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检测
TESTING
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UN38.3 测试报告
UN38.3 Test Report

报告编号 Report No.	CCJC2513110R01
样品名称 Sample name	磷酸铁锂电芯 LiFePO4 Cell
型号 Model	LiFePO4Cell-32700-7000mAh
申请商 Applicant	湖南华兴锂电新能源有限责任公司 HUNAN HUAXING LITHIUM BATTERY NEW ENERGY CO., LTD.

深圳诚测检测技术有限公司
Shenzhen CCJC Technology Co., Ltd

申请商 Applicant	名称 Name	湖南华兴锂电新能源有限责任公司 HUNAN HUAXING LITHIUM BATTERY NEW ENERGY CO., LTD.
	地址 Address	湖南省长沙市宁乡高新技术产业园区金水西路 399 号 No.399 Jinshui West Road, Ningxiang High-tech Industrial Park, Changsha, Hunan, 410600 China
制造商 Manufacturer	名称 Name	湖南华兴锂电新能源有限责任公司 HUNAN HUAXING LITHIUM BATTERY NEW ENERGY CO., LTD.
	地址 Address	湖南省长沙市宁乡高新技术产业园区金水西路 399 号 No.399 Jinshui West Road, Ningxiang High-tech Industrial Park, Changsha, Hunan, 410600 China
	电话 Tel: 0731-88310888	邮箱 Mail: 530792915@qq.com
	网址 Website: /	
生产厂 Factory	名称 Name	湖南华兴锂电新能源有限责任公司 HUNAN HUAXING LITHIUM BATTERY NEW ENERGY CO., LTD.
	地址 Address	湖南省长沙市宁乡高新技术产业园区金水西路 399 号 No.399 Jinshui West Road, Ningxiang High-tech Industrial Park, Changsha, Hunan, 410600 China
测试实验室 Testing Laboratory	名称 Name	深圳诚测检测技术有限公司 Shenzhen CCJC Technology Co., Ltd
	地址 Address	广东省深圳市宝安区松岗街道溪头社区溪头路 25 号厂房 101 (1-3 层) 1-3/F., Factory Building 101, No.25, Xitou Road, Xitou, Songgang Subdistrict, Bao'an District, Shenzhen, Guangdong, China
	电话 Tel: 0086-755-23707853	邮箱 Mail: service@ccjctek.com
	网址 Website: www.ccjctek.com	
测试标准 Test Standard	联合国《试验和标准手册》（第 8 版）38.3 节 UN "Manual of Tests and Criteria" ST/SG/AC.10/11/Rev.8/Subsection 38.3	

接收日期 Accepted date	2025-04-16	测试日期 Test date	2025-04-16 ~ 2025-05-13

测试项目 Test items	高度模拟、温度试验、振动、冲击、外部短路、撞击、强制放电。 Altitude simulation, Thermal test, Vibration, Shock, External short circuit, Impact, Forced discharge.
测试结论 Conclusion	经测试，样品符合联合国《试验和标准手册》（第 8 版）38.3 节标准要求。 The sample has passed the test items of UN "Manual of Tests and Criteria" ST/SG/AC.10/11/Rev.8/ Subsection 38.3.

主检人：
Tested by: 李远勇 Li Yuan Yong
职位 Position: 测试工程师 Test Engineer

审核人：
Inspected by: 陈聪 Cong chen
职位 Position: 项目工程师 Project Engineer

批准人：
Approved by: 程鹏 Roc Cheng
职位 Position: 技术负责人 Technical Manager

签发日期：
Date of Issue: 2025-05-13

Shenzhen CCJC Technology Co., Ltd CCJC

基本信息 General Information:	
产品名称 .....:	磷酸铁锂电芯
Product name .....:	LiFePO4 Cell
型号参数 Model and Parameters .....:	LiFePO4Cell-32700-7000mAh, 3.2V, 7000mAh, 22.4Wh
商标 Trade Mark.....:	/

技术参数 Technical Parameters:	
	电池 Cell
型号 Model	LiFePO4Cell-32700-7000mAh
形状 Shape	圆柱形 Cylindrical
标称电压 Nominal Voltage	3.2V
额定容量 Rated Capacity	7000mAh
标准充电电流 Standard Charge Current	7000mA
标准放电电流 Standard Discharge Current	7000mA
最大持续充电电流 Max. Continuous Charge Current	21000mA
最大持续放电电流 Max. Continuous Discharge Current	21000mA
充电截止电流 End Charge Current	300mA
最大充电电压 Max. Charge Voltage	3.65V
放电终止电压 Discharge Cut-off Voltage	2.0V

测试项目 Test items	样品编号 Sample Number
T.1: 高度模拟 Altitude simulation	C01 – C10
T.2: 温度测试 Thermal test	
T.3: 振动 Vibration	
T.4: 冲击 Shock	
T.5: 外短路 External short circuit	
T.6: 挤压 Crush or 撞击 Impact	C11 – C20
T.7 过充电 Overcharge	N/A
T.8: 强制放电 Forced discharge	C21 – C40

样品状况良好。
The sample's status is good.

测试步骤：

Test Procedure:

1. 小型电池或电池组应按顺序进行试验 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，以便测试经过充放电的电池组。

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..

2. 为了量化质量损失，可用以下公式计算：质量损失(%)=(M_1-M_2)/M_1×100

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

Mass loss(%)=(M_1-M_2)/M_1×100

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".

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、无泄气、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.

4. 备注 Remark：

测试判定： Possible test case verdicts:	
判定不适用于测试对象 Test case does not apply to the test object .....:	N/A
测试符合规定 Test object does meet the requirement .....:	P (Pass)
测试不符合规定 Test object does not meet the requirement .....:	F (Fail)

UN 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
38.3.4.1	**Test T.1: 高度模拟/Altitude simulation**		**P**
	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°C±5°C）下存放至少 6 小时。 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±5°C)		P
	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 mass loss, 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、无破裂和无起火现象。 No leakage, no venting, no disassembly, no rupture and no fire. 测试数据见表 38.3.4.1。 The data see table 38.3.4.1.	P
38.3.4.2	**Test T.2: 温度试验/Thermal test**		**P**
	试验电池和电池组应先在试验温度等于 72°C±2°C 的条件下存放至少 6 小时，接着再在试验温度等于-40°C±2°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°C±5°C）下存放 24 小时。 Test cells and batteries are to be stored for at least six hours at a test temperature equal to 72±2°C, followed by storage for at least six hours at a test temperature equal to - 40±2°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 and batteries are to be stored for 24 hours at ambient temperature (20 ±5°C).		P
	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.		N/A
	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 mass loss, 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、无破裂和无起火现象。 No leakage, no venting, no disassembly, no rupture and no fire. 测试数据见表 38.3.4.2。 The data see table 38.3.4.2.	P

UN 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
38.3.4.3	**Test T.3: 振动/Vibration**		**P**
	电池和电池组紧固于振动机平台，但紧固程度不能造成电池变形以致不能准确传递振动。振动应是正弦波形，对数频率扫描从 7 赫兹到 200 赫兹，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.		P
	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)应有所不同。 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).		P
	对电池和小型电池组：从 7 赫兹开始，保持 1 gn 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 8 gn(频率约为 50 赫兹)。将最大加速度保持在 8 gn 直到频率增加到 200 赫兹。 For cells and small batteries: from 7 Hz a peak acceleration of 1 gn 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 gn occurs (approximately 50 Hz). A peak acceleration of 8 gn is then maintained until the frequency is increased to 200 Hz.		P
	对大型电池组：从 7 赫兹开始，保持 1 gn 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 2 gn (频率约为 25 赫兹)。将最大加速度保持在 2 gn 直到频率增加到 200 赫兹。 For large batteries: from 7 Hz to a peak acceleration of 1 gn 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 2 gn occurs (approximately 25 Hz). A peak acceleration of 2 gn is then maintained until the frequency is increased to 200 Hz.		N/A

UN 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
	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%，电池和电池组即符合本项要求。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、无破裂和无起火现象。 No leakage, no venting, no disassembly, no rupture and no fire. 测试数据见表 38.3.4.3。 The data see table 38.3.4.3.	P
38.3.4.4	**Test T.4: 冲击/Shock**		**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.		P
	每个电池必须经受最大加速度 150g_n 和脉冲持续时间 6 毫秒的半正弦波冲击。针对大型电池必须经受最大加速度 50g_n 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		P
	每个电池组须经受的正弦波冲击的最大加速度取决于电池组的质量。小型电池组的脉冲持续时间 6 毫秒，大型电池组的脉冲持续时间 11 毫秒。以下公式用于计算合适的最低限度最大加速度。 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.		N/A

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

* Mass is expressed in kilograms.

UN 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
	每个电池或电池组须在三个互相垂直的电池或电池组安装方位的正极方向经受三次冲击，接着在负极方向经受三次冲击，总共经受 18 次冲击。 Each cell or battery shall be subjected to three shocks in the positive direction and to three shocks in the negative direction in each of three mutually perpendicular mounting positions of the cell or battery for a total of 18 shocks.		P
	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、无破裂和无起火现象。 No leakage, no venting, no disassembly, no rupture and no fire. / 测试数据见表 38.3.4.4。 The data see table 38.3.4.4.	P
38.3.4.5	**Test T.5: 外部短路/External short circuit**		**P**
	对于待试电池或电池组，应加温一段必要的时间，使从外壳测量的温度达到均匀的稳定温度 57±4°C。这段时间的长短取决于电池或电池组的大小和设计，对于这个持续时间应加以评估和记录。如无法进行这种评估，则小型电池和小型电池组的暴露时间应至少 6 小时，大型电池和小型电池组的暴露时间应至少 12 小时。然后，电池或电池组应在 57±4°C 条件下经受总外电阻小于 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°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±4°C shall be subjected to one short circuit condition with a total external resistance of less than 0.1 ohm.		P

UN 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
	这一短路条件应在电池或电池组外壳温度回到57±4°C 后继续至少 1 小时，或在大型电池组的情况下外壳温度降幅达试验中所观察的最高温升幅的二分之一并保持低于该数值。 短路和降温阶段的温度应至少相当于环境温度。 This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to 57±4°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.		P
	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 disassembly, no rupture and no fire during the test and within six hours after the test.	在测试过程中以及之后 6 个小时内，外表温度不超 170°C，并且无解体，无破裂，无起火现象发生。 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. 测试数据见表 38.3.4.5。 The data see table 38.3.4.5.	P
38.3.4.6	**Test T.6: 撞击/挤压/Impact / Crush**		**P**
	撞击(适合于直径大于或等于 18mm 的圆柱形电芯)/Test procedure – Impact (applicable to cylindrical cells greater than or equal to 18 mm in diameter)	直径等于 32 mm 的圆柱形电芯/Cylindrical cells equal to 32 mm in diameter	P
	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 毫米 ± 0.1 毫米，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 千克 ± 0.1 千克的重锤从 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 sample cell or component cell is to be placed on a flat smooth surface. A 15.8 mm±0.1mm 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±0.1 kg mass is to be dropped from a height of 61±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.		P

UN 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
	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 ±0.1 毫米弯曲表面的纵轴垂直。每一试样只经受一次撞击。 /The test sample is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8 mm±0.1mm diameter curved surface lying across the centre of the test sample. Each sample is to be subjected to only a single impact.		P
	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）/Test Procedure – Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells less than 18 mm in diameter).	直径等于 32 mm 的圆柱形电芯/ Cylindrical cells equal to 32 mm in diameter	N/A
	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 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.		N/A
	(a) 施加力达到 13kN±0.78kN The applied force reaches 13kN±0.78kN		N/A
	(b) 样品的电压下降至少 100mV (b) The voltage of the cell drops by at least 100 mV		N/A
	(c) 电池变形达原始厚度的 50%以 上。 (c)The cell is deformed by 50% or more of its original thickness.		N/A
	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.		N/A
	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 tests.		N/A

UN 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
	电芯满足要求：在测试过程中以及之后 6 个小时内，外表温度不超过 170°C，并且无解体和无起火现象发生。 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 this test.	无解体，无起火现象发生。 No disassembly and no fire. 测试数据见表 38.3.4.6。 The data see table 38.3.4.6.	P
38.3.4.7	**Test T.7: 过充电/Overcharge**		**N/A**
	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： 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:		N/A
	(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 (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.		N/A
	(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。 (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.		N/A
	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 disassembly and no fire during the test and within seven days after the test.		N/A
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 12 伏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。 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.		P

UN 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
	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).		P
	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 disassembly and no fire during the test and within seven days after the test.	无解体，无起火现象发生。 No disassembly and no fire. 测试数据见表 38.3.4.8 The data see table 38.3.4.8.	P

TABLE: 38.3.4.1	高度模拟 Altitude simulation						P
Sample No.	Before Test		After Test		Mass loss (%)	Voltage loss (%)	Result
	Mass (g)	OCV (V)	Mass (g)	OCV (V)			
Fully charged at first cycle							
C01	145.973	3.51	145.969	3.49	0.003	0.57	P
C02	145.289	3.52	145.286	3.50	0.002	0.57	P
C03	145.476	3.51	145.472	3.49	0.003	0.57	P
C04	144.970	3.53	144.967	3.51	0.002	0.57	P
C05	145.053	3.52	145.049	3.50	0.003	0.57	P
Fully charged after 25 cycles							
C06	145.787	3.51	145.784	3.49	0.002	0.57	P
C07	145.327	3.52	145.323	3.50	0.003	0.57	P
C08	145.537	3.53	145.534	3.51	0.002	0.57	P
C09	145.664	3.51	145.660	3.49	0.003	0.57	P
C10	145.278	3.52	145.275	3.50	0.002	0.57	P

TABLE: 38.3.4.2	温度试验 Thermal test						P
Sample No.	Before Test		After Test		Mass loss (%)	Voltage loss (%)	Result
	Mass (g)	OCV (V)	Mass (g)	OCV (V)			
Fully charged at first cycle							
C01	145.969	3.49	145.930	3.42	0.027	2.01	P
C02	145.286	3.50	145.248	3.42	0.026	2.29	P
C03	145.472	3.49	145.433	3.42	0.027	2.01	P
C04	144.967	3.51	144.929	3.43	0.026	2.28	P
C05	145.049	3.50	145.010	3.43	0.027	2.00	P
Fully charged after 25 cycles							
C06	145.784	3.49	145.746	3.42	0.026	2.01	P
C07	145.323	3.50	145.284	3.42	0.027	2.29	P
C08	145.534	3.51	145.496	3.43	0.026	2.28	P
C09	145.660	3.49	145.621	3.42	0.027	2.01	P
C10	145.275	3.50	145.237	3.42	0.026	2.29	P

TABLE: 38.3.4.3	振动 Vibration						P
Sample No.	Before Test		After Test		Mass loss (%)	Voltage loss (%)	Result
	Mass (g)	OCV (V)	Mass (g)	OCV (V)			
Fully charged at first cycle							
C01	145.930	3.42	145.930	3.42	0.000	0.00	P
C02	145.248	3.42	145.248	3.41	0.000	0.29	P
C03	145.433	3.42	145.433	3.42	0.000	0.00	P
C04	144.929	3.43	144.929	3.42	0.000	0.29	P
C05	145.010	3.43	145.010	3.43	0.000	0.00	P
Fully charged after 25 cycles							
C06	145.746	3.42	145.745	3.42	0.001	0.00	P
C07	145.284	3.42	145.284	3.42	0.000	0.00	P
C08	145.496	3.43	145.496	3.43	0.000	0.00	P
C09	145.621	3.42	145.620	3.42	0.001	0.00	P
C10	145.237	3.42	145.237	3.42	0.000	0.00	P

TABLE: 38.3.4.4	冲击 Shock						P
Sample No.	Before Test		After Test		Mass loss (%)	Voltage loss (%)	Result
	Mass (g)	OCV (V)	Mass (g)	OCV (V)			
Fully charged at first cycle							
C01	145.930	3.42	145.930	3.42	0.000	0.00	P
C02	145.248	3.41	145.248	3.41	0.000	0.00	P
C03	145.433	3.42	145.432	3.42	0.001	0.00	P
C04	144.929	3.42	144.929	3.42	0.000	0.00	P
C05	145.010	3.43	145.009	3.43	0.001	0.00	P
Fully charged after 25 cycles							
C06	145.745	3.42	145.745	3.42	0.000	0.00	P
C07	145.284	3.42	145.284	3.42	0.000	0.00	P
C08	145.496	3.43	145.496	3.42	0.000	0.29	P
C09	145.620	3.42	145.620	3.42	0.000	0.00	P
C10	145.237	3.42	145.237	3.41	0.000	0.29	P

TABLE: 38.3.4.5	外部短路 External short circuit			P
Sample No.	Ambient (ºC) (At 57±4ºC)	Resistance of circuit (mΩ)	Maximum case temperature (ºC)	Results
Fully charged at first cycle				
C01	56.5	82.6	78.9	P
C02	56.7	87.7	79.3	P
C03	56.6	92.1	80.2	P
C04	56.7	90.8	81.6	P
C05	56.5	89.7	83.4	P
Fully charged after 25 cycles				
C06	56.6	79.2	82.1	P
C07	56.7	78.2	80.9	P
C08	56.6	85.3	79.6	P
C09	56.5	84.1	78.4	P
C10	56.7	83.9	82.8	P

TABLE: 38.3.4.6	撞击 Impact				P
TABLE: 38.3.4.6	挤压 Crush				N/A
Sample No.	Maximum case temperature (ºC)	Results	Sample No.	Maximum case temperature (ºC)	Results
50% of the design rated capacity at first cycle			50% of the design rated capacity after 25 cycles		
C11	23.3	P	C16	23.5	P
C12	23.5	P	C17	23.3	P
C13	23.6	P	C18	23.6	P
C14	23.5	P	C19	23.5	P
C15	23.3	P	C20	23.4	P

TABLE: 38.3.4.7	电池过充试验 Overcharge Test of batteries				N/A
Sample No.	OCV (V)	Results	Sample No.	OCV (V)	Results
Fully charged at first cycle			Fully charged after 25 cycles		
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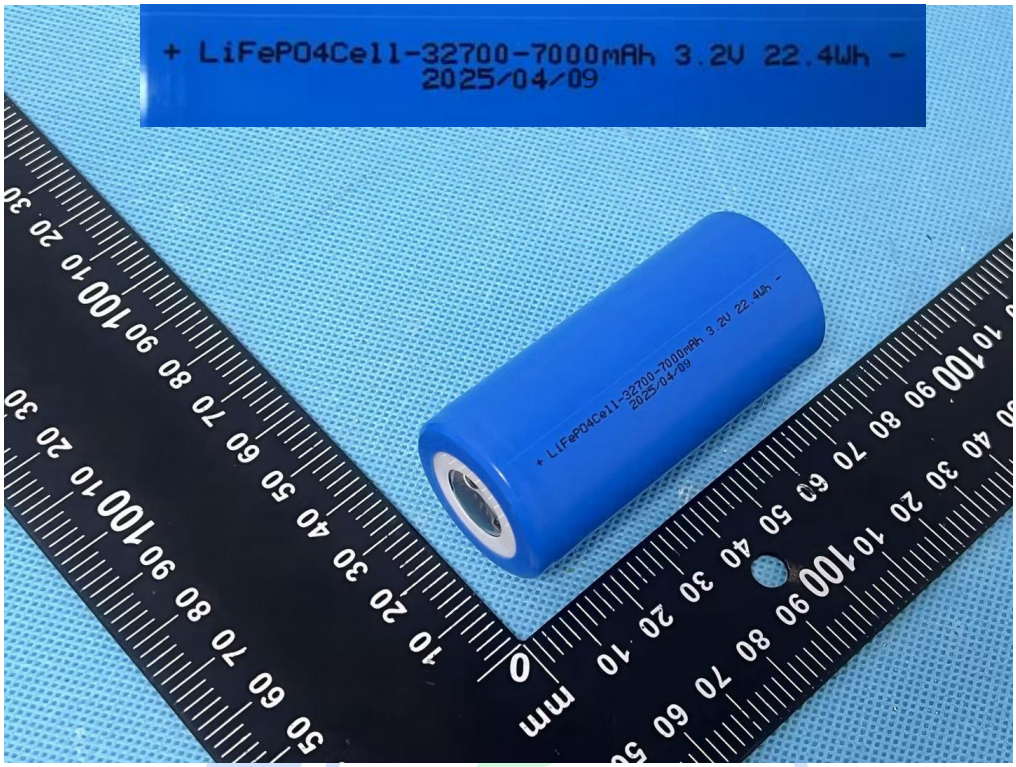
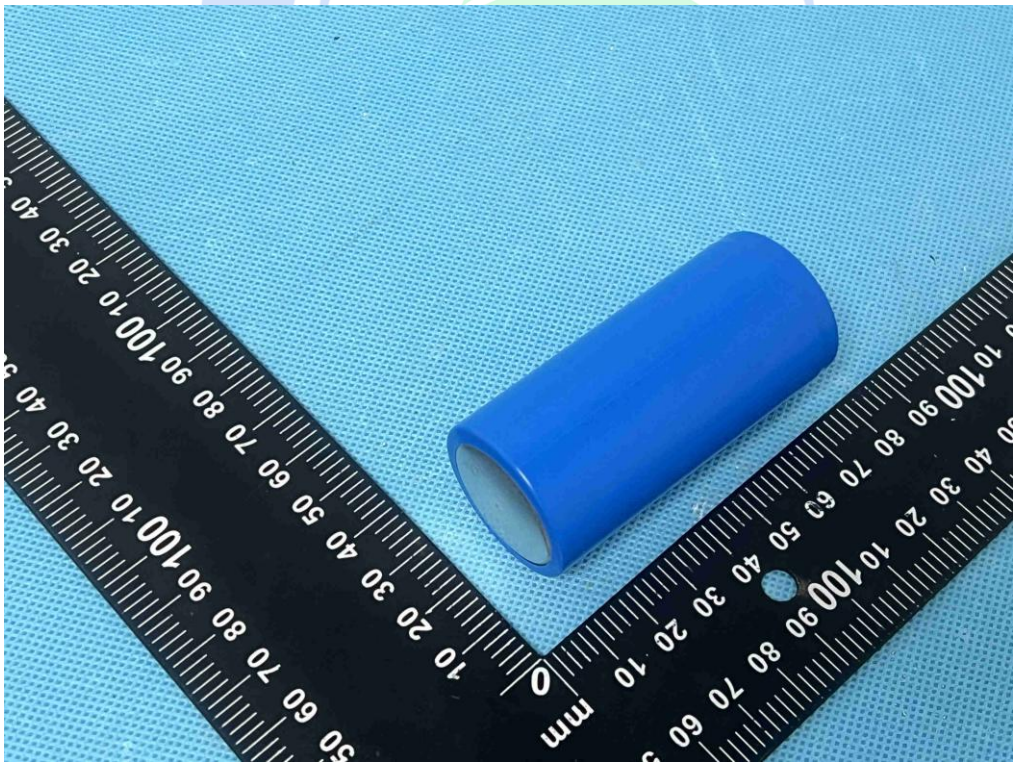
TABLE: 38.3.4.8	强制放电 Forced discharge				P
Sample No.	OCV (V)	Results	Sample No.	OCV (V)	Results
Fully charged at first cycle			Fully charged after 25 cycles		
C21	2.68	P	C31	2.67	P
C22	2.65	P	C32	2.68	P
C23	2.66	P	C33	2.66	P
C24	2.65	P	C34	2.68	P
C25	2.64	P	C35	2.65	P
C26	2.65	P	C36	2.64	P
C27	2.67	P	C37	2.68	P
C28	2.68	P	C38	2.67	P
C29	2.66	P	C39	2.66	P
C30	2.65	P	C40	2.65	P

电池照片 Cell photos





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测试实验室.....：	深圳诚测检测技术有限公司
Testing Laboratory.....:	Shenzhen CCJC Technology Co., Ltd
地址.....：	广东省深圳市宝安区松岗街道溪头社区溪头路 25 号厂房 101 (1-3 层)
Address.....:	1-3/F., Factory Building 101, No.25, Xitou Road, Xitou, Songgang Subdistrict, Bao'an District, Shenzhen, Guangdong, China
电话 Tel.....:	0086-755-23707853
邮箱 Mail.....:	service@ccjctek.com
网址 Website.....:	www.ccjctek.com