Report No.: 18270BC20333801
报告编号

UN38.3 Test Report
UN38.3 测试报告

Client Name 委托单位	:	**VTC Power Co.,Ltd** 深圳市威泰科锂能有限公司
Address 地址	:	**Room 623, Tianhui Building, Yeqin Road, Longgang District, Shenzhen City, Guangdong Province, China** 广东省深圳市龙岗区业勤一路天汇大厦 **623** 室
Product Name 产品名称	:	**LiFePO4 Battery** 磷酸铁锂电池组
Date 日期	:	**Nov. 16, 2022** **2022** 年 **11** 月 **16** 日

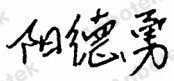
Shenzhen Anbotek Compliance Laboratory Limited
深圳安博检测股份有限公司

1. SAMPLE DESCRIPTION 样品描述:

Sample Name: 样品名称	LiFePO4 Battery 磷酸铁锂电池组		Sample Model: 样品型号	VTC-4F7	
Manufacturer: 制造商	VTC Power Co.,Ltd 深圳市威泰科锂能有限公司				
Address of manufacturer: 制造商地址	Room 623, Tianhui Building, Yeqin Road, Longgang District, Shenzhen City, Guangdong Province, China 广东省深圳市龙岗区业勤一路天汇大厦 623 室				
Factory: 工厂	VTC Power Co.,Ltd 深圳市威泰科锂能有限公司				
Address of factory: 工厂地址	Room 623, Tianhui Building, Yeqin Road, Longgang District, Shenzhen City, Guangdong Province, China 广东省深圳市龙岗区业勤一路天汇大厦 623 室				
Nominal Voltage: 标称电压	12.8V	Rated Capacity: 额定容量	7Ah 89.6Wh	Trademark: 商标	/
Charge Current: 充电电流	1.4A	Maximum Continuous Charge Current: 最大持续充电电流	7A	End Charge Current: 充电截止电流	0.07A
Cut-off Voltage: 终止电压	8V	Maximum Continuous Discharge Current: 最大持续放电电流	7A	Limited Charge Voltage: 充电限制电压	14.6V
Cells Number: 内含电芯个数	4	Cell Model: 电芯型号	32800	Cell Rated Capacity: 电芯额定容量	7Ah
Date of Sample Received: 样品接收日期	Nov. 03, 2022 2022 年 11 月 03 日				
Date of Test: 检测日期	Nov. 03, 2022 to Nov. 14, 2022 2022 年 11 月 03 日至 2022 年 11 月 14 日				

Tested by: 检测

Checked by: 审核

Approved by: 批准 

2. REFERENCE METHOD 参考方法

UN "Manual of Tests and Criteria" ST/SG/AC.10/11/Rev.7/Amend.1/Subsection 38.3
联合国《试验和标准手册》（第 7 版修订 1）38.3 节

3. EQUIPMENT LIST 设备清单

Name of equipment /Model 设备名称/型号	Serial No. 编号
Altitude Simulation Testing Machine 模拟高空低压试验箱 BE-DY-125	SE-132
High Fast Temperature&Humidity Chamber 快速温变箱 ZJ-KSWB1506	SE-1488
Electromagnetic Vibration Testing Machine 电磁式振动试验机 EV103	SE-439
Shock Testing Machine 机械冲击台 HSKT-10	SE-440
High Temperature Short Circuit Test Chamber 高温短路试验箱 KY-CS50	SE-4071
Impact Testing Machine 冲击试验机 BE-5060	SE-136
Battery Charge And Discharge System 电池充放电系统 CT-4002-80V40A-NA	SE-1507
DC Power Supply 直流电源 QJ3020E	SE-1562
Electronic loading 电子负载 JT6111	SE-1561
Temperature and humidity indicator 温湿度计 HTC-1	SE-1188
Temperature and humidity indicator 温湿度计 HTC-1	SE-1189
TRUE RMS multimeter 台式万用表 MS8040	SE-2010
High-precision Electronic Counting Balance 高精度电子计数天平 CHS-D	SE-1483
Data Acquisition/Swith Unit 温升记录仪 34970A	SE-004

4. ENVIRONMENTAL CONDITIONS OF THE TEST 环境条件

Temperature: (20±5) °C R.H.: (25~75) %RH
温度 相对湿度

5. TEST ITEM AND CONCLUSION 测试项目及结论

ITEM 测试项目	SAMPLE NUMBER 样品编号	STANDARD 执行标准	CONCLUSION 结论
Altitude simulation 高度模拟	B1~B4, B5~B8	ST/SG/AC.10/11/Rev.7/Amend1	经测试，该样品符合联合国《试验和标准手册》（第 7 版修订 1）38.3 节标准要求 The sample has passed the items of UN "Manual of Tests and Criteria" ST/SG/AC.10/11/Rev.7/Amend1/Subsection 38.3
Thermal test 热测试			
Vibration 振动			
Shock 冲击			
External short circuit 外部短路			
Impact 撞击	C1~C5, C6~C10		
Overcharge 过度充电	B9~B12, B13~B16		
Forced discharge 强制放电	C11~C20, C21~C30		

Notes 说明：

B1~B4: Batteries at first cycle in fully charged states;
为第 1 个充放电周期完全充电状态的电池；

B5~B8: Batteries after 25 cycles ending in fully charged states;
为第 25 个充放电周期后完全充电状态的电池；

B9~B12: Batteries at first cycle in fully charged states;
为第 1 个充放电周期完全充电状态的电池；

B13~B16: Batteries after 25 cycles ending in fully charged states;
为第 25 个充放电周期后完全充电状态的电池；

C1~C5: Cells at first cycle at 50% of the design rated capacity;
为第 1 个充放电周期 50%设计额定容量状态的电芯；

C6~C10: Cells at 25 cycle at 50% of the design rated capacity;
为第 25 个充放电周期 50%设计额定容量状态的电芯；

C11~C20: Cell batteries at first cycle in fully discharged states;
为第 1 个充放电周期完全放电状态的电芯；

C21~C30: Cells after 25 cycles ending in fully discharged states.
为第 25 个充放电周期后完全放电状态的电芯。

6. TEST METHOD 测试方法

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:

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

Where M_1 is the mass before the test and M_2 is the mass after the test. When mass loss does not exceed the values in Table blow, it shall be considered as “no mass loss”.
小型电芯或电池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芯或电池。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进行，以便测试交替充电放电过的电池。
质量损失依照下式计算：

$$\text{质量损失}(\%)= (M_1-M_2)/M_1 *100$$

式中 M_1 是试验前的质量，M_2 是试验后的质量。如质量损失不超过下表所列数值，即视为”无质量损失”。

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

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 ± 5 °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.1 高度模拟
试验电芯和电池应在压力等于或低于 11.6 千帕和环境温度为(20°±5°C) 下存放至少 6 小时。
要求电芯和电池无渗漏、无排气、无解体、无破裂、无起火，并且每个试验电芯或电池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芯和电池。

T.2 Thermal test
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 until 10 total cycles are complete, after which all test cells and batteries are to be stored for 24 hours at ambie nt temperature (20 ± 5°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.2 热测试
试验电芯和电池应先在试验温度等于 72±2°C 的条件下存放至少 6 小时，接着再在试验温度等于-40±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，完成 10 次，接着将所有试验电芯和电池在环境温度（20±5°C）下存放 24 小时。对于大型电芯和电池，暴露于极端试验温度的时间至少应为 12 小时。

要求电芯和电池无渗漏、无排气、无解体、无破裂和无起火，并且每个试验电芯或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%。有关电压的要求不适用于完全放电状态的试验电芯和电池。

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 between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes. This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting positions of the cell. One of the directions of vibration must be perpendicular to the terminal face.

The logarithmic frequency sweep 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).

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

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 g_n occurs (approximately 25 Hz). A peak acceleration of 2 g_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 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

电芯和电池紧固于振动机平台，但紧固程度不能造成电芯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 赫兹和 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相互垂直的电芯安装方位的每一方向重复进行 12 次，共为时 3 小时。其中一个振动方向必须与端面垂直。

作对数式频率扫描，对总质量不足 12 千克的电芯和电池（电芯和小型电池），和对 12 千克及更大的电池（大型电池）有所不同。

对电芯和小型电池：从 7 赫兹开始，保持 1 g_n 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（总位移 1.6 毫米），并增加频率直到最大加速度达到 8 g_n（频率约为 50 赫兹）。将最大加速度保持在 8 g_n 直到频率增加到 200 赫兹。

对大型电池：从 7 赫兹开始，保持 1 g_n 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（总行程 1.6 毫米）并增加频率直到最大加速度达到 2 g_n（频率约为 25 赫兹）。将最大加速度保持在 2 g_n 直到频率增加到 200 赫兹。

要求电芯和电池无渗漏、无排气、无解体、无破裂和无起火，并且每个试验电芯或电池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芯和电池。

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 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 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.

Battery 电池	Minimum peak acceleration 最小峰值加速度	Pulse duration 脉冲持续时间
Small batteries 小型电池	150 g_n or result of formula Acceleration(gn)= $\sqrt{\left(\frac{100850}{mass*}\right)}$ whichever is smaller	6 ms
Large batteries 大型电池	50 g_n or result of formula Acceleration(gn)= $\sqrt{\left(\frac{30000}{mass*}\right)}$ whichever is smaller	11 ms

* Mass is expressed in kilograms.

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.
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.4 冲击

试验电芯和电池用坚固支架紧固在试验机上，支架支撑着每个试验电池的所有安装面。

每个电芯须经受最大加速度 150 g_n 和脉冲持续时间 6 毫秒的半正弦波冲击。不过，大型电芯需须经受最大加速度 50 g_n 和脉冲持续时间 11 毫秒的半正弦波冲击。

每个电芯须经受半正弦波冲击的峰值加速度取决于电池的质量。对小型电池的脉冲持续时间为 6 毫秒，对大型电池的脉冲持续时间为 11 毫秒。上面的公式用于计算合适的最低限度最大加速度。

每个电芯或电池须在三个相互垂直的电芯或电池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。

要求电芯和电池无渗漏、无排气、无解体、无破裂和无起火，并且每个试验电芯或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%。有关电压的要求不适用于完全放电状态的试验电芯和电池。

T.5 External short circuit

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°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.
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.
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.5 外部短路

对于待试电芯或电池，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芯或电池的大小和设计，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，则小型电芯或电池的暴露时间应至少持续 6 小时，大型电芯或电池的暴露时间应至少持续 12 小时。然后，电芯或电池在 57±4°C 下经受总外电阻小于 0.1 欧姆的短路条件。

这一短路条件应在电芯或电池外壳温度回到 57±4°C 后持续至少 1 小时，或在大电池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此温度值。

短路和降温阶段应至少相当于环境温度。

要求电芯和电池外壳温度不超过 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。

T.6 Impact / Crush

Impact (applicable to cylindrical cells greater than 18 mm in diameter)

The sample cell or component cell is to be placed on a flat smooth surface. A 15.8 ± 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 ± 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.

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 ± 0.1mm diameter curved surface lying across the centre of the test sample. Each sample is to be subjected to only a single impact.

Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells not more than 18 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 13 ± 0.78 kN;

(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 6 h. 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 this test.

T.6 撞击/挤压

撞击（适用于直径不小于 18 毫米的圆柱形电芯）

试样电芯或组成电芯放在平坦光滑的表面上，一根 316 型不锈钢棒横放在试样中心，钢棒直径 15.8 ± 0.1 毫米，长度至少 6 厘米，或电芯最长端的尺度，取二者之长者。将一块 9.1± 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水平支撑表面呈 90 度落下。

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。

挤压（棱柱形、袋装、硬币/纽扣电芯和直径小于 18 毫米的圆柱形电芯）

将电芯或组成电芯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 ± 0.78 千牛顿；

（b） 电芯的电压下降至少 100 毫伏；或

（c） 电芯变形达到原始厚度的 50%或以上。

一旦达到最大压力、电压下降 100 毫伏或更多，或电芯变形至少达原厚度的 50%，即可解除压力。

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

每个试样电芯或组成电芯只做一次挤压试验。试样应继续观察 6 小时。试验应使用之间未做过其他试验的电芯或组成电芯进行。

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

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.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不大于 18 伏时，试验的最小电压应是电池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。

试验应在环境温度下进行，进行试验的时间应为 24 小时。

要求可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 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).

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.

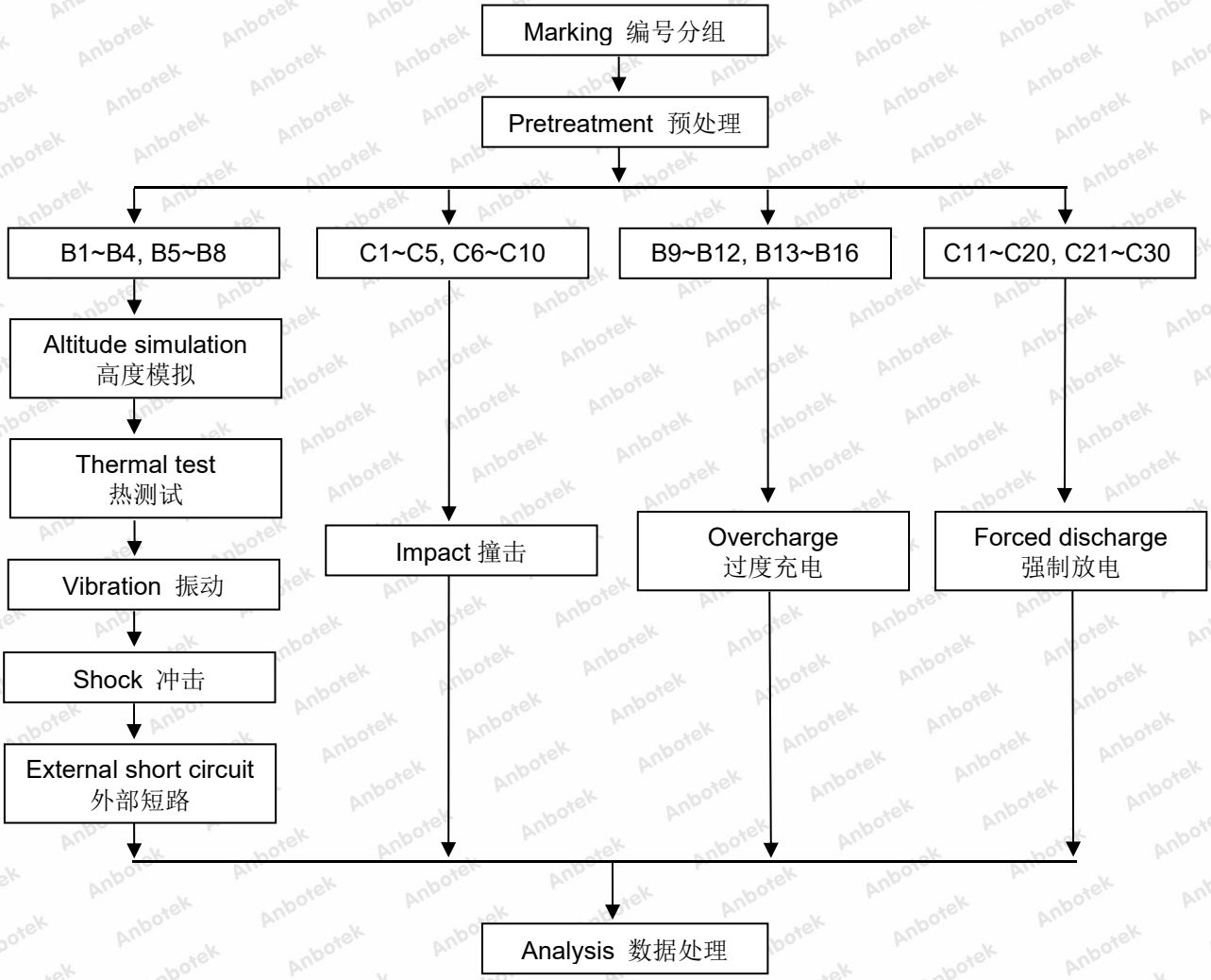
T.8 强制放电

每个电芯应在环境温度下与 12 伏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（小时）应等于其额定容量除以初始试验电流（安培）。

要求原电芯或可充电电芯在试验过程中和试验后 7 天内无解体，无起火。

7. TEST PROCEDURE 测试程序



8. DATA 测试数据

T.1 Altitude simulation 高度模拟

No. 编号	Pre-test 测试前		After test 测试后		Mass loss 质量亏损 (%)	Voltage loss 电压亏损 (%)	Whether leakage, venting, disassembly, rupture, fire (Y/N) 有无渗漏，排气，解体，破裂和起火（是/否）
	Mass 质量 克(g)	Voltage 电压 伏(V)	Mass 质量 克(g)	Voltage 电压 伏(V)			
B1	904.49	13.653	904.49	13.650	0.00	0.02	N
B2	906.90	13.639	906.90	13.639	0.00	0.00	N
B3	905.64	13.640	905.58	13.640	0.01	0.00	N
B4	905.77	13.638	905.77	13.638	0.00	0.00	N
B5	907.63	13.648	907.63	13.648	0.00	0.00	N
B6	904.86	13.650	904.80	13.647	0.01	0.02	N
B7	904.90	13.640	904.90	13.640	0.00	0.00	N
B8	905.17	13.637	905.17	13.637	0.00	0.00	N

T.2 Thermal test 热测试

No. 编号	Pre-test 测试前		After test 测试后		Mass loss 质量亏损 (%)	Voltage Loss 电压亏损 (%)	Whether leakage, venting, disassembly, rupture, fire (Y/N) 有无渗漏，排气，解体，破裂和起火（是/否）
	Mass 质量 克(g)	Voltage 电压 伏(V)	Mass 质量 克(g)	Voltage 电压 伏(V)			
B1	904.49	13.650	904.23	13.599	0.03	0.37	N
B2	906.90	13.639	906.68	13.591	0.02	0.35	N
B3	905.58	13.640	905.35	13.583	0.03	0.42	N
B4	905.77	13.638	905.60	13.590	0.02	0.35	N
B5	907.63	13.648	907.42	13.600	0.02	0.35	N
B6	904.80	13.647	904.55	13.590	0.03	0.42	N
B7	904.90	13.640	904.62	13.591	0.03	0.36	N
B8	905.17	13.637	904.90	13.587	0.03	0.37	N

T.3 Vibration 振动

No. 编号	Pre-test 测试前		After test 测试后		Mass loss 质量亏损 (%)	Voltage Loss 电压亏损 (%)	Whether leakage, venting, disassembly, rupture, fire (Y/N) 有无渗漏，排气，解体，破裂和起火（是/否）
	Mass 质量 克(g)	Voltage 电压 伏(V)	Mass 质量 克(g)	Voltage 电压 伏(V)			
B1	904.23	13.599	904.16	13.599	0.01	0.00	N
B2	906.68	13.591	906.68	13.591	0.00	0.00	N
B3	905.35	13.583	905.35	13.583	0.00	0.00	N
B4	905.60	13.590	905.60	13.587	0.00	0.02	N
B5	907.42	13.600	907.42	13.597	0.00	0.02	N
B6	904.55	13.590	904.49	13.590	0.01	0.00	N
B7	904.62	13.591	904.62	13.591	0.00	0.00	N
B8	904.90	13.587	904.90	13.587	0.00	0.00	N

T.4 Shock 冲击

Peak acceleration: 150 g_n, Pulse duration: 6 ms
峰值加速度：150 g_n， 脉冲时间：6 ms

No. 编号	Pre-test 测试前		After test 测试后		Mass loss 质量亏损 (%)	Voltage Loss 电压亏损 (%)	Whether leakage, venting, disassembly, rupture, fire (Y/N) 有无渗漏，排气，解体，破裂和起火（是/否）
	Mass 质量 克(g)	Voltage 电压 伏(V)	Mass 质量 克(g)	Voltage 电压 伏(V)			
B1	904.16	13.599	904.16	13.599	0.00	0.00	N
B2	906.68	13.591	906.68	13.588	0.00	0.02	N
B3	905.35	13.583	905.28	13.583	0.01	0.00	N
B4	905.60	13.587	905.60	13.587	0.00	0.00	N
B5	907.42	13.597	907.42	13.597	0.00	0.00	N
B6	904.49	13.590	904.49	13.590	0.00	0.00	N
B7	904.62	13.591	904.62	13.591	0.00	0.00	N
B8	904.90	13.587	904.85	13.584	0.01	0.02	N

T.5 External short circuit 外部短路

No. 编号	Peak temperature (°C) 最高温度	Whether disassembly, rupture, fire (Y/N) 有无解体，破裂，起火（是/否）
B1	57.6	N
B2	58.6	N
B3	58.3	N
B4	57.5	N
B5	58.7	N
B6	58.6	N
B7	57.5	N
B8	57.5	N

T.6 Impact 撞击

No. 编号	Peak temperature (°C) 最高温度	Whether disassembly, fire (Y/N) 有无解体，起火（是/否）
C1	23.7	N
C2	24.3	N
C3	23.9	N
C4	24.4	N
C5	24.4	N
C6	24.4	N
C7	23.5	N
C8	23.9	N
C9	24.0	N
C10	24.1	N

T.7 Overcharge 过度充电

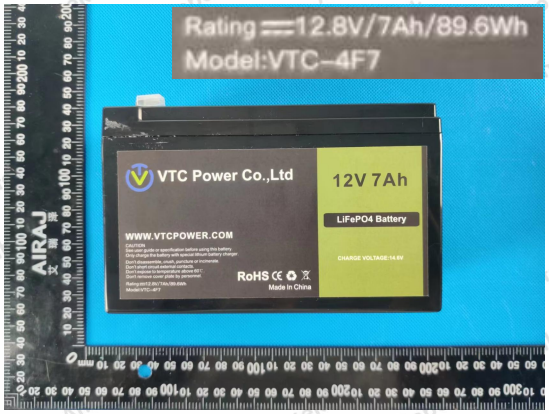
No. 编号	Whether disassembly, fire (Y/N) 有无解体，起火（是/否）
B9	N
B10	N
B11	N
B12	N
B13	N
B14	N
B15	N
B16	N

T.8 Forced discharge 强制放电

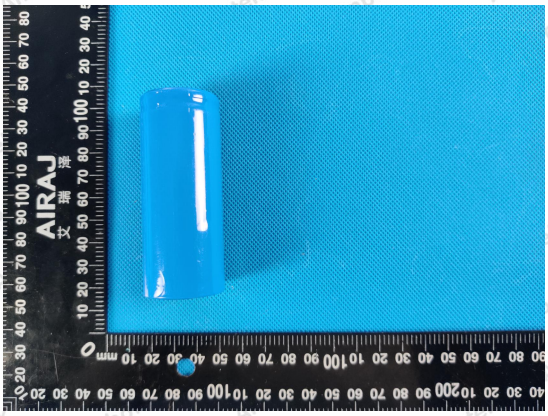
No. 编号	Whether disassembly, fire (Y/N) 有无解体，起火（是/否）
C11	N
C12	N
C13	N
C14	N
C15	N
C16	N
C17	N
C18	N
C19	N
C20	N
C21	N
C22	N
C23	N
C24	N
C25	N
C26	N
C27	N
C28	N
C29	N
C30	N

9. PHOTOS OF THE SAMPLE 样品照片

Battery 电池



Cell 电芯



DECLARATION

声明

1. Reference documents for the testing: UN "Manual of Tests and Criteria" ST/SG/AC.10/11/Rev.7/Amend.1/Subsection 38.3
   测试参考文件：联合国《试验和标准手册》（第7版修订1）38.3节
2. Test place Lab: Shenzhen Anbotek Compliance Laboratory Limited
   Address: East of 4/F., Building A, Hourui No.3 Industrial Zone, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China
   测试实验室：深圳安博检测股份有限公司
   地址：广东省深圳市宝安区西乡街道后瑞第三工业区A栋四楼东
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-- End of report --

-- 报告结束 --