检 测
CNAS L0095

INSPECTION
CNAS IB 0011

2007002171A

No.: RZUN2009-0182

检 验 报 告
TEST REPORT

NAME OF SAMPLE: Lithium-ion rechargeable battery
产品名称： 锂离子可充电电池组

CLIENT: DONG GUAN LARGE ELECTRONICS CO., LTD.
委托单位： 东莞市钜大电子有限公司

CLASSIFICATION OF TEST: Commission Test
检验类别： 委托测试

广 州 威 凯 检 测 技 术 研 究 所

Guangzhou Vkan Certification and Testing Institute
(CVC - former GTIHEA)

检 验 报 告
TEST REPORT

Commissioned by: DONG GUAN LARGE ELECTRONICS CO., LTD. 委托单位: 东莞市钜大电子有限公司	Name of samples: Lithium-ion rechargeable battery 样品名称:锂离子可充电电池
Commissioner address: HUANGJIN 2-WAY, BAIMA INDUSTRIAL ZONE, NAN CHENG DISTRICT, DONGGUAN CITY, GUANDONG, P.R. CHINA 委托单位地址: 广东省东莞市南城区白马工业区黄金二路	Type/Model: 型号规格: 103450 7,4V 1600mAh 11,84Wh
Manufacturer: DONG GUAN LARGE ELECTRONICS CO., LTD. 制造商: 东莞市钜大电子有限公司	Appearance: Blue 样品外观颜色: 蓝色
Manufacturer address: HUANGJIN 2-WAY, BAIMA INDUSTRIAL ZONE, NAN CHENG DISTRICT, DONGGUAN CITY, GUANDONG, P.R. CHINA 制造商地址: 广东省东莞市南城区白马工业区黄金二路	Trade mark: LARGE 商标:
Factory: DONG GUAN LARGE ELECTRONICS CO., LTD. 生产厂: 东莞市钜大电子有限公司	Package of goods: Polyethylene package & corrugated carton 样品外包装：聚乙烯袋和纸箱
Factory address: HUANGJIN 2-WAY, BAIMA INDUSTRIAL ZONE, NAN CHENG DISTRICT, DONGGUAN CITY, GUANDONG, P.R. CHINA 生产厂地址: 广东省东莞市南城区白马工业区黄金二路	Sample status: The sample's status is good. 样品状态: 样品状况良好。
Classification of test: Commission Test 检验类别: 委托测试	Quantity of sample: 1 Package; 28 Batteries, 20 Cells 样品数量: 1 个包装箱，28 个电池，20 个电芯
Tested according to: 测试标准:ST/SG/AC.10/11/Rev.4+A2:2007 Section 38.3	Sample identification: p1#, b1# -b28#, c1# -c20# 样品标识序号: p1# , b1# -b28#, c1# -c20#
Test item: 7 items 测试项目： 7 项	Means of receiving: Submitted by manufacturer 接样方式：制造商送样
Receiving date: 2009-07-20 接样日期：2009 年 07 月 20 日	Completing date: 2009-08-19 鉴定完成日期：2009 年 08 月 19 日

Test conclusion:
检验结论：

The Lithium-ion rechargeable batteries by DONG GUAN LARGE ELECTRONICS CO., LTD. are tested accordin to Section 38.3 of Amendments to the Fourth Revised Edition of the Recommendations on the Transport of Dangerous Goods, Manual of Test and Criteria (ST/SG/AC.10/11/Rev.4+A2:2007 Section 38.3).

检验结论: 由东莞市钜大电子有限公司送检的锂离子可充电电池，依据《关于危险品货物运输的建议书》第四修订版第 38.3 节进行检测。

Test result: Pass
检验结果： 通过

Seal of CVC:
CVC 公章：
Date of issue:
签发日期：2009.08.20

Approved by: 批准：

Reviewed by: Huang Kun 审核：

Tested by: Zhang Siyao 检测：

Description and illustration of the sample:
样品说明及描述：

The samples' status is good.
样品状况良好。

The rating of Lithium-ion rechargeable batteries are 103450, 7,4V, 1600mAh and 11,84Wh.
103050 电池额定值为 7,4V、1600mAh、11,84Wh。

The size of Battery is 70×51×10,50(mm).
电池尺寸是 70×51×10.50(mm)。

The conditions of the batteries of sample No. b1# to b4# are at first cycle, in fully charged state.
样品编号 b1#-b4#的状态为第一个交替充电放电周期完全充电状态的电池。
The conditions of the batteries of sample No. b5# to b8# are at first cycle, in fully discharged state.
样品编号 b5# -b8#的状态为第一个交替充电放电周期完全放电状态的电池。
The conditions of the batteries of sample No. b9# to b12# are after fifty cycles ending in fully charged state.
样品编号 b9# -b12#的状态为在五十个交替充电放电周期结束后完全充电状态的电池。
The conditions of the batteries of sample No. b13# to b16# are after fifty cycles ending in fully discharged state.
样品编号 b13# -b16#的状态为在五十个交替充电放电周期结束后完全放电状态的电池。
The conditions of the batteries of sample No. b17# to b20# are at first cycle, in fully charged state.
样品编号 b17#-b20#的状态为第一个交替充电放电周期完全充电状态的电池。
The conditions of the batteries of sample No. b21# to b24# are after fifty cycles ending in fully charged state.
样品编号 b21# -b24#的状态为在五十个交替充电放电周期结束后完全充电状态的电池。
The conditions of the batteries of sample No. b25# to b28# are for backup.
样品编号 b25# -b28#为备样电池。
The conditions of component cells of sample No. c1# to c10# are at first cycle at 50% of the design rated capacity, in fully charged state.
样品编号 c1# -c10#的状态为第一个交替充电放电周期完全充电状态电芯容量设计值的 50%。
The conditions of component cells of sample No. c10# to c20 # are at first cycle, in fully discharged state.
样品编号 c10# -c20#的状态为在第一个交替充电放电周期完全放电状态的电芯。

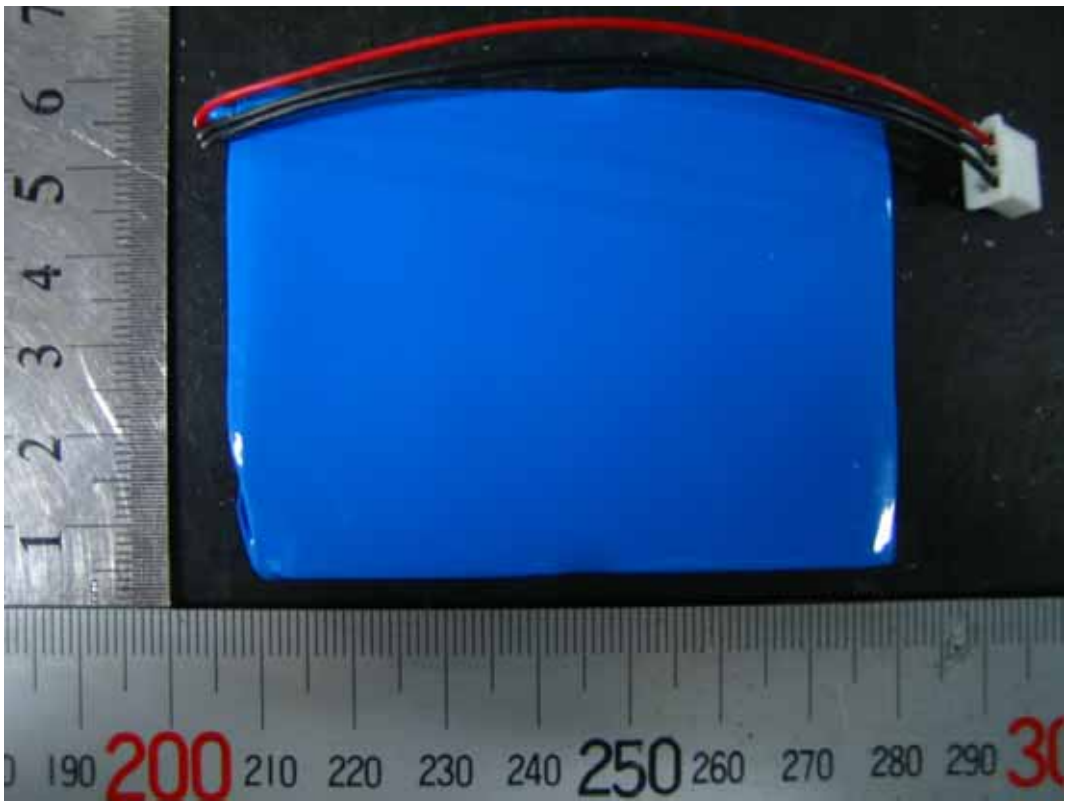
Description of the sampling procedure:
取样程序的说明: /

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。

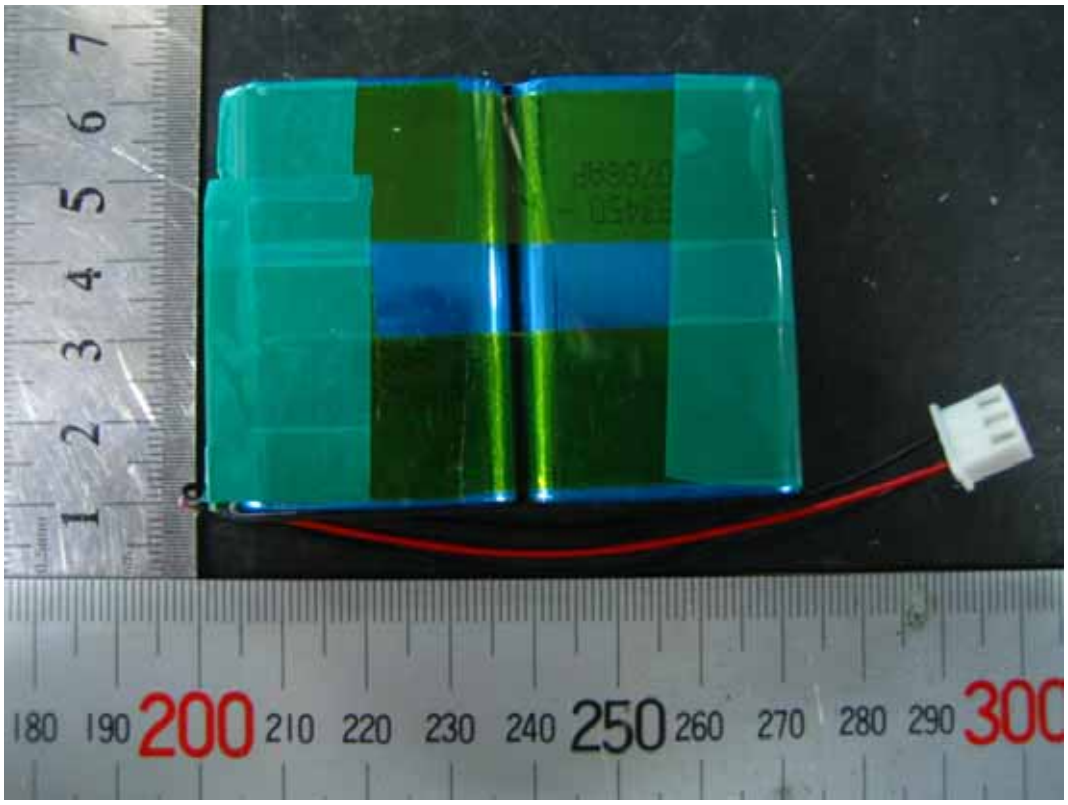
Photos of Samples and markings/样品照片及标识

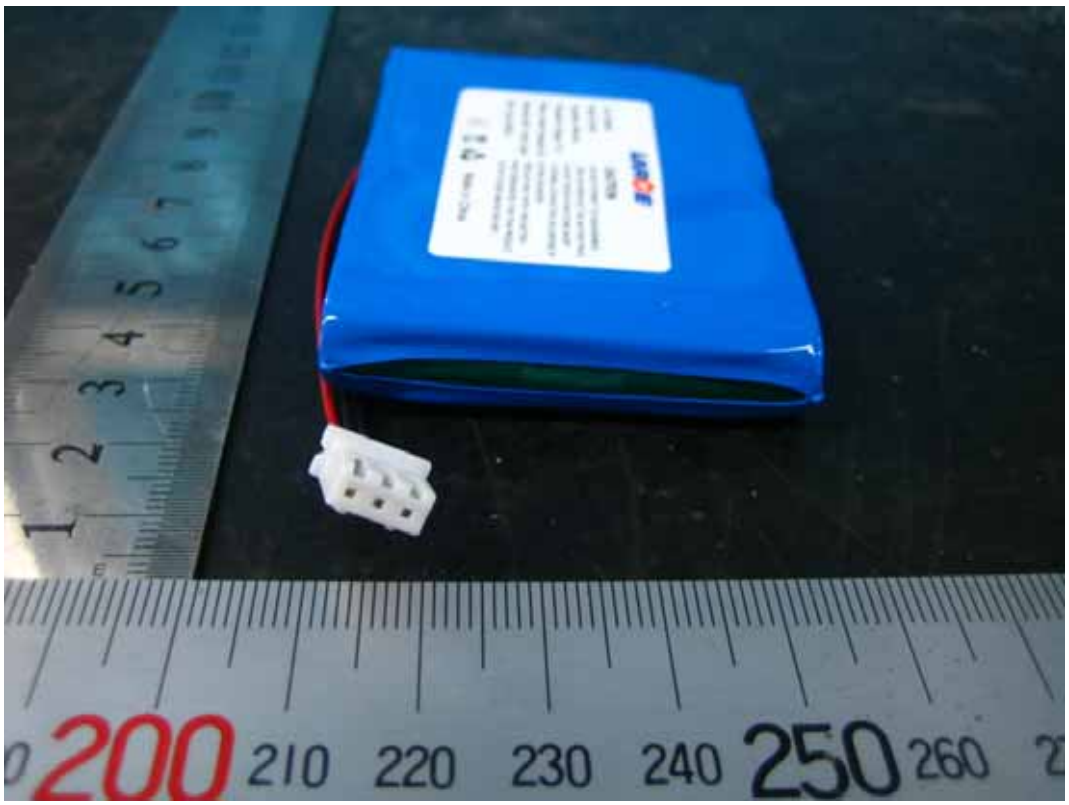
Battery/电池(103450 7,4V 1600mAh)



Photos of Samples and markings/样品照片及标识

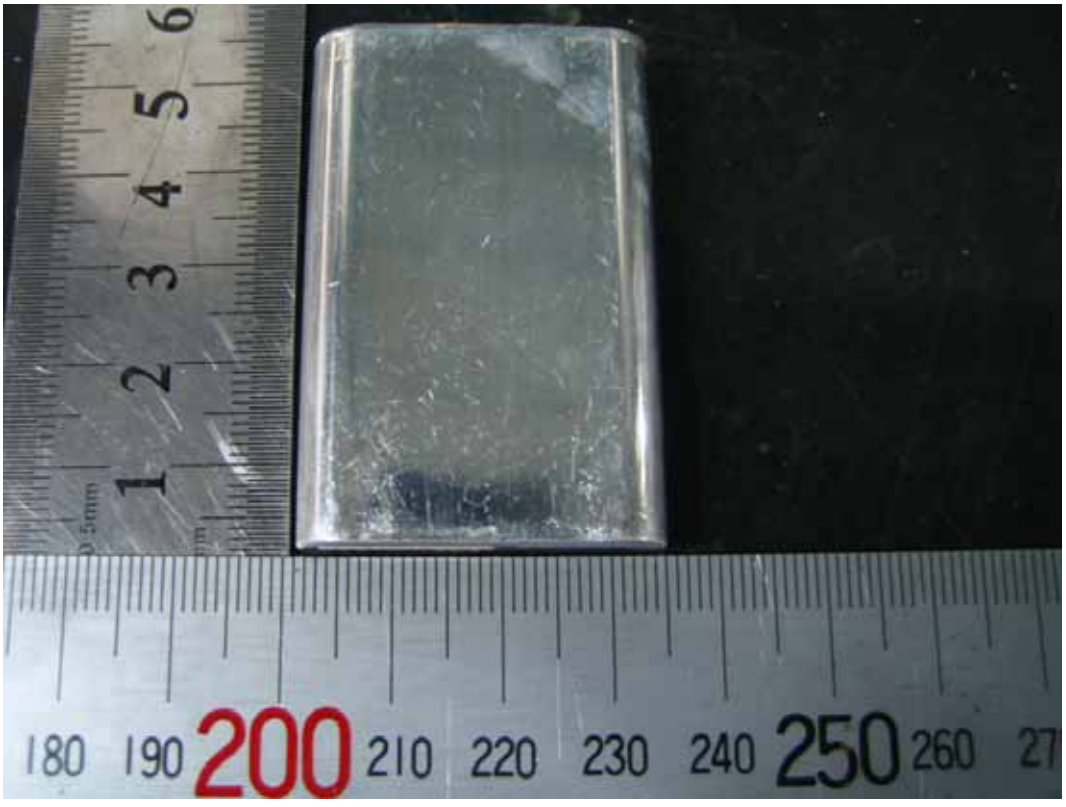
Battery/电池(103450 7,4V 1600mAh)





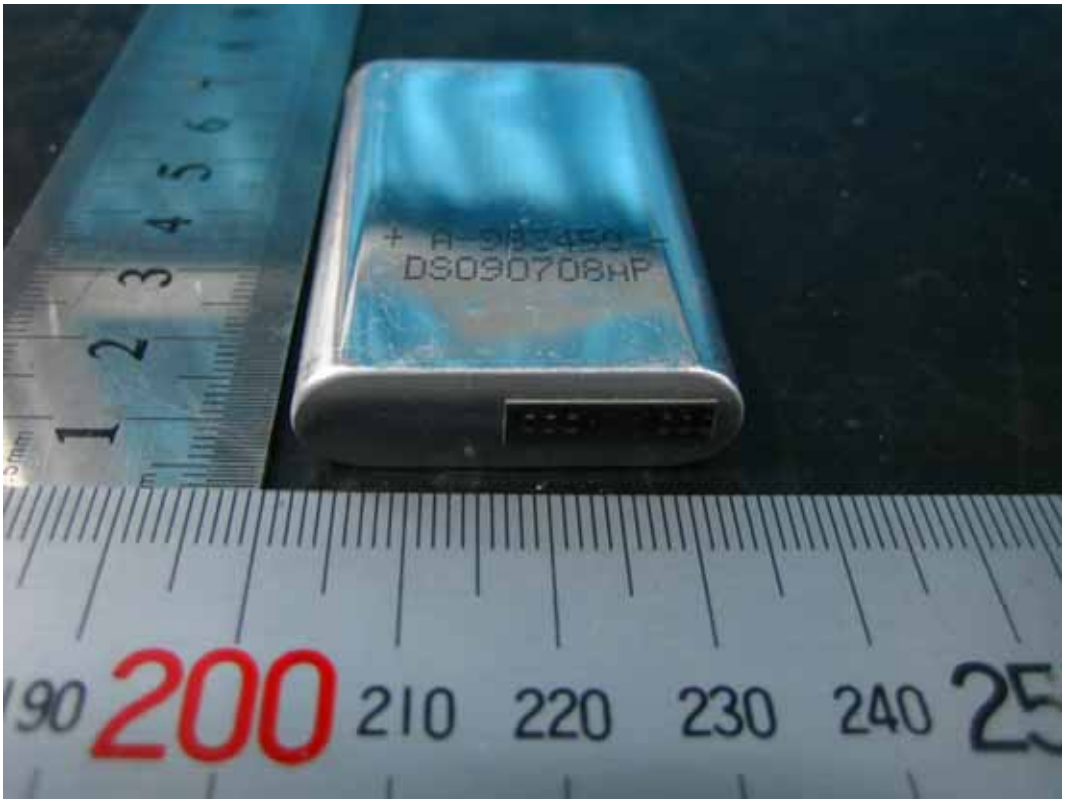
Photos of Samples and markings/样品照片及标识

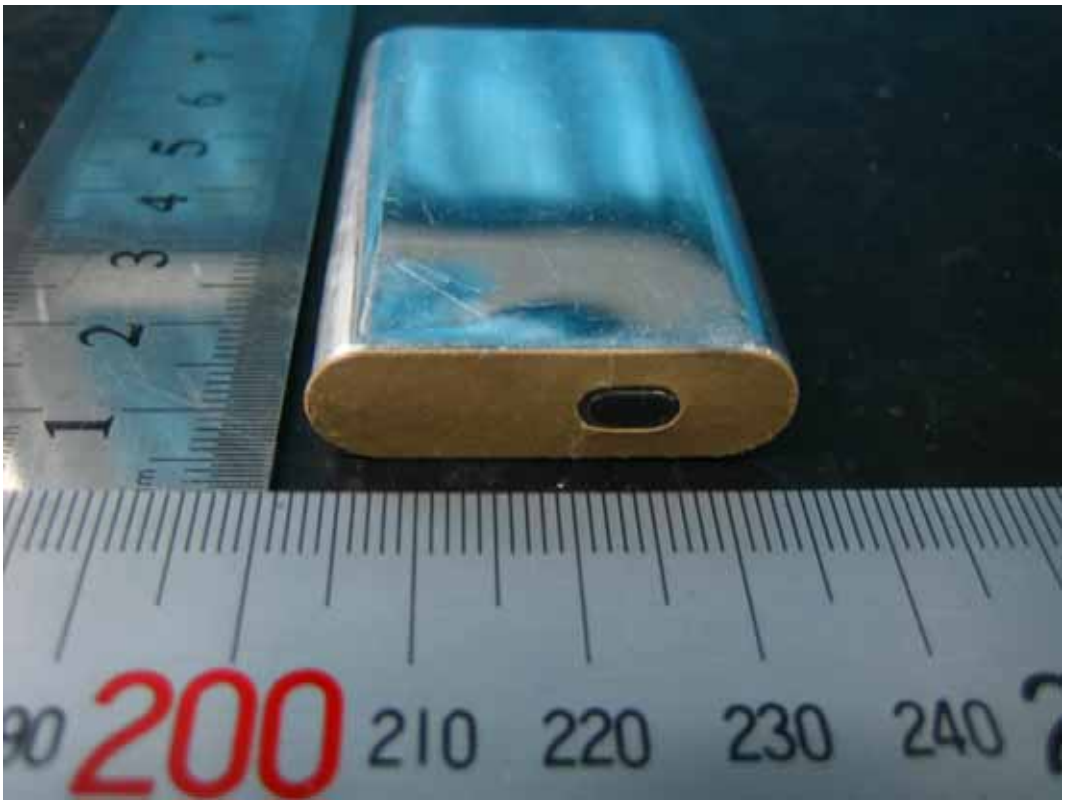
Cell/电芯(103450AHJ 3,7V 1600mAh)



Photos of Samples and markings/样品照片及标识

Cell/电芯(103450AHJ 3,7V 1600mAh)





Photos of Samples and markings/样品照片及标识

Packages

Clause 章节	Requirements 标准要求	Result 测试结果	Verdict 判定
38.3	**Lithium Batteries/锂电池**		P
38.3.1	**Purpose/目的**		N
38.3.2	**Scope/范围**		N
38.3.3	**Sample requirements/待测样品要求**		N
38.3.4	**Procedure/测试步骤**		P
	Test 1 to 5 must be conducted in sequence./测试 1 至测试 5 需按顺序进行		N
	Test 6 and 8 should be conducted using not otherwise tested cells or batteries/测试 6 和测试 8 中所用的样品为未进行其他测试的样品		N
	Test 7 may be conducted using undamaged batteries previously used in tests 1 to 5 for purposes of testing on cycled batteries/测试 7 中所采用的样品为通过测试 1 至测试 5 且未被损坏的样品		N

Clause 章节	Requirements 标准要求		Result 测试结果				Verdict 判定
38.3.4.1	**Test 1: Altitude simulation/测试 1：高度模拟**						**P**
38.3.4.1.1	Purpose/目的						N
	This test simulates air transport under low-pressure conditions/本测试模拟低压条件下的航空运输						N
38.3.4.1.2	Test procedure/测试步骤						N
	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℃)/ 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						N
38.3.4.1.3	Requirement/标准要求： Cells and batteries no mass loss/样品没有质量损失						P
	Batteries mass of pre-test 测试前样品（电池）质量	Sample No. 样品号	b1#	b2#	b3#	b4#	N
		Mass (g) 质量 (g)	75,089	74,727	74,508	75,416	
		Sample No. 样品号	b5#	b6#	b7#	b8#	
		Mass (g) 质量 (g)	74,404	74,724	75,112	75,244	
		Sample No. 样品号	b9#	b10#	b11#	b12#	
		Mass (g) 质量 (g)	74,145	74,791	74,075	75,186	
		Sample No. 样品号	b13#	b14#	b15#	b16#	
		Mass (g) 质量 (g)	75,052	75,406	75,146	74,915	
	Batteries mass of after-test 测试后样品（电池）质量	Sample No. 样品号	b1#	b2#	b3#	b4#	N
		Mass (g) 质量 (g)	75,084	74,722	74,502	75,411	
		Sample No. 样品号	b5#	b6#	b7#	b8#	
		Mass (g) 质量 (g)	74,399	74,718	75,107	75,238	
		Sample No. 样品号	b9#	b10#	b11#	b12#	
		Mass (g) 质量 (g)	74,139	74,786	74,070	75,181	
		Sample No. 样品号	b13#	b14#	b15#	b16#	
		Mass (g) 质量 (g)	75,047	75,401	75,141	74,909	
	The mass loss of batteries (%) Mass loss (%)= ($M_{pre\text{-}test}$ - $M_{after\text{-}test}$) x 100 / $M_{pre\text{-}}$	Sample No. 样品号	b1#	b2#	b3#	b4#	P
		Mass loss(%) 质量损失 (%)	0,006	0,006	0,008	0,006	

Clause 章节	Requirements 标准要求		Result 测试结果				Verdict 判定
	test Mass loss limit: ≤0,1% 样品（电池）的质量损失： 质量损失 (%)= (测试前样品的质量- 测试后样品的质量) x 100 / 测试前样品的质量 - 样品质量损失：≤ 0,1%	Sample No. 样品号	b5#	b6#	b7#	b8#	
		Mass loss(%) 质量损失 (%)	0,006	0,008	0,006	0,007	
		Sample No. 样品号	b9#	b10#	b11#	b12#	
		Mass loss(%) 质量损失 (%)	0,008	0,006	0,006	0,006	
		Sample No. 样品号	b13#	b14#	b15#	b16#	
		Mass loss(%) 质量损失 (%)	0,006	0,006	0,006	0,008	
	No leakage, no venting, no disassembly, no rupture and no fire 样品（电池）应无漏液、冒烟、分解、破裂以及着火现象的发生	Sample No. 样品号	b1#	b2#	b3#	b4#	P
		Status 样品状态	ok	ok	ok	ok	
		Sample No. 样品号	b5#	b6#	b7#	b8#	
		Status 样品状态	ok	ok	ok	ok	
		Sample No. 样品号	b9#	b10#	b11#	b12#	
		Status 样品状态	ok	ok	ok	ok	
		Sample No. 样品号	b13#	b14#	b15#	b16#	
		Status 样品状态	ok	ok	ok	ok	
	Open circuit voltage changed 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
	Open circuit voltage of pre-test (V) 测试前样品（电池）的开路电压(V)	Sample No. 样品号	b1#	b2#	b3#	b4#	N
		Voltage (V) 开路电压 (V)	8,358	8,351	8,356	8,356	
		Sample No. 样品号	b9#	b10#	b11#	b12#	
		Voltage (V) 开路电压 (V)	8,363	8,365	8,358	8,358	
	Open circuit voltage of after-test (V) 测试后样品（电池）的开路电压(V)	Sample No. 样品号	b1#	b2#	b3#	b4#	N
		Voltage (V) 开路电压 (V)	8,350	8,343	8,349	8,349	
		Sample No. 样品号	b9#	b10#	b11#	b12#	

Clause 章节	Requirements 标准要求		Result 测试结果				Verdict 判定
		Voltage (V) 开路电压 (V)	8,356	8,360	8,351	8,348	
	The change rate between pre-test and after test of open circuit voltage (Change rate = $V_{after-test}$ / $V_{pre-test}$ x100%) Limited Change rate: ≥90% 试验前后开路电压的变化比值： 开路电压变化比值=测试后样品的开路电压/测试前样品的开路电压 开路电压变化比值：≥ 90%	Sample No 样品号.	b1#	b2#	b3#	b4#	P
		Change rate 试验前后开路电压的比值(%)	99,90	99,90	99,91	99,91	
		Sample No 样品号	b9#	b10#	b11#	b12#	
		Change rate 试验前后开路电压的比值(%)	99,91	99,94	99,91	99,88	

38,3,4,2	**Test 2: Thermal test/测试 2: 热冲击**						**P**
38,3,4,2,1	Purpose/目的						N
	This test assesses cell and battery seal integrity and internal electrical connections, The test is conducted using rapid and extreme temperature changes/本测试检测电池和电芯的密封性和内部的线路连接性，测试在快速且极端的温度变化条件下进行						N
38,3,4,2,2	Test procedure/测试步骤						N
	Test cells and batteries are to be stored for at least six hours at a test temperature equal to 75±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 is 30 minutes, This procedure is to be repeated 10 times, after which all test cells and batteries are to be stored for 24 hours at ambient temperature (20±5℃), For large cells and batteries the duration of exposure to the test temperature extremes should be at least 12 hours./ 将电芯和电池在温度为 75±2℃的条件下贮存不少于 6 个小时（大电池应不少于 12 个小时），然后，在温度－40±2℃条件下贮存不少于 6 个小时（大电池应不少于 12 个小时）。重复操作上述步骤 10 次，然后，将其在环境温度为 20±5℃的条件下放置 24 个小时。						N
38,3,4,2,3	Requirements/标准要求 Cells and batteries Mass loss limit: ≤0,1% /样品质量损失≤0,1%						P
	Mass of pre-test 测试前样品（电池）质量	Sample No. 样品号	b1#	b2#	b3#	b4#	N
		Mass (g) 质量 (g)	75,084	74,722	74,502	75,411	
		Sample No. 样品号	b5#	b6#	b7#	b8#	
		Mass (g) 质量 (g)	74,399	74,718	75,107	75,238	
		Sample No. 样品号	b9#	b10#	b11#	b12#	

Clause 章节	Requirements 标准要求		Result 测试结果				Verdict 判定
		Mass (g) 质量 (g)	74,139	74,786	74,070	75,181	
		Sample No. 样品号	b13#	b14#	b15#	b16#	
		Mass (g) 质量 (g)	75,047	75,401	75,141	74,909	
	Mass of after-test 测试后样品（电池）质量	Sample No. 样品号	b1#	b2#	b3#	b4#	N
		Mass (g) 质量 (g)	75,076	74,714	74,492	75,401	
		Sample No. 样品号	b5#	b6#	b7#	b8#	
		Mass (g) 质量 (g)	74,391	74,711	75,100	75,230	
		Sample No. 样品号	b9#	b10#	b11#	b12#	
		Mass (g) 质量 (g)	74,131	74,780	74,061	75,171	
		Sample No. 样品号	b13#	b14#	b15#	b16#	
		Mass (g) 质量 (g)	75,039	75,393	75,134	74,903	
	The mass loss of batteries (%) Mass loss (%)= ($M_{pre-test}$ - $M_{after-test}$) x 100 / $M_{pre-test}$ Mass loss limit: ≤0,1% 样品（电池）的质量损失： 质量损失 (%)= (测试前样品的质量- 测试后样品的质量) x 100 / 测试前样品的质量 样品质量损失: ≤0,1%	Sample No. 样品号	b1#	b2#	b3#	b4#	P
		Mass loss(%) 质量损失 (%)	0,010	0,010	0,013	0,013	
		Sample No. 样品号	b5#	b6#	b7#	b8#	
		Mass loss(%) 质量损失 (%)	0,010	0,009	0,009	0,010	
		Sample No. 样品号	b9#	b10#	b11#	b12#	
		Mass loss(%) 质量损失 (%)	0,010	0,008	0,012	0,013	
		Sample No. 样品号	b13#	b14#	b15#	b16#	
		Mass loss(%) 质量损失 (%)	0,010	0,010	0,009	0,008	
	No leakage, no venting, no disassembly, no rupture and no fire 且样品应无漏液、冒烟、分解、破裂以及着火现象的发生	Sample No. 样品号.	b1#	b2#	b3#	b4#	P
		Status 样品状态	ok	ok	ok	ok	
		Sample No. 样品号	b5#	b6#	b7#	b8#	
		Status 样品状态	ok	ok	ok	ok	
		Sample No. 样品号	b9#	b10#	b11#	b12#	

Clause 章节	Requirements 标准要求		Result 测试结果				Verdict 判定
		Status 样品状态	ok	ok	ok	ok	
		Sample No. 样品号	b13#	b14#	b15#	b16#	
		Status 样品状态	ok	ok	ok	ok	
	Open circuit voltage changed not less than 90%, The requirement relating to voltage is not applicable to test cells and batteries at full discharged states. 试验后样品（电池）开路电压应不低于试验前开路电压的 90％.						P
	Open circuit voltage of pre-test (V) 测试前样品（电池）的开路电压(V)	Sample No. 样品号	b1#	b2#	b3#	b4#	N
		Voltage (V) 开路电压 (V)	8,350	8,343	8,349	8,349	
		Sample No. 样品号	b9#	b10#	b11#	b12#	
		Voltage (V)/ 开路电压 (V)	8,356	8,360	8,351	8,348	
	Open circuit voltage of after-test (V) 测试后样品（电池）的开路电压(V)	Sample No. 样品号	b1#	b2#	b3#	b4#	N
		Voltage (V)/ 开路电压 (V)	8,230	8,225	8,226	8,234	
		Sample No. 样品号	b9#	b10#	b11#	b12#	
		Voltage (V)/ 开路电压 (V)	8,246	8,251	8,222	8,217	
	The change rate between pre-test and after test of open circuit voltage (Change rate = $V_{after\text{-}test}$ / $V_{pre\text{-}test}$ x100%) Limited Change rate: ≥90% 试验前后（电池）开路电压的变化比值： 开路电压变化比值=测试后样品的开路电压/测试前样品的开路电压 开路电压变化比值：≥ 90%	Sample No. 样品号	b1#	b2#	b3#	b4#	P
		Change rate 试验前后开路电压的比值(%)	98,56	98,58	98,52	98,62	
		Sample No. 样品号.	b9#	b10#	b11#	b12#	
		Change rate 试验前后开路电压的比值(%)	98,68	98,69	98,45	98,43	

Clause 章节	Requirements 标准要求	Result 测试结果	Verdict 判定
38,3,4,3	**Test 3: Vibration/测试 3: 振动**		**P**
38,3,4,3,1	Purpose/目的		N
	This test simulates vibration during transport/本测试模拟在运输过程中的碰撞		N
38,3,4,3,2	Test procedure/测试步骤		N
	Cells and batteries are firmly secured to the platform of the vibration machine without distorting the cells in such a manner as to faithfully transmit the vibration, The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes, This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting position of the cell, One of the directions of vibration must be perpendicular to the terminal face, 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/ 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。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，共 3 个小时。		N
38,3,4,3,3	Requirements/测试步骤 Cells and batteries Mass loss limit: ≤0,1%/样品质量损失≤0,1%		P

	Mass of before-test 测试前样品（电池）质量	Sample No. 样品号	b1#	b2#	b3#	b4#	N
		Mass (g) 质量 (g)	75,076	74,714	74,492	75,401	
		Sample No. 样品号	b5#	b6#	b7#	b8#	
		Mass (g) 质量 (g)	74,391	74,711	75,100	75,230	
		Sample No. 样品号	b9#	b10#	b11#	b12#	
		Mass (g) 质量 (g)	74,131	74,780	74,061	75,171	
		Sample No. 样品号.	b13#	b14#	b15#	b16#	
		Mass (g) 质量 (g)	75,039	75,393	75,134	74,903	
	Mass of after-test 测试后样品（电池）质量	Sample No. 样品号	b1#	b2#	b3#	b4#	N
		Mass (g) 质量 (g)	75,074	74,714	74,492	75,400	
		Sample No. 样品号	b5#	b6#	b7#	b8#	
		Mass (g) 质量 (g)	74,391	74,710	75,098	75,230	
		Sample No. 样品号	b9#	b10#	b11#	b12#	
		Mass (g) 质量 (g)	74,130	74,780	74,061	75,171	

Clause 章节	Requirements 标准要求		Result 测试结果				Verdict 判定
		Sample No. 样品号	b13#	b14#	b15#	b16#	
		Mass (g) 质量 (g)	75,038	75,392	75,134	74,902	
	The mass loss of batteries (%) Mass loss (%)= ($M_{pre-test}$ - $M_{after-test}$) x 100 / $M_{pre-test}$ Mass loss limit: ≤0,1% 样品（电池）的质量损失： 质量损失 (%)= (测试前样品的质量- 测试后样品的质量) x 100 / 测试前样品的质量 样品质量损失：≤0,1%	Sample No. 样品号.	b1#	b2#	b3#	b4#	P
		Mass loss(%) 质量损失 (%)	0,002	0,000	0,000	0,001	
		Sample No. 样品号	b5#	b6#	b7#	b8#	
		Mass loss(%) 质量损失 (%)	0,000	0,001	0,002	0,000	
		Sample No. 样品号	b9#	b10#	b11#	b12#	
		Mass loss(%) 质量损失 (%)	0,001	0,000	0,000	0,000	
		Sample No. 样品号	b13#	b14#	b15#	b16#	
		Mass loss(%) 质量损失 (%)	0,001	0,001	0,000	0,001	
	No leakage, no venting, no disassembly, no rupture and no fire 且样品应无漏液、冒烟、分解、破裂以及着火现象的发生	Sample No. 样品号.	b1#	b2#	b3#	b4#	P
		Status 样品状态	ok	ok	ok	ok	
		Sample No. 样品号	b5#	b6#	b7#	b8#	
		Status 样品状态	ok	ok	ok	ok	
		Sample No. 样品号	b9#	b10#	b11#	b12#	
		Status 样品状态	ok	ok	ok	ok	
		Sample No. 样品号	b13#	b14#	b15#	b16#	
		Status 样品状态	ok	ok	ok	ok	
	Open circuit voltage changed not less than 90%, The requirement relating to voltage is not applicable to test cells and batteries at full discharged states. 试验后样品（电池）开路电压应不低于试验前开路电压的 90％						P
	Open circuit voltage of pre-test (V) 测试前样品（电池）的开路电压(V)	Sample No. 样品号	b1#	b2#	b3#	b4#	N
		Voltage (V) 开路电压 (V)	8,230	8,225	8,226	8,234	
		Sample No. 样品号	b9#	b10#	b11#	b12#	
		Voltage (V) 开路电压 (V)	8,246	8,251	8,222	8,217	

Clause 章节	Requirements 标准要求		Result 测试结果				Verdict 判定
	Open circuit voltage of after-test (V) 测试后样品的开路（电池）电压(V)	Sample No. 样品号	b1#	b2#	b3#	b4#	N
		Voltage (V) 开路电压 (V)	8,226	8,223	8,223	8,231	
		Sample No. 样品号	b9#	b10#	b11#	b12#	
		Voltage (V) 开路电压 (V)	8,243	8,248	8,220	8,214	
	(Change rate = $V_{after\text{-}test}$ / $V_{pre\text{-}test}$ x100%) Limited Change rate: ≥90% 开路电压变化比值=测试后样品的开路电压/测试前样品的开路电压 开路电压变化比值：≥ 90％	Sample No. 样品号	b1#	b2#	b3#	b4#	P
		Change rate 试验前后开路电压的比值(%)	99,95	99,97	99,96	99,96	
		Sample No. 样品号	b9#	b10#	b11#	b12#	
		Change rate 试验前后开路电压的变化比值(%)	99,96	99,96	99,97	99,96	

38,3,4,4	**Test 4: Shock/Test 4: 冲击**						**P**
38,3,4,4,1	Purpose/目的						N
	This test simulates possible impacts during transport/本测试模拟运输过程中的碰撞						N
38,3,4,4,2	Test procedure/测试步骤						N
	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, 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, However, large cells and large batteries shall be subjected to a half-sine or peak acceleration of 50 gn and pulse duration of 11 milliseconds, Each cell or battery is subjected to three shocks in the positive direction followed by three shocks in the positive direction followed by the negative direction of each of three mutually perpendicular mounting positions of the cell for a total of 18 shocks 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。						N
38,3,4,4,3	Requirements/标准要求 Cells and batteries no mass lost≤0,1%/样品质量损失不应大于 0.1%						P
	Mass of pre-test 测试前样品（电池）质量	Sample No. 样品号	b1#	b2#	b3#	b4#	N
		Mass (g) 质量 (g)	75,074	74,714	74,492	75,400	
		Sample No. 样品号	b5#	b6#	b7#	b8#	

Clause 章节	Requirements 标准要求		Result 测试结果				Verdict 判定
		Mass (g) 质量 (g)	74,391	74,710	75,098	75,230	
		Sample No. 样品号	b9#	b10#	b11#	b12#	
		Mass (g) 质量 (g)	74,130	74,780	74,061	75,171	
		Sample No. 样品号	b13#	b14#	b15#	b16#	
		Mass (g) 质量 (g)	75,038	75,392	75,134	74,902	
	Mass of after-test 测试后样品（电池）质量	Sample No. 样品号	b1#	b2#	b3#	b4#	N
		Mass (g) 质量 (g)	75,074	74,713	74,490	75,400	
		Sample No. 样品号	b5#	b6#	b7#	b8#	
		Mass (g) 质量 (g)	74,390	74,710	75,098	75,229	
		Sample No. 样品号	b9#	b10#	b11#	b12#	
		Mass (g) 质量 (g)	74,127	74,780	74,058	75,170	
		Sample No. 样品号	b13#	b14#	b15#	b16#	
		Mass (g) 质量 (g)	75,038	75,390	75,131	74,900	
	The mass loss of batteries (%)： Mass loss (%)= ($M_{pre-test}$ - $M_{after-test}$) x 100 / $M_{pre-test}$/ Mass loss limit: ≤0,1% 样品（电池）的质量损失： 质量损失 (%)= (测试前样品的质量- 测试后样品的质量) x 100 / 测试前样品的质量 样品质量损失不应大于0.1%	Sample No. 样品号	b1#	b2#	b3#	b4#	P
		Mass loss(%) 质量损失 (%)	0,000	0,001	0,002	0,000	
		Sample No. 样品号	b5#	b6#	b7#	b8#	
		Mass loss(%) 质量损失 (%)	0,001	0,000	0,000	0,001	
		Sample No. 样品	b9#	b10#	b11#	b12#	
		Mass loss(%) 质量损失 (%)	0,003	0,000	0,003	0,001	
		Sample No. 样品号	b13#	b14#	b15#	b16#	
		Mass loss(%) 质量损失 (%)	0,000	0,002	0,003	0,002	
	No leakage, no venting, no disassembly, no rupture and no fire 且样品应无漏液、冒烟、分解、破裂以及着火现象发生	Sample No. 样品号	b1#	b2#	b3#	b4#	P
		Status 样品状态	ok	ok	ok	ok	
		Sample No. 样品号	b5#	b6#	b7#	b8#	
		Status 样品状态	ok	ok	ok	ok	
		Sample No. 样品号	b9#	b10#	b11#	b12#	

Clause 章节	Requirements 标准要求		Result 测试结果				Verdict 判定
		Status 样品状态	ok	ok	ok	ok	
		Sample No. 样品号	b13#	b14#	b15#	b16#	
		Status 样品状态	ok	ok	ok	ok	
	Open circuit voltage changed not less than 90%, The requirement relating to voltage is not applicable to test cells and batteries at full discharged states. 样品（电池）试验后开路电压应不低于试验前开路电压的 90％						P
	Open circuit voltage of pre-test (V) 测试前样品（电池）的开路电压(V)	Sample No. 样品号	b1#	b2#	b3#	b4#	N
		Voltage (V) 开路电压 (V)	8,226	8,223	8,223	8,231	
		Sample No. 样品号	b9#	b10#	b11#	b12#	
		Voltage (V) 开路电压 (V)	8,243	8,248	8,220	8,214	
	Open circuit voltage of after-test (V) 测试后样品（电池）的开路电压(V)	Sample No. 样品号	b1#	b2#	b3#	b4#	N
		Voltage (V) 开路电压 (V)	8,224	8,220	8,221	8,229	
		Sample No. 样品号	b9#	b10#	b11#	b12#	
		Voltage (V) 开路电压 (V)	8,240	8,245	8,218	8,211	
	(Change rate = $V_{after\text{-}test}$ / $V_{pre\text{-}test}$ x100%) Limited Change rate: ≥90% 开路电压变化比值=测试后样品的开路电压/测试前样品的开路电压 开路电压变化比值：≥ 90%	Sample No. 样品号	b1#	b2#	b3#	b4#	P
		Change rate 试验前后开路电压的比值(%)	99,97	99,96	99,97	99,97	
		Sample No. 样品号	b9#	b10#	b11#	b12#	
		Change rate 试验前后开路电压的比值(%)	99,96	99,96	99,97	99,96	

Clause 章节	Requirements 标准要求	Result 测试结果				Verdict 判定
38,3,4,5	**Test 5: External Short Circuit/测试 5 外接短路**					**P**
38,3,4,5,1	Purpose/目的					N
	This test simulates an external short circuit/本测试模拟外部短路					N
38,3,4,5,2	Test procedure/测试步骤					N
	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 0,1 ohm 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, 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 欧姆的电阻器短路 1 小时以上，随后，电芯或电池的外表温度恢复到 55±2℃。之后，对电芯或电池必须进一步观察 6 个小时才能下结论。					N
38,3,4,5,3	Requirements/标准要求					P
	Cells' or batteries' external temperature not exceed 170℃ 电芯或电池在表面温度恢复到 55±2℃之后 6 个小时前后，其外表温度应不超过 170℃	Sample No. 样品号	b1#	b2#	b3#	b4#	P
		Temp. (℃) 温度 (℃)	55,2	55,2	55,1	55,3	
		Sample No. 样品号	b5#	b6#	b7#	b8#	
		Temp. (℃) 温度 (℃)	55,2	55,1	55,3	55,2	
		Sample No. 样品号	b9#	b10#	b11#	b12#	
		Temp. (℃) 温度 (℃)	55,3	55,2	55,1	55,2	
		Sample No. 样品号	b13#	b14#	b15#	b16#	
		Temp. (℃) 温度 (℃)	55,3	55,3	55,2	55,2	
	No disassembly, no rupture and no fire within six hours of this test 电芯或电池在表面温度恢复到 55±2℃之后 6 个小时前后，应无分解、破裂和着火现象发生。	Sample No. 样品号	b1#	b2#	b3#	b4#	P
		Status 样品状态	ok	ok	ok	ok	
		Sample No. 样品号	b5#	b6#	b7#	b8#	
		Status 样品状态	ok	ok	ok	ok	
		Sample No. 样品号	b9#	b10#	b11#	b12#	
		Status 样品状态	ok	ok	ok	ok	
		Sample No. 样品号	b13#	b14#	b15#	b16#	
		Status 样品状态	ok	ok	ok	ok	

Clause 章节	Requirements 标准要求	Result 测试结果				Verdict 判定
38,3,4,6	**Test 6: Impact/测试 6: 撞击**					**P**
38,3,4,6,1	Purpose/目的					N
	This test simulates an impact 本测试模拟样品遭受冲击					N
38,3,4,6,2	Test procedure/测试步骤					N
	This test sample cell or component cell is to be placed on a flat surface, 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, A cylindrical or prismatic cell is to be impacted with its longitudinal axis of the 15,8 mm diameter curved surface lying across the center of the wide and narrow sides will subjected to the impact, Each sample is to be subjected to only a single impact, Separate samples are to be used for each impact, A coin or button cell is to be impacted with the flat surface of the sample parallel to the flat surface and the 15,8mm diameter curved surface lying across its center, 将试验样品用的电芯或聚合物电芯放在一个平面上，将一直径为 15.8㎜ 的横木横过电池中部放置，然后，将一质量为 9.1kg 的物体从 61±2.5㎝ 的高度落向样品。					N
38,3,4,6,3	Requirements/标准要求					P
	Cells' or batteries' external temperature not exceed 170℃ 电芯或电池的最高表面温度应不超过 170℃	Sample No. 样品号	c1#	c2#	c3#	c4#	P
		Temp. (℃) 温度 (℃)	112,7	99,1	74,6	89,8	
		Sample No. 样品号	c5#	c6#	c7#	c8#	
		Temp. (℃) 温度 (℃)	90,3	26,0	24,8	76,3	
		Sample No. 样品号	c9#	c10#	c11#	c12#	
		Temp. (℃) 温度 (℃)	24,2	24,6	40,1	40,0	
		Sample No. 样品号	c13#	c14#	c15#	c16#	
		Temp. (℃) 温度 (℃)	39,6	41,1	40,3	23,7	
		Sample No. 样品号	c17#	c18#	c19#	c20#	
		Temp. (℃) 温度 (℃)	23,7	23,9	24,4	24,0	
	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分解和着火现象发生	Sample No. 样品号	c1#	c2#	c3#	c4#	P
		Status 样品状态	ok	ok	ok	ok	
		Sample No. 样品号	c5#	c6#	c7#	c8#	
		Status 样品状态	ok	ok	ok	ok	
		Sample No. 样品号	c9#	c10#	c11#	c12#	

Clause 章节	Requirements 标准要求		Result 测试结果				Verdict 判定
		Status 样品状态	ok	ok	ok	ok	
		Sample No. 样品号	c13#	c14#	c15#	c16#	
		Status 样品状态	ok	ok	ok	ok	
		Sample No. 样品号	c17#	c18#	c19#	c20#	
		Status 样品状态	ok	ok	ok	ok	

38,3,4,7	**Test 7: Overcharge/测试 7: 过充电**		**P**
38,3,4,7,1	Purpose/目的		N
	This test evaluates the ability of a rechargeable battery to withstand an overcharge condition 本测试评估可充电池在过充电条件的安全性能		N
38,3,4,7,2	Test procedure/测试步骤		N
	The charge current shall be twice the manufacturer's recommended maximum continuous charge current, The minimum voltage of the test shall be as follows: 8,4V 以 2 倍制造厂推荐的最大持续充电电流对样品充电，本测试最小电压为：		N
	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 a) 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小于两倍的厂家标定最大充电电压或者是 22V	The manufacturer's recommended maximum charge voltage of the samples is 8,4V ,and The manufacturer's recommended maximum continuous charge current is 1600mA The voltage of the test is 16,8V, and the current is 3200mA 厂家提供的最大充电电压为 8,4V，最大电流为 1600mA，测试的电压为 16,8V，电流为 3200mA	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 b) 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 1.2 倍的厂家标定最大充电电压	/	N
	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。		N

Clause 章节	Requirements 标准要求		Result 测试结果				Verdict 判定
38,3,4,7,3	Requirements/标准要求						P
	No disassembly, no rupture and no fire within seven days of this test 试验样品在试验中和试验后 7 天内，应无分解和着火现象发生。	Sample No. 样品号.	b17#	b18#	b19#	b20#	P
		Status 样品状态	ok	ok	ok	ok	
		Sample No. 样品号.	b21#	b22#	b23#	b24#	
		Status 样品状态	ok	ok	ok	ok	

注 意 事 项
Important

1. 本报告无检验单位公章、骑封章无效。
   The test report is invalid without the official stamp of CVC and Paging seal 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、审核人及鉴定人签名无效。
   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 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. 本检验结果中“ N ”表示“ 不适用 ”，“ P ”表示“ 通过 ”，“ F ”表示“ 不通过 ”。
   As for the test result, “N” means “not applicable”, “P” means “pass” and “F” means “fail”.

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