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中国认可
国际互认
检测
TESTING
CNAS L0095

No.: RZUN2023-6739

检 测 报 告
TEST REPORT

UN38.3

NAME OF SAMPLE: 产品名称：	Li-MnO2 Button Cell 锂-二氧化锰扣式电池
CLIENT: 委托单位：	CHANGZHOU JINTAN CHAOCHUANG BATTERY CO.,LTD 常州金坛超创电池有限公司
CLASSIFICATION OF TEST: 检测类别：	Commission Test 委托测试

威凯检测技术有限公司
CVC Testing Technology Co., Ltd.

检 测 报 告
TEST REPORT

Name of samples: Li-MnO2 Button Cell 样品名称:锂-二氧化锰扣式电池	Type/Model: 型号规格: CR2032 3,0V 210mAh
Color: Silver 样品颜色:银色	Physical shape: Button 样品形状：纽扣
Commissioned by: CHANGZHOU JINTAN CHAOCHUANG BATTERY CO.,LTD 委托单位: 常州金坛超创电池有限公司	Commissioner address: XIYANG VILLAGE MAOLU TOWN JINTAN CHANGZHOU JIANGSU 委托单位地址:江苏省金坛区茅麓镇西阳村
Manufacturer: CHANGZHOU JINTAN CHAOCHUANG BATTERY CO.,LTD 制造商: 常州金坛超创电池有限公司	Manufacturer address: XIYANG VILLAGE MAOLU TOWN JINTAN CHANGZHOU JIANGSU 制造商地址: 江苏省金坛区茅麓镇西阳村
Factory: CHANGZHOU JINTAN CHAOCHUANG BATTERY CO.,LTD 生产厂: 常州金坛超创电池有限公司	Factory address: XIYANG VILLAGE MAOLU TOWN JINTAN CHANGZHOU JIANGSU 生产厂地址: 江苏省金坛区茅麓镇西阳村
Classification of test: Commission Test 检测类别: 委托测试	Quantity of sample: 40 cells 样品数量: 40 个电芯
Tested according to: 测 试 标 准 : ST/SG/AC.10/11/Rev.7/Amend.1/Section 38.3	Sample identification: 样品标识序号: c1#~c40#
Receiving date: 接样日期：2023-11-28	Means of receiving: Submitted by commissioner 接样方式：委托单位送样
Completing date: 完成日期：2023-12-25	Test item: 7 items 测试项目：7 项

Test conclusion:
检测结论:

The Li-MnO2 Button Cells submitted by CHANGZHOU JINTAN CHAOCHUANG BATTERY CO.,LTD are tested according to Section 38.3 of the Seventh revised edition Amendment 1 of the Manual of Tests and Criteria (ST/SG/AC.10/11/Rev.7/Amend.1/Section 38.3). The test items are full items. The test results comply with the relevant requirements of the standard.

由常州金坛超创电池有限公司送检的锂-二氧化锰扣式电池，依据联合国《试验和标准手册》第七修订版修正 1 第 38.3 节进行检测，试验为全项目，试验结果符合标准相关要求。

Seal of CVC
CVC 盖章
Date of issue:
签发日期:2023-12-28

Title: Manager
批准人职务： 经理

Approved by: Huang Kun Reviewed by: Zhang Siyao Tested by: Chen Zeyan

批 准： 审 核： 检 测：

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: φ20mm*3,2mm
Aggregate Lithium content of each cell/ 单个电芯的锂含量: 0,055g

Test item 试验项目	Sample No. 样品编号	State 状态	Remark 备注
T.1~T.5	c1#~c10#	in undischarged states 未放电状态	-
	c11#~c20#	in fully discharged states 完全放电状态	-
T.6	c21#~c25#	in undischarged states 未放电状态	-
	c26#~c30#	in fully discharged states 完全放电状态	-
T.8	c31#~c40#	in fully discharged states 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:
试验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。

Trade mark/商标：CR2032（无品牌）、CR2032（GNENG）、CR2032（STAR BULLY）、CR2032｛（CHAOCHUANG）（SC100、SC200、SC360、SC500、SC800、SC628、SC508、SC928、SC358、SC218、 SC158）、CR2032UL 桶、CR2032 大桶、CR2032 中性桶、CR2032 定中性、CR2032 老中、CR2032mAh 桶、CR2032 老中桶、CR2032STD、CHAOCHUANG CR2032、CR2032 S CHAOCHUANG、CR2032 L CHAOCHUANG 、 CR2032 H CHAOCHUANG 、 CR2032 CHAOCHUANG LED 、 CR2032 GREATCELL 桶、CR2032 H ADMA、CR2032 ADMA、CR2032 S ADMA、CR2032（Maxell）、CR2032 LED 、CR2032 ATECH、CR2032 CHAOCHUANG、CR2032 垃圾桶、CR2032 H、CR2032 TOSHIBA、CR2032 REANTA、CR2032 BEXEL、CR2032ANSMANN、CR2032 BIXLINK、CR2032 老中 2、CR2032 MORITOKU、CR2032 金力中性、CR2032 双鹿中性、CR2032 南孚、CR2032 GoldenPower、CR2032 SUNNYBATT 、 CR2032 GIGAMAX 、 CR2032 Navigator 、 CR2032 MastAK 、 CR2032 EPA 、 CR2032 DURACELL、CR2032 IKEA、CR2032 electroninks、CR2032 HW、CR2032 TPOΦH、CR2032 ERGOLUX、CR2032 CELEWELL、CR202 warriors、CR2032 Focusray、CR2032 HT、CR2032 CTECHI、CR2032 TDM、CR2032 KEYKO、CR2032 PROMAX、CR2032 艾科夫、CR2032 双鹿、CR2032 Camelion、CR2032 Westinghouse、CR2032 Excell、CR2032 RAYOVAC、CR2032 CECASA、CR2032 UNOMRT、CR2032 AKID 、 CR2032 FOXLUX 、 CR2032 SONNEN 、 CR2032 perfeo 、 CR2032 DL/DURACELL 、 CR2032 EXPOCELL、CR2032 TAURUS、CR2032 CHANGHONG、CR2032 TCL、CR2032 HYUNDAI、CR2032 达达、CR2032 Ecobattey、CR2032 JUPITER、CR2032 Fujicom、CR2032 selex、CR2032 PHILIPS、CR2032 KBISBOW 、 CR2032 NOMA 、 CR2032 Z 、 CR2032 LDLC 、 CR2032 Life 、 CR2032 Jauch 、 Vomiko 、 Ecobattery、NOMA、MWK、intelbras、双鹿中、GC、KPENTON、zeus、Energizer、TGL、amazon、PB、PC、GoldenPower、M&G、金力中、MORITOKU、TAURUS、renata、BASICELL、PC、PB、RAYOVAC、deli、amazonbasics、Mirex、TESLA、KOOMAX、justinkeys、HIM、PROCELL、DURACELL、AZ MDF、Mobius、日英桶、ORBUS、warriors 儿安、DOMSEM、DALICELL、Camelion 儿安、GMCELL、ALLMAX、M 桶儿安、中性儿安、JBWCELL、Matsushima、3V 垃圾桶儿安、GREATCELL 桶儿安、垃圾桶儿安、H 桶儿安、L 桶儿安、老中儿安、三菱、PHILIPS、JAUCH 儿安、IKEA 儿安、Starmax、GREATCELL 儿安、Starmax、GREATCELL 儿安、chaochuang WT、chaochuangH WT、MAXRUN、MAXRUN 儿安、Intenso、KODAK、SENCOR、全英文儿安、WILKINSON、HTSZ、HTSZ WT、NACCON H、Finepower、H HTSZ、UYUNI 儿安、OWLA、H MAXFORT、LED 儿安、MAXRUN 桶 儿安、Heybright、UP&UP、DUNBA、GAOPAAEC

Photos of Samples and Labels/样品照片及标识

Cell/电芯（CR2032 3,0V 210mAh）

















Photos of Samples and Labels/样品照片及标识

Cell/电芯（CR2032 3,0V 210mAh）























Photos of Samples and Labels/样品照片及标识

Cell/电芯（CR2032 3,0V 210mAh）



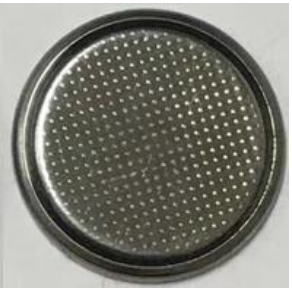


























Photos of Samples and Labels/样品照片及标识

Cell/电芯（CR2032　3,0V　210mAh）



















Photos of Samples and Labels/样品照片及标识

Cell/电芯（CR2032 3,0V 210mAh）







38.3.4	**Procedure/试验步骤**		—
38.3.4.1	**Test T.1: Altitude simulation/试验 T.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 hours 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		
	Requirement/标准要求： 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	The samples c1#~c20# : No leakage, no venting, no disassembly, no rupture and no fire/编号为 c1#~c20#的样品：无漏液、无排气、无解体、无破裂以及无着火现象 The data is shown in Table 1./数据见表 1	
38.3.4.2	**Test T.2: Thermal test/试验 T.2: 温度试验**		**P**
	Test cells and batteries are to be stored for/电池存储条件如下： 1 For small cells and batteries: one temperature cycle: 72±2℃(6h) —-40±2℃(6h) /对于小型电芯和电池：一次温度循环为 72±2℃(6h) —-40±2℃(6h) For large cells and batteries: one temperature cycle: 72±2℃(12h) —-40±2℃(12h) /对于大型电芯和电池：一次温度循环为 72±2℃(12h) —-40±2℃(12h) 2 The maximum time interval between test temperature extremes is 30 minutes/温度转换最大间隔时间为 30min 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，电池在 20±5℃的条件下 搁置 24 小时		
	Requirements/标准要求 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	The samples c1#~c20# : No leakage, no venting, no disassembly, no rupture and no fire/编号为 c1#~c20#的样品：无漏液、无排气、无解体、无破裂以及无着火现象 The data is shown in Table 1./数据见表 1	

38.3.4.3	**Test T.3: Vibration/试验 T.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 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。 3 For cells and small batteries: from 7 Hz a peak acceleration of 1gn 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 $8g_n$ occurs (approximately 50Hz). A peak acceleration of $8g_n$ is then maintained until the frequency is increased to 200Hz. / 对于电芯和小型电池：从 7Hz 开始，以 $1g_n$ 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 $8g_n$ 的峰值加速度（大约 50Hz）。然后保持 $8g_n$ 的峰值加速度，直到频率增加到 200Hz。 For large batteries: from 7Hz a peak acceleration of $1g_n$ 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 $2g_n$ occurs (approximately 25Hz). A peak acceleration of $2g_n$ is then maintained until the frequency is increased to 200Hz. / 对于大型电池：从 7Hz 开始，以 $1g_n$ 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 $2g_n$ 的峰值加速度（大约 25Hz）。然后保持 $2g_n$ 的峰值加速度，直到频率增加到 200Hz。 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。		
	Requirements/标准要求 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	The samples c1#~c20# : No leakage, no venting, no disassembly, no rupture and no fire/编号为 c1#~c20#的样品：无漏液、无排气、无解体、无破裂以及无着火现象 The data is shown in Table 1./数据见表 1	

<table>
<tr><td rowspan="3">38.3.4.4</td><td colspan="2">Test T.4: Shock/Test T.4: 冲击</td><td rowspan="3">P</td></tr>
<tr><td colspan="2">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。
2 Each cell shall be subjected to a half-sine shock of peak acceleration of 150 g_n and pulse duration of 6 milliseconds. Large cells may be subjected to a half-sine shock of peak acceleration of 50 g_n and pulse duration of 11 milliseconds. / 对每个电芯以峰值为 150g_n 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_n 和脉冲持续时间 11 毫秒的半正弦波冲击。
Small batteries shall be subjected to a half-sine shock of peak acceleration of 150 g_n (or Acceleration(g_n)= $\sqrt{\left(\frac{100850}{mass}\right)}$, which is smaller) and pulse duration of 6 milliseconds, large batteries shall be subjected to a half-sine of peak acceleration of 50 g_n (or Acceleration(g_n)= $\sqrt{\left(\frac{30000}{mass}\right)}$, which is smaller) and pulse duration of 11 milliseconds/对每个电池以峰值为 150g_n（或与 $\sqrt{\left(\frac{100850}{mass}\right)}$ 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_n（或与 $\sqrt{\left(\frac{30000}{mass}\right)}$ 中的较小值）和脉冲持续时间 11 毫秒的半正弦波冲击。
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。</td></tr>
<tr><td>Requirements/标准要求：
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</td><td>The samples c1#~c20# :
Acceleration= 150g_n

No leakage, no venting, no disassembly, no rupture and no fire/编号为 c1#~c20#的样品：
峰值加速度= 150g_n
无漏液、无排气、无解体、无破裂以及无着火现象
The data is shown in Table 1./数据见表 1</td></tr>
</table>

<table>
<tr><td rowspan="3">38.3.4.5</td><td colspan="2">Test T.5: External Short Circuit/试验 T.5 外部短路</td><td rowspan="3">P</td></tr>
<tr><td colspan="2">1 The cell or battery to be tested shall be heated for a period of time necessary to reach a homogeneous stabilized temperature 57±4℃/加热电芯或电池样品直到温度稳定在 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℃, 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 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；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。
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。</td></tr>
<tr><td>Requirements/标准要求：
During the test and within six hours after test ,the cells or batteries
在试验过程中以及之后 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.
无解体、无破裂和无着火现象发生。</td><td>The samples c1#~c20# :
no disassembly, no rupture and no fire/编号为 c1#~c20# 的样品：无解体、无破裂以及无着火现象
The data is shown in Table 1./数据见表 1</td></tr>
</table>

	Test T.6: Impact / Crush / 试验 T.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 毫米的圆柱形电池）		
	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 centre 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。		**N/A**
	Requirements/标准要求： 1 Cells external temperature not exceed 170℃.电芯或电池的最高表面温度应不超过 170℃ 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	-	
38.3.4.6	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/纽扣电池和直径小于 18 毫米的圆柱形电池）		**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. / 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℃.电芯或电池的最高表面温度应不超过 170℃ 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 c21#~c30#: no disassembly and no fire/编号为 c21#~c30#的样品：无解体、无着火现象 The data is shown in Table 2./数据见表 2	

38.3.4.7	**Test T.7: Overcharge/试验 T.7: 过度充电**		**N/A**
	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/本试验最小电压见下文		
	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，本试验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，本试验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。	—	
	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。	—	
38.3.4.8	**Test T.8: Forced discharge/试验 T.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。		
	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试验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 c31#~c40#: No disassembly and no fire /编号为 c31#~c40#的样品：无解体、无着火现象 For voltage data before test, see table 3. / 试验前电压见表 3	

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 T.1: Altitude simulation/ 试验 T.1：高度模拟**		**Test T.2: Thermal test/ 试验 T.2: 温度试验**		**Test T.3: Vibration/ 试验 T.3: 振动**		**Test T.4: Shock/ 试验 T.4: 冲击**		**Test T.5: External Short Circuit/试验 T.5 外部短路**
			Mass Loss(%) 质量损失(%)	OCV Retention Ratio(%) 电压保留比(%)	Mass Loss(%) 质量损失(%)	OCV Retention Ratio(%) 电压保留比(%)	Mass Loss(%) 质量损失(%)	OCV Retention Ratio(%) 电压保留比(%)	Mass Loss(%) 质量损失(%)	OCV Retention Ratio(%) 电压保留比(%)	Temp. (℃) 温度 (℃)
c1#	2,841	3,256	0,000	99,94	0,000	100,00	0,035	99,97	0,000	99,97	67,8
c2#	2,916	3,274	0,000	99,91	0,000	100,00	0,068	99,97	0,068	100,00	68,7
c3#	2,882	3,270	0,000	99,79	0,000	100,00	0,069	99,94	0,069	99,97	68,6
c4#	2,866	3,273	0,000	99,91	0,034	100,00	0,069	100,00	0,069	99,94	69,2
c5#	2,868	3,264	0,000	99,88	0,104	100,00	0,069	100,00	0,069	99,94	68,9
c6#	2,877	3,272	0,000	99,94	0,069	100,00	0,104	99,94	0,069	99,91	69,0
c7#	2,877	3,274	0,000	99,88	0,069	100,00	0,069	99,97	0,104	99,94	69,5
c8#	2,896	3,266	0,000	100,00	0,069	99,97	0,138	99,94	0,069	99,91	68,6
c9#	2,920	3,263	0,000	100,00	0,068	99,97	0,102	99,94	0,068	100,00	68,4
c10#	2,908	3,263	0,000	100,00	0,103	99,94	0,068	99,97	0,103	100,00	68,7
c11#	2,875	—	0,000	—	0,000	—	0,069	—	0,069	—	60,5
c12#	2,918	—	0,000	—	0,034	—	0,068	—	0,068	—	59,6
c13#	2,915	—	0,000	—	0,034	—	0,034	—	0,068	—	59,0
c14#	2,878	—	0,000	—	0,000	—	0,034	—	0,069	—	59,5
c15#	2,871	—	0,000	—	0,000	—	0,034	—	0,000	—	59,8
c16#	2,878	—	0,000	—	0,000	—	0,104	—	0,000	—	60,3
c17#	2,877	—	0,000	—	0,000	—	0,069	—	0,000	—	60,2
c18#	2,878	—	0,000	—	0,000	—	0,104	—	0,000	—	59,9
c19#	2,890	—	0,000	—	0,069	—	0,069	—	0,069	—	59,7
c20#	2,907	—	0,000	—	0,068	—	0,068	—	0,068	—	59,6

Table2: Crush | 表 2:挤压											
Test T.6: Crush | 试验 T.6:挤压	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）	3,253	3,198	3,266	3,260	3,274	2,790	2,785	2,793	2,860	2,843
	Temp. (℃) 温度 (℃)	26,5	26,3	26,4	26,1	26,5	28,0	26,6	28,7	29,2	28,8

Table 3：Forced discharge / 表 3. 强制放电											
Test T.8: Forced discharge **/ 试验 T.8: 强制放电**	Sample No. 样品号	c31#	c32#	c33#	c34#	c35#	c36#	c37#	c38#	c39#	c40#
	OCV prior to test / 试验前电压(V)	2,801	2,821	2,750	2,838	2,804	2,846	2,855	2,802	2,784	2,821

注 意 事 项
Important

1. 报告无检测单位印章无效。
   The test report is invalid without the 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。
The test data and test results given in this test report should only be used for purposes of scientific research, teaching and internal quality control when the CMA symbol is not presented.

地 址： 广东省广州市科学城开泰大道天泰一路 3 号
广东省广州市黄埔区光谱东路 179 号百事高智慧园 D 栋（测试地点）
Lab Address: No.3, Tiantai 1st Road, Kaitai Avenue, Science City, Guangzhou， Guangdong, China.
Testing Location: Building D, BASIGO INTELLIGENT, No.179, Guangpu East Road, Huangpu District, Guangzhou, P. R. China.
电 话(Tel)：020 32293888 邮政编码(Post Code)：510663
传 真(FAX)：020 32293889 E-mail： office@cvc.org.cn
http://www.cvc.org.cn

SAFETY DATA SHEET

Section 1. Identification

Products Name	Alkaline Zinc-Manganese Dry Battery LR6/LR03
Manufacture Name	TIANJIN JUHUA DANENG BATTERY CO.,LTD
Address	No.47 Gaoxin Ave,Beichen Hi-Teach Industial Park,Tianjin,China
Postcode	300409
Emergency Telephone No.	022-86993188
Fax	022-86993123
E-mail	307540313@qq.com
Date Prepared	2025-01-01

Section 2. Hazard（s ）Identification

Reference as follow if contact Potassium hydroxide.

Eye	Causes severe eye burns. May cause irreversible eye injury. Contact may cause ulcerations of the conjunctiva and cornea. Eye damage may be delayed.
Skin	Causes skin burns. May cause deep, penetrating ulcers of the skin.
Inhalation	Irritation may lead to chemical pneumonitis and pulmonary edema. Causes severe irritation of upper respiratory tract with coughing, burns, breathing difficulty, and possible coma.
Ingestion	Harmful if swallowed.
Health Hazards (Acute and Chronic)	These chemicals are contained in a sealed can. Risk of exposure occurs only if the battery is mechanically or electrically abused. The most likely risk is acute exposure when a battery vents.
Sign/Symptoms of Exposure	A shorted battery can cause thermal and chemical burns upon contact with the skin. May be a reproductive hazard.

Section 3. Composition/Information on Ingredients

Chemical Name	Molecule formula	CAS No.	Weight（%）
Zinc	Zn	7440-66-6	23%~27%
Manganese dioxide	MnO_2	1313-13-9	27%~31%
Carbon	C	7782-42-5	3%~4%
Polypropylene	$(C_3H_6)_n$	9003-07-0	2%~3%
Copper	Cu	7440-50-8	1%
Potassium hydroxide	KOH	1310-58-3	4.5%~5.5%
Water	H_2O	7732-18-5	8%~9%
Iron	Fe	7439-89-6	17%~19%
Chromium	Cr	7440-47-3	4%~5%
Nickel	Ni	7440-02-0	1.5%~2.5%

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Section 4. First Aid Measures

Eyes	Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.
Skin	Get medical aid at once. Immediately remove contaminated clothes and rinse skin with plenty of water or shower for 15 minutes. Discard contaminated clothing in a manner which limits further exposure.
Inhalation	Get medical aid immediately. Remove from exposure and move to fresh air immediately. Use oxygen if available. Use oxygen device such as mask or bag.
Ingestion	Do not induce vomiting. Calla physician immediately.
Note to Physician	May be toxic to the body. Wash out the solution with water promptly in an emergency. Treat symptomatically and supportively.

Section 5. Fire- Fighting Measures

Flash Point	N/A
Auto-Ignition Temperature	N/A
Extinguishing Media	Dry chemical, CO_2.
Special Fire-Fighting Procedures	Self-contained breathing apparatus.
Unusual Fire and Explosion Hazards	Cell may vent when subjected to excessive heat-exposing battery contents.
Hazardous Combustion Products	Carbon monoxide, carbon dioxide, lithium oxide fumes.

Section 6. Accidental Release Measures

Steps to be Taken in case Material is Released or Spilled	If the battery is accidental broken and leaks out, wipe it up with a cloth, and dispose of it in a plastic bag and put into a steel can. The preferred response is to leave the area and allow the batteries to cool and vapors to dissipate. Provide maximum ventilation. Avoid skin and eye contact or inhalation of vapors. Remove spilled material with absorbent and incinerate.
Waste Disposal Method	It is recommended to discharge the battery to the end, handing in the abandoned batteries to related department unified, dispose of the batteries in accordance with approved local, state, and federal requirements. Consult state environmental protection agency and/or federal EPA.

Section 7. Handling and Storage

Do not charge. The batteries should not be opened, destroyed or incinerate, since they may leak or rupture and release to the environment the ingredients that they contain in the hermetically sealed container.

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Do not short circuit terminals, or over charge the battery, forced over-discharge, throw to fire. Do not crush or puncture the battery, or immerse in liquids.	
Precautions to betaken in handling and storing	Avoid mechanical or electrical abuse. Storage preferably in cool, dry and ventilated area, which is subject to little temperature change. Storage at high temperatures should be avoided. Do not place the battery near heating equipment, nor expose to direct sunlight for long periods.
Other Precautions	Batteries may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures. Do not short or install with incorrect polarity.

Section 8. Exposure Controls/Personal Protection

Respiratory Protection	In case of battery venting, provide as much ventilation as possible. Avoid confined areas with venting batteries. Respiratory protection is not necessary under conditions of normal use.
Ventilation	Not necessary under conditions of normal use.
Protective Gloves	Not necessary under conditions of normal use.
Other Protective Clothing or Equipment	Not necessary under conditions of normal use.
Personal Protection is recommended for venting batteries	Respiratory protection, protective gloves, protective clothing and safety glass with side shields.

Section 9. Physical and Chemical Properties

Nominal Voltage	1.5V
Appearance characters	Blue and golden with odorless columned solid.

Section 10. Stability and Reactivity

Stability	Stable for normal.
Conditions to Avoid	Elevated temperatures fire and ignition sources, mechanical abuse and electrical abuse.
Hazardous Decomposition Products	When exposed to fire or extreme heat, batteries may emit toxic fumes.

Section 11. Toxicological Information

Inhalation, skin contact and eye contact are possible when the battery is opened. Exposure to internal contents, the corrosive fumes will be very irritation to skin, eyes and mucous membranes. Overexposure can cause symptoms of non-fibrotic lung injury and membrane irritation.

Section 12. Ecological Information

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When promptly used or disposed the battery does not present environmental hazard. When disposed, keep away from water, rain and snow.

Section 13. Disposal Considerations

Appropriate method of disposal of substance or preparation

Dispose of the batteries in accordance with approved local, state, and federal requirements. Consult state environmental agency.

Section 14. Transport Information

The batteries are considered to be "Dry cell" batteries and are unregulated for purpose of transportation by the U.S. DOT, ICAO, IATA and IMDG. The only DOT requirement for shipping these batteries is special provision 130 which states: " Batteries, dry are not subject to the requirements of this subchapter only when they are offered for transportation in a manner that prevents the dangerous evolution of heat (For example, by the effective insulation of exposed terminals). The only requirement for shipping these batteries by ICAO and IATA is Special Provision A123 which states: " An electrical battery or battery powered device having the potential of dangerous evolutions of heat that is not prepared so as to prevent a short-circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals; or in the case of equipment, by disconnection of the battery and protection of exposed terminals) is forbidden from transportation." The international Maritime Dangerous Goods Code (IMDG) regulate them for ocean transportation under Special Provision 304 which says : Batteries, dry, containing corrosive electrolyte which will not flow out of the battery if the battery case is cracked are not subject to the provision of this Code provided the batteries are securely packed and protected against short-circuits. Examples of such batteries are: alkali-manganese, zinc carbon, nickel metal hydride and nickel-cadmium batteries. Such batteries have been packed in inner packaging in such a manner as to effectively prevent short circuit and movement that could lead to short-circuit.

Transport Fashion: By air, by sea, by railway, by highway.

The conclusion:Not regulated by IMO IMDG.

Section 15. Regulatory Information

Law Information

《Dangerous Goods Regulation 66th Editon》
《Recommendations on Transport of Dangerous Goods Model Regulations》
《International Maritime Dangerous Goods 41-22 Editon》
《Technical Instructions for the Safe Transport of Dangerous Goods》
《Classification and code of dangerous goods》
《Occupational Safety and Health Act》(OSHA)
《Toxic Substances Control Act》(TSCA)
《Consumer Product Safety Act》(CPSA)
《Federal Environmental Pollution Control Act》(FEPCA)
《The Oil Pollution Act》(OPA)
《Superfund Amendments and Reauthorization Act III(302/311/312/313)》(SARA)
《Resource Conservation and Recovery Act》(RCRA)

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《Safety Drinking Water Act》(CWA)
《California Proposition 65》
《Code of Federal Regulations》(CFR)
In accordance with all Federal, State and local laws.

Section 16. Other Information

The above information is based on the data of which we are aware and is believed to be correct as of the data hereof. Since this information may be applied under conditions beyond our control and with which maybe unfamiliar and since data made available subsequent to the data hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

MSDS Creation Date: 2025-01-01

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海 运
By Sea

NO.202500809106190

CNAS 中国认可 检验 INSPECTION CNAS IB0071

运输危险性鉴定书

Hazard Classification and Identification Report for Transport of Goods

非限制性货物

样品名称 ： 碱性电池（LR03 1.5V 900mAh）

Sample Name: Alkalina battery（LR03 1.5V 900mAh）

委托单位 ： 天津市钜华大能电池有限公司
TIANJIN JUHUADANENG BATTERY CO.,LTD

生产单位 ： 天津市钜华大能电池有限公司
TIANJIN JUHUADANENG BATTERY CO.,LTD

上海化工院检测有限公司 检验检测专用章

Witness Better Life SICIT 上海化工院检测有限公司
SHANGHAI INSTITUTE OF CHEMICAL INDUSTRY TESTING CO.,LTD.

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运输危险性鉴定书

Hazard Classification and Identification Report for Transport of Goods

NO. 202500809106190

样品名称 Sample Name	中文 Chinese	碱性电池（LR03 1.5V 900mAh）
	英文 English	Alkalina battery（LR03 1.5V 900mAh）
委托单位 Applicant		天津市钜华大能电池有限公司 TIANJIN JUHUADANENG BATTERY CO.,LTD
生产单位 Manufacturer		天津市钜华大能电池有限公司 TIANJIN JUHUADANENG BATTERY CO.,LTD
检验方法、程序 Inspection Methods and Procedures		国际海事组织《国际海运危险货物规则》（2022版） IMO International Maritime Dangerous Goods Code (2022 Edition)
样品外观与气味 Appearance & Odor		黑色,白色双色金属外壳，无臭 black and whiteMetal shell,odorless

IDENTIFICATION CONCLUSION 鉴定结论

1. 危险性识别(Hazards identification)

无。
None.

2. 海运按照IMO IMDG Code办理的类项(Suggestion according to IMO IMDG Code)

可按非限制性货物条件办理。
The product is not subject to IMO IMDG Code.

3. 包装类别(Packing Group)

无。
None.

检验日期: Inspection Date: 2024-12-06　签发日期: Issue Date: 2024-12-08　生效日期: Effective Date: 2025-01-01

备注 Comment	/

批准 Approver: 王[illegible]　审核 Checker: 董[illegible]　主检 Appraiser: 钱[illegible]

运输危险性鉴定书

Hazard Classification and Identification Report for Transport of Goods

NO. 202500809106190

鉴定项目 Identification Items	鉴　定　结　果 Identification Results
爆炸危险性鉴定 Identification of Explosive Hazards	本品不属于爆炸品。 The product is not classified in Explosives.
易燃危险性鉴定 Identification of Flammable Hazards	本品不属于易燃危险品。 The product is not classified in Flammable Substances.
氧化危险性鉴定 Identification of Oxidative Hazards	本品不属于氧化剂和有机过氧化物。 The product is not classified in Oxidizing Substances and Organic Peroxides.
毒害及传染危险性鉴定 Identification of Toxic & Infectious Hazards	本品不属于毒害品和感染性物质。 The product is not classified in Toxic and Infectious Substances.
放射危险性鉴定 Identification of Radioactive Hazard	本品无放射危险性。 The product is not classified in Radioactive Material.
腐蚀危险性鉴定 Identification of Corrosive Hazard	本品不属于腐蚀品。 The product is not classified in Corrosives.
其他危险性鉴定 Identification of other Hazards	电池必须具有适当的防短路措施，若是以电池为动力的装置、设备或车辆还须采取有效的防止意外启动措施。 The battery must be protected appropriately to prevent a short circuits and any battery powered device, equipment or vehicle must be effectively prepared to prevent unintentional activation.

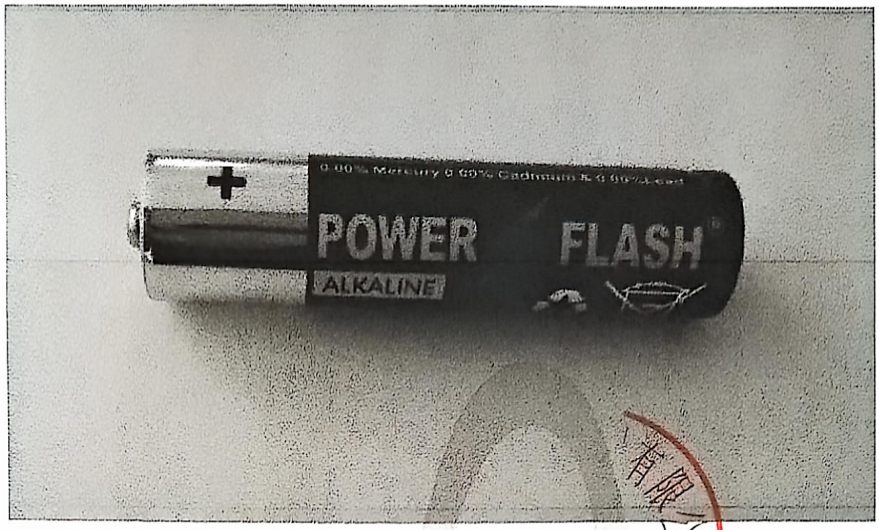
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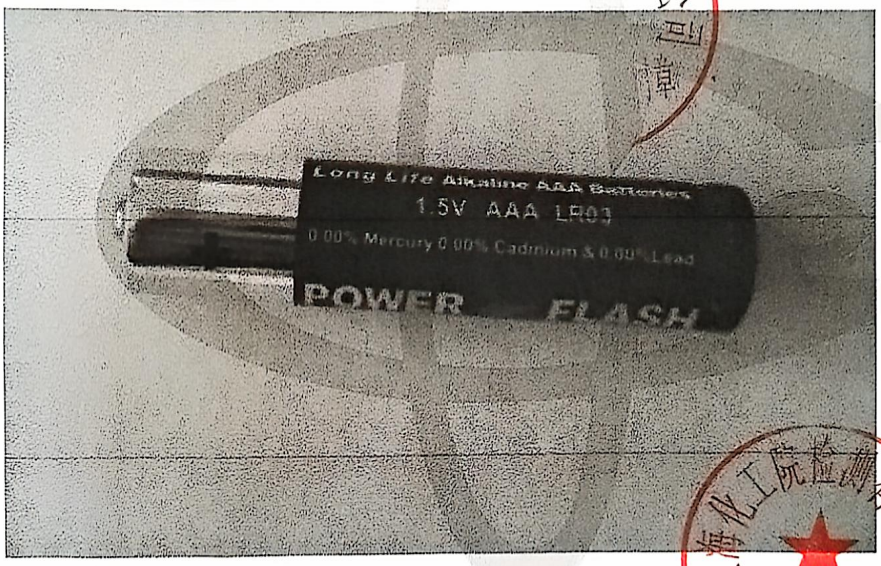
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Hazard Classification and Identification Report for Transport of Goods

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检验检测专用章
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