中国认可
国际互认
检测
TESTING
CNAS L4065

2016191719D

Report No.:
报告编号：MED20160805U01

# 检 验 报 告

## TEST REPORT

NAME OF SAMPLE: 36V Lithium Ion Battery Pack
产品名称： 36V 鋰電池組

CLIENT: Melton International L.L.C
委托单位： 美爾頓車業（東莞）有限公司

CLASSIFICATION OF TEST: Commission test
检验类别： 委托检测

广州邦禾检测技术有限公司

**Guangzhou MCM Certification and Testing Co., Ltd**

| Applicant information<br>申请资料 | |
|---|---|
| Name of samples<br>样品名称 | 36V Lithium Ion Battery Pack<br>36V 鋰電池組 |
| Type/ Model<br>型号规格 | BL07 36V 11Ah 396Wh |
| Trade mark<br>商标 | TranzX |
| Commission by<br>委托单位 | Melton International L.L.C<br>美爾頓車業（東莞）有限公司 |
| Commissioner address<br>委托单位地址 | New City Science Ind Liaobu Town Dong Guan City China<br>廣東省東莞市寮步鎮新城科技工業園 |
| Manufacturer<br>制造商 | Melton International L.L.C<br>美爾頓車業（東莞）有限公司 |
| Manufacturer address<br>制造商地址 | New City Science Ind Liaobu Town Dong Guan City China<br>廣東省東莞市寮步鎮新城科技工業園 |
| Factory<br>生产厂 | Melton International L.L.C<br>美爾頓車業（東莞）有限公司 |
| Factory address<br>生产厂地址 | New City Science Ind Liaobu Town Dong Guan City China<br>廣東省東莞市寮步鎮新城科技工業園 |
| Appearance<br>样品外观颜色 | Black<br>黑色 |
| Sample status<br>样品状态 | Good<br>完好 |
| Package of goods<br>样品外包装 | — |
| Quantity of sample<br>样品数量 | 41pcs |
| Sample identification<br>样品标识序号 | b1#～b16# ; c1#～c25# |
| Reference standard<br>参考标准 | MH/T1052-2013《Tests for lithium batteries transported by air》<br>MH/T1052-2013《航空运输锂电池测试规范》 |
| Receiving date<br>接样日期 | 2016.08.05 |
| Completing date<br>完成日期 | 2016.08.22 |

# Test Conclusion
# 测试结论

| No.序号 | Name of test 测试项目名称 | Testing standard 测试标准 | Test result 测试结果 | Conclusion 本项结论 | Remarks 备注 |
|---|---|---|---|---|---|
| 1 | Altitude simulation 高度模拟 | UN Manual of Tests and Criteria ST/SG/AC.10/11/Rev.5/amend.2, 38.3. 联合国《关于危险货物运输的建议书试验和标准手册》ST/SG/AC. 10/11/Rev. 5/amend. 2, 38. 3. | See Appendix 1 见附表 1 | Passed 合格 | / |
| 2 | Thermal test 温度试验 | | See Appendix 2 见附表 2 | Passed 合格 | / |
| 3 | Vibration 振动 | | See Appendix 3 见附表 3 | Passed 合格 | / |
| 4 | Shock 冲击 | | See Appendix 4 见附表 4 | Passed 合格 | / |
| 5 | External Short-circuit 外部短路 | | See Appendix 5 见附表 5 | Passed 合格 | / |
| 6 | Impact 撞击 | | See Appendix 6 见附表 6 | Passed 合格 | / |
| | Crush 挤压 | | / | / | N/A 不适用 |
| 7 | Overcharge 过度充电 | | See Appendix 7 见附表 7 | Passed 合格 | / |
| 8 | Forced discharge 强制放电 | | See Appendix 8 见附表 8 | Passed 合格 | / |

**Conclusion/结论:**

The 36V Lithium Ion Battery Packs submitted by Melton International L.L.C had passed the test items of UNITED NATIONS "Recommendations on the Transport of Dangerous Goods, Manual of Test and Criteria ST/SG/AC.10/11/Rev.5/amend.2, 38.3.

由美爾頓車業（東莞）有限公司送检的 36V 鋰電池組符合联合国《关于危险品货物运输的建议书 试验和标准手册》ST/SG/AC. 10/11/Rev. 5/amend. 2，38. 3 的要求。

Seal/检验专用章:

Date of issue:/日期: Aug. 23, 2016

**WARM PROMPT:** This test report can be used only for areas excluding Shanghai (not including the use of applying for the certification for safe transport of Shanghai Research Institute of Chemical Industry).

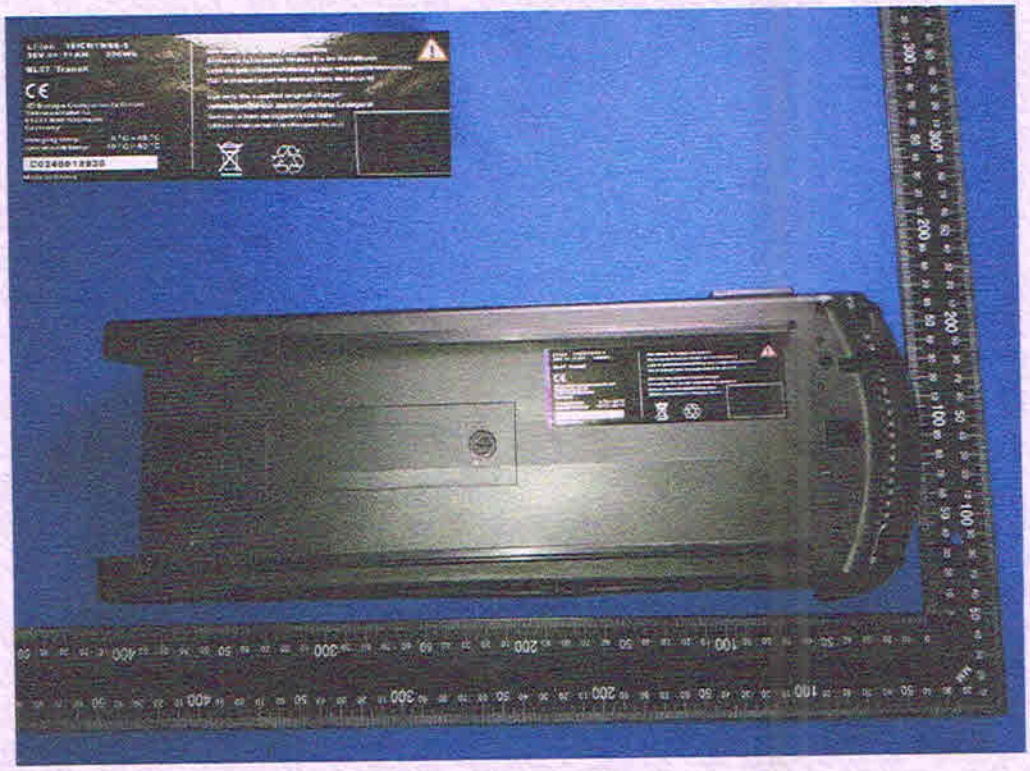
**温馨提示:** 此份报告适用于"非上海地区"（不适用于申请上海化工鉴定书）。

Approver: Liang Hongcheng　　Checker: Hu Pingfei　　Tester: Huang Yining

批准: Liang Hongcheng　　审核: Hu Pingfei　　测试: Huang Yining

# Photos of samples and markings
# 样品及标识照片

**Battery（BL07 36V 11Ah 396Wh）**



# Appendix 1
# 附表 1

| Test Items<br>测试项目 | Altitude simulation<br>高度模拟 |
|---|---|
| 1,1 | **Test procedure**<br>**测试步骤** |
| | 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℃).<br>试验电池芯和电池在环境温度(20±5℃)下，储存在小于等于 11,6kPa 的压力下至少六小时。 |
| 1,2 | **Sample status**<br>**样品状态** |
| | b1#~b4#, at first cycle in fully charged states。<br>b1#～b4#，在第一个循环完全充电的电池。 |
| | b5#~b8#, after 50 cycles ending in fully charged states。<br>b5#～b8#，在第五十个循环完全充电的电池。 |
| 1,3 | **Result**<br>**测试结果** |

| Sample No.<br>样品编号 | Before 测试前 | | After 测试后 | | Mass loss<br>质量损失<br>(%) | Residual OCV<br>剩余电压<br>(%) | Test result<br>测试结果 |
|---|---|---|---|---|---|---|---|
| | Mass<br>样品质量<br>(g) | Voltage<br>开路电压<br>(V) | Mass<br>样品质量<br>(g) | Voltage<br>开路电压<br>(V) | | | |
| b1# | 3105,0 | 41,8 | 3105,0 | 41,7 | 0,000 | 99,76 | O |
| b2# | 3100,0 | 41,7 | 3100,0 | 41,7 | 0,000 | 100,00 | O |
| b3# | 3102,0 | 41,7 | 3102,0 | 41,7 | 0,000 | 100,00 | O |
| b4# | 3101,8 | 41,7 | 3101,8 | 41,7 | 0,000 | 100,00 | O |
| b5# | 3097,0 | 41,7 | 3097,0 | 41,7 | 0,000 | 100,00 | O |
| b6# | 3100,0 | 41,8 | 3100,0 | 41,7 | 0,000 | 99,76 | O |
| b7# | 3098,0 | 41,8 | 3098,0 | 41,7 | 0,000 | 99,76 | O |
| b8# | 3105,2 | 41,7 | 3105,2 | 41,7 | 0,000 | 100,00 | O |

Note: **L**-Leakage, **V**-Venting, **D** -Disassembly, **R** -Rupture, **F**-Fire, **O**-No leakage, no venting, no disassembly, no rupture, no fire.

注：L- 泄漏；V- 排气；D- 解体；R- 破裂；F - 起火；O- 无泄漏、无排气、无解体、无破裂、无起火。

# Appendix 2
# 附表 2

| Test Items<br>测试项目 | Thermal test<br>温度试验 |
|---|---|
| 1,1 | **Test procedure**<br>**测试步骤** |
| | Test cells and batteries are to be stored for at least six hours at a test temperature equal to 72±2℃, followed by storage for at least six hours at a test temperature equal to -40±2℃, The maximum time interval between test temperature extremes in 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 ambient temperature (20±5℃).<br>将电芯和电池在温度为 72±2℃的条件下贮存不少于 6 个小时，然后，在温度-40±2℃条件下贮存不少于 6 个小时，两个温度间的间隔最长为 30min, 重复操作上述步骤直到 10 次，然后，将其在环境温度为 20±5℃的条件下放置 24 个小时。 |
| 1,2 | **Sample status**<br>**样品状态** |
| | **b1#~b4#**, at first cycle in fully charged states。<br>b1#～b4#在第一个循环完全充电的电池。 |
| | **b5#~b8#**, after 50 cycles ending in fully charged states。<br>b5#～b8#，在第五十个循环完全充电的电池。 |
| 1,3 | **Result**<br>**测试结果** |

| Sample No.<br>样品编号 | Before 测试前 | | After 测试后 | | Mass loss<br>质量损失<br>(%) | Residual OCV<br>剩余电压<br>(%) | Test result<br>测试结果 |
|---|---|---|---|---|---|---|---|
| | Mass<br>样品质量<br>(g) | Voltage<br>开路电压<br>(V) | Mass<br>样品质量<br>(g) | Voltage<br>开路电压<br>(V) | | | |
| b1# | 3105,0 | 41,7 | 3104,4 | 41,1 | 0,019 | 98,56 | O |
| b2# | 3100,0 | 41,7 | 3100,2 | 41,2 | 0,000 | 98,80 | O |
| b3# | 3102,0 | 41,7 | 3101,6 | 41,1 | 0,013 | 98,56 | O |
| b4# | 3101,8 | 41,7 | 3101,4 | 41,2 | 0,013 | 98,80 | O |
| b5# | 3097,0 | 41,7 | 3096,8 | 41,2 | 0,006 | 98,80 | O |
| b6# | 3100,0 | 41,7 | 3100,0 | 41,1 | 0,000 | 98,56 | O |
| b7# | 3098,0 | 41,7 | 3097,4 | 41,0 | 0,019 | 98,32 | O |
| b8# | 3105,2 | 41,7 | 3104,8 | 41,2 | 0,013 | 98,80 | O |

Note: **L**-Leakage, **V**-Venting, **D** -Disassembly, **R** -Rupture, **F**-Fire, **O**-No leakage, no venting, no disassembly, no rupture, no fire.

注：L- 泄漏；V- 排气；D- 解体；R- 破裂；F - 起火；O- 无泄漏、无排气、无解体、无破裂、无起火。

# Appendix 3
# 附表 3

| Test Items<br>测试项目 | Vibration<br>振动 |
|---|---|
| 1,1 | **Test procedure**<br>**测试步骤** |
| | 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 wave form 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 position of the cell.<br>将电芯和电池牢固地安装在振动台的台面上，然后开始振动。振动以正弦波形式，以 7Hz 增加至 200Hz，然后再减少回到 7Hz 为一个循环，一个循环持续 15 分钟的对数扫频。每个电芯和电池从三个互相垂直的方向上循环 12 次，3 个小时。 |
| 1,2 | **Sample status**<br>**样品状态** |
| | b1#~b4#, at first cycle in fully charged states。<br>b1#～b4#，在第一个循环完全充电的电池。 |
| | b5#~b8#, after 50 cycles ending in fully charged states。<br>b5#～b8#，在第五十个循环完全充电的电池。 |
| 1,3 | **Result**<br>**测试结果** |

| Sample No.<br>样品编号 | Before 测试前 | | After 测试后 | | Mass loss<br>质量损失<br>(%) | Residual OCV<br>剩余电压<br>(%) | Test result<br>测试结果 |
|---|---|---|---|---|---|---|---|
| | Mass<br>样品质量<br>(g) | Voltage<br>开路电压<br>(V) | Mass<br>样品质量<br>(g) | Voltage<br>开路电压<br>(V) | | | |
| b1# | 3104,4 | 41,1 | 3104,4 | 41,1 | 0,000 | 100,00 | O |
| b2# | 3100,2 | 41,2 | 3100,4 | 41,1 | 0,000 | 99,76 | O |
| b3# | 3101,6 | 41,1 | 3101,8 | 41,1 | 0,000 | 100,00 | O |
| b4# | 3101,4 | 41,2 | 3101,4 | 41,2 | 0,000 | 100,00 | O |
| b5# | 3096,8 | 41,2 | 3096,8 | 41,2 | 0,000 | 100,00 | O |
| b6# | 3100,0 | 41,1 | 3100,2 | 41,0 | 0,000 | 99,76 | O |
| b7# | 3097,4 | 41,0 | 3097,4 | 41,0 | 0,000 | 100,00 | O |
| b8# | 3104,8 | 41,2 | 3104,8 | 41,2 | 0,000 | 100,00 | O |

Note: **L**-Leakage, **V**-Venting, **D** -Disassembly, **R** -Rupture, **F**-Fire, **O**-No leakage, no venting, no disassembly, no rupture, no fire.

注：L- 泄漏；V- 排气；D- 解体；R- 破裂；F - 起火；O- 无泄漏、无排气、无解体、无破裂、无起火。

# Appendix 4
# 附表 4

| Test Items 测试项目 | Shock 冲击 |
|---|---|
| 1,1 | **Test procedure** **测试步骤** |
| | 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 battery, Each cell or battery shall be subjected to a half-sine shock of peak acceleration of 150gn and pulse duration of 6 milliseconds, 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.<br>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。对每个电芯或电池以峰值为 150gn 的半正弦的加速度撞击，脉冲持续 6 毫秒。按三个互相垂直轴向分别对其正负极各碰撞三次，每个电芯或电池碰撞总次数为 18 次。 |
| 1,2 | **Sample status** **样品状态** |
| | b1#~b4#, at first cycle in fully charged states。<br>b1#～b4#在第一个循环完全充电的电池。 |
| | b5#~b8#, after 50 cycles ending in fully charged states。<br>b5#～b8#，在第五十个循环完全充电的电池。 |
| 1,3 | **Result** **测试结果** |

| Sample No. 样品编号 | Before 测试前 | | After 测试后 | | Mass loss 质量损失 (%) | Residual OCV 剩余电压 (%) | Test result 测试结果 |
|---|---|---|---|---|---|---|---|
| | Mass 样品质量 (g) | Voltage 开路电压 (V) | Mass 样品质量 (g) | Voltage 开路电压 (V) | | | |
| b1# | 3104,4 | 41,1 | 3104,4 | 41,1 | 0,000 | 100,00 | O |
| b2# | 3100,4 | 41,1 | 3100,4 | 41,1 | 0,000 | 100,00 | O |
| b3# | 3101,8 | 41,1 | 3101,8 | 41,1 | 0,000 | 100,00 | O |
| b4# | 3101,4 | 41,2 | 3101,4 | 41,2 | 0,000 | 100,00 | O |
| b5# | 3096,8 | 41,2 | 3096,8 | 41,2 | 0,000 | 100,00 | O |
| b6# | 3100,2 | 41,0 | 3100,2 | 41,0 | 0,000 | 100,00 | O |
| b7# | 3097,4 | 41,0 | 3097,4 | 41,0 | 0,000 | 100,00 | O |
| b8# | 3104,8 | 41,2 | 3104,8 | 41,2 | 0,000 | 100,00 | O |

Note: **L**-Leakage, **V**-Venting, **D**-Disassembly, **R**-Rupture, **F**-Fire, **O**-No leakage, no venting, no disassembly, no rupture, no fire.

注：L- 泄漏；V- 排气；D- 解体；R- 破裂；F - 起火；O- 无泄漏、无排气、无解体、无破裂、无起火。

# Appendix 5
# 附表 5

| Test Items<br>测试项目 | External short circuit<br>外部短路 | | |
|---|---|---|---|
| 1,1 | **Test procedure**<br>**测试步骤** | | |
| | The cell or battery to be tested shall be temperature stabilized so that its external case temperature reaches 55±2℃ and then the cell or battery shall be subjected to a short circuit condition with a total external resistance of less than 0,1ohm at 55±2℃, This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to 55±2℃, the cell or battery must be observed for a further six hour for the test to be concluded.<br>保持试验环境温度稳定在 55±2℃，以使电芯或电池样品外表温度达到 55±2℃，然后，在此温度下，将其正负极用小于 0,1 欧姆的线路短接，待电芯或电池的外表温度恢复到 55±2℃之后再持续 1 小时以上，对电芯或电池必须进一步观察 6 个小时才能下结论。 | | |
| 1,2 | **Sample status**<br>**样品状态** | | |
| | b1#~b4#, at first cycle in fully charged states。<br>b1#～b4#在第一个循环完全充电的电池。 | | |
| | b5#~b8#, after 50 cycles ending in fully charged states。<br>b5#～b8#，在第五十个循环完全充电的电池。 | | |
| 1,3 | **Result**<br>**测试结果** | | |
| Sample No.<br>样品编号 | Max. External Temperature<br>样品表面最高温度<br>(℃) | Test result<br>测试结果 | Remark<br>备注 |
| b1# | 55,9 | O | / |
| b2# | 56,8 | O | / |
| b3# | 56,4 | O | / |
| b4# | 57,0 | O | / |
| b5# | 55,7 | O | / |
| b6# | 56,2 | O | / |
| b7# | 55,9 | O | / |
| b8# | 56,7 | O | / |

Note: **D** -Disassembly, **R** -Rupture, **F**-Fire, **O**- no disassembly, no rupture, no fire.

注： D- 解体；R- 破裂；F - 起火；O-无解体、无破裂、无起火。

# Appendix 6
# 附表 6

| Test Items<br>测试项目 | Impact<br>撞击 | | |
|---|---|---|---|
| 1,1 | **Test procedure**<br>**测试步骤** | | |
| | The sample cell or component cell is to be placed on a flat smooth surface. A 15,8 mm ± 0,1mm diameter, at least 6 cm long, or the longest dimension of the cell, whichever is greater, Type 316 stainless steel bar is to be placed across the centre of the sample. A 9,1 kg ± 0,1 kg mass is to be dropped from a height of 61 ± 2,5 cm at the intersection ofthe bar and sample in a controlled manner using a near rictionless, 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 15,8mm ± 0,1mm diameter curved surface lying across the centre of the test sample. Each sample is to be subjected to only a single impact.<br>样品电芯或组成电芯被放置平坦表面上。一根直径为 15,8± 0,1 毫米，长度至少 6 厘米（或该电芯的最大尺寸，以较大者为准）的 316 型不锈钢棒横放在样品的中心。一个重达 9,1 ± 0,1 千克的铁锤从 61±2,5 厘米高处以几乎无摩擦和零拉力的姿态沿垂直轨道或通道跌落至不锈钢棒与样品的交结点上。用以引导跌落的垂直轨道或通道应与水平支撑面形 90°。 被撞击的圆柱形电池的纵轴应与不锈钢棒平面表面平行，并与横放在样品中心直径为 15,8 毫米弯曲表面的纵轴垂直。每只样品只经受一次撞击。 | | |
| 1,2 | **Sample status**<br>**样品状态** | | |
| | C1#~C5#, at first cycle at 50% of the design rated capacity;<br>C1#～C5#，在第一个循环 50%的额定容量； | | |
| | **Result**<br>**测试结果** | | |
| Sample No.<br>样品编号 | Max. External Temperature<br>样品表面最高温度<br>(℃) | Test result<br>测试结果 | Remark<br>备注 |
| C1# | 23,6 | O | / |
| C2# | 22,9 | O | / |
| C3# | 23,3 | O | / |
| C4# | 23,6 | O | / |
| C5# | 23,0 | O | / |

Note: **D** -Disassembly, **F**-Fire, **O**- no disassembly, no fire.

注：D- 解体；F - 起火；O-无解体、无起火。

# Appendix 7
# 附表 7

| Test Items<br>测试项目 | Overcharge<br>过度充电 | | |
|---|---|---|---|
| 1,1 | **Test procedure**<br>**测试步骤** | | |
| | 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 or 22V<br>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该是两倍的厂家推荐最大充电电压或者是 22V | / | |
| | When the manufacturer's recommended charge voltage is more than 18V, the minimum voltage of the test shall be 1,2 times maximum charge voltage<br>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该为 1, 2 倍的厂家推荐最大充电电压 | The manufacturer's recommended maximum charge voltage is 42,0V. The manufacturer's recommended maximum continuous charge current is 5,0A. The voltage of the test is 50,4V. And the Current is 10,0A.<br>厂家推荐最大充电电压为 42, 0V，厂家推荐最大充电电流为 5, 0A. 测试的电压为 50, 4V，电流为 10, 0A。 | |
| 1,2 | **Sample status**<br>**样品状态** | | |
| | b9#~b12#, at first cycle in fully charged states.<br>b9#～b12#，在第一个循环完全充电的电池。 | | |
| | b13#~b16#, after 50 cycles ending in fully charged states.<br>b13#～b16#, 在第五十个循环完全充电的电池。 | | |
| 1,3 | **Result**<br>**测试结果** | | |
| Sample No.<br>样品编号 | Voltage Before test (V)<br>测试前开路电压(V) | Test result<br>测试结果 | Remark<br>备注 |
| b9# | 41,7 | O | / |
| b10# | 41,7 | O | / |
| b11# | 41,8 | O | / |
| b12# | 41,7 | O | / |
| b13# | 41,7 | O | / |
| b14# | 41,7 | O | / |
| b15# | 41,7 | O | / |
| b16# | 41,8 | O | / |

Note: **D** -Disassembly, **F**-Fire, **O**- no disassembly, no fire.

注： D- 解体；F － 起火；O-无解体、无起火。

# Appendix 8
# 附表 8

| Test Items<br>测试项目 | Forced discharge<br>强制放电 |
|---|---|
| 1,1 | **Test procedure**<br>**测试步骤** |
| | 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 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).<br>在 20±5℃的环境温度下，将单个电芯连接在 12V 的直流电源及所串联的适当大小电阻负荷回路上进行强制放电，此直流电源提供每个电芯初始电流为制造厂指定的最大放电电流，放电时间为额定容量除以初始电流。 |
| 1,2 | **Sample status**<br>**样品状态** |
| | C6#~C15#, at first cycle in fully discharged states;<br>C6#～C15#，在第一个循环完全放电的电芯； |
| | C16#~C25#, after 50 cycles ending in fully discharged states;<br>C16#～C25#，在第五十个循环完全放电的电芯； |
| 1,3 | **Result**<br>**测试结果** |

| Sample No.<br>样品编号 | Voltage Before test<br>测试前开路电压<br>(V) | Test result<br>测试结果 | Sample No.<br>样品编号 | Voltage Before test<br>测试前开路电压<br>(V) | Test result<br>测试结果 |
|---|---|---|---|---|---|
| C6# | 3,298 | O | C16# | 3,268 | O |
| C7# | 3,233 | O | C17# | 3,262 | O |
| C8# | 3,236 | O | C18# | 3,268 | O |
| C9# | 3,262 | O | C19# | 3,266 | O |
| C10# | 3,262 | O | C20# | 3,262 | O |
| C11# | 3,263 | O | C21# | 3,238 | O |
| C12# | 3,228 | O | C22# | 3,233 | O |
| C13# | 3,236 | O | C23# | 3,236 | O |
| C14# | 3,262 | O | C24# | 3,238 | O |
| C15# | 3,263 | O | C25# | 3,268 | O |

Note: **D** -Disassembly, **F**-Fire, **O**- no disassembly, no fire.

注： D- 解体；F - 起火；O-无解体、无起火。

# 注 意 事 项

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