	外部短路 External short circuit	电池单体充放电测试设备 Battery single charge and discharge test equipment	CTS-20V5A	2025.12.23
		高温电池短路试验机 High temperature battery short circuit tester	SC-DL103H-R1-F3	2025.11.13
		数据采集仪 Data acquisition instrument	LR8431-30	2025.12.03
6	挤压 Crush	电池单体充放电测试设备 Battery single charge and discharge test equipment	CTS-20V5A	2025.12.23
		电池挤压针刺试验机 Battery crush needle tester	BE-6047-2T	2026.01.20
		数据采集仪 Data acquisition instrument	LR8431-30	2025.12.03

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序号 NO.	测试项目 Test item	使用的设备 Instruments of measurement used in the test		
		名称 Name of equipment	规格型号 Model	校准有效日期 Due date
7	过度充电 Overcharge	电池单体充放电测试设备 Battery single charge and discharge test equipment	CTS-20V5A	2025.12.23
		电池模组充放电测试仪 Battery module charge and discharge tester	MCT200-06-8ME	2025.09.25
		数据采集仪 Data acquisition instrument	LR8431-30	2025.12.03
8	强制放电 Forced discharge	电池单体充放电测试设备 Battery single charge and discharge test equipment	CTS-20V5A	2025.12.23
		数据采集仪 Data acquisition instrument	LR8431-30	2025.12.03
		可调电子负载 Adjustable electronic load	IT8702/IT8722IT8723/IT8733	2025.11.20

4. 测试项目分项判定 (Item verdict)

测试项目 ITEM	样品编号 SAMPLE NUMBER	结论 CONCLUSION
T.1 高度模拟 (Altitude simulation)	C1~C5 C6~C10	通过 (PASS)
T.2 温度试验 (Thermal test)		通过 (PASS)
T.3 振动试验 (Vibration)		通过 (PASS)
T.4 冲击试验 (Shock)		通过 (PASS)
T.5 外部短路 (External short circuit)		通过 (PASS)
T.6 挤压 (Crush)	C11~C15, C16~C20	通过 (PASS)
T.7 过度充电 (Overcharge)	——	——
T.8 强制放电(Forced discharge)	C21~C30, C31~C40	通过 (PASS)

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说明 (Notes) :

- T.1-T.5: C1~C5 为第一个充放电周期完全充电状态的电池; C6~C10 为 25 个充放电周期后完全充电状态的电池;
- T.1-T.5: C1~C5 are five batteries at first cycle in fully charged states; C6~C10 are five batteries after 25 cycles ending in fully charged states;
- T.6: C11~C15 为第一个充放电周期 50%设计额定容量状态的电芯; C16~C20 为 25 个充放电周期 50%设计额定容量状态的电芯;
- T.6: C11~C15 are five cells at first cycle at 50% of the design rated capacity; C16~C20 are five cells after 25 cycles ending at 50% of the design rated capacity;
- T.8: C21~C30 为第一个充放电周期完全放电状态的电芯; C31~C40 为 25 个充放电周期后完全放电状态的电芯。
- T.8: C21~C30 are ten cells at first cycle in fully discharged states; C31~C40 are ten cells after 25 cycles ending in fully discharged states.

5. 测试方法 (TEST METHOD)

小型电池或电池组必须按顺序进行试验 T.1 至 T.5。试验 T.6 和 T.8 应使用未另外试验过的电池或电池组。试验 T.7 可以使用原先在试验 T.1 至 T.5 中使用过的未损坏电池组进行, 以便测试交替充电放电过的电池组。

质量损失依照下式计算:

$$\text{质量损失}(\%)=(M1-M2)/M1*100$$

式中 M1 是实验前质量, M2 是试验后质量。如质量损失不超过下表所列数值, 即视为“无质量损失”。

Tests T.1 to T.5 shall be conducted in sequence on the same cell or battery. Tests T.6 and T.8 shall be conducted using not otherwise tested cells or 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.

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

$$\text{Mass loss}(\%)=(M1-M2)/M1*100$$

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 shall be considered as “no mass loss”.

电池或电池组质量 M Mass M of cell or battery	质量损失限值 Mass loss limit
M<1 克(g)	0.5%
1 克(g)≤M≤75 克(g)	0.2%
M>75 克(g)	0.1%

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T.1 高度模拟

试验电池和电池组应在压力等于或低于 11.6kPa 和环境温度为 ($20^{\circ}\text{C}\pm 5^{\circ}\text{C}$) 下存放至少 6h。

要求电池和电池组无渗漏、无排气、无解体、无破裂、无起火, 并且每个实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实验前电压的 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。

T.1 Altitude simulation

Test cells and batteries shall be stored at a pressure of 11.6 kPa or less for at least six hours at ambient temperature($20^{\circ}\text{C}\pm 5^{\circ}\text{C}$).

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.

T.2 温度试验

试验电池和电池组应先在试验温度等于 $72^{\circ}\text{C}\pm 2^{\circ}\text{C}$ 条件下存放至少 6h, 接着再在试验温度等于 $-40^{\circ}\text{C}\pm 2^{\circ}\text{C}$ 条件下存放至少 6h。两个极端试验温度之间的最大时间间隔为 30min。程序重复进行 10 次, 接着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 24h。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 12h。

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。

T.2 Thermal test

Test cells and batteries are to be stored for at least six hours at a test temperature to $72^{\circ}\text{C}\pm 2^{\circ}\text{C}$, followed by storage for at least six hours at a test temperature equal to $-40^{\circ}\text{C}\pm 2^{\circ}\text{C}$. 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($20^{\circ}\text{C}\pm 5^{\circ}\text{C}$). For large cells and batteries the duration of exposure to the test temperature extremes should be at least 12 hours.

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.

T.3 振动试验

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 7Hz 和 200Hz 之间, 再回到 7Hz, 跨度为 15min。这一振动过程须对三个相互垂直的电池安装方位的每一方向重复进行 12 次, 共为 3 小时。其中一个振动方向必须与端面垂直。

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作对数式频率扫描，对总质量不足 12kg 的电池和电池组（电池和小型电池组），和对 12kg 及更大的电池组有所不同。

对电池和小型电池组：从 7Hz 开始，保持 $1g_n$ 的最大加速度，直到频率达到 18Hz。振幅保持在 0.8mm（总偏移 1.6mm），并增加频率直到最大加速度达到 $8g_n$ （频率约 50Hz），保持 $8g_n$ 最大加速度直到频率增加到 200Hz。

对大型电池组：从 7Hz 开始，保持 $1g_n$ 的最大加速度，直到频率达到 18Hz。振幅保持在 0.8mm（总偏移 1.6mm），并增加频率直到最大加速度达到 $2g_n$ （频率约 25Hz），保持 $2g_n$ 最大加速度直到频率增加到 200Hz。

要求电池和电池组无渗漏、无排气、无解体、无破裂和无起火，每个试验电池或电池组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。

T.3 Vibration

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 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 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 of more than 12 kg (large batteries).

For cells and small batteries: form 7 Hz a peak acceleration of $1g_n$ 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 $8g_n$ occurs (approximately 50 Hz). A peak acceleration of $8g_n$ is then maintained until the frequency is increased to 200 Hz.

For large batteries: form 7 Hz to a peak acceleration of $1g_n$ 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 $2g_n$ occurs (approximately 25 Hz). A peak acceleration of $2g_n$ is then maintained until the frequency is increased to 200 Hz.

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 immediate prior to this procedure. The requirement relation to voltage is not applicable to test cell and batteries at fully discharged states.

T.4 冲击试验

试验电池和电池组用坚硬支架紧固在试验装置上，支架支撑每个试验电池组的所有安装面。每个电池和电池组须经受最大加速度 $150g_n$ 和脉冲时间 6ms 的半正弦波冲击。每个电池或电池组须在三个相互垂直的电池或电池组安装方位的正方向经受三次冲击，接着再反方向经受三次冲击，总共经受 18 次冲击。

每个电池经受半正弦波冲击最大加速度取决于电池的质量。大型电池和大型电池组脉

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冲持续时间 11ms 的半正弦波冲击，小型电池脉冲持续时间 6ms 的半正弦波冲击。
提供下面的公式来计算合适的最小峰值加速度。

电池	最小峰值加速度	脉冲持续时间
小电池	150g _n 或者 加速度 (g _n) = $\sqrt{\left(\frac{100850}{\text{质量}^*}\right)}$ 取较小值	6 ms
大电池	50g _n 或者 加速度 (g _n) = $\sqrt{\left(\frac{30000}{\text{质量}^*}\right)}$ 取较小值	11 ms

每个电池或电池组须在三个相互垂直的安装方位的正方向经受三次冲击，接着再反方向经受三次冲击，总共经受 18 次冲击。

要求电池和电池组无渗漏、无排气、无解体、无破裂和无起火，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。

T.4 Shock

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 or battery shall be subjected to a half-sine shock of peak acceleration of 150 g_n and pulse duration of 6 milliseconds. Alternatively , large cells may be subjected to a half-sine shock of peak acceleration of 50 g_n and pulse duration of 11 milliseconds.

Each cell or battery shall be subjected to a half-sine shock of peak acceleration depending on the mass of battery. The pulse of 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.

Battery	Minimum peak acceleration	Pulse duration
Small batteries	150 g _n or result of formula Acceleration(g _n)= $\sqrt{\left(\frac{100850}{\text{mass}^*}\right)}$ Whichever is smaller	6 ms
Large batteries	50 g _n or result of formula Acceleration(g _n)= $\sqrt{\left(\frac{30000}{\text{mass}^*}\right)}$ Whichever is smaller	11 ms

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Each cell or battery shall be 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 or battery for a total 18 shocks.

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 relation to voltage is not applicable to test cell and batteries at fully discharged states.

T.5 外部短路

待测电芯或电池应加热一段必要的时间，以达到均匀稳定的温度 $57^{\circ}\text{C}\pm 4^{\circ}\text{C}$ 。在外壳上测量。这段时间取决于电芯或电池的大小和设计，应进行评估和记录。如果此评估不可行，则小电芯和小电池的暴露时间至少为 6 小时，大电芯和大电池的暴露时间至少为 12 小时。在 $57^{\circ}\text{C}\pm 4^{\circ}\text{C}$ 时，电芯或蓄电池应处于一次总外电阻小于 0.1 欧姆的短路状态。

在电池或电池外壳温度恢复到 $57^{\circ}\text{C}\pm 4^{\circ}\text{C}$ 后，这种短路状态至少持续一小时，或者在大型电池的情况下，在测试期间观察到的最大温度升高降低了一半，并保持在该值以下。

短路和冷却阶段应至少在环境温度下进行。

电芯、蓄电池的外部温度不超过 170°C ，在试验过程中及试验后 6 小时内无拆卸、无破裂、无火灾，均符合该要求。

待测电芯或电池应加热一段必要的时间，以达到均匀稳定的温度 $57^{\circ}\text{C}\pm 4^{\circ}\text{C}$ 。在外壳上测量。这段时间取决于电芯或电池的大小和设计，应进行评估和记录。如果此评估不可行，则小电芯和小电池的暴露时间至少为 6 小时，大电芯和大电池的暴露时间至少为 12 小时。在 $57^{\circ}\text{C}\pm 4^{\circ}\text{C}$ 时，电芯或蓄电池应处于一次总外电阻小于 0.1 欧姆的短路状态。

在电池或电池外壳温度恢复到 $57^{\circ}\text{C}\pm 4^{\circ}\text{C}$ 后，这种短路状态至少持续一小时，或者在大型电池的情况下，在测试期间观察到的最大温度升高降低了一半，并保持在该值以下。

短路和冷却阶段应至少在环境温度下进行。

电芯、蓄电池的外部温度不超过 170°C ，在试验过程中及试验后 6 小时内无拆卸、无破裂、无火灾，均符合该要求。

T.5 External short circuit

The cell or battery to be tested shall be heated for a period of time necessary to reach a homogeneous stabilized temperature of $57^{\circ}\text{C}\pm 4^{\circ}\text{C}$, 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 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 $57^{\circ}\text{C}\pm 4^{\circ}\text{C}$ shall be 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 or battery external case temperature has returned to $57^{\circ}\text{C}\pm 4^{\circ}\text{C}$, or in the case of the large batteries, has decreased by half of the maximum temperature increase observed during the test and remains

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below that value.

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

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.

T.6 挤压

挤压（棱柱形、袋装、硬币/纽扣电池和直径小于 18mm 的圆柱形电池）

将电池或元件电池置于两个平面间挤压，挤压力度逐渐加大，在第一个接触点上的速度大约为 1.5cm/s。挤压持续进行，直到出现以下三种情况之一，即可解除压力：

- (a) 施加的力量达到 13kN±0.78kN;
- (b) 电池的电压下降 100mV 或更多;
- (c) 电池变形达到原始厚度的 50%以上。

棱柱形或袋装电池应从最宽的一面施压。纽扣/硬币形电池应从平坦表面施压。圆柱形电池应从与纵轴垂直的方向施压。

每一个试样电池或元器件电池只做一次挤压试验。试样应继续观察 6h。试验应使用之前从未做过其它试验的电池或元器件进行。

要求电池和电池组外壳温度应不超过 170°C，试验过程中及试验后 6h 内无解体、无起火。

T.6 Crush

Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells less than 18.0 mm in diameter)

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 100 mV; or
- (c) The cell is deformed by 50 % or more of its original thickness.

Once the maximum pressure has been obtained, the voltage drops by 100 mV or more, or the cell is deformed by at least 50 % of its original thickness, the pressure shall be released.

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.

Each test cell or component cell is to be subjected to one crush only. The test sample shall be observed for a further 6h. The test shall be conducted using test cells or component cells that have not previously been subjected to other tests.

Cells and component 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.

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T.7 过度充电

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 $\leq 18\text{V}$ ，试验的最小电压为最大充电电压两倍或 22V 中的较小者；

(b) 制造商建议的充电电压 $> 18\text{V}$ ，试验的最小电压为最大充电电压的 1.2 倍。

试验应在环境温度下进行，进行试验的时间为 24h。

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。

T.7 Overcharge

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.

Tests are to be conducted at ambient temperature; the duration of the test shall be 24 hours.

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

T.8 强制放电

每个电池应在环境温度下与 12V 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的条件下强制放电。

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，放电时间应等于其额定容量除以初始试验电流。

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。

T.8 Forced discharge

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.

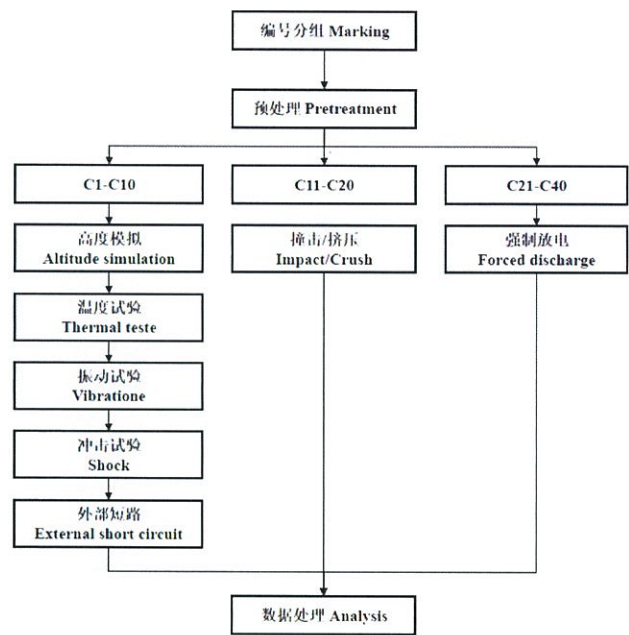
The specified discharge current is to be obtained connecting a resistive load of the appropriate size and rating in series with the test cell. Each cell shall be forced discharged for a time interval (in hours) equal to its rated capacity divided by the initial test current (in ampere).

Primary or rechargeable cells meet this requirement if there is no disassembly and no fire during the test and within 7 days after the test.

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6. 测试程序(TEST PROCEDURE)



7. 测试数据 (DATA)

T.1 高度模拟 (Altitude simulation)

电池 编号 No.	测试前 Pre-test		测试后 After test		质量亏损 Mass loss (%)	电压亏损 Voltage loss(%)	有无渗漏, 排气, 解体, 破裂和起火 (是/否) Whether leakage, venting, disassembly, rupture, fire (Y/N)
	质量 Mass 克(g)	电压 Voltage 伏(V)	质量 Mass 克(g)	电压 Voltage 伏(V)			
C1	133.25	4.165	133.16	4.164	0.070	0.024	N
C2	133.50	4.163	133.44	4.162	0.045	0.024	N
C3	133.80	4.167	133.79	4.165	0.006	0.048	N
C4	133.90	4.167	133.86	4.166	0.030	0.026	N
C5	133.92	4.168	133.79	4.167	0.094	0.012	N
C6	134.20	4.165	134.15	4.163	0.040	0.046	N
C7	134.04	4.162	133.92	4.161	0.090	0.034	N
C8	133.93	4.161	133.79	4.160	0.099	0.012	N
C9	133.76	4.160	133.74	4.159	0.016	0.019	N
C10	133.74	4.163	133.66	4.162	0.064	0.046	N

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T.2 温度试验 (Thermal test)

电池 编号 No.	测试前 Pre-test		测试后 After test		质量亏损 Mass loss (%)	电压亏损 Voltage loss (%)	有无渗漏, 排气, 解体, 破裂和起火 (是/否) Whether leakage, venting, disassembly, rupture, fire (Y/N)
	质量 Mass 克(g)	电压 Voltage 伏(V)	质量 Mass 克(g)	电压 Voltage 伏(V)			
C1	133.16	4.164	133.11	4.162	0.038	0.038	N
C2	133.44	4.162	133.35	4.161	0.067	0.024	N
C3	133.79	4.165	133.79	4.164	0.001	0.022	N
C4	133.86	4.166	133.80	4.165	0.043	0.019	N
C5	133.79	4.167	133.73	4.166	0.046	0.036	N
C6	134.15	4.163	134.05	4.162	0.071	0.007	N
C7	133.92	4.161	133.82	4.160	0.074	0.014	N
C8	133.79	4.160	133.70	4.158	0.070	0.041	N
C9	133.74	4.159	133.72	4.159	0.017	0.012	N
C10	133.66	4.162	133.62	4.160	0.031	0.036	N

T.3 振动试验(Vibration)

电池 编号 No.	测试前 Pre-test		测试后 After test		质量亏损 Mass loss (%)	电压亏损 Voltage loss (%)	有无渗漏, 排气, 解体, 破裂和起火 (是/否) Whether leakage, venting, disassembly, rupture, fire (Y/N)
	质量 Mass 克(g)	电压 Voltage 伏(V)	质量 Mass 克(g)	电压 Voltage 伏(V)			
C1	133.11	4.162	133.02	4.162	0.068	0.002	N
C2	133.35	4.161	133.29	4.159	0.048	0.048	N
C3	133.79	4.164	133.67	4.163	0.092	0.029	N
C4	133.80	4.165	133.70	4.164	0.072	0.022	N
C5	133.73	4.166	133.67	4.165	0.043	0.024	N
C6	134.05	4.162	134.05	4.161	0.000	0.046	N
C7	133.82	4.160	133.80	4.159	0.013	0.031	N
C8	133.70	4.158	133.58	4.157	0.094	0.041	N
C9	133.72	4.159	133.60	4.157	0.088	0.046	N
C10	133.62	4.160	133.60	4.159	0.010	0.034	N

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T.4 冲击试验(Shock)

电池 编号 No.	测试前 Pre-test		测试后 After test		质量亏损 Mass loss (%)	电压亏损 Voltage loss (%)	有无渗漏, 排气, 解体, 破裂和起火 (是/否) Whether leakage, venting, disassembly, rupture, fire (Y/N)
	质量 Mass 克(g)	电压 Voltage 伏(V)	质量 Mass 克(g)	电压 Voltage 伏(V)			
C1	133.02	4.162	132.93	4.161	0.067	0.029	N
C2	133.29	4.159	133.16	4.158	0.095	0.034	N
C3	133.67	4.163	133.59	4.162	0.058	0.017	N
C4	133.70	4.164	133.66	4.162	0.034	0.043	N
C5	133.67	4.165	133.65	4.164	0.013	0.010	N
C6	134.05	4.161	133.93	4.161	0.090	0.000	N
C7	133.80	4.159	133.75	4.157	0.042	0.038	N
C8	133.58	4.157	133.47	4.155	0.076	0.043	N
C9	133.60	4.157	133.57	4.156	0.018	0.010	N
C10	133.60	4.159	133.55	4.157	0.040	0.046	N

T.5 外部短路(External short circuit)

电池编号 No.	最高温度 Peak temperature (℃)	有无解体, 破裂和起火 (是/否) Whether disassembly, rupture, fire (Y/N)
C1	109.6	N
C2	109.3	N
C3	99.7	N
C4	114.5	N
C5	102.3	N
C6	94.5	N
C7	93.4	N
C8	99.6	N
C9	101.0	N
C10	91.6	N

电池编号 No.	最高温度 Peak temperature (℃)	有无解体, 起火 (是/否) Whether disassembly, fire (Y/N)
C11	24.4	N
C12	24.2	N
C13	24.5	N
C14	24.2	N
C15	24.0	N
C16	24.4	N
C17	24.4	N
C18	24.2	N
C19	24.8	N
C20	24.1	N

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T.8 强制放电(Forced discharge)

电池编号 No.	有无解体，起火（是/否） Whether disassembly, fire (Y/N)
C21	N
C22	N
C23	N
C24	N
C25	N
C26	N
C27	N
C28	N
C29	N
C30	N
C31	N
C32	N
C33	N
C34	N
C35	N
C36	N
C37	N
C38	N
C39	N
C40	N

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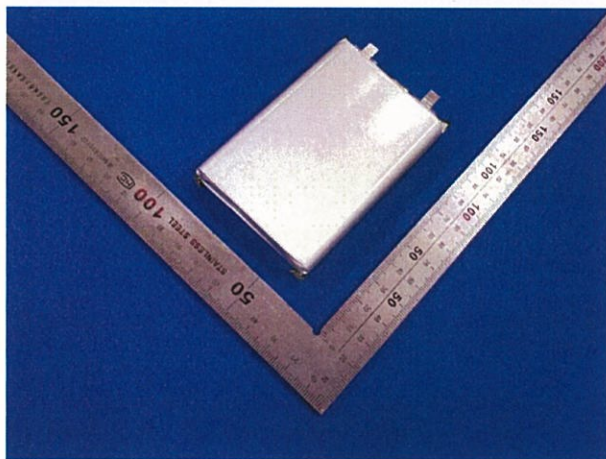
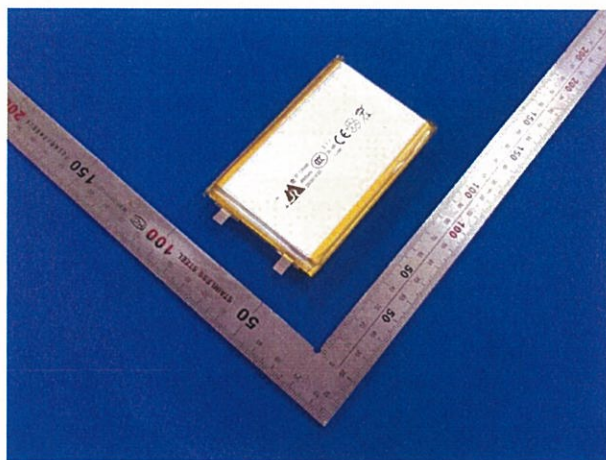
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样品照片

照片 1:



电芯照片

照片 2:



电芯标识

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附注 APPENDIX:

1. 试验地点:
Place of test
(if not the same with the address of this report)
广东省广州市黄埔区南云二路 8 号品尧电子产业
园门机大楼 (C 座) 101、202 房
Room 101 & 202, Menji Building (Block
C), PinYao Electronic Industrial Park, No. 8
Nanyun 2nd Road, Huangpu District, Guangzhou,
Guangdong Province, China
2. 检验环境条件:
Testing ambient conditions
温度 Temperature: (20~25) °C
相对湿度 Relative humidity: (55~65) %
3. 偏离标准方法的说明 (如适用):
Statement of deviating standard method
(if applicable)

4. 检验结果不确定度说明 (如适用):
Uncertainty statement of test results
(if applicable)

5. 分包项目及分包方 (如适用):
Subcontracted items and subcontractors
(if applicable)





广东产品质量监督检验研究院

GUANGDONG TESTING INSTITUTE OF PRODUCT QUALITY SUPERVISION

广东产品质量监督检验研究院(简称广东质检院、英文简称GQI)成立于1983年9月,又名广州电气安全检验所、广东省试验认证研究院,是广东省市场监督管理局(知识产权局)直属的副厅级事业单位。

广东质检院是广东省市场监督管理局(知识产权局)属下的法定社会第三方专门从事产品质量检验检测和认证的机构、中国合格评定国家认可委员会(CNAS)认可的国家级实验室和检验机构、国际电工委员会电工设备及元件合格评定体系组织(IECEE)认可的国际CB实验室、中国国家认证认可监督管理委员会(CNCA)指定的国家强制性产品认证(CCC)检测机构、中国质量认证中心(CQC)等认证机构签约的实验室、中国船级社认可的产品检测和试验机构,是广东省市场监督管理局(知识产权局)指定的产品质量鉴定组织单位,广东、海南、陕西、甘肃和山东等省高级人民法院注册认可的司法委托质量鉴定机构。广东质检院属下有广东质检中诚认证有限公司、广安电气检测中心(广东)有限公司、广东华安消防技术服务有限公司及广东质检技术开发公司等4家公司。

广东质检院现有1个总部、3个基地,拥有现代化实验室和办公场所约14.8万平方米,资产超13.6亿元,各类高素质的专业技术和管理人员逾千名,先进的检测仪器设备逾18000台(套)。经认可的检验检测资质为92类3516种产品/项目,涉及标准10882项;国际互认CB检测能力为12类184项标准。广东质检院是集检验检测、认证、鉴定、能力验证提供者、标准制修订及科研于一体,致力于建设国际先进、国内一流,倍受社会和行业尊敬的权威技术机构。

广东质检院目前拥有10个国家产品质量检验检测中心、16个省产品质量监督检验站和7个广东省工程技术研究中心,分别是:

- ☐ 国家电器产品安全质量检验检测中心
- ☐ 国家智能电网输配电设备质量检验检测中心(广东)
- ☐ 国家食品质量检验检测中心(广东)
- ☐ 国家消防产品质量检验检测中心(广东)
- ☐ 国家电线电缆产品质量检验检测中心(广东)

- ☐ 国家家具产品质量检验检测中心(广东)
- ☐ 国家涂料产品质量检验检测中心(广东)
- ☐ 国家机械产品安全质量检验检测中心
- ☐ 国家太阳能光伏产品质量检验检测中心(广东)
- ☐ 国家工业机器人质量检验检测中心(广东)

- ☆ 广东省质量监督儿童玩具检验站
- ☆ 广东省质量监督家用空调器检验站(顺德)
- ☆ 广东省质量监督转基因食品及食品有害物质检验站
- ☆ 广东省质量监督蓄电池检验站
- ☆ 广东省质量监督电动自行车检验站
- ☆ 广东省质量监督轻纺产品检验站
- ☆ 广东省质量监督高压输配电设备检验站
- ☆ 广东省质量监督金银珠宝玉石检验站

- ☆ 广东省质量监督变压器产品检验站(东莞)
- ☆ 广东省质量监督工业机器人检验站(顺德)
- ☆ 广东省质量监督可穿戴智能产品检验站(广州)
- ☆ 广东省质量监督交通通信产品检验站(广州)
- ☆ 广东省质量监督3D打印及纳米材料检验站(顺德)
- ☆ 广东省质量监督新能源汽车充电设备及动力电池检验站(广州)
- ☆ 广东省质量监督超高清显示产品检验站(广州)
- ☆ 广东省质量监督儿童用品检验站(广州)

- 广东省电力变压器及开关设备检测(广安)工程技术研究中心
- 广东省智能LED照明检测工程技术研究中心
- 广东省木材鉴定与评估工程技术研究中心
- 广东省食品生物危害因素监测工程技术研究中心

- 广东省特种电线电缆产品检测工程技术研究中心
- 广东省高分子材料失效分析工程技术研究中心
- 广东省安全性乳化剂研制、应用及检测工程技术研究中心