



中国认可  
国际互认  
检测  
TESTING  
CNAS L13753



# UN38.3 测试报告

## UN38.3 Test Report

报告编号 Report No.: S03A24070594U00101

样品名称: 二氧化锰锂电池  
Sample Name: Lithium manganese dioxide battery

---

样品型号: CR2016  
Sample Model:

---

委托单位: Ropla Elektronik Sp. z o.o.  
Applicant:

---

签发日期: 2024-07-25  
Issue Date:

---

广东储能检测技术有限公司

报告专用章  
Special Seal for Report

Guangdong ESTL Technology Co., Ltd.

样品名称 Sample Name	二氧化锰锂电池 Lithium manganese dioxide battery	样品型号 Sample Model	CR2016
测试实验室 Testing laboratory	广东储能检测技术有限公司 Guangdong ESTL Technology Co., Ltd.		
实验室地址 Laboratory address	广东省东莞市松山湖园区总部二路9号1栋1单元101、201-208 室、4单元201室和11号1栋2单元101室。 Room 101, 201-208, Unit 1, & Room 201, Unit 4, Building 1, No.9/Room 101, Unit 2, Building 1, No.11, Zongbu 2nd Road, Songshanhu Park, Dongguan, Guangdong, China		
委托单位 Applicant	Ropla Elektronik Sp. z o.o.		
委托单位地址 Applicant Address	ul.Wroclawska 1C,52-200 Suchy Dwór		
生产厂家 Manufacturer	Ropla Elektronik Sp. z o.o.		
生产厂家地址 Manufacturer Address	ul.Wroclawska 1C,52-200 Suchy Dwór		
电芯生产单位 Factory of Cell	Ropla Elektronik Sp. z o.o.		
测试标准 Standard	联合国《试验和标准手册》第八修订版第38.3节 UNITED NATIONS the "Manual of Test and Criteria" (ST/SG/AC.10/11/Rev.8) Section 38.3.		
接样日期 Date of sample receipt	2024-07-08		
测试日期 Tested date	2024-07-08 to 2024-07-25		
<p>检验结论 Test conclusion:</p> <p>由Ropla Elektronik Sp. z o.o.送检的二氧化锰锂电池, 依据联合国《试验和标准手册》第八修订版第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>The Lithium manganese dioxide battery submitted by Ropla Elektronik Sp. z o.o. are tested according to UNITED NATIONS the "Manual of Test and Criteria" (ST/SG/AC.10/11/Rev.8) Section 38.3. The test items are full items. The test results comply with the relevant requirements of the standard</p>			

检测 Tested by

陈保霖

审核 Reviewed by

李美娜

批准 Approved by

[Signature]



样品信息 Sample Information			
标称电压 Nominal Voltage	3V	额定容量 Rated Capacity	90mAh
锂含量 Lithium content	0.025g	放电终止电压 Discharge Cut-Off Voltage	/
放电电流 Discharge Current	0.1mA	最大持续放电电流 Max. Continuous Discharge Current	5mA
电芯尺寸 Cell dimensions		Φ20mm*T1.6mm	
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: /			
<b>Remarks/备注:</b> 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:															
<b>Tests performed (name of test and test clause):</b>		<b>Testing location:</b>													
<table border="1"> <thead> <tr> <th>Test items</th> <th>Sample Number</th> </tr> </thead> <tbody> <tr> <td>T.1: Altitude simulation / 高度模拟</td> <td rowspan="5">C1 - C20</td> </tr> <tr> <td>T.2: Thermal test / 温度测试</td> </tr> <tr> <td>T.3: Vibration / 振动</td> </tr> <tr> <td>T.4: Shock / 冲击</td> </tr> <tr> <td>T.5: External short circuit / 外接短路</td> </tr> <tr> <td>T.6: Crush / 挤压 or Impact/撞击</td> <td>C21 - C30</td> </tr> <tr> <td>T.7 Overcharge / 过充电</td> <td>--</td> </tr> <tr> <td>T.8: Forced discharge / 强制放电</td> <td>C31 - C40</td> </tr> </tbody> </table>	Test items	Sample Number	T.1: Altitude simulation / 高度模拟	C1 - C20	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	C21 - C30	T.7 Overcharge / 过充电	--	T.8: Forced discharge / 强制放电	C31 - C40	<p><b>测试地点:</b>            广东储能检测技术有限公司            Guangdong ESTL Technology Co., Ltd.            广东省东莞市松山湖园区总部二路9号1栋1单元101、201-208 室、4单元201室和11号1栋2单元101室。            Room 101, 201-208, Unit 1, &amp; Room 201, Unit 4, Building 1, No.9/Room 101, Unit 2, Building 1, No.11, Zongbu 2nd Road, Songshanhu Park, Dongguan, Guangdong, China</p>
Test items	Sample Number														
T.1: Altitude simulation / 高度模拟	C1 - C20														
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	C21 - C30														
T.7 Overcharge / 过充电	--														
T.8: Forced discharge / 强制放电	C31 - C40														
<p>The sample's status is good.            样品状况良好。</p> <p>The conditions of the batteries of samples No. C1 to C10 are in undischarged states.            样品编号C1 - C10为未放电状态的电池。</p> <p>The conditions of the batteries of samples No. C11 to C20 are in fully discharged states.            样品编号C11 - C20为完全放电状态的电池。</p> <p>The conditions of the batteries of samples No. C21 to C25 are in undischarged states.            样品编号C21 - C25为未放电状态的电池。</p> <p>The conditions of the batteries of samples No. C26 to C30 are in fully discharged states.            样品编号C26 - C30为完全放电状态的电池。</p> <p>The conditions of the batteries of samples No. C31 to C40 are in fully discharged states.            样品编号C31- C40为完全放电状态的电池。</p>															

**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(%)=(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 is considered as "no mass loss".

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”。

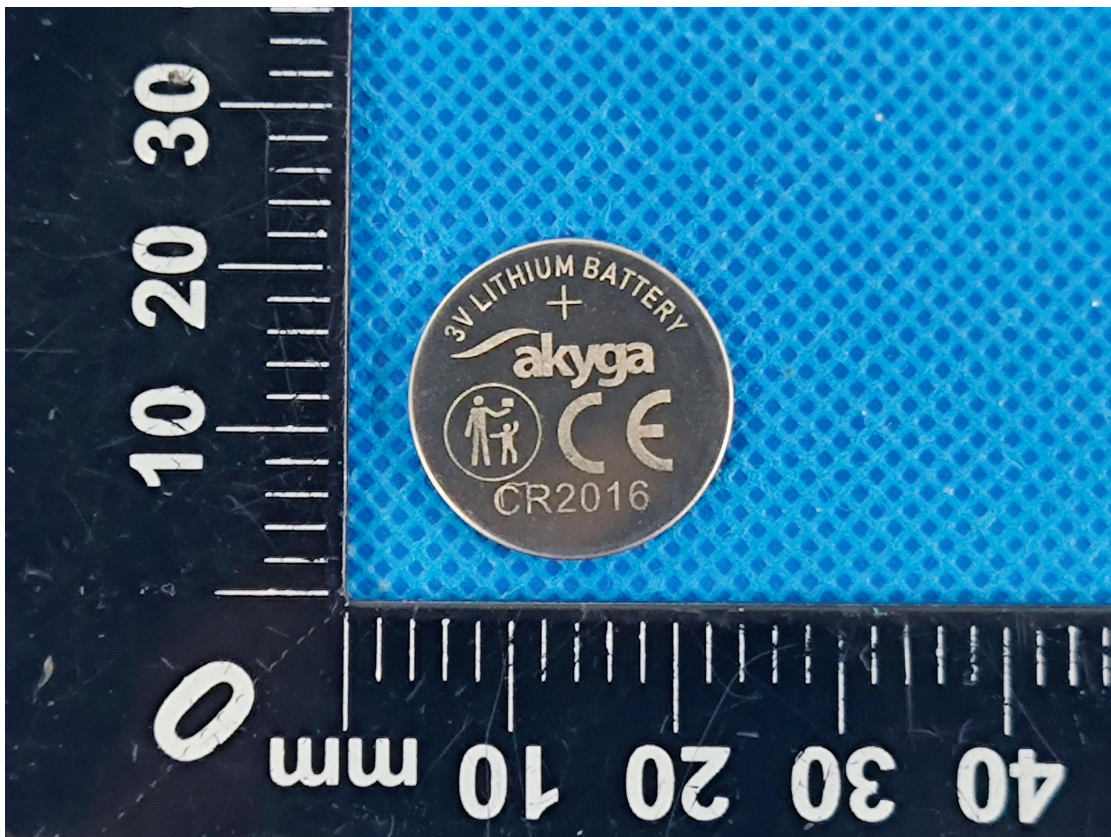
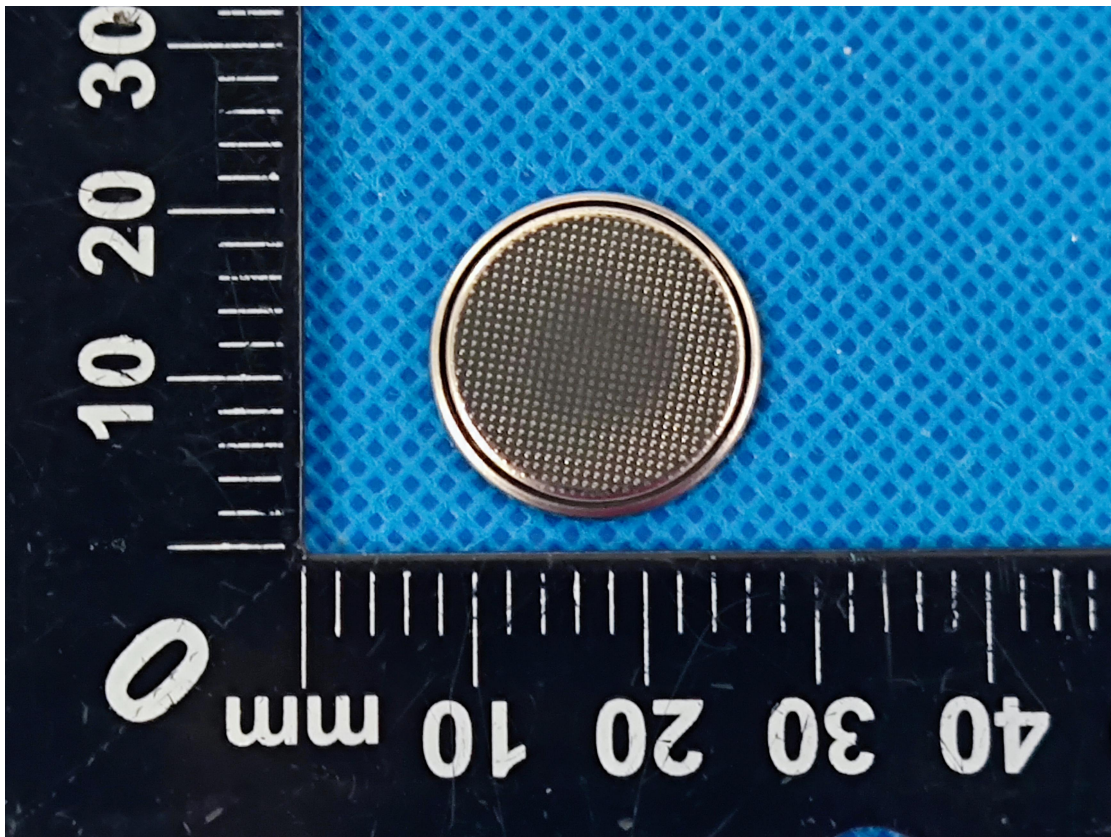
Mass M of cell or battery 电芯或电池的质量	Mass loss limit 质量损失限值
M<1g	0.5%
1g≤M≤75g	0.2%
M>75g	0.1%

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



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
	<b>Requirement / 标准要求:</b> 1. Cells and batteries Mass loss limit: ≤0.2%. 样品质量损失≤0.2%。 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°C的条件下 搁置24 小时。		P
	<b>Requirements / 标准要求:</b> 1. Cells and batteries Mass loss limit: ≤0.2%. 样品质量损失≤0.2%。 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
38.3.4.3	<b>Test 3: Vibration / 测试 3: 振动</b>		<b>P</b>
	1. Cells and batteries are firmly secured to the platform of the vibration machine.		P

	<p>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.</p> <p>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.</p> <p>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.</p> <p>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>Requirements / 标准要求:</p> <p>1. Cells and batteries Mass loss limit: <math>\leq 0.2\%</math>.</p> <p>样品质量损失<math>\leq 0.2\%</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.</p> <p>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.</p> <p>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.</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 see table 1.</p> <p>/测试数据见表1。</p>	P
38.3.4.4	<p><b>Test 4: Shock / 测试 4: 冲击</b></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.</p> <p>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>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.</p> <p>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="335 499 943 969"> <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}{\text{mass}^a}\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}{\text{mass}^a}\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) = $\sqrt{\left(\frac{100850}{\text{mass}^a}\right)}$ Whichever is smaller	6ms	Large batteries	50 gn or result of formula Acceleration (gn) = $\sqrt{\left(\frac{30000}{\text{mass}^a}\right)}$ Whichever is smaller	11ms		P
Battery	Minimum peak acceleration	Pulse duration										
Small batteries	150 gn or result of formula Acceleration (gn) = $\sqrt{\left(\frac{100850}{\text{mass}^a}\right)}$ Whichever is smaller	6ms										
Large batteries	50 gn or result of formula Acceleration (gn) = $\sqrt{\left(\frac{30000}{\text{mass}^a}\right)}$ 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: ≤0.2%. 样品质量损失≤0.2%。</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									
38.3.4.5	<p><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 temperature stabilized so that its external case temperature reaches 57±4°C. 保持试验环境温度稳定在57±4°C，以使电芯或电池样品外表温度达到57±4°C。</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 57±4°C, This short circuit condition is continued for at least one hour after the cell or battery external case</p>		P									

	<p>temperature has returned to <math>57\pm 4^{\circ}\text{C}</math>.</p> <p>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.</p> <p>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:</p> <p>During the test and within six hours after test, the cells or batteries.</p> <p>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>.</p> <p>外表温度不超过<math>170^{\circ}\text{C}</math>。</p> <p>2. No disassembly, no rupture and no fire.</p> <p>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></p> <p>外表温度不超过<math>170^{\circ}\text{C}</math></p> <p>No disassembly, no rupture and no fire.</p> <p>无解体、无破裂和无着火现象发生。</p> <p>The data see table 1.</p> <p>/测试数据见表1。</p>	P
38.3.4.6	<p><b>Test 6: Impact / Crush / 测试6: 撞击 / 挤压</b></p>		P
	<p>Impact (applicable to cylindrical cells not less than 18mm in diameter).</p> <p>撞击 (适用于直径不小于18 毫米的圆柱形电池)。</p>		N/A
	<p>1. This test sample cell or component cell is to be placed on a flat smooth surface.</p> <p>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 <math>61\pm 2.5\text{cm}</math> onto the sample.</p> <p>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<math>61\pm 2.5\text{cm}</math> 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 <math>\pm 0.1\text{mm}</math> diameter curved surface lying across the centre of the test sample. Each sample is to be subjected to only a single impact.</p> <p>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<math>15.8\pm 0.1</math> 毫米弯曲表面的纵轴垂直。每一个试样只经受一次撞击。</p>		N/A
	<p>Requirements / 标准要求:</p> <p>1. Cells external temperature not exceed <math>170^{\circ}\text{C}</math>.</p> <p>电芯或电池的最高表面温度应不超过<math>170^{\circ}\text{C}</math>。</p> <p>2. No disassembly and no fire within six hours of this test.</p> <p>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>		N/A
	<p>Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells less than 18mm in diameter).</p> <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)。</p>		P
<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</p>	<p>The applied force reaches <math>13\text{ kN} \pm 0.78\text{ kN}</math>.</p> <p>施加的力达到13 千牛</p>	P	

	<p>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>	±0.78 千牛。	
	<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 no rupture 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、无破裂和无着火现象发生。</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
38.3.4.7	<p><b>Test 7: Overcharge / 测试 7: 过充电</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>Requirements / 标准要求:</p>		N/A
			N/A

	<p>No disassembly and no fire within seven days of this test.</p> <p>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>		
<b>38.3.4.8</b>	<p><b>Test 8: Forced discharge / 测试 8: 强制放电</b></p>		<b>P</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.</p> <p>20±5℃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>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> <p>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>Requirements / 标准要求:</p> <p>No disassembly and no fire within seven days of this test.</p> <p>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.</p> <p>无解体和无着火现象。</p> <p>The data see table 2.</p> <p>/测试数据见表2。</p>	P

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(%)	Temp. (°C) 温度 (°C)
C1	1.666	3.318	0.060	99.97	0.060	99.07	0.000	100.00	0.000	100.00	84.6
C2	1.609	3.322	0.000	100.00	0.124	99.04	0.000	100.00	0.062	100.00	79.3
C3	1.642	3.309	0.061	100.00	0.061	99.03	0.000	100.00	0.000	100.00	90.2
C4	1.614	3.314	0.000	100.00	0.124	99.09	0.000	99.97	0.000	100.00	97.1
C5	1.620	3.326	0.000	99.97	0.123	99.07	0.062	100.00	0.000	100.00	88.3
C6	1.616	3.319	0.000	100.00	0.124	99.04	0.000	100.00	0.000	100.00	82.5
C7	1.627	3.303	0.000	100.00	0.061	99.06	0.000	100.00	0.000	100.00	86.1
C8	1.605	3.307	0.062	99.97	0.125	99.03	0.062	100.00	0.000	100.00	91.4
C9	1.643	3.311	0.000	100.00	0.061	99.09	0.000	100.00	0.000	100.00	93.6
C10	1.635	3.315	0.000	99.97	0.061	99.06	0.000	99.97	0.000	100.00	87.0

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(%)	Temp. (°C) 温度 (°C)
C11	1.628	--	0.061	--	0.061	--	0.000	--	0.000	--	74.5
C12	1.604	--	0.000	--	0.125	--	0.000	--	0.000	--	77.7
C13	1.611	--	0.000	--	0.062	--	0.000	--	0.000	--	80.2
C14	1.637	--	0.000	--	0.061	--	0.000	--	0.000	--	75.1
C15	1.640	--	0.000	--	0.061	--	0.000	--	0.000	--	73.2
C16	1.649	--	0.000	--	0.121	--	0.000	--	0.000	--	76.9
C17	1.622	--	0.062	--	0.062	--	0.000	--	0.000	--	78.0
C18	1.610	--	0.000	--	0.124	--	0.000	--	0.000	--	71.5
C19	1.654	--	0.000	--	0.121	--	0.000	--	0.000	--	75.2
C20	1.629	--	0.000	--	0.061	--	0.061	--	0.000	--	79.1



**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)
C21	3.315	23.6	--	--	C31	--
C22	3.309	23.4	--	--	C32	--
C23	3.323	23.5	--	--	C33	--
C24	3.320	23.7	--	--	C34	--
C25	3.314	23.5	--	--	C35	--
C26	--	23.7	--	--	C36	--
C27	--	23.8	--	--	C37	--
C28	--	23.6	--	--	C38	--
C29	--	23.9	--	--	C39	--
C30	--	23.7	--	--	C40	--

--- 报告结束 ---

--- End of Report ---

# 声明

## Declaration

1. 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.

2. 对检验报告若有异议，应于收到报告之日起十五日内向检验单位提出。

Objections to the test report must be submitted to ESTL 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 ESTL.

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。

ESTL'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.

8. 本报告无本公司“检测报告专用章”或“公章”无效。

This report is invalid without the company's "Special seal for Test Report" or "official seal".

9. 本报告未加盖CMA资质认定标志，不具有社会证明作用，本公司不承担因此引发的任何风险和法律责  
任。

This report is not stamped with CMA qualification certification mark, which does not have the function of social proof, and the Company does not assume any risks and legal liabilities caused by this.