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Global Testing Group

UN38.3 测试报告
UN38.3 Test Report

报告编号Report No.: S03A22120577U00201

样品名称： Sample Name:	锂离子电池系统 Li-ion Battery System
样品型号： Sample Model:	00347
委托单位： Applicant:	横店集团东磁股份有限公司 Hengdian Group DMEGC Magnetics CO., LTD.
签发日期： Issue Date:	2023-07-22

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.

样品描述 Sample Description			
样品名称 Sample Name	锂离子电池系统 Li-ion Battery System	样品型号 Sample Model	00347
测试实验室 Testing laboratory	广东储能检测技术有限公司 Guangdong ESTL Technology Co., Ltd.		
测试地址 Testing 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。 Room 101, 201-208, Unit 1, Building 1, No. 9 Headquarters 2nd Road, Songshan Lake Park, Dongguan, Guangdong, China.		
委托单位 Applicant	横店集团东磁股份有限公司 Hengdian Group DMEGC Magnetics CO., LTD.		
委托单位地址 Applicant Address	浙江省东阳市横店工业区 Hengdian Industrial Zone ,Dongyang City, Zhejiang Province, China.		
制造商 Manufacturer	横店集团东磁股份有限公司 Hengdian Group DMEGC Magnetics CO., LTD.		
制造商地址 Manufacturer Address	浙江省东阳市横店工业区 Hengdian Industrial Zone ,Dongyang City, Zhejiang Province, China.		
电芯生产单位 Factory of Cell	横店集团东磁股份有限公司 Hengdian Group DMEGC Magnetics CO., LTD.		
测试标准 Standard	联合国《试验和标准手册》第七版第38.3节 UNITED NATIONS the "Manual of Test and Criteria" (ST/SG/AC.10/11/Rev.7) Section 38.3.		
接样日期 Date of sample receipt	2022-12-13		
测试日期 Tested date	2022-12-14 to 2023-01-07		

检验结论 Test conclusion:

由横店集团东磁股份有限公司送检的锂离子电池系统，依据联合国《试验和标准手册》第七版第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。

The Li-ion Battery System submitted by Hengdian Group DMEGC Magnetics CO., LTD. are tested according to UNITED NATIONS the "Manual of Test and Criteria" (ST/SG/AC.10/11/Rev.7) Section 38.3. The test items are full items. The test results comply with the relevant requirements of the standard.

检测 Tested by　　审核 Reviewed by　　批准 Approved by

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.

样品信息 Sample Information			
标称电压 Nominal Voltage	24V	额定容量 Rated Capacity	10Ah
瓦时 Watt-hour	240Wh	商标 Trade mark	--
充电限制电压 Limited Charge Voltage	29.4V	放电终止电压 Discharge Cut-Off Voltage	21V
充电电流 Charge Current	1.74A	最大持续充电电流 Max. Continuous Charge Current	4.35A
放电电流 Discharge Current	8.7A	最大持续放电电流 Max. Continuous Discharge Current	10A
充电截止电流 End Charge Current	174mA	电池尺寸 Battery dimensions	184mm*151mm*62mm
电芯型号 Cell Model	NCR18650BD	电芯容量 Cell Rated Capacity	2900mAh
组合方式 Compound mode	7S3P		
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 / 温度试验	
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

The samples' state 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；

Testing location:

测试地点：

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。

Room 101, 201-208, Unit 1, Building 1, No. 9 Headquarters 2nd Road, Songshan Lake Park, Dongguan, Guangdong, China.

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:

Mass loss(%)=$(M_1-M_2)/M_1\times100$

为了量化质量损失，可用以下公式计算：质量损失(%)=$(M_1-M_2)/M_1\times100$

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".

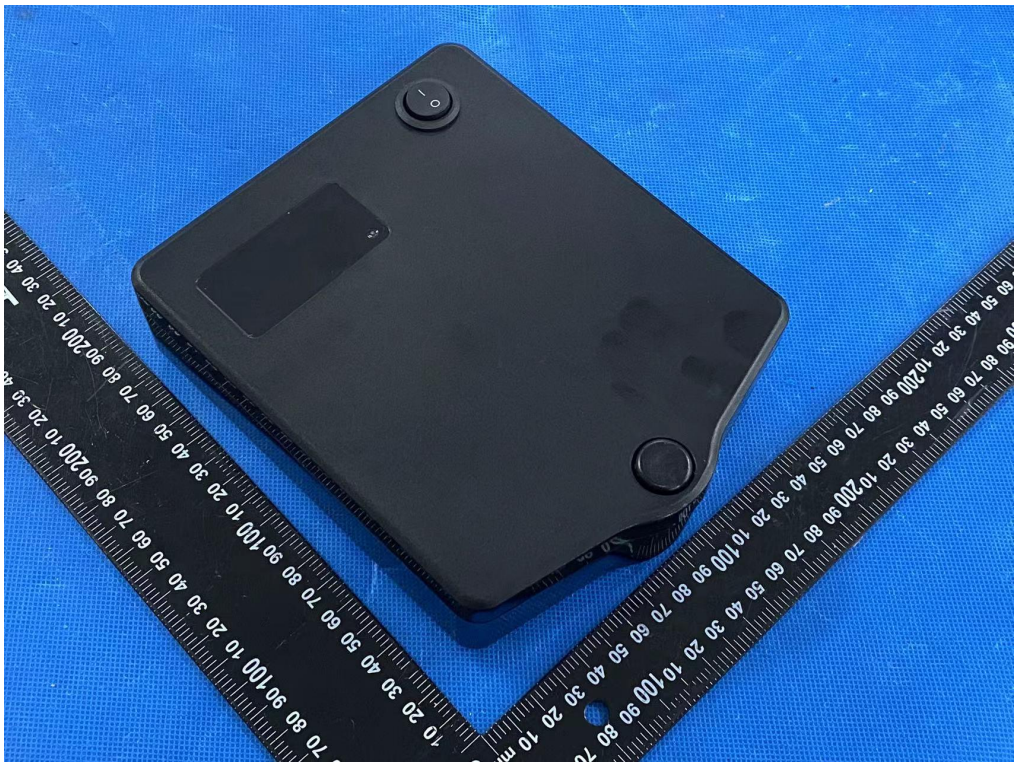
式中：M_1是试验前的质量，M_2是试验后的质量。如果质量损失不超过下表所列的数值，应视为“无质量损失”。

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

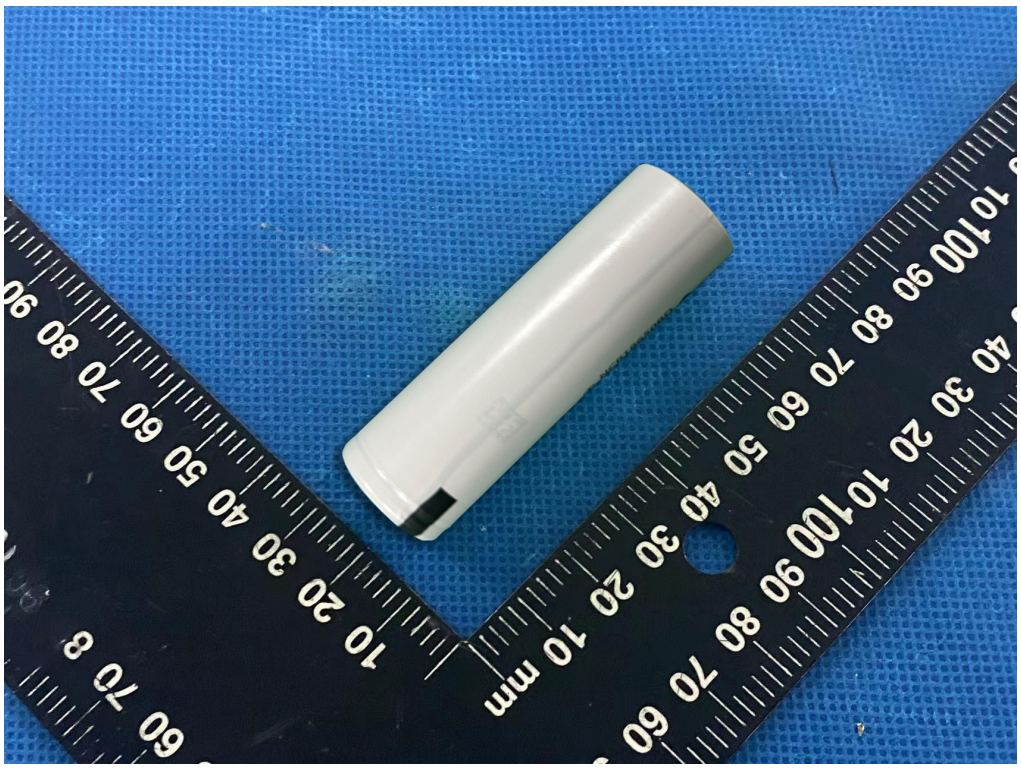
3. In test T.1 to T.4, batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test battery after testing is not less than 90% of its voltage immediately prior to this procedure.

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



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	**Test 1: Altitude simulation / 测试1：高度模拟**		**P**
	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℃). 试验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	**Test 2: Thermal test / 测试 2: 温度试验**		**P**
	Test cells and batteries are to be stored for 试验电芯和电池存储条件如下： 1. one temperature cycle: 72±2℃(6h) — -40±2℃(6h). 一次温度循环为72±2℃(6h) — -40±2℃(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℃). 循环结束后，所有试验电芯和电池在 20±5℃的条件下 搁置24 小时。		P
	Requirements / 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	**Test 3: Vibration / 测试 3: 振动**		**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。 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。 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。 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
	Requirements / 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芯和电池。 3. No leakage, no venting, no disassembly, no rupture and no fire. 样品应无漏液、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
38.3.4.4	**Test 4: Shock / 测试 4: 冲击**		**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. 试验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
	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
	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. 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

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

	Requirements / 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芯和电池。 3. No leakage, no venting, no disassembly, no rupture and no fire. 样品应无漏液、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
38.3.4.5	**Test 5: External Short Circuit / 测试5 外接短路**		**P**
	1. The cell or battery to be tested shall be temperature stabilized so that its external case temperature reaches 57±4℃. 保持试验环境温度稳定在57±4℃，以使电芯或电池样品外表温度达到57±4℃。 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℃, This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to 57±4℃. 将样品正负极用小于0.1Ω 的总电阻回路进行短路，样品的外表温度恢复到57±4℃之后保持短路状态1 小时以上。 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
	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。 1. External temperature not exceed 170℃. 外表温度不超过170℃。 2. No disassembly, no rupture and no fire. 样品应无解体、无破裂和无着火现象发生。	External temperature not exceed 170℃ 外表温度不超过170℃ No disassembly, no rupture and no fire. 无解体、无破裂和无着火现象发生。 The data see table 1. /测试数据见表1。	P
38.3.4.6	**Test 6: Impact / Crush / 测试6: 撞击 / 挤压**		**P**
	Impact (applicable to cylindrical cells not less than 18mm in diameter). 撞击（适用于直径不小于18 毫米的圆柱形电芯）。		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元件电芯放在一个平坦光滑的平面上。 2. A 15.8mm±0.1mm 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±0.1mm的钢棒横过电池中部放置后，将一质量为9.1kg±0.1kg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 15.8mm±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15.8mm±0.1mm弯曲表面的纵轴垂直。每一个试样只经受一次撞击。		P
	Requirements / 标准要求： 1. Test cells or component cells external temperature not exceed 170℃. 电芯或元件电芯的最高表面温度应不超过170℃。 2. No disassembly and no fire within six hours of this test. 试验结束后6 个小时之内，应无解体和无着火现象发生。	External temperature not exceed 170℃ 外表温度不超过170℃ No disassembly, no rupture and no fire. 无解体、无破裂和无着火现象发生。 The data see table 2. /测试数据见表2。	P
	Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells less than 18mm in diameter). 挤压（适用于棱柱形、袋装、硬币/纽扣电芯和直径小于18毫米的圆柱形电芯）。		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. 将电芯或元件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) The applied force reaches 13 kN ± 0.78 kN. 施加的力达到13 千牛±0.78 千牛。 (b) The voltage of the cell drops by at least 100 mV. 电芯的电压下降至少100 毫伏。 (c) The cell is deformed by 50% or more of its original thickness. 电芯变形达原始厚度的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. 棱柱形或袋装电芯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。圆柱形电芯应从与纵轴垂直的方向施压。		N/A
	Requirements / 标准要求： 1. Test cells or component cells external temperature not exceed 170℃. 电芯或元件电芯的最高表面温度应不超过170℃。 2. No disassembly and no fire within six hours of this test. 试验结束后6 个小时之内，应无解体和无着火现象发生。		N/A
38.3.4.7	**Test 7: Overcharge / 测试 7: 过充电**		**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: 本测试最小电压为: 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℃, The duration of the test shall be 24 hours. 20±5℃的环境温度下，试验持续24 小时。	The voltage of the test is 35.28V, and the current is 5.7A. / 测试电压为35.28V, 电流为5.7A.	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。	No disassembly and no fire 无解体和无着火现象发生。 The data see table 2. /测试数据见表2。	P
38.3.4.8	**Test 8: Forced discharge / 测试 8: 强制放电**		**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℃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
	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
	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。	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

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. (℃) 温度 (℃)
B1	1291.8	29.25	0.000	100.00	0.000	99.08	0.000	99.90	0.000	100.00	56.8
B2	1293.2	29.26	0.000	100.00	0.008	99.01	0.000	99.93	0.000	100.00	56.4
B3	1290.5	29.26	0.000	99.97	0.000	99.11	0.000	99.83	0.000	100.00	56.6
B4	1291.8	29.26	0.000	100.00	0.008	99.08	0.008	99.90	0.000	100.00	56.7
B5	1294.6	29.27	0.000	99.97	0.000	99.04	0.000	99.86	0.000	100.00	56.4
B6	1289.7	29.25	0.000	100.00	0.008	99.11	0.008	99.90	0.000	100.00	56.2
B7	1290.6	29.27	0.000	99.97	0.008	99.04	0.000	99.93	0.000	100.00	56.5
B8	1292.9	29.26	0.000	99.97	0.008	99.04	0.008	99.90	0.000	100.00	56.3

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. (℃) / 温度 (℃)	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	3.682	102.6	B9	29.26	C11	3.384
C2	3.679	92.7	B10	29.27	C12	3.365
C3	3.676	112.4	B11	29.26	C13	3.372
C4	3.681	93.8	B12	29.26	C14	3.386
C5	3.684	99.1	B13	29.27	C15	3.379
C6	3.681	95.8	B14	29.25	C16	3.375
C7	3.677	90.7	B15	29.26	C17	3.380
C8	3.685	89.6	B16	29.26	C18	3.374
C9	3.683	104.2	--	--	C19	3.368
C10	3.680	113.8	--	--	C20	3.381
--	--	--	--	--	C21	3.377
--	--	--	--	--	C22	3.385
--	--	--	--	--	C23	3.369
--	--	--	--	--	C24	3.376
--	--	--	--	--	C25	3.378
--	--	--	--	--	C26	3.384
--	--	--	--	--	C27	3.377
--	--	--	--	--	C28	3.385
--	--	--	--	--	C29	3.369
--	--	--	--	--	C30	3.372

--- 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天内向检验单位提出。

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。

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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。

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