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国际互认  
检测  
TESTING  
CNAS L0095

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No.: RZUN2020-1593

# 检测报告

## TEST REPORT

**UN38.3**

NAME OF SAMPLE:

Li-ion Rechargeable Battery

产品名称:

可充电锂离子电池

CLIENT:

ICON ENERGY SYSTEM (SHENZHEN) CO.,LTD

委托单位:

博科能源系统(深圳)有限公司

CLASSIFICATION OF TEST:

Commission Test

检测类别:

委托测试

威凯检测技术有限公司  
Vkan Certification & Testing Co., Ltd.




# 检测报告

## TEST REPORT

No.:RZUN2020-1593

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Name of samples: Li-ion Rechargeable Battery 样品名称:可充电锂离子电池	Type/Model: 型号规格: IBA001GA 7,26V 5000mAh 36,3Wh
Color: Blue 样品颜色:蓝色	Physical shape:Cylindrical 样品形状: 圆柱形
Commissioned by: ICON ENERGY SYSTEM (SHENZHEN) CO.,LTD 委托单位: 博科能源系统(深圳)有限公司	Manufacturer: ICON ENERGY SYSTEM (SHENZHEN) CO.,LTD 制造商: 博科能源系统(深圳)有限公司
Commissioner address:201, 301, 401, 501 of Plant B and 201, 301, 401, 501, No.4 Guanqing Road, Luhu Community, Guanhu Street, Longhua District, Shenzhen City, Guangdong Province, P. R. China. 委托单位地址:中国广东省深圳市龙华区观澜街道鹭湖社区观清路 4 号 201、301、401、501, 厂房 B 栋 201、301、401、501	Manufacturer address:201, 301, 401, 501 of Plant B and 201, 301, 401, 501, No.4 Guanqing Road, Luhu Community, Guanhu Street, Longhua District, Shenzhen City, Guangdong Province, P. R. China. 制造商地址: 中国广东省深圳市龙华区观澜街道鹭湖社区观清路 4 号 201、301、401、501, 厂房 B 栋 201、301、401、501
Classification of test: Commission Test 检测类别: 委托测试	Quantity of sample: 8 battery packs, 30 cells 样品数量: 8 个电池组, 30 个电芯
Tested according to: 测试标准: ST/SG/AC.10/11/Rev.6/Amend.1/Section 38.3	Sample identification: 样品标识序号:b1#~b8#, c1#~c30#
Receiving date: 接样日期: 2020-04-25	Means of receiving: Submitted by commissioner 接样方式: 委托单位送样
Completing date: 完成日期: 2020-05-18	Test item: 8 items 测试项目: 8 项
Test conclusion: 检测结论: <p>The Li-ion Rechargeable Batteries submitted by ICON ENERGY SYSTEM (SHENZHEN) CO.,LTD are tested according to Section 38.3 of the Sixth revised Edition Amendment 1 of the Recommendations on the Transport of Dangerous Goods, Manual of Test and Criteria (ST/SG/AC.10/11/Rev.6/Amend.1/Section 38.3). The test items are full items. The test results comply with the relevant requirements of the standard.</p> <p>由博科能源系统(深圳)有限公司送检的可充电锂离子电池, 依据《关于危险货物运输的建议书》试验和标准手册第六修订版修正 1 第 38.3 节进行检测, 试验为全项目, 测试结果符合标准相关要求。</p> <p style="text-align: center;"> Date of issue: 签发日期:2020.5.19</p>	

Title: Manager  
批准人职务: 经理

Approved by:

批准:

Huangkuo

Reviewed by:

审核:

zhang siyao

Tested by:

检测:

Wei Guohua

Description and illustration of the sample:

样品说明及描述:

The sample's status is good

样品状况良好。

Cell Dimensions/电芯尺寸:  $\phi 18\text{mm} \times 65\text{mm}$

Test item 测试项目	Sample No. 样品编号	State 状态	Remark 备注
T.1~T.5	b1#~b4#	at first cycle, in fully charged states 第一个交替充电放电周期完全充电状态	-
	b5#~b8#	after 25 cycles ending in fully charged states 第 25 个交替充电放电周期完全充电状态	
T.6	c1#~c5#	at first cycle at 50% of the design rated capacity 第一个交替充电放电周期充电到设计额定容量的 50%	-
	c6#~c10#	after 25 cycles ending at 50% of the design rated capacity 第 25 个交替充电放电周期充电到设计额定容量的 50%	
T.7	b1#~b4#	at first cycle, in fully charged states 第一个交替充电放电周期完全充电状态	using undamaged samples previously used in tests T.1 to T.5 使用试验 T.1 至 T.5 未损坏的样品
	b5#~b8#	after 25 cycles ending in fully charged states 第 25 个交替充电放电周期完全充电状态	
T.8	c11#~c20#	at first cycle, in fully discharged states 第一个交替充电放电周期完全放电状态	-
	c21#~c30#	after 25 cycles ending in fully discharged states 第 25 个交替充电放电周期完全放电状态	-

Description of the sampling procedure:

取样程序的说明:

/

Description of the deviation from the standard, if any:

测试结果不符合标准项的说明:

/

Remarks:

备注:

Throughout this report a comma is used as the decimal separator.

本报告中以逗号代替小数点。

Photos of Samples and Labels/样品照片及标识

Battery/电池 (IBA001GA 7,26V 5000mAh 36,3Wh)



Photos of Samples and Labels/样品照片及标识

Inner Cell/内部电芯 (ICR18650-26J 3,63V 2600mAh )



ST/SG/AC.10/11/Rev.6/Amend.1/Section 38.3			
Clause 章节	Requirements 标准要求	Result 测试结果	Verdict 判定
38.3.4	<b>Procedure/测试步骤</b>		—
38.3.4.1	<b>Test 1: Altitude simulation/测试 1: 高度模拟</b>		P
	<p>Test cells and batteries shall be stored at a pressure of 11,6kPa or less for at least six hours at ambient temperature (20±5°C)/ 将电芯和电池在温度为 20±5°C, 大气压力为不大于 11,6kpa 的环境中贮存不少于 6 个小时</p> <p>Requirement/标准要求:</p> <p>1 Cells and batteries Mass loss limit: ≤0,1% /样品质量损失≤0,1%</p> <p>2 Open circuit voltage not less than 90%, The requirement relating to voltage is not applicable to test cells and batteries at full discharged states. 样品试验后开路电压应不低于试验前开路电压的 90%,此要求不适用于完全放完电的电池和电芯。</p> <p>3 No leakage, no venting, no disassembly, no rupture and no fire 样品 (电池) 应无漏液、无排气、无解体、无破裂以及无着火现象的发生</p>		
38.3.4.2	<b>Test 2: Thermal test/测试 2: 热冲击</b>		P
	<p>Test cells and batteries are to be stored for/电池存储条件如下:</p> <p>1 For small cells and batteries: one temperature cycle: 72±2°C(6h) —40±2°C(6h) /对于小型电芯和电池: 一次温度循环为 72±2°C(6h) —40±2°C(6h)</p> <p>For large cells and batteries: one temperature cycle: 72±2°C(12h) —40±2°C(12h) /对于大型电芯和电池: 一次温度循环为 72±2°C(12h) —40±2°C(12h)</p> <p>2 The maximum time interval between test temperature extremes is 30 minutes/温度转换最大间隔时间为 30min</p> <p>3 This procedure is to be repeated 10 times/重复 10 次循环</p> <p>4 after which all test cells and batteries are to be stored for 24 hours at ambient temperature (20±5°C)/循环结束后, 电池在 20±5°C的条件下 搁置 24 小时</p>		
	<p>Requirements/标准要求</p> <p>1 Cells and batteries Mass loss limit: ≤0,1% /样品质量损失≤0,1%</p> <p>2 Open circuit voltage not less than 90%, The requirement relating to voltage is not applicable to test cells and batteries at full discharged states. 样品试验后开路电压应不低于试验前开路电压的 90%,此要求不适用于完全放完电的电池和电芯。</p> <p>3 No leakage, no venting, no disassembly, no rupture and no fire 样品 (电池) 应无漏液、无排气、无解体、无破裂以及无着火现象的发生</p>	<p>The samples b1#~b8# :</p> <p>No leakage, no venting, no disassembly, no rupture and no fire/编号为 b1#~b8#的样品: 无漏液、无排气、无解体、无破裂以及无着火现象</p> <p>The data is shown in Table 1./数据见表 1</p>	

ST/SG/AC.10/11/Rev.6/Amend.1/Section 38.3			
Clause 章节	Requirements 标准要求	Result 测试结果	Verdict 判定
38.3.4.3	<p><b>Test 3: Vibration/测试 3: 振动</b></p> <p>1 Cells and batteries are firmly secured to the platform of the vibration machine /电芯和电池牢固地安装在振动台（的台面）上</p> <p>2 The vibration: a sinusoidal waveform with a logarithmic sweep between 7Hz and 200Hz and back to 7Hz traversed in 15 minutes/振动以正弦波形式，以 7Hz 增加至 200Hz，然后在减少回到 7Hz 为一个循环，一个循环持续 15 分钟的对数前移传送。</p> <p>3 For cells and small batteries: from 7 Hz a peak acceleration of 1g<sub>n</sub> is maintained until 18Hz is reached. The amplitude is then maintained at 0.8mm (1.6mm total excursion) and the frequency increased until a peak acceleration of 8g<sub>n</sub> occurs (approximately 50Hz). A peak acceleration of 8g<sub>n</sub> is then maintained until the frequency is increased to 200Hz. / 对于电芯和小型电池：从 7Hz 开始，以 1g<sub>n</sub> 的峰值加速度保持不变，直到达到 18Hz。然后将振幅保持在 0.8mm（总偏移 1.6mm）并且频率增加直到出现 8g<sub>n</sub> 的峰值加速度（大约 50Hz）。然后保持 8g<sub>n</sub> 的峰值加速度，直到频率增加到 200Hz。</p> <p>For large batteries: from 7Hz a peak acceleration of 1g<sub>n</sub> is maintained until 18Hz is reached. The amplitude is then maintained at 0.8mm (1.6mm total excursion) and the frequency increased until a peak acceleration of 2g<sub>n</sub> occurs (approximately 25Hz). A peak acceleration of 2g<sub>n</sub> is then maintained until the frequency is increased to 200Hz. / 对于大型电池：从 7Hz 开始，以 1g<sub>n</sub> 的峰值加速度保持不变，直到达到 18Hz。然后将振幅保持在 0.8mm（总偏移 1.6mm）并且频率增加直到出现 2g<sub>n</sub> 的峰值加速度（大约 25Hz）。然后保持 2g<sub>n</sub> 的峰值加速度，直到频率增加到 200Hz。</p> <p>4 This cycle repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting position of the cell. One of the directions of vibration must be perpendicular to the terminal face. /以振动的其中一个方向必须是垂直样品极性，对每个电芯从三个互相垂直的方向上循环 12 次，每个方向 3 个小时，共 9 小时。</p>		P
	<p>Requirements/标准要求</p> <p>1 Cells and batteries Mass loss limit: ≤0,1% /样品质量损失≤0,1%</p> <p>2 Open circuit voltage not less than 90%, The requirement relating to voltage is not applicable to test cells and batteries at full discharged states. 样品试验后开路电压应不低于试验前开路电压的 90%，此要求不适用于完全放完电的电池和电芯。</p> <p>3 No leakage, no venting, no disassembly, no rupture and no fire 样品（电池）应无漏液、无排气、无解体、无破裂以及无着火现象的发生</p>	<p>The samples b1#~b8#: No leakage, no venting, no disassembly, no rupture and no fire/编号为 b1#~b8# 的样品：无漏液、无排气、无解体、无破裂以及无着火现象</p> <p>The data is shown in Table 1./数据见表 1</p>	

ST/SG/AC.10/11/Rev.6/Amend.1/Section 38.3				
Clause 章节	Requirements 标准要求	Result 测试结果	Verdict 判定	
38.3.4.4	<p><b>Test 4: Shock/测试 4: 冲击</b></p> <p>1 Test cells and batteries shall be secured to the testing machine/以稳固的托架固定住每个电芯和电池样品的全部配件表面。</p> <p>2 Each cell shall be subjected to a half-sine shock of peak acceleration of 150 g<sub>n</sub> and pulse duration of 6 milliseconds. Large cells may be subjected to a half-sine shock of peak acceleration of 50 g<sub>n</sub> and pulse duration of 11 milliseconds. / 对每个电芯以峰值为 150g<sub>n</sub> 的半正弦的加速度撞击，脉冲持续 6 毫秒，大型电芯须经受最大加速度 50g<sub>n</sub> 和脉冲持续时间 11 毫秒的半正弦波冲击。</p> <p>Small batteries shall be subjected to a half-sine shock of peak acceleration of 150 g<sub>n</sub> (or Acceleration(g<sub>n</sub>)= <math>\sqrt{\left(\frac{100850}{mass}\right)}</math>, which is smaller) and pulse duration of 6 milliseconds, large batteries shall be subjected to a half-sine of peak acceleration of 50 g<sub>n</sub> (or Acceleration(g<sub>n</sub>)= <math>\sqrt{\left(\frac{30000}{mass}\right)}</math>, which is smaller) and pulse duration of 11 milliseconds/对每个电池以峰值为 150g<sub>n</sub> (或与 <math>\sqrt{\left(\frac{100850}{mass}\right)}</math> 中的较小值) 的半正弦的加速度撞击，脉冲持续 6 毫秒，大型电池须经受最大加速度 50g<sub>n</sub> (或与 <math>\sqrt{\left(\frac{30000}{mass}\right)}</math> 中的较小值) 和脉冲持续时间 11 毫秒的半正弦波冲击。</p> <p>3 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 of 18 shocks/每个电池或电池组须在三个互相垂直的电池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。</p>		P	
	<p>Requirements/标准要求:</p> <p>1 Cells and batteries Mass loss limit: ≤0,1% /样品质量损失≤0,1%</p> <p>2 Open circuit voltage not less than 90%, The requirement relating to voltage is not applicable to test cells and batteries at full discharged states. 样品试验后开路电压应不低于试验前开路电压的 90%，此要求不适用于完全放完电的电池和电芯。</p> <p>3 No leakage, no venting, no disassembly, no rupture and no fire 样品（电池）应无漏液、无排气、无解体、无破裂以及无着火现象的发生</p>			<p>The samples b1#~b8# :</p> <p>Acceleration= 150g<sub>n</sub></p> <p>No leakage, no venting, no disassembly, no rupture and no fire/编号为 b1#~b8# 的样品:</p> <p>峰值加速度= 150g<sub>n</sub></p> <p>无漏液、无排气、无解体、无破裂以及无着火现象</p> <p>The data is shown in Table 1./数据见表 1</p>



ST/SG/AC.10/11/Rev.6/Amend.1/Section 38.3			
Clause 章节	Requirements 标准要求	Result 测试结果	Verdict 判定
38.3.4.5	<b>Test 5: External Short Circuit/测试 5 外接短路</b>		P
	<p>1 The cell or battery to be tested shall be heated for a period of time necessary to reach a homogeneous stabilized temperature <math>57\pm4^{\circ}\text{C}</math>/加热电芯或电池样品直到温度稳定在 <math>57\pm4^{\circ}\text{C}</math></p> <p>2 the cell or battery shall be subjected to a short circuit condition with a total external resistance of less than 0,1 ohm at <math>57\pm4^{\circ}\text{C}</math>, This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to <math>57\pm4^{\circ}\text{C}</math>, 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. /将样品正负极用小于 <math>0,1\Omega</math> 的总电阻回路进行短路, 样品的外表温度恢复到 <math>57\pm4^{\circ}\text{C}</math>之后保持短路状态 1 小时以上; 对于大电池, 电池温度降低至最高温升值的一半时实验结束。</p> <p>3 the cell or battery must be observed for a further six hours for the test to be concluded, /对电芯或电池必须进一步观察 6 个小时才能下结论。</p>		
	<p>Requirements/标准要求: During the test and within six hours after test ,the cells or batteries 在测试过程中以及之后 6 个小时内, 电芯或电池样品</p> <p>1. External temperature not exceed <math>170^{\circ}\text{C}</math> 外表温度不超过 <math>170^{\circ}\text{C}</math></p> <p>2. No disassembly, no rupture and no fire. 无解体、无破裂和无着火现象发生。</p>	<p>The samples b1#~b8# : no disassembly, no rupture and no fire/编号为 b1#~b8# 的样品: 无解体、无破裂以及无着火现象</p> <p>The data is shown in Table 1./数据见表 1</p>	

ST/SG/AC.10/11/Rev.6/Amend.1/Section 38.3			
Clause 章节	Requirements 标准要求	Result 测试结果	Verdict 判定
38.3.4.6	<b>Test 6: Impact / Crush / 测试 6: 撞击/挤压</b> Impact (applicable to cylindrical cells not less than 18mm in diameter) / 撞击（适用于直径不小于 18 毫米的圆柱形电池）		P
	1 This test sample cell or component cell is to be placed on a flat smooth surface/ 将试验样品用的电芯或聚合物电芯放在一个平坦光滑的平面上 2 A 15,8 mm diameter bar is to be placed across the center of the sample, A 9,1kg mass is to be dropped from a height of 61±2,5cm onto the sample./将一直径为 15,8mm 的不锈钢圆棒横过电池中部放置后，将一质量为 9,1kg 的物体从 61±2,5cm 的高度落向样品。 3 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./ 接受撞击的试样，纵轴应与平坦的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。每一个试样只经受一次撞击。		
	Requirements/标准要求: 1 Cells external temperature not exceed 170°C.电芯或电池的最高表面温度应不超过 170°C 2 No disassembly, no fire within six hours of this test 试验结束后 6 个小时之内，电芯和聚合物电芯应无解体和无着火现象发生	The samples c1#~c10#: no disassembly and no fire/ 编号为 c1#~c10#的样品：无解体、无着火现象 The data is shown in Table 2./数据见表 2	P
38.3.4.6	<b>Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells less than 18mm in diameter)</b> / 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）		N/A
	1 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. / 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) The applied force reaches 13 kN ± 0,78 kN. / 施加的力达到 13kN±0,78kN (b) The voltage of the cell drops by at least 100 mV,/电池的电压下降至少 100 毫伏 (c) The cell is deformed by 50% or more of its original thickness./电池变形达原始厚度的 50%以上。 2. 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. /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。圆柱形应从与纵轴垂直的方向施压。		
	Requirements/标准要求: 1 Cells external temperature not exceed 170°C.电芯或电池的最高表面温度应不超过 170°C 2 No disassembly, no fire within six hours of this test 试验结束后 6 个小时之内，电芯和聚合物电芯应无解体和无着火现象发生	-	

ST/SG/AC.10/11/Rev.6/Amend.1/Section 38.3			
Clause 章节	Requirements 标准要求	Result 测试结果	Verdict 判定
38.3.4.7	<b>Test 7: Overcharge/测试 7: 过充电</b>		P
	1 The charge current shall be twice the manufacturer's recommended maximum continuous charge current/以 2 倍制造厂推荐的最大持续充电电流对样品充电 2 The minimum voltage of the test shall be as follows/本测试最小电压见下文		
	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/ 如果厂家推荐的充电电压不超过 18V, 本测试的最小充电电压应是厂家标定最大充电电压的两倍或者是 22V 之中的较小者。 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/ 如果厂家推荐的充电电压超过 18V, 本测试的最小充电电压应是厂家标定最大充电电压的 1,2 倍。 3 Tests are to be conducted at ambient temperature 20±5°C, The duration of the test shall be 24 hours/20±5°C 的环境温度下, 试验持续 24 小时。	The voltage of the test is 8,4V, and the current is 10,0A 测试的电压为 8,4V, 电流为 10,0A	
	Requirements/标准要求: No disassembly and no fire within seven days of this test 试验样品在试验中和试验后 7 天内, 应无解体和无着火现象发生。	The samples b1#~b8# : For voltage data before test, see table 3. / 试验前电压见表 3 no disassembly, no rupture and no fire/编号为 b1#~b8# 的样品: 无解体、无着火现象	
38.3.4.8	<b>Test 8: Forced discharge/测试 8: 强制放电</b>		P
	Each cell shall be forced discharged at ambient temperature by connecting it in series with a 12 V D.C. power supply at an initial current equal to the maximum discharge current specified by the manufacturer, 20±5°C 的环境温度下, 将单个电芯连接在 12V 的直流电源上进行强制放电, 此直流电源提供给每个电芯初始电流为制造厂指定的最大放电电流。		
	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) 指定的放电电流通过串联在测试电芯上的合适大小和功率的负载来获得, 每个电芯的强制放电时间 (小时) 为额定容量除以初始电流 (安培)。		
	Requirements/标准要求: No disassembly and no fire within seven days of this test 试验样品在试验中和试验后 7 天内, 应无解体和无着火现象发生。	The samples c11#~c30#: no disassembly and no fire/编号为 c11#~c30# 的样品: 无解体、无着火现象 The data is shown in Table 4./数据见表 4	

Table1: T1~T5 / 表 1. 试验 1~试验 5

Sample No. 样品号	Mass prior to test / 试验前质量(g)	OCV prior to test / 试验前电压(V)	Test 1: Altitude simulation/ 测试 1: 高度模拟		Test 2: Thermal test/ 测试 2: 热冲击		Test 3: Vibration/ 测试 3: 振动		Test 4: Shock/ 测试 4: 冲击		Test 5: External Short Circuit/测试 5 外接短路
			Mass loss(%) 质量损失(%)	Change ratio 电压比(%)	Mass loss(%) 质量损失(%)	Change ratio 电压比(%)	Mass loss(%) 质量损失(%)	Change ratio 电压比(%)	Mass loss(%) 质量损失(%)	Change ratio 电压比(%)	
b1#	195,295	8,368	0,001	99,95	0,016	98,84	0,001	99,95	0,000	100,00	58,3
b2#	195,450	8,362	0,001	99,94	0,014	98,90	0,002	99,99	0,000	100,00	57,8
b3#	195,246	8,366	0,002	99,94	0,016	98,80	0,001	99,96	0,000	100,00	58,6
b4#	195,692	8,364	0,001	99,94	0,015	98,82	0,002	99,98	0,000	100,00	58,4
b5#	195,268	8,366	0,001	99,95	0,018	98,82	0,002	99,95	0,000	100,00	57,9
b6#	195,441	8,368	0,001	99,94	0,017	98,86	0,002	99,98	0,000	100,00	58,8
b7#	195,530	8,368	0,001	99,95	0,016	98,85	0,002	99,98	0,000	100,00	58,3
b8#	195,383	8,366	0,001	99,94	0,016	98,80	0,001	99,98	0,000	100,00	58,2

Table2: Impact / 表 2: 撞击

Test 6: Impact/测试 6: 撞击	Sample No. 样品号	c1#	c2#	c3#	c4#	c5#	c6#	c7#	c8#	c9#	c10#
	OCV prior to test / 试验前电压 (V)	3,687	3,683	3,683	3,686	3,681	3,684	3,683	3,683	3,676	3,689
Temp. (°C) 温度 (°C)	124,8	55,9	100,2	86,6	55,5	102,3	89,8	103,5	55,7	81,1	

Table3: Overcharge Test of batteries/ 表 3 电池过充试验

Test 7: Overcharge e /测试 7: 过充电	Sample No. 样品号	b1#	b2#	b3#	b4#	b5#	b6#	b7#	b8#
	OCV prior to test /试 验前电压 (V)	8,364	8,362	8,365	8,367	8,361	8,364	8,362	8,365

Table 4: Forced discharge / 表 4. 强制放电

Test 8: Forced discharge / 测试 8: 强 制放电	Sample No. 样品号	c11#	c12#	c13#	c14#	c15#	c16#	c17#	c18#	c19#	c20#
	OCV prior to test / 试验前电压(V)	3,367	3,382	3,365	3,359	3,375	3,369	3,372	3,375	3,382	3,366
	Sample No. 样品号	c21#	c22#	c23#	c24#	c25#	c26#	c27#	c28#	c29#	c30#
OCV prior to test / 试验前电压(V)	3,373	3,368	3,365	3,384	3,377	3,364	3,368	3,373	3,363	3,367	

## 注 意 事 项 Important

1. 报告无检测单位印章无效。  
The test report is invalid without the official stamp of CVC.
2. 未经本试验室书面同意，不得部分地复制本报告。  
Nobody is allowed to photocopy or partly photocopy this test report without written permission of CVC.
3. 本报告无批准人、审核人及检测人签名无效。  
The test report is invalid without the signatures of Ratifier, Reviewer and Testing engineer.
4. 本报告涂改无效。  
The test report is invalid if altered,
5. 对检测报告若有异议，应于收到报告之日起十五天内向检测单位提出。  
Objections to the test report must be submitted to CVC within 15 days,
6. 本报告仅对送检样品负责。  
The test report is valid for the tested samples only.
7. 判定栏中“-”表示“不需要判定”，“P”表示“通过”，“F”表示“不通过”，“N/A”表示“不适用”。  
As for the Verdict, “-” means “no need for judgement”, “P” means “pass”, “F” means “fail” and “N/A” means “not applicable”.

*\*\*报告中未加 CMA 标志时，检测数据和结果仅供科研、教学或内部质量控制之用。\*\**

地 址：中国 广州市科学城开泰大道天泰一路 3 号

Address: No.3, Tiantaiyi Road, Kaitai Avenue, Science City, Guangzhou P. R. China.

电 话(Tel): 020 32293888

传 真(FAX): 020 32293889

邮政编码(Post Code): 510663

E-mail: office@cvc.org.cn

http://www.cvc.org.cn



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检测  
TESTING  
CNAS L6214



# UN38.3 测试报告

## UN38.3 Test Report

报告编号 Report No.: SA2007282U 03001

样品名称: 可充电锂离子聚合物电池组  
Sample Name: Rechargeable Li-ion Battery

样品型号: GSP-2S2P-XT3A  
Sample Model:

委托单位: 广州鹏辉能源科技股份有限公司  
Applicant: Guangzhou Great Power Energy & Technology Co., Ltd.

签发日期: 2020-08-20  
Issue Date:

东莞市安磁检测技术有限公司

Dongguan Anci Electronic Technology Co., Ltd.



Dongguan Anci Electronic Technology Co., Ltd.

Address: 1-2 Floor, Building A, No.11, Headquarters 2 Road, Songshan Lake Hi-tech Industrial, Development Zone, Dongguan City, Guangdong Pr. China

Tel: 0769-85075888 Fax: 0769-58075898

E-mail: ada@anci.com Web: www.anci.com

样品描述 Sample Description			
样品名称 Sample Name	可充电锂离子聚合物电池组 Rechargeable Li-ion Battery	样品型号 Sample Model	GSP-2S2P-XT3A
测试实验室 Testing laboratory	东莞市安磁检测技术有限公司 Dongguan Anci Electronic Technology Co., Ltd.		
测试地址 Testing Address	广东东莞市松山湖高新技术产业开发区总部2路11号A座1-2层 1-2 Floor, Building A, No.11, Headquarters 2 Road, Songshan Lake Hi-tech Industrial, Development Zone, Dongguan City, Guangdong Pr. China		
委托单位 Applicant	广州鹏辉能源科技股份有限公司 Guangzhou Great Power Energy & Technology Co., Ltd.		
委托单位地址 Applicant Address	中国广东省广州市番禺区沙湾镇市良路（西村段）912号 NO.912, West Village Segment, Shiliang Road, Shawan Town, Panyu District, Guangzhou City, Guangdong Province 511483, P. R.China		
制造商 Manufacturer	广州鹏辉能源科技股份有限公司 Guangzhou Great Power Energy & Technology Co., Ltd.		
制造商地址 Manufacturer Address	中国广东省广州市番禺区沙湾镇市良路（西村段）912号 NO.912, West Village Segment, Shiliang Road, Shawan Town, Panyu District, Guangzhou City, Guangdong Province 511483, P. R.China		
电芯生产单位 Factory of Cell	广州鹏辉能源科技股份有限公司 Guangzhou Great Power Energy & Technology Co., Ltd.		
测试标准 Standard	ST/SG/AC.10/11/Rev.6/Amend.1 Section 38.3		
测试日期 Tested date	2020-07-25 to 2020-08-06		
<p>检验结论 Test conclusion:</p> <p>The Rechargeable Li-ion Battery submitted by Guangzhou Great Power Energy &amp; Technology Co., Ltd. are tested according to Section 38.3 of the six of the Recommendations on the Transport of Dangerous Goods, Manual of Test and Criteria (ST/SG/AC.10/11/Rev.6/Amend.1 Section 38.3). The test items are full items. The test results comply with the relevant requirements of the standard.</p> <p>由广州鹏辉能源科技股份有限公司送检的可充电锂离子聚合物电池组，依据《关于危险品货物运输的建议书》试验和标准手册第六修订版修正1第38.3节进行检测，试验为全项目，测试结果符合标准相关要求。</p>			

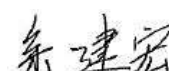
检测 Tested by

陈保霖

审核 Reviewed by



批准 Approved by






样品信息 Sample Information			
标称电压 Nominal Voltage	7.2V	额定容量 Rated Capacity	5000mAh
瓦时 Watt-hour	36.0Wh	商标 Trade mark	--
充电上限电压 Limited Charge Voltage	8.4V	放电终止电压 Discharge Cut-Off Voltage	6.2V
充电电流 Charge Current	2500mA	最大持续充电电流 Max. Continuous Charge Current	3400mA
放电电流 Discharge Current	1000mA	最大持续放电电流 Max. Continuous Discharge Current	12000mA
充电截止电流 End Charge Current	20mA	电池尺寸 Battery dimensions	137.9mm*36.7mm*18.6mm
电芯型号 Cell Model	ICR18650- 26J2	电芯容量 Cell Rated Capacity	2600mAh
组合方式 Compound mode	2S2P		
Description of the sampling procedure: / 取样程序的说明: /			
Description of the deviation from the standard, if any: / 测试结果不符合标准项的说明: /			
Remarks/备注: 1. 本报告中以点代替小数点。 Throughout this report a comma is used as the decimal separator. 2. 判定栏中“-”表示“不需要判定”，“P”表示“通过”，“F”表示“不通过”，“N/A”表示“不适用”。 As for the Verdict, “-” means “no need for judgement”, “P” means “pass”, “F” means “fail” and “N/A” means “not applicable”.			

**Summary of testing:**

**Tests performed (name of test and test clause):**

Test items	Sample Number
T.1: Altitude simulation / 高度模拟	B1# - B8#
T.2: Thermal test / 温度测试	
T.3: Vibration / 振动	
T.4: Shock / 冲击	
T.5: External short circuit / 外接短路	
T.6: Crush / 挤压 or Impact / 撞击	C1# - C10#
T.7 Overcharge / 过充电	B9# - B16#
T.8: Forced discharge / 强制放电	C11# - C30#

**Testing location:**

**测试地点:**

东莞市安磁检测技术有限公司  
 Dongguan Anci Electronic Technology Co., Ltd.  
 广东东莞市松山湖高新技术产业开发区总部  
 2路11号A座1-2层  
 1-2 Floor, Building A, No.11, Headquarters  
 2 Road, Songshan Lake Hi-tech Industrial,  
 Development Zone, Dongguan City,  
 Guangdong Pr. China

The samples' statu is good.

样品状况良好。

Batteries of B1#~B4# B9#~B12 are full charged after one cycle;

多电芯电池B1#~B4# B9#~B12 为1次循环满电状态;

Batteries of B5#~B8# B13#~B16 are full charged after twenty-five cycles;

多电芯电池B5#~B8# B13#~B16为25次循环满电状态;

Rechargeable cells of C1#~C5# are 50% charged after one cycle;

可充电电芯C1#~C5#为1次循环后50%充电状态;

Rechargeable cells of C6#~C10# are 50% charged after twenty-five cycles;

可充电电芯C6#~C10#为25次循环后50%充电状态;

Rechargeable cells of C11#~C20# are full discharged after one cycle;

可充电电芯C11#~C20#为1次循环完全放电状态;

Rechargeable cells of C21#~C30# are full discharged after twenty-five cycles;

可充电电芯C21#~C30#为25次循环完全放电状态;

**Test Procedure:**

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

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

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

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

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

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 below, it is considered as "no mass loss".

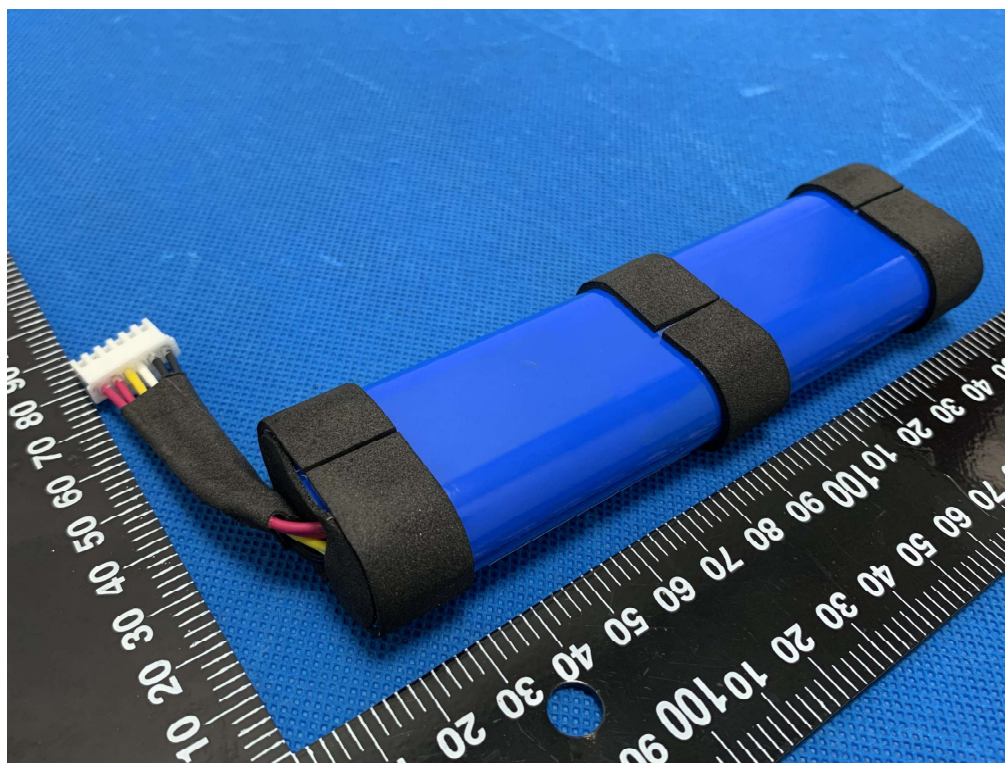
式中： $M_1$ 是试验前的质量， $M_2$ 是试验后的质量。如果质量损失不超过下表所列的数值，应视为“无质量损失”。

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

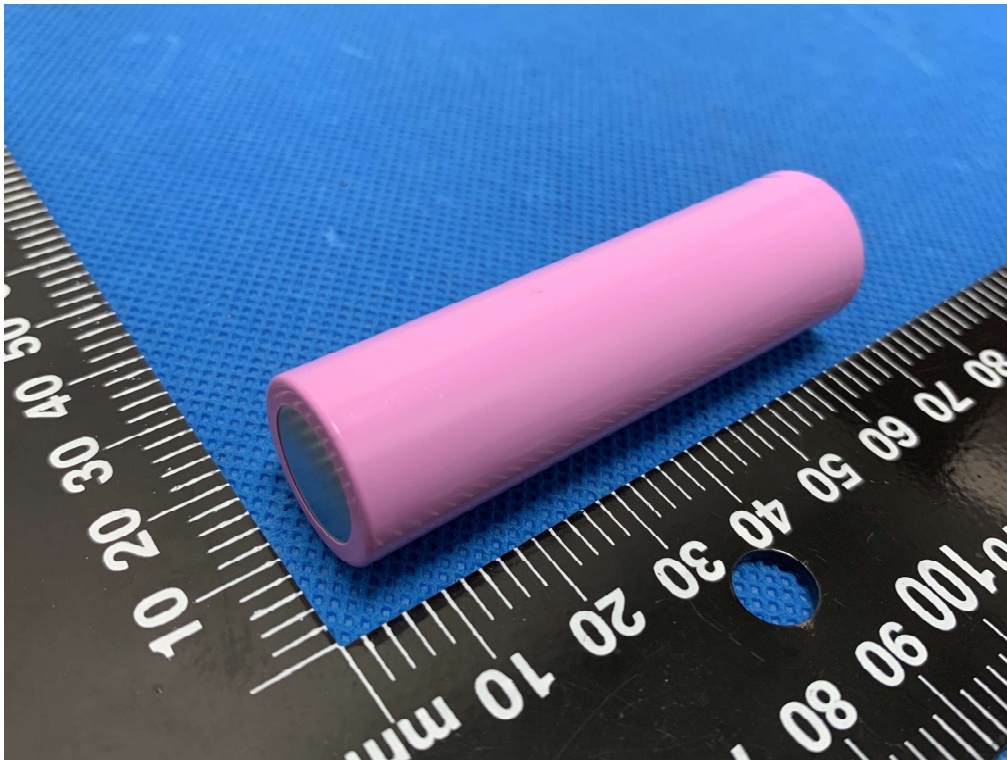
3. In test T.1 to T.4, batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test battery after testing is not less than 90% of its voltage immediately prior to this procedure.

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%。

Photos of Samples and Labels/样品照片及标识



Photos of Samples and Labels/样品照片及标识



38.3.4	Procedure / 测试步骤		判定 Verdict
38.3.4.1	<b>Test 1: Altitude simulation / 测试1: 高度模拟</b>		<b>P</b>
	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°C). 将电芯和电池在温度为20±5℃，大气压力为不大于11.6kpa 的环境中贮存不少于6 个小时。		P
	Requirement / 标准要求: 1. Cells and batteries Mass loss limit: ≤0.1%. 样品质量损失≤0.1%。 2. Open circuit voltage not less than 90%, The requirement relating to voltage is not applicable to test cells and batteries at full discharged states. 样品试验后开路电压应不低于试验前开路电压的90%,此要求不适用于完全放完电的电池和电芯。 3. No leakage, no venting, no disassembly, no rupture and no fire. 样品（电池）应无漏液、无排气、无解体、无破裂以及无着火现象的发生。	No leakage, no venting, no disassembly, no rupture and no fire. 无漏液、无排气、无解体、无破裂以及无着火现象。 The data see table 1. /测试数据见表1。	P
38.3.4.2	<b>Test 2: Thermal test / 测试 2: 温度实验</b>		<b>P</b>
	Test cells and batteries are to be stored for 电池存储条件如下: 1. one temperature cycle: 72±2°C(6h) — -40±2°C(6h). 一次温度循环为72±2°C(6h) — -40±2°C(6h)。 2. The maximum time interval between test temperature extremes is 30 minutes. 温度转换最大间隔时间为30mins。 3. This procedure is to be repeated 10 times. 重复10 次循环。 4. after which all test cells and batteries are to be stored for 24 hours at ambient temperature (20±5°C). 循环结束后，电池在 20±5℃的条件下 搁置24 小时。		P

	<p>Requirements / 标准要求:</p> <p>1. Cells and batteries Mass loss limit: <math>\leq 0.1\%</math>. 样品质量损失<math>\leq 0.1\%</math>.</p> <p>2. Open circuit voltage not less than 90%, The requirement relating to voltage is not applicable to test cells and batteries at full discharged states. 样品试验后开路电压应不低于试验前开路电压的90%,此要求不适用于完全放完电的电池和电芯。</p> <p>3. No leakage, no venting, no disassembly, no rupture and no fire. 样品（电池）应无漏液、无排气、无解体、无破裂以及无着火现象的发生。</p>	<p>No leakage, no venting, no disassembly, no rupture and no fire. 无漏液、无排气、无解体、无破裂以及无着火现象。 The data see table 1. /测试数据见表1。</p>	<p>P</p>
<p><b>38.3.4.3</b></p>	<p><b>Test 3: Vibration / 测试 3: 振动</b></p>		<p><b>P</b></p>
	<p>1. Cells and batteries are firmly secured to the platform of the vibration machine. 电芯和电池牢固地安装在振动台（的台面）上。</p> <p>2. The vibration :a sinusoidal waveform with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes. 振动以正弦波形式，以7Hz 增加至200Hz，然后在减少回到7Hz 为一个循环，一个循环持续15 分钟的对数前移传送。</p> <p>3. the logarithmic frequency sweep is as follows: 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 50Hz), A peak acceleration of 8 gn is then maintained until the frequency is increased to 200 Hz. 对数扫频为:从7 赫兹开始保持1gn 的最大加速度直到频率为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。</p> <p>4. This cycle repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting position of the cell. One of the directions of vibration must be perpendicular to the terminal face. 以振动的其中一个方向必须是垂直样品极性，对每个电芯从三个互相垂直的方向上循环12 次，每个方向3 个小时，共9 小时。</p>		<p>P</p>

	<p>Requirements / 标准要求:</p> <p>1. Cells and batteries Mass loss limit: ≤0.1%. 样品质量损失≤0.1%.</p> <p>2. Open circuit voltage not less than 90%, The requirement relating to voltage is not applicable to test cells and batteries at full discharged states. 样品试验后开路电压应不低于试验前开路电压的90%,此要求不适用于完全放完电的电池和电芯。</p> <p>3. No leakage, no venting, no disassembly, no rupture and no fire. 样品（电池）应无漏液、无排气、无解体、无破裂以及无着火现象的发生。</p>	<p>No leakage, no venting, no disassembly, no rupture and no fire. 无漏液、无排气、无解体、无破裂以及无着火现象。 The data see table 1. /测试数据见表1。</p>	<p>P</p>									
<p>38.3.4.4</p>	<p><b>Test 4: Shock / 测试 4: 冲击</b></p>		<p>P</p>									
	<p>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 gn and pulse duration of 6 milliseconds. Alternatively, large cells may be subjected to a half-sine shock of peak acceleration of 50 gn and pulse duration of 11 milliseconds. 被测电芯和电池应通过坚固的方式紧固在试验设备上，可以支撑每个被测电池的所有面。每个电芯或电池应用峰值加速度150 gn、脉冲时间6 ms的半正弦波进行冲击。或者大电芯应用峰值加速度50 gn、脉冲时间11 ms的半正弦波进行冲击。</p>		<p>P</p>									
	<p>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. 每个电池应用半正弦波冲击的峰值加速度大小取决于电池的质量。小电池应用6 ms的脉冲时间以及大电池应用11 ms的脉冲时间。根据下面的公式来计算合适的最小峰值加速度。</p> <table border="1" data-bbox="327 1503 924 1960"> <thead> <tr> <th>Battery</th> <th>Minimum peak acceleration</th> <th>Pulse duration</th> </tr> </thead> <tbody> <tr> <td>Small batteries</td> <td>                     150 gn or result of formula                      Acceleration (gn)  <math display="block">= \sqrt{\left(\frac{100850}{mass *}\right)}</math>                      Whichever is smaller                 </td> <td>6ms</td> </tr> <tr> <td>Large batteries</td> <td>                     50 gn or result of formula                      Acceleration (gn)  <math display="block">= \sqrt{\left(\frac{30000}{mass *}\right)}</math>                      Whichever is smaller                 </td> <td>11ms</td> </tr> </tbody> </table>	Battery	Minimum peak acceleration	Pulse duration	Small batteries	150 gn or result of formula Acceleration (gn) $= \sqrt{\left(\frac{100850}{mass *}\right)}$ Whichever is smaller	6ms	Large batteries	50 gn or result of formula Acceleration (gn) $= \sqrt{\left(\frac{30000}{mass *}\right)}$ Whichever is smaller	11ms		<p>N/A</p>
Battery	Minimum peak acceleration	Pulse duration										
Small batteries	150 gn or result of formula Acceleration (gn) $= \sqrt{\left(\frac{100850}{mass *}\right)}$ Whichever is smaller	6ms										
Large batteries	50 gn or result of formula Acceleration (gn) $= \sqrt{\left(\frac{30000}{mass *}\right)}$ Whichever is smaller	11ms										



	<p>Each cell or battery is 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> <p>每个电芯或电池应在三个垂直面的正向各承受三次冲击，负向再各承受3次冲击，共18次。</p>		P
	<p>Requirements / 标准要求:</p> <p>1. Cells and batteries Mass loss limit: <math>\leq 0.1\%</math>. 样品质量损失<math>\leq 0.1\%</math>。</p> <p>2. Open circuit voltage not less than 90%, The requirement relating to voltage is not applicable to test cells and batteries at full discharged states. 样品试验后开路电压应不低于试验前开路电压的90%,此要求不适用于完全放完电的电池和电芯。</p> <p>3. No leakage, no venting, no disassembly, no rupture and no fire. 样品（电池）应无漏液、无排气、无解体、无破裂以及无着火现象的发生。</p>	<p>No leakage, no venting, no disassembly, no rupture and no fire. 无漏液、无排气、无解体、无破裂以及无着火现象。</p> <p>The data see table 1. /测试数据见表1。</p>	P
<b>38.3.4.5</b>	<b>Test 5: External Short Circuit / 测试5 外接短路</b>		<b>P</b>
	<p>1. The cell or battery to be tested shall be temperature stabilized so that its external case temperature reaches <math>57\pm 4^\circ\text{C}</math>. 保持试验环境温度稳定在<math>57\pm 4^\circ\text{C}</math>，以使电芯或电池样品外表温度达到<math>57\pm 4^\circ\text{C}</math>。</p> <p>2. the cell or battery shall be subjected to a short circuit condition with a total external resistance of less than 0.1 ohm at <math>57\pm 4^\circ\text{C}</math>, This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to <math>57\pm 4^\circ\text{C}</math>. 将样品正负极用小于<math>0.1\Omega</math>的总电阻回路进行短路，样品的外表温度恢复到<math>57\pm 4^\circ\text{C}</math>之后保持短路状态1小时以上。</p> <p>3. the cell or battery must be observed for a further six hour for the test to be concluded. 对电芯或电池必须进一步观察6个小时才能下结论。</p>		P
	<p>Requirements / 标准要求:</p> <p>During the test and within six hours after test, the cells or batteries. 在测试过程中以及之后6个小时内，电芯或电池样品。</p> <p>1. External temperature not exceed <math>170^\circ\text{C}</math>. 外表温度不超过<math>170^\circ\text{C}</math>。</p> <p>2. No disassembly, no rupture and no fire. 无解体、无破裂和无着火现象发生。</p>	<p>External temperature not exceed <math>170^\circ\text{C}</math> 外表温度不超过<math>170^\circ\text{C}</math></p> <p>No disassembly, no rupture and no fire. 无解体、无破裂和无着火现象发生。</p> <p>The data see table 1. /测试数据见表1。</p>	P
<b>38.3.4.6</b>	<b>Test 6: Impact / Crush / 测试6: 撞击 / 挤压</b>		<b>P</b>

	<p><b>Impact (applicable to cylindrical cells not less than 18mm in diameter).</b>          撞击（适用于直径不小于18毫米的圆柱形电池）。</p>		P
	<p>1. This test sample cell or component cell is to be placed on a flat smooth surface.          将试验样品用的电芯或聚合物电芯放在一个平坦光滑的平面上。</p> <p>2. A 15.8 mm diameter bar is to be placed across the center of the sample, A 9.1kg mass is to be dropped from a height of 61±2.5cm onto the sample.          将一直径为15.8mm的横木横过电池中部放置后，将一质量为9.1kg的物体从61±2.5cm的高度落向样品。</p> <p>3. 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.          接受撞击的试样，纵轴应与平坦的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。每一个试样只经受一次撞击。</p>		P
	<p><b>Requirements / 标准要求:</b></p> <p>1. Cells external temperature not exceed 170°C.          电芯或电池的最高表面温度应不超过170°C。</p> <p>2. No disassembly and no fire within six hours of this test.          试验结束后6个小时之内，电芯和聚合物电芯应无解体和无着火现象发生。</p>	<p>External temperature not exceed 170°C          外表温度不超过170°C</p> <p>No disassembly, no rupture and no fire.          无解体、无破裂和无着火现象发生。</p> <p>The data see table 2.          /测试数据见表2。</p>	P
	<p><b>Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells less than 18mm in diameter).</b>          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）。</p>		N/A

	<p>1. 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.</p> <p>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：</p> <p>(a) The applied force reaches 13 kN ± 0.78 kN. 施加的力达到13 千牛±0.78 千牛。</p> <p>(b) The voltage of the cell drops by at least 100 mV. 电池的电压下降至少100 毫伏。</p> <p>(c) The cell is deformed by 50% or more of its original thickness. 电池变形达原始厚度的50%以上。</p> <p>2. 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. 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。圆柱形应从与纵轴垂直的方向施压。</p>	<p>The applied force reaches 13 kN ± 0.78 kN. 施加的力达到13 千牛 ±0.78 千牛。</p>	<p>N/A</p>
	<p>Requirements / 标准要求:</p> <p>1. Cells external temperature not exceed 170°C. 电芯或电池的最高表面温度应不超过170°C。</p> <p>2. No disassembly and no fire within six hours of this test 试验结束后6 个小时之内，电芯和聚合物电芯应无解体和无着火现象发生。</p>		<p>N/A</p>
<p><b>38.3.4.7</b></p>	<p><b>Test 7: Overcharge / 测试 7: 过充电</b></p>		<p><b>P</b></p>

	<p>1. The charge current shall be twice the manufacturer's recommended maximum continuous charge current. 以2 倍制造厂推荐的最大持续充电电流对样品充电。</p> <p>2. The minimum voltage of the test shall be as follows: 本测试最小电压为:</p> <p>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. 如果厂家推荐的充电电压不超过18V, 本测试的最小充电电压应是厂家标定最大充电电压的两倍或者是22V 之中的较小者。</p> <p>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. 如果厂家推荐的充电电压超过18V, 本测试的最小充电电压应是厂家标定最大充电电压的1.2 倍。</p> <p>3. Tests are to be conducted at ambient temperature 20±5°C, The duration of the test shall be 24 hours. 20±5°C的环境温度下, 试验持续24 小时。</p>	<p>The voltage of the test is 16.8V, and the current is 6.8A. / 测试电压为16.8V, 电流为6.8A.</p>	<p>P</p>
	<p>Requirements / 标准要求: No disassembly and no fire within seven days of this test. 试验样品在试验中和试验后7 天内, 应无解体和无着火现象发生。</p>		
<p><b>38.3.4.8</b></p>	<p><b>Test 8: Forced discharge / 测试 8: 强制放电</b></p>		<p><b>P</b></p>
	<p>Each cell shall be forced discharged at ambient temperature by connecting it in series with a 12 V D.C. power supply at an initial current equal to the maximum discharge current specified by the manufacturer. 20±5°C的环境温度下, 将单个电芯连接在12V 的直流电源上进行强制放电, 此直流电源提供给每个电芯初始电流为制造厂指定的最大放电电流。</p>		<p>P</p>
	<p>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). 指定的放电电流通过串联在测试电芯上的合适大小和功率的负载来获得, 每个电芯的强制放电时间 (小时) 为额定容量除以初始电流 (安培)。</p>		<p>P</p>
	<p>Requirements / 标准要求: No disassembly and no fire within seven days of this test. 试验样品在试验中和试验后7 天内, 应无解体和无着火现象发生。</p>	<p>No disassembly and no fire. 无解体和无着火现象。 The data see table 2. /测试数据见表2。</p>	<p>P</p>

## Main Test Apparatus 主要测试仪器

Serial No. 设备编号	Name of Equipment 设备名称	Model 型号	Calibration Date 校准日期	Next Calibration Date 下次校准日期
AN-020	数字万用表	FLUKE, 15B	2020/03/10	2021/03/09
AN-158	电脑式电池挤压试验机	GAOXIN, GX-5067-CSM	2020/03/10	2021/03/09
AN-159	电磁式振动试验仪	LABTONE, EV203	2020/03/10	2021/03/09
AN-160	机械式冲击试验机	LABTONE, HSKT-10	2020/03/10	2021/03/09
AN-162	电池低压高空模拟试验箱	GAOXIN, GX-3020-Z	2020/03/10	2021/03/09
AN-163	可编程恒温恒湿试验箱（快速温度变化试验箱）	GAOXIN, GX-3000-150LT	2020/03/10	2021/03/09
AN-164	电池重物冲击试验机	GAOXIN, GX-5066	2020/03/10	2021/03/09
AN-166	数显温湿度计	THPIM, X6R-TH-B	2020/03/10	2021/03/09
AN-169	电子天平秤	YINGHENG, YHC	2020/03/10	2021/03/09
AN-170	时钟	Yongchun	2020/03/10	2021/03/09
AN-171	数字大气压力表	YIOU, BY-2003P	2020/03/10	2021/03/09
AN-174	电池性能检测系统	Xinwei, CT-4008-5V12A	2020/03/10	2021/03/09
AN-175	电池性能检测系统	Xinwei, CT-4008-5V12A	2020/03/10	2021/03/09
AN-176	电池性能检测系统	Xinwei, CT-4008-5V12A	2020/03/10	2021/03/09
AN-177	电池性能检测系统	Xinwei, CT-4008-5V12A	2020/03/10	2021/03/09
AN-178	电池性能检测系统	Xinwei, CT-4008-5V12A	2020/03/10	2021/03/09
AN-185	多路温度测试仪	Rongxin, TWC-2A	2020/03/10	2021/03/09
AN-186	多路温度测试仪	Rongxin, TWC-2A	2020/03/10	2021/03/09
AN-210	直流稳压电源	Rui Yuan, WYK-6030K	2020/03/10	2021/03/09
AN-211	直流稳压电源	Rui Yuan, WYK-6030K	2020/03/10	2021/03/09
AN-212	直流稳压电源	Rui Yuan, WYK-6030K	2020/03/10	2021/03/09
AN-213	直流稳压电源	Rui Yuan, WYK-6030K	2020/03/10	2021/03/09
AN-214	直流稳压电源	Rui Yuan, WYK-6030K	2020/03/10	2021/03/09
AN-217	电池短路试验机	GAOXIN, GX-6055-B5	2020/03/10	2021/03/09
AN-218	直流稳压电源	Rui Yuan, WYK-6060K	2020/03/10	2021/03/09
AN-263	动力电池检测系统	Xinwei, CE-7002-200V100A	2020/03/10	2021/03/09

**Table 1: T1-T5 / 表1. 试验1-试验5**

Sample No. / 样品编号	Mass prior to test / 试验前质量(g)	OCV prior to test / 试验前电压(V)	Test 1: Altitude simulation 测试 1: 高度模拟		Test 2: Thermal test 测试 2: 温度实验		Test 3: Vibration 测试 3: 振动		Test 4: Shock 测试 4: 冲击		Test 5: External Short Circuit 测试 5: 外接短路
			Mass loss(%) 质量损失 (%)	Change ratio 电压比(%)	Mass loss(%) 质量损失 (%)	Change ratio 电压比(%)	Mass loss(%) 质量损失 (%)	Change ratio 电压比(%)	Mass loss(%) 质量损失 (%)	Change ratio 电压比(%)	
B1#	193.295	8.36	0.000	100.000	0.008	99.043	0.000	100.000	0.000	100.000	56.7
B2#	193.642	8.37	0.000	100.000	0.007	98.805	0.000	100.000	0.000	100.000	56.8
B3#	193.628	8.36	0.001	100.000	0.008	99.043	0.000	100.000	0.000	100.000	56.7
B4#	193.539	8.36	0.000	100.000	0.008	98.923	0.000	100.000	0.000	100.000	57.0
B5#	193.728	8.37	0.000	100.000	0.007	98.805	0.000	100.000	0.000	100.000	56.5
B6#	193.659	8.37	0.000	100.000	0.007	98.805	0.000	100.000	0.000	100.000	57.1
B7#	193.527	8.36	0.000	100.000	0.008	99.043	0.000	100.000	0.000	100.000	57.2
B8#	193.296	8.37	0.000	100.000	0.007	98.925	0.000	100.000	0.000	100.000	56.8

Table 2: T6-T8 / 表2. 试验6-试验8						
Test 6: Impact / Crush / 测试6: 撞击/挤压			Test 7: Overcharge / 测试7:过充电		Test 8: Forced discharge / 测试8: 强制放电	
Sample No. / 样品编号	OCV prior to test / 试验前电压 (V)	Temp. (°C) / 温度 (°C)	Sample No. / 样品编号	OCV prior to test / 试验前电压 (V)	Sample No. / 样品编号	OCV prior to test / 试验前电压 (V)
C1#	3.795	118.3	B9#	8.36	C11#	3.315
C2#	3.801	127.0	B10#	8.37	C12#	3.308
C3#	3.798	121.5	B11#	8.36	C13#	3.331
C4#	3.786	125.9	B12#	8.36	C14#	3.326
C5#	3.803	128.4	B13#	8.37	C15#	3.314
C6#	3.788	120.2	B14#	8.36	C16#	3.321
C7#	3.789	118.1	B15#	8.37	C17#	3.309
C8#	3.792	113.4	B16#	8.37	C18#	3.311
C9#	3.796	117.9	--	--	C19#	3.316
C10#	3.785	116.9	--	--	C20#	3.325
--	--	--	--	--	C21#	3.330
--	--	--	--	--	C22#	3.324
--	--	--	--	--	C23#	3.313
--	--	--	--	--	C24#	3.306
--	--	--	--	--	C25#	3.314
--	--	--	--	--	C26#	3.322
--	--	--	--	--	C27#	3.328
--	--	--	--	--	C28#	3.317
--	--	--	--	--	C29#	3.319
--	--	--	--	--	C30#	3.326

--- 报告结束 ---  
--- End of report ---

## 声明 Declaration

1. 本报告无批准人、审核人及鉴定人签名无效。

The test report is invalid without the signatures of Ratifier, Reviewer and Testing engineer.

2. 对检验报告若有异议，应于收到报告之日起十五天内向检验单位提出。

Objections to the test report must be submitted to ANCI within 15 days.

3. 未经本试验室书面同意，不得部分地复制本报告。

Nobody is allowed to photocopy or partly photocopy this test report without written permission of ANCI.

4. 客户必须如实提供样品及资料，并保证申报品名和样品以及运输货物相同，否则本检测单位不承担任何相关责任。

The client should provide samples and relevant data, at the same time, they should guarantee the consistence of the product's name the declared, the samples they provided and the goods to be transported. Otherwise we will not bear any relevant responsibilities.

5. 本报告仅对送检样品负责。

The test report is valid for the tested samples only.

6. 任何情况下检测单位的赔偿责任都不会超过检测单位就本次检测所收取的检测费用。

ANCI's liability under no circumstance will exceed the testing fee received from applicant for test conducted hereof this testing report.

7. 本报告涂改无效。

The test report is invalid if altered.

--- 报告结束 ---

--- End of report ---