

**TEST REPORT**

Report No.: NCT22019186XB1-1

Date: May. 18, 2022

Page 1 of 4

**Applicant** : Guangzhou shundi Ming electronics technology co.,LTD  
**Address** : 5th Floor, Ganhu Industrial Village(Factory Building), Industrial Processing Zone, Xintang Guangdong, Town, Zengcheng District Guangzhou  
**Manufacturer** : Guangzhou shundi Ming electronics technology co.,LTD  
**Address** : 5th Floor, Ganhu Industrial Village(Factory Building), Industrial Processing Zone, Xintang Guangdong, Town, Zengcheng District Guangzhou  
**Products** : Li-ion Battery  
: SDM 18650X2-4000,18650-4400, 18650-4500, 18650-4600, 18650-4800,  
**Model / NO.** 18650-5000,18650-5200,18650-5600,18650-5800,18650-6000,  
18650-6200, 18650-6400, 18650-6600, 18650-3600  
**Trademark** : N/A  
**Receiving Date** : May. 10, 2022  
**Testing Period** : May. 10, 2022 to May. 18, 2022

**Test Requested:** Selected test(s) as requested by client.

**Test Method:** Please refer to next page(s).

**Test Results:** Please refer to next page(s).

**Conclusion:** Based upon the performed tests by submitted samples, the test results comply with the limits of the Directive 2006/66/EC and its amended Directive 2013/56/EU.

**Signed for and on behalf of**  
**Shenzhen NCT Testing Technology Co., Ltd.**



Shenzhen NCT Testing Technology Co., Ltd.

1 / F, No. B Building, Mianshang Younger Pioneer Park, Hangcheng Road, Gushu Xixiang Street,  
Baoan District, Shenzhen, Guangdong, China

**TEST REPORT**

Report No.: NCT22019186XB1-1

Date: May. 18, 2022

Page 2 of 4

**Test Results by chemical method (Unit: mg/kg):****Test Method:**

No.	Test Item :	Test Method (Reference)	MDL(%)	Limit(%)	Result
1	Lead (Pb)	Acid digestion method, ICP-OES	0.0002	---	N.D.
2	Cadmium (Cd)	Acid digestion method, ICP-OES	0.0002	0.002	N.D.
3	Mercury (Hg)	Acid digestion method, ICP-OES	0.0002	0.0005	N.D.

**Note:**

(1) 1 mg/kg = 1 ppm = 0.0001%

(2) N.D. = Not Detected (less than MDL)

(3) MDL = Method Detection Limit

(4) "--" = Not Regulated

(5) Remark: According to the Article 21(3) of Directive 2006/66/EC, Battery, accumulator and button cell shall include the chemical symbol Mercury when containing more than 0.0005% of Hg, the chemical symbol Cadmium when containing more than 0.002% of Cd and the chemical symbol Pb when containing more than 0.004% of Pb.

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## TEST REPORT

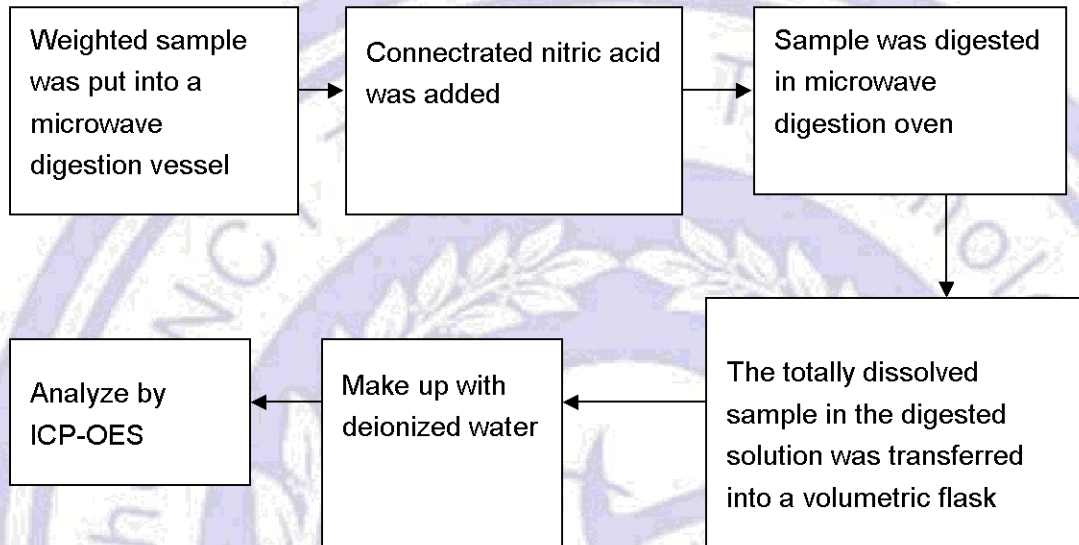
Report No.: NCT22019186XB1-1

Date: May. 18, 2022

Page 3 of 4

### Test Flow

#### 1. To Determine Lead, Cadmium and Mercury Contents:





## TEST REPORT

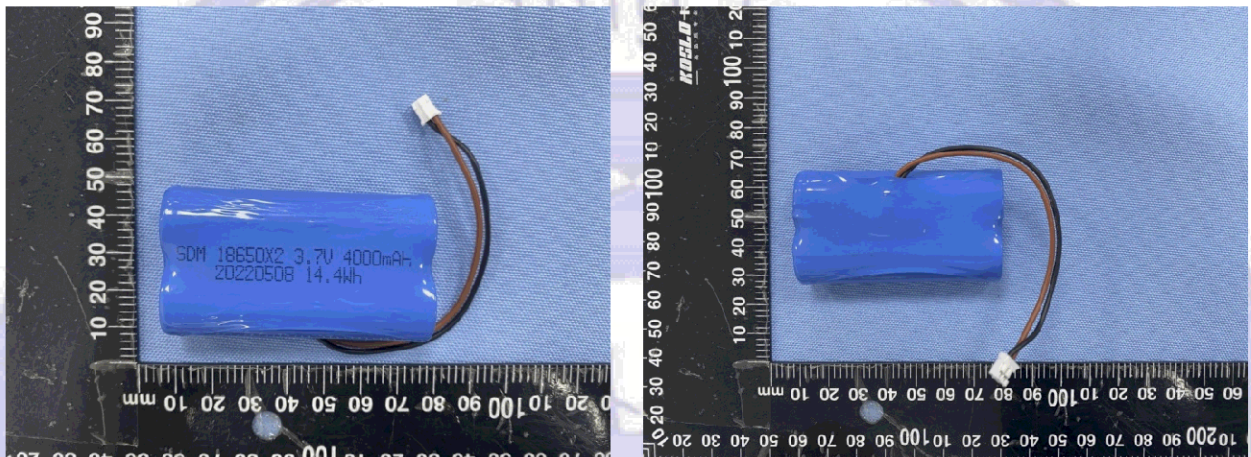
Report No.: NCT22019186XB1-1

Date: May. 18, 2022

Page 4 of 4

### Photos

Model: SDM 18650X2-4000



\*\*\*End of Report\*\*\*

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Search Number: NCT22019186XB1-1

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# MSDS Report

<b>Prepared For :</b> 申请商:	Guangzhou shundi Ming electronics technology co., LTD 广州市顺迪铭电子科技有限公司 3 floor No.78, new Dun Road, Xintang, Zengcheng, Guangzhou 广州市增城市新塘新墩路 78 号 3 楼
<b>Product Name:</b> 产品名称:	Rechargeable lithium-ion battery 可充电锂离子电池
<b>Model 型号:</b>	18650 3.7V 4000MAH
<b>Nominal Voltage:</b> 标称电压	3.7V
<b>Typical Capacity:</b> 典型容量:	4000mAh, 14.8Wh
<b>Weight 重量:</b>	94g
<b>Dimension 尺寸 :</b>	67.5mm X 37.5mm X 20.0mm(L×W×T)
<b>Prepared By :</b> 编制单位:	Shenzhen NCT Testing Technology Co., Ltd. 深圳诺测检测技术有限公司 2A, 2/F., Building C and 1/F., Building B, Mianshang Younger Pioneer Park, Hangcheng Road, Gushu, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China 广东省深圳市宝安区西乡街道固戍航城大道绵商青年创业园 B 栋第 1 层、 C 栋 2 层 2A
<b>Report No.</b> 报告编号:	NCT21046740XM1-1

Written by 编写: Vera Li

Approved by 批准:

Inspected by 审核: Hely Wang

Date 日期: 2022.01.01



# Material Safety Data Sheet

## 化学品安全技术说明书

### Section 1- Chemical Product & Company Identification

#### 第一部分 化学品及企业标识

**Product Name:** Rechargeable lithium-ion battery

产品名称: 可充电锂离子电池

**Manufacture:** Guangzhou shundi Ming electronics technology co., LTD

制造商: 广州市顺迪铭电子科技有限公司

**Address:** 3 floor No.78, new Dun Road, Xintang, Zengcheng, Guangzhou

地址: 广州市增城市新塘新墩路 78 号 3 楼

**Contact Person** 联系人: Mr. Yuan

**Tel** 电话: +86-13500006519

**Fax** 传真: N/A

**Emergency Tel** 应急电话: +86-13500006519

**E-mail** 邮箱: 1336951420@qq.com

**F-Item Code** 项目号: NCT21046740XM1-1

### Section 2- Hazards Identification

#### 第二部分 危险性概述

<b>Hazard Description</b> 危险性描述	Not dangerous with normal use. Do not dismantle, open or shred the battery ingredients contained within or their ingredients products could be harmful. 正常使用没有危险, 不能拆解、打开或分解电池, 里面的材料或成分是有危害的。
<b>Primary Route(s) of Exposure</b> 接触途径	Inhalation, Ingestion, Skin contact and Eye contact. 吸入、食入、皮肤接触、眼睛接触。



<b>Potential Health Effects</b>	<b>Inhalation:</b> Vapors or mists from a ruptured battery may cause respiratory irritation. 吸入：破裂的电池散发出来的气雾会引起呼吸道刺激。
<b>Potential Health Effects</b>	<b>Ingestion:</b> The battery ingredients contained within or their ingredients products can cause serious chemical burns of mouth, esophagus, and gastrointestinal tract. 食入：电池的组成成分或原料可以导致嘴，食道和胃肠道的严重化学烧伤。
<b>Potential Health Effects</b>	<b>Skin:</b> Skin contact with contents of an open battery can cause severe irritation or burns to the skin. 皮肤：皮肤接触到电池的內部化学材料可能会导致严重的刺激或烧伤皮肤。
<b>Potential Health Effects</b>	<b>Eye:</b> Eye contact with contents of an open battery can cause severe irritation or burns to the eye. 眼睛：眼睛接触到电池的內部化学材料可能会导致严重的刺激或烧伤眼睛。

## Section 3- Composition/Information on Ingredients

### 第三部分 成分/组成信息

<b>Chemical Name</b> 化学名称	<b>Concentration or concentration ranges (%)</b> 浓度或浓度范围(%)	<b>CAS Number</b> CAS 号 (化学文摘索引登记号)
Lithium Cobalt Oxide 钴酸锂	35-38	12190-79-3
Graphite 石墨	20-22	7782-42-5
Copper 铜	9-10	7440-50-8
Aluminum 铝	5-6	7429-90-5
Ethylene carbonate 碳酸乙烯酯	14-16	96-49-1
Polypropylene 聚丙烯	5-6	9003-07-0
Carbonate, methyl ethyl 碳酸甲乙酯	4-5	623-53-0
Phosphate(1-), hexafluoro-, lithium 六氟磷酸锂	5-6	21324-40-3

Note: CAS number is Chemical Abstract Service Registry Number.

注意：CAS 号是化学文摘服务注册号。

N/A=Not apply.

N/A =不适用。

## Section 4- First Aid Measures



## 第四部分 急救措施

<b>Inhalation</b> 吸入	Remove source of contamination or move victim to fresh air. Obtain medical advice. 移除污染源或者将受害者移至新鲜空气处。寻求医生建议。
<b>Ingestion</b> 食入	Please rinse mouth thoroughly with water. Induce vomiting under the guidance of professional personage. Please seek medical treatment in time. 立即用清水漱口，在专业人士的指导下催吐，速就医。
<b>Skin contact</b> 皮肤接触	Remove contaminated clothes and rinse skin with plenty of water or shower for 15 minutes. Get medical aid. 脱下已污染衣服，用大量的水冲洗至少 15 分钟，速就医。
<b>Eye contact</b> 眼睛接触	Irrigate with flowing water for 15 minutes. If irritation persists, consult a physician. 用流动水冲洗 15 分钟，如刺激持续发生，请求助于医生。

## Section 5- Fire Fighting Measures

## 第五部分 消防措施

<b>Characteristics of Hazard</b> 危险特性	Toxic fumes, gases or vapors may evolve on burning. 火灾时可释放有害浓烟、气体或者蒸汽。
<b>Hazardous Combustion Products</b> 燃烧产生的危险物品	Carbon monoxide, carbon dioxide, lithium oxide fumes and so on. 一氧化碳，二氧化碳，锂氧化物烟气等。
<b>Fire-extinguishing Methods and Extinguishing Media</b> 灭火方法及灭火剂	Please use water, dry sand and other proper fire extinguishing media. 请使用水，干燥沙等合适的灭火介质。
<b>Attention in Fire-extinguishing</b> 灭火注意事项	The firemen should put on antigas masks and full fire-fighting suits. 消防人员须佩戴防毒面具、穿全身消防服。

## Section 6- Accidental Release Measures

**第六部分 泄露应急处理**

<b>Personal Precautions, protective equipment, and emergency procedures</b> 个人预防措施、防护装备和应急程序	Restrict access to area until completion of clean-up. Do not touch the spilled material. Wear adequate personal protective equipment as indicated in Section 8. 限制区域,直到完成清理工作。请勿触摸泄漏的材料。穿戴适当的个人防护设备,如第 8 部分所示。
<b>Environmental Precautions</b> 环境保护措施	Prevent material from contaminating soil and from entering sewers or waterways. 防止物质污染土壤和进入下水道或水道。
<b>Methods and materials for Containment</b> 方法和材料控制	Stop the leak if safe to do so. Contain the spilled liquid with dry sand or earth. Clean up spills immediately. 出于安全,阻止泄漏,可以用干砂或沙土来遏制液体泄露,立即清理泄漏。
<b>Methods and materials for cleaning up</b> 清理的方法和材料	Absorb spilled material with an inert absorbent (dry sand or earth). Scoop contaminated absorbent into an acceptable waste container. Collect all contaminated absorbent and dispose of according to directions in Section 13. Scrub the area with detergent and water; collect all contaminated wash water for proper disposal. 用惰性吸收剂(干砂或沙土)吸收溢出的材料。污染物转移到可吸收废物的容器。收集所有受污染的吸收剂和根据第 13 部分的指令处置。用洗涤剂和水清洁污染区域,收集所有受污染的洗涤水进行适当处置。

**Section 7- Handling and Storage****第七部分 操作处置与储存**

<b>Handling</b> 操作	Don't handling the batteries in manner that allows terminals to short circuit. Do not open, disassemble, crush or burn battery. 不要以让接头短路的方式对电池进行操作。不要打开,分解,挤压或燃烧电池。
<b>Storage</b> 储存	If the battery is subject to storage for such a long term as more than 3 months, it is recommended to recharge the battery periodically. 如果电池长期存放超过 3 个月,建议定期对电池充电。 Long period storage: -10℃~35℃, 60±25%R.H 长期存储: -10℃~35℃, 相对湿度 60±25% Do not storage the battery haphazardly in a box or drawer where they may short-circuit each other or be short-circuited by other metal objects. 不要将电池随意丢在盒子或抽屉里,以免电池之间或电池与其他金属物质发生短路。 Keep out of reach of children. 储存在小孩接触不到的地方。 Do not expose the battery to heat or fire. Avoid storage in direct sunlight. 不要将电池暴露在火源和热源附近,避免在阳光直射下存储。



Do not store together with oxidizing and acidic materials.  
不要与氧化和酸性物质存储在一起。

## Section 8 - Exposure Controls/Personal Protection

### 第八部分 接触控制和个体防护

<b>Engineering Controls</b> 工程控制	<p>No engineering controls are required for handling batteries that have not been damaged. Personal protective equipments for damaged batteries should include chemical resistant gloves and safety glasses.</p> <p>操作未破损的电池，没有工程控制要求。对于破损的电池，个人防护用品应包括化学品防护手套和安全眼镜。</p>
<b>Personal Protective Equipment</b> 个人防护设备	<p><b>Respiratory Protection:</b> In case of battery venting, provide as much ventilation as possible. Avoid confined areas with venting cell cores. Respiratory Protection is not necessary under conditions of normal use. Not necessary under conditions of normal use.</p> <p>呼吸保护：当电池排气阀打开时，应尽量使通风设备开至最大，避免将打开排气阀的电芯局限在某一狭窄空间内。正常操作条件下，呼吸保护是不必要的。正常使用条件下不必考虑。</p> <p><b>Protective Gloves:</b> Not necessary under conditions of normal use.</p> <p>防护手套：正常使用条件下不必考虑。</p> <p><b>Other Protective Clothing or Equipment:</b> Not necessary under conditions of normal use.</p> <p>其他防护服装或设备：正常使用条件下不必考虑。</p> <p>Personal Protection is recommended for venting battery: Respiratory Protection, Protective Gloves, Protective Clothing and safety glass with side shields.</p> <p>当电池排气阀打开时，应做好个人防护：呼吸防护，防护手套，防护服装和有护边的安全玻璃罩都是要准备的。</p>

## Section 9- Physical and Chemical Properties

### 第九部分 理化特性

<b>Physical State</b> 物理状态	<p>Form: Solid 形态：固体</p>
	<p>Color: Blue 颜色：蓝色</p>
	<p>Odour: Odorless 气味：无气味</p>
<b>Change in condition</b> 变化条件：	



<b>pH, with indication of the concentration</b> pH, 有浓度指示	No data is available 无数据可提供
<b>Melting point/freezing point</b> 熔点/凝固点	No data is available 无数据可提供
<b>Boiling Point, initial boiling point</b> 沸点, 初沸点	No data is available 无数据可提供
<b>Flash Point</b> 闪点	No data is available 无数据可提供
<b>Upper/lower flammability or explosive limits</b> 上/下燃烧或爆炸限值	No data is available 无数据可提供
<b>Vapor Pressure</b> 蒸汽压	No data is available 无数据可提供
<b>Vapor Density: (Air = 1)</b> 蒸汽密度: (空气= 1)	No data is available 无数据可提供
<b>Density/relative density</b> 密度/相对密度	No data is available 无数据可提供
<b>Solubility in Water</b> 水溶性	Insoluble 不能溶解
<b>n-octanol/water partition coefficient</b> 正辛醇/水分配系数	No data is available 无数据可提供
<b>Auto-ignition temperature</b> 自燃温度	No data is available 无数据可提供
<b>Decomposition temperature</b> 分解温度	No data is available 无数据可提供
<b>Odour threshold</b> 溴阈	No data is available 无数据可提供
<b>Evaporation rate</b> 蒸发速率	No data is available 无数据可提供
<b>Flammability (soil, gas)</b> 易燃性 (土壤, 气体)	No data is available 无数据可提供
<b>Viscosity</b>	No data is available

粘度

无数据可提供

## Section 10 – Stability and Reactivity

### 第十部分 稳定性和反应性

<b>Stability</b> 稳定性	Stable under normal temperatures and pressures. 常温常压下稳定。
<b>Conditions to Avoid</b> 应避免的条件	Heat above 70°C or Incinerate, Deform, Mutilate, Crush, Disassemble, Overcharge, Short circuit, Expose over a long period to humid conditions. 加热 70°C 以上或焚烧、变形、毁坏、粉碎、拆卸、过充电、短路, 长时间暴露在潮湿的条件下。
<b>Hazardous Decomposition Products</b> 危害分解物	Toxic Fumes, and may form peroxides. 有毒烟雾, 并可能形成过氧化物。
<b>Possibility of Hazardous Reaction</b> 危险反应的可能性	If leaked, forbidden to contact with strong oxidizers, mineral acids, strong alkalis, halogenated hydrocarbons. 如果发生泄露, 避免与强氧化剂, 无机酸, 强碱, 卤代烃接触。

## Section 11 – Toxicological Information

### 第十一部分 毒理学信息

<b>Irritation</b> 刺激	In the event of exposure to internal contents, vapor fumes may be very irritating to the eyes and skin. 内部物质暴露的情况下, 蒸汽烟雾可能对眼睛和皮肤产生刺激性。
<b>Sensitization</b> 致敏	No data is available 无数据可提供
<b>Reproductive Toxicity</b> 再生毒性	No data is available 无数据可提供
<b>Toxicologically Synergistic Materials</b> 协同材料毒理学	No data is available 无数据可提供

## Section 12-Ecological Information



**第十二部分 生态学信息**

<b>General note</b> 通用信息	Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system. 不允许未稀释或大量的产品到达地下水、水道或污水系统。
<b>Anticipated behavior of a chemical product in environment/possible environmental impact/ecotoxicity</b> 化学产品在环境/可能的环境预期的行为的一种生态毒性	No data is available 无数据可提供
<b>Mobility in soil</b> 土壤中移动性	No data is available 无数据可提供
<b>Persistence and Degradability</b> 持久性和降解性	No data is available 无数据可提供

**Section 13 – Disposal Considerations****第十三部分 废弃处置**

<b>Waste Treatment</b> 废弃处置方法	Recycle or dispose of in accordance with government, state & local regulations. 建议遵照国家和地方法规处置或再利用。
<b>Attention for Waste Treatment</b> 废弃注意事项	Deserted batteries couldn't be treated as ordinary trash. Couldn't be thrown into fire or placed in high temperature. Couldn't be dissected, pierced, crushed or treated similarly. Best way is recycling. 废电池不能被当做普通垃圾。不能扔进火中或置于高温下。不能解体, 刺穿, 破碎或类似的处理。最好的办法是回收利用。

**Section 14 – Transport Information****第十四部分 运输信息**

This report applies to by sea, by air and by land;  
本报告适用于海运, 空运和陆运

The Rechargeable lithium-ion battery (model: 18650 3.7V 4000MAH) tested according to the requirements of



the UNITED NATIONS "Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria" Part III, subsection 38.3;

该可充电锂离子电池（型号：18650 3.7V 4000MAH）经过测试符合联合国《关于危险货物运输的建议书 实验和标准手册》第三部分，第 38.3 章节的要求。

The Rechargeable lithium-ion battery was protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to short circuit;  
该可充电锂离子电池做了防短路保护。包括防止与同一封装内的导电材料接触可能导致的短路。

The packaging shall be adequate to avoid mechanical damage during transport, handling and stacking.  
包装应足以避免在运输，处理和堆放期间的机械损坏。

The package must be handled with care and that a flammability hazard exists if the package is damaged.  
包装必须小心处理，如果包装损坏，存在易燃危险。

The Rechargeable lithium-ion battery can be shipped by air in according to Section IB of PACKING INSTRUCTION 965, or Section II of PACKING INSTRUCTION 966~967 of the 2022 IATA Dangerous Goods regulations 63<sup>rd</sup> Edition.

该可充电锂离子电池可以根据 2022 年 IATA 危险物品规则第 63 版包装指令 965 第 IB 部分或包装指令 966~967 第 II 部分运输。

With regard to transport, the following regulations are cited and considered:

关于运输，引用和考虑了以下法规：

- The International Civil Aviation Organization (ICAO) Technical Instructions.
- 国际民用航空组织（ICAO）技术细则。
- The International Air transport Association (IATA) Dangerous Goods Regulations.
- 国际航空运输协会（IATA）危险物品规则。

UN number of lithium battery: UN3480 or UN3481;

锂电池的 UN 编号：UN3480 或 UN3481;

UN Proper shipping name/Description (technical name): Lithium ion batteries or Lithium ion batteries contained in equipment or Lithium ion batteries packed with equipment;

UN 合适的运输名称/描述（技术名称）：锂离子电池，锂离子电池内置于设备中或锂离子电池与设备包装在一起；

UN Classification (Transport hazard class): Class 9 (PI965 Section IB) or N/A (PI966~967 Section II)

UN 分类（运输危险类别）：9 类危险品（包装指令 965 第 IB 部分）或者 不适用（包装指令 966~967 第 II 部分）

- The International Maritime Dangerous Goods (IMDG) Code.
- 国际海运危险货物（IMDG）规则。

UN number of lithium battery: UN3480 or UN3481;

锂电池的 UN 编号：UN3480 或 UN3481;

UN Proper shipping name/Description (technical name): Lithium ion batteries or Lithium ion batteries contained in equipment or Lithium ion batteries packed with equipment;

UN 合适的运输名称/描述（技术名称）：锂离子电池，锂离子电池内置于设备中或锂离子电池与设备包装在一起；

UN Classification (Transport hazard class): N/A

UN 分类（运输危险类别）：不适用



Marine pollutant(Y/N): N

海洋污染物 (Y/N) : N

The battery is not restricted according to IMO IMDG Code (inc Amdt 40-20).

海运按照 IMO IMDG Code (inc Amdt 40-20) 可按普通货物条件办理。

Need to meet the Special Provision: International maritime dangerous goods code (IMDG) 188, 230, 348, 384.

需要符合这些特殊条款: 国际海运危险货物规则 (IMDG) 188, 230, 348, 384.

EmS No.: F-A, S-I

EmS 编号: F-A, S-I

## Section 15 – Regulatory Information

### 第十五部分 法规信息

《Dangerous Goods Regulations》

《危险物品规则》

《Recommendations on the Transport of Dangerous Goods Model Regulations》

《危险货物运输的建议模型规定》

《International Maritime Dangerous Goods》

《国际海上危险货物运输》

《Technical Instructions for the Safe Transport of Dangerous Goods》

《危险货物安全运输技术指南》

《Classification and code of dangerous goods》

《危险货物分类与代码》

《Occupational Safety and Health Act》(OSHA)

《职业安全与健康法案》(OSHA)

《Toxic Substance Control Act》(TSCA)

《有毒物质控制法》(TSCA)

《Consumer Product Safety Act》(CPSA)

《消费者产品安全法案》(CPSA)

《Federal Environmental Pollution Control Act》(FEPCA)

《联邦环境污染控制法》(FEPCA)

《The Oil Pollution Act》(OPA)

《石油污染法》(OPA)

《Superfund Amendments and Reauthorization Act TitleIII(302/311/312/313)》(SARA)

《超级基金修正案和再授权法案 TitleIII(302/311/312/313)》(SARA)

《Resource Conservation and Recovery Act》(RCRA)

《资源保护和恢复法案》(RCRA)

《Safety Drinking Water Act》(CWA)

《安全饮用水法》(CWA)



《California Proposition 65》

《加州 65 号提案》

《Code of Federal Regulations》(CFR) 49 CFR sections 100-185, 49 CFR -173.185

《联邦条例》(CFR) 49 CFR sections 100-185, 49 CFR -173.185

EU Battery Directive (2006/66/EC, 2013/56/EU)

欧盟电池指令(2006/66/EC, 2013/56/EU)

Regulation (EC) No. 1907/2006 on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)

关于化学品的注册、评估、授权和限制(EC)第 1907/2006 号规例

In accordance with all Federal, State and local laws.

符合所有联邦、州和地方法律。

## Section 16 – Additional Information

### 第十六部分 其他信息

The information above is believed to be accurate and represents the best information currently available to us. However, we makes no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. Although reasonable precautions have been taken in the preparation of the data contained herein, it is offered solely for your information, consideration and investigation. This material safety data sheet provides guidelines for the safe handling and use of this product; it does not and cannot advise on all possible situations, therefore, your specific use of this product should be evaluated to determine if additional precautions are required.

The data/information contained herein has been reviewed and approved for general release on the basis that this document contains no export controlled information.

在我们看来上面的信息是准确的，这是我们目前能提供的最佳的信息。但是，对于这些信息，我们不对商品的性能做任何明示的或者暗示的保证，我们也不对使用这些信息造成的后果担负任何责任。用户应当自己调查研究后决定这些信息是否适用于他们的特定用途。尽管在该文档里提出了合理的预警，但是这仅仅只是给您做参考，考量和调查。这份化学品安全技术说明书提供了安全处理和使用该产品的指南，但是它没有，也不能对所有可能发生的情景提出建议，所以您需要根据您对该产品的特定使用情况来决定是否需要其他的预防措施。

此处所包含的数据/信息作为普通版本已经审核并批准，但是本文档不包含出口控制信息。

\*\*\*\*\***End of report 报告结束**\*\*\*\*\*



中国认可  
检验  
INSPECTION  
CNAS IB0078

危险物品  
DANGEROUS GOODS

## 航空运输条件鉴别报告书

### Identification and Classification Report for Air Transport of Goods

度有效  
12月31日

此报告本年度有效  
有效期至2022年12月31日

报告编号: PEKGZ202112105632LW740001

Issued No.:

生效日期:

2022.01.01

Effective Date:

委托单位: 广州市顺迪铭电子科技有限公司

Applicant: Guangzhou shundi Ming electronics technology co., LTD

物品名称: 可充电锂离子电池 18650 3.7V 4000MAH 14.8Wh

Name of Goods: Rechargeable lithium-ion battery 18650 3.7V 4000MAH 14.8Wh

北京迪捷姆空运技术开发有限公司

Beijing DGM Air Transport Technology Development Co.,Ltd.





# 报告书使用约定

## Terms of the Using of the Report

1. 本公司依据本年度国际航协《危险品规则》以及委托人（托运人或其代理人）提供的物品及其运输信息，确定货物的航空运输条件并出具此报告书。

The report is issued by DGM China according to IATA *Dangerous Goods Regulations* published in the current year and the information of the goods and the information of its shipping provided by the applicant (shipper or his agent).

2. 依据鉴别的需要，本公司要求委托人提供真实、完整的货物样品及资料。

According to the demand of identification and classification, DGM China requires the applicant to provide true and exact sample and data of the cargo.

3. 委托人保证申报的物品和/或提供的样品与交运的货物是同一种物质。

The applicant guarantees that the declared goods and/or the sample who provides should be identical with the contents of cargo that is to be transported.

4. 本公司仅对样品的鉴别结果负责。

DGM China is only responsible for the identification and classification of the sample provided by the applicant.

5. 本报告书经主检员、审核人和批准人签字并加盖本公司印章后生效。

This report will be effective only after it is signed by the inspector, checker and approver, and stamped by DGM China.

6. 未经本公司书面批准，不得复制本报告书。

The duplicating of this report is prohibited without the written approval of DGM China.

7. 私自转让、复制、盗用、冒用、涂改、或以任何媒体形式篡改的报告书无效。

The report is invalid when anything of the following happens - illegal transfer, reproduce, embezzlement, imposture, modification or tampering in any media form.

8. 为适应国际航协《危险品规则》的年度变化，报告书仅在本年度内有效。

This report is only valid within the year in which the IATA *Dangerous Goods Regulations* is effective.

地址：北京首都国际机场货运北路天竺综合保税区BGS货运楼249室

邮编：101300

电话：010-69479673

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网址：[www.dgmchina.com.cn](http://www.dgmchina.com.cn)

E-mail: [test@dgmchina.com.cn](mailto:test@dgmchina.com.cn)



项目编号 Item No.		PEKGZ202112105632	签发日期 Issued Date	2021. 12. 11
鉴别目的 Identification Purpose		是否属于航空运输危险物品 Dangerous Goods or not restricted	鉴别日期 Identification Date	2021. 12. 11
鉴别依据 Identification Criteria		IATA DGR 63rd, 2022		
物品名称 Name of Goods	中文 Chinese	可充电锂离子电池 18650 3.7V 4000MAH 14.8Wh		
	英文 English	Rechargeable lithium-ion battery 18650 3.7V 4000MAH 14.8Wh		
生产厂家 Manufacturer		广州市顺迪铭电子科技有限公司 Guangzhou shundi Ming electronics technology co., LTD		
件数 Pieces		注：本栏内容为托运人或其代理人在使用本报告书时候填写的运输信息，不属于鉴定内容。运输信息与报告书的关联性以及实际运输货物与报告书的一致性由托运人或其代理人保证，如发生任何不一致由托运人或其代理人承担全部责任。 (请认真填写本栏内容，并盖章) 负责人： 联系方式：		
运单号 Air waybill No.				
目的港 Destination				
物品信息 Nature of the goods		<p>该样品为蓝色近长方体电池。          型号：18650 3.7V 4000MAH          尺寸：67.5mm*37.5mm*20.0mm          每包装件中电池/电芯数量：64          每包装件中电池/电芯净重：6.016kg          该电池已经做好防短路措施并装入坚固的外包装内。          该锂电池不属于召回电池，不属于废弃和回收电池，并按照DGR3.9.2.6(e)规定的质量体系进行制造          根据委托方所提供的声明：本报告所述锂离子电池（或电芯）交付运输时，其荷电状态不超过设计额定容量的30%。          (注：单块电池的重量为94g。该电池的UN38.3检测报告由深圳诺测检测技术有限公司出具，报告编号：NCT19050563XB1-1；该电池的1.2米跌落测试报告由深圳诺测检测技术有限公司出具，报告编号：NCT19050563XB1-2。)          该电池的UN38.3试验概要由深圳诺测检测技术有限公司出具，详见附页。          This sample is blue almost cuboid battery.          Model: 18650 3.7V 4000MAH          Size: 67.5mm*37.5mm*20.0mm          Number of batteries / cells per package: 64          Net quantity of batteries/cells per package: 6.016kg          Batteries have been protected so as to prevent short circuits and packed in strong rigid outer packagings.          The lithium batteries don't belong to batteries returned to the manufacturer for safety reasons, are not waste lithium batteries and not lithium batteries being shipped for recycling or disposal, are manufactured under a quality management program as described in 3.9.2.6(e).          Lithium ion cells and batteries must be offered for transport at a state of charge(SoC) not exceeding 30% of their rated design capacity.</p>		





项目编号 Item No.		PEKGZ202112105632			
物品名称 Name of Goods	中文 Chinese	可充电锂离子电池 18650 3.7V 4000MAH 14.8Wh			
	英文 English	Rechargeable lithium-ion battery 18650 3.7V 4000MAH 14.8Wh			
鉴别结论 Conclusions		<p>该货物为锂离子/聚合物电池, 单独包装。额定瓦特小时为14.8Wh。已通过 UN38.3 测试, 已通过包装件1.2米跌落试验, 每个包装件上均有锂电池标记。</p> <p>参考有关资料, 根据DGR有关规定, 该物质分类识别为第9类(或项)危险品, UN3480。 This goods is lithium ion/polymer battery, packed individually. Watt-hour rating is 14.8Wh. Each battery is of a type proved to meet the Requirements of each test in the UN MANUAL OF TESTS AND CRITERIA, Part III, sub-section 38.3, Each package is capable of withstanding a 1.2m drop test in any orientation without damage to the cells contained therein, without shifting of the contents so as to allow cell to cell contact and without release of contents, Each package is marked with lithium battery mark.</p> <p>According to IATA DGR this substance is classified as dangerous goods Class (or division)9, UN3480.</p>			
建议运输 条件 Suggestion for Transport Condition	UN/ID 编号 UN/ID No.	运输专用名称 Proper Shipping Name		类或项 Class or Div. (次要危险性) (Subsidiary Risk)	包装等级 Packing Group
	UN3480	Lithium ion batteries		9	/
	包装说明 Packing Inst.	客货机 Passenger and Cargo Aircraft	Forbidden		
		仅限货机 Cargo Aircraft only	965, IB		
	注意事项 Remarks	本货物仅限货机运输。 The goods can be transported on cargo aircraft only.			
主检员 Prepared by:		审核人 Checked by:		批准人 Approved by:	
罗涛		梁生		报告单位 (盖章) Stamp	

制单: 毕丽雯

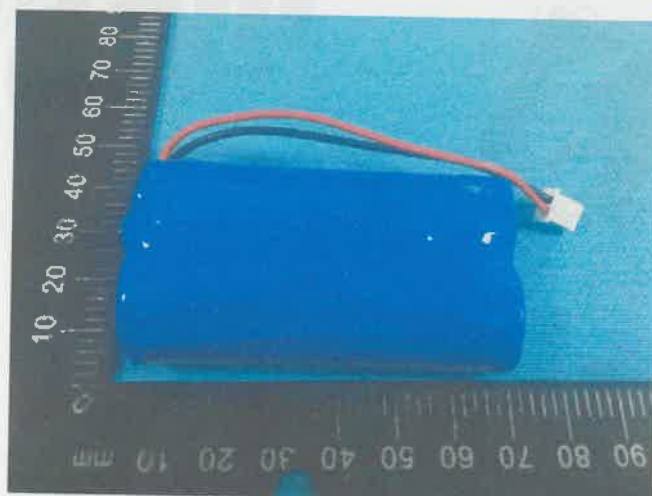
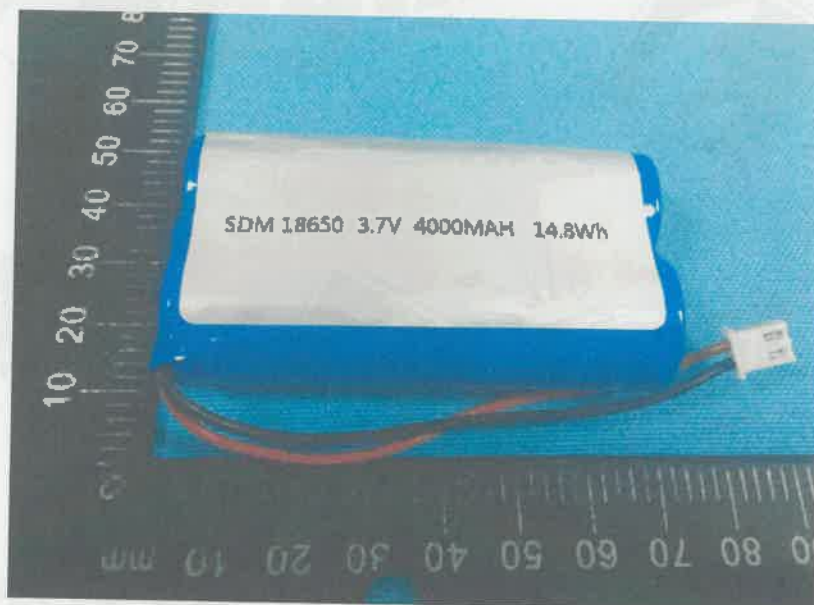


北京迪捷姆空运技术开发有限公司

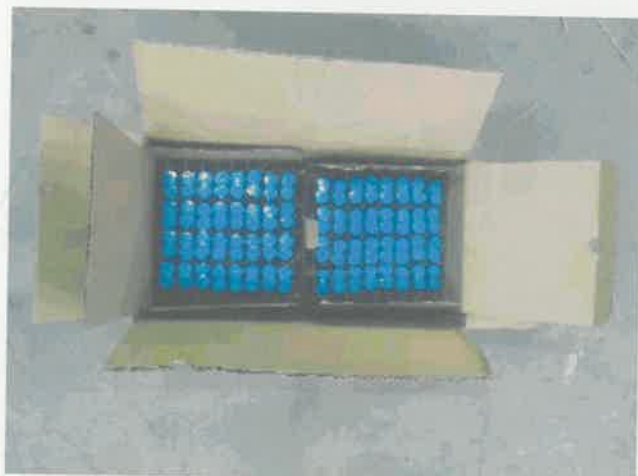
项目编号: PEKGZ202112105632

物品名称: 可充电锂离子电池 18650 3.7V 4000MAH 14.8Wh

电池/电芯 Battery / Cell:



包装件 Package:





## UN38.3 测试概要

### UN38.3 Test Summary

按照《试验和标准手册》第 38.3 小节对锂电池或锂电池组进行试验的情况概要  
Lithium cell or battery test summary in accordance with sub-section 38.3 of Manual of Tests and Criteria

<b>Product Name</b> 产品名称	Rechargeable lithium-ion battery 可充电锂离子电池	<b>Sample Model</b> 样品型号	18650 3.7V 4000MAH
<b>Basic parameter</b> 基本参数	3.7V, 4000mAh	<b>Product Type</b> 产品类型	Lithium ion battery 锂离子电池组
<b>Rated Energy</b> 额定能量	14.8Wh	<b>Lithium Content</b> 锂含量	--
<b>Sample Mass</b> 样品重量	94g	<b>Sample Physical description</b> 样品物理形态	Blue, Prismatic, Solid 蓝色, 棱柱形, 固体
<b>Client</b> 委托方	Guangzhou shundi Ming electronics technology co., LTD 广州市顺迪铭电子科技有限公司		
<b>Client Address</b> 委托方地址	3 floor No.78, new Dun Road, Xintang, Zengcheng, Guangzhou 广州市增城市新塘新墩路 78 号 3 楼		
<b>Manufacturer</b> 制造商	Guangzhou shundi Ming electronics technology co., LTD 广州市顺迪铭电子科技有限公司		
<b>Manufacturer Address</b> 制造商地址	3 floor No.78, new Dun Road, Xintang, Zengcheng, Guangzhou 广州市增城市新塘新墩路 78 号 3 楼		
<b>Factory</b> 工厂	Guangzhou shundi Ming electronics technology co., LTD 广州市顺迪铭电子科技有限公司		
<b>Factory Address</b> 工厂地址	3 floor No.78, new Dun Road, Xintang, Zengcheng, Guangzhou 广州市增城市新塘新墩路 78 号 3 楼		
<b>Manufacturer's contact information</b> 制造商联系信息	<b>Phone number</b> 电话号码	+86-13500006519	
	<b>Email address</b> 电子邮箱地址	1336951420@qq.com	
	<b>Website</b> 网址	---	

<b>UN38.3 Test Report No.</b> <b>UN38.3 测试报告编号</b>	NCT19050563XB1-1	<b>Test Date</b> <b>测试时间</b>	Dec. 13, 2019- Dec. 31, 2019
<b>Test No. 测试编号</b>	<b>Test item 测试项目</b>	<b>Conclusion 结论</b>	
T1	Altitude simulation 高度模拟	Pass 合格	
T2	Thermal test 温度试验	Pass 合格	
T3	Vibration 振动	Pass 合格	
T4	Shock 冲击	Pass 合格	
T5	External short circuit 外部短路	Pass 合格	
T6	Impact/Crush 撞击/挤压	Pass 合格	
T7	Overcharge 过度充电	Pass 合格	
T8	Forced discharge 强制放电	Pass 合格	
<b>Test Reference</b> <b>测试依据</b>	UNITED NATIONS "Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria" (ST/SG/AC.10/11/Rev.6/Amend.1 Section 38.3) 联合国《关于危险货物运输的建议书·实验和标准手册》第六修订版修正1第38.3节。		
<b>Assembled Battery Description</b> <b>集成电池组说明</b>	-----		
<b>Test Laboratory</b> <b>测试实验室</b>	Shenzhen NCT Testing Technology Co., Ltd. 深圳诺测检测技术有限公司		
<b>Test Lab's Address</b> <b>测试实验室地址</b>	1 / F, No. B Building, Mianshang Younger Pioneer Park, Hangcheng Road, Gushu Xixiang Street, Baoan District, Shenzhen, Guangdong, China 中国广东省深圳市宝安区西乡街道固成航城大道绵商青年创业园B栋第1层		
<b>Test Lab's Phone</b> <b>测试实验室电话</b>	+86-755-27790922		
<b>Test Lab's Email</b> <b>测试实验室邮箱</b>	sales@nct-testing.com		
<b>Test Lab's Website</b> <b>测试实验室网址</b>	http://www.nct-testing.cn		
<b>Tested by</b> <b>主检人</b>	<i>Michael Lei</i>	<b>Test Engineer</b> <b>测试工程师</b>	
<b>Inspected by</b> <b>审核人</b>	<i>Holy Wang</i>	<b>Technical Manager</b> <b>技术经理</b>	
<b>Approved by</b> <b>批准人</b>	<i>Billy Tu</i>	<b>General Manager</b> <b>总经理</b>	



**Identification and Classification Report for Transport of Goods**

**货物运输条件鉴别报告书**

**(Not subject to these Regulations)**

**非限制性**

Name of Goods:

Rechargeable lithium-ion battery 18650 3.7V  
4000MAH 14.8Wh

货物名称:

可充电锂离子电池 18650 3.7V 4000MAH 14.8Wh

Commission by:

Guangzhou shundi Ming electronics technology co.,  
LTD

委托单位:

广州市顺迪铭电子科技有限公司

Transportation:

Marine

运输方式:

海运

**Shenzhen NCT Testing Technology Co., Ltd.**

深圳诺测检测技术有限公司

Battery information 电池信息	Product Name 产品名称	Rechargeable lithium-ion battery 可充电锂离子电池	Model 型号	18650 3.7V 4000MAH
	Ratings 额定值	3.7V, 4000mAh	Colour 颜色	Blue 蓝色
	UN38.3 Test report No. UN38.3 检测报告 编号	NCT19050563XB1-1	Size 尺寸	(67.5×37.5× 20.0)mm
Package information 包装信息	Package weight 包装件重量	7.0kg	Number of batteries 电池数量	64/PCS
	Package Size 包装件尺寸	(390×270×150)mm	Battery net weight 电池净重	6.016kg
	1.2m Test report No. 1.2m 检测报告编号	NCT19050563XB1-2	Number of equipment 设备数量	N/A
Commissioned by 委托单位	Guangzhou shundi Ming electronics technology co., LTD 广州市顺迪铭电子科技有限公司			
Commissioner address 委托单位地址	3 floor No.78, new Dun Road, Xintang, Zengcheng, Guangzhou 广州市增城市新塘新墩路 78 号 3 楼			
Manufacturer 制造商	Guangzhou shundi Ming electronics technology co., LTD 广州市顺迪铭电子科技有限公司			
Manufacturer address 制造商地址	3 floor No.78, new Dun Road, Xintang, Zengcheng, Guangzhou 广州市增城市新塘新墩路 78 号 3 楼			
Identification Criteria 鉴定依据	IMDG CODE (Amdt 40-20) Special Provision 188. IMDG CODE (Amdt 40-20) 特殊规定 188			
Conclusion 鉴定结果	(UN No.) UN 编号:	/		
	(PSN) 运输专用名称:	/		
	(Class or Div.) 危险货物类别:	/		
	(PG) 包装等级:	/		
Comment 备注	Not Restricted As per IMDG CODE Special Provision 188. 根据 IMDG CODE 特殊规定 188 不受限制。			
Accepting Date 委托日期	2022.01.01	Issue Date 签发日期	2022.01.01	



Item 鉴别项目名称	Inspection Result 检验结果
Watt-hour rating of the battery is 14.8Wh. 该电池额定瓦特小时数为 14.8Wh。	≤100Wh
Each battery is proved to meet the requirements of each test in the UN MANUAL OF TESTS AND CRITERIA, Part III, sub-section 38.3. 锂电池已通过联合国《试验和标准手册》第 III 部分 38.3 测试。	Conform 符合
Batteries were manufactured under a quality management programme. 电池按照规定的质量管理体系进行制造。	Conform 符合
The lithium batteries don't belong to batteries returned to the manufacturer for safety reasons, are not waste lithium batteries and not lithium batteries being shipped for recycling or disposal. 该锂电池不属于召回电池，不属于废弃和回收电池。	Conform 符合
Each package is capable of withstanding a 1.2m drop test. 通过包装件 1.2 米跌落试验。	Conform 符合
The package must be appropriately marked according to special provision 188. 包装件需要按照特殊规定 188 的要求进行适当标记。	Conform 符合

Tested by:

主检: Michael Lei

Reviewed by:

审核: Hely Wang

Approved by:

批准:

## (Photo) 图片:

### Samples 样品:



### Package 包装:





## Important Notice

### 注意事项

1. This certification is issued according to "International Maritime Dangerous Goods" and transport information provided by the applicant (shipper or his agent).

本鉴定书依据《国际海运危险货物规则》，委托人(托运人或代理人)提供的物品及其运输信息出具。

2. The conclusion of this certification is responsible only for the sample provided by the applicant. The applicant should undertake the law responsibility that result from providing untruth sample and untruth information.

本鉴定书的鉴定结论仅对客户所送样品负责。由于客户提供的样品及其信息不真实而导致的一切后果均由客户负责。

3. This certification takes no account of the state and operator variations.

本鉴定书不考虑国家及经营人差异。

4. This certification will be effective only after it is signed or stamped by testing engineer, reviewer, approver, and stamped by NCT.

本鉴定书经主检人、审核人、批准人签字或签章并加盖本公司印章后生效。

5. This certification is invalid when anything of the following happens – illegal transfer, reproduction, embezzlement, imposture, modification or tampering in any media form.

本鉴定书私自转让、复制、盗用、冒用、涂改或以任何媒体形式篡改的均属无效。

6. This certification is valid from 2022-01-01 to 2022-12-31.

本鉴定书从 2022 年 01 月 01 日到 2022 年 12 月 31 日有效。

Company: Shenzhen NCT Testing Technology Co., Ltd.

试验单位: 深圳诺测检测技术有限公司

Address: 2A, 2/F., Building C and 1/F., Building B, Mianshang Younger Pioneer Park, Hangcheng Road, Gushu, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China

地 址: 广东省深圳市宝安区西乡街道国成航城大道绵商青年创业园 B 栋第 1 层、C 栋 2 层 2A

Hotline: 400-8868-419

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<http://www.ncttesting.com>

## UN38.3 测试概要


### UN38.3 Test Summary

按照《试验和标准手册》第 38.3 小节对锂电池或锂电池组进行试验的情况概要

#### Lithium cell or battery test summary in accordance with sub-section 38.3 of Manual of Tests and Criteria

<b>Product Name</b> 产品名称	Rechargeable lithium-ion battery 可充电锂离子电池	<b>Sample Model</b> 样品型号	18650 3.7V 4000MAH
<b>Basic parameter</b> 基本参数	3.7V, 4000mAh	<b>Product Type</b> 产品类型	Lithium ion battery 锂离子电池组
<b>Rated Energy</b> 额定能量	14.8Wh	<b>Lithium Content</b> 锂含量	--
<b>Sample Mass</b> 样品重量	94g	<b>Sample Physical description</b> 样品物理形态	Blue, Prismatic, Solid 蓝色, 棱柱形, 固体
<b>Client</b> 委托方	Guangzhou shundi Ming electronics technology co., LTD 广州市顺迪铭电子科技有限公司		
<b>Client Address</b> 委托方地址	3 floor No.78, new Dun Road, Xintang, Zengcheng, Guangzhou 广州市增城市新塘新墩路 78 号 3 楼		
<b>Manufacturer</b> 制造商	Guangzhou shundi Ming electronics technology co., LTD 广州市顺迪铭电子科技有限公司		
<b>Manufacturer Address</b> 制造商地址	3 floor No.78, new Dun Road, Xintang, Zengcheng, Guangzhou 广州市增城市新塘新墩路 78 号 3 楼		
<b>Factory</b> 工厂	Guangzhou shundi Ming electronics technology co., LTD 广州市顺迪铭电子科技有限公司		
<b>Factory Address</b> 工厂地址	3 floor No.78, new Dun Road, Xintang, Zengcheng, Guangzhou 广州市增城市新塘新墩路 78 号 3 楼		
<b>Manufacturer's contact information</b> 制造商联系信息	<b>Phone number</b> 电话号码	+86-13500006519	
	<b>Email address</b> 电子邮箱地址	1336951420@qq.com	
	<b>Website</b> 网址	----	



<b>UN38.3 Test Report No.</b> <b>UN38.3 测试报告编号</b>	NCT19050563XB1-1	<b>Test Date</b> <b>测试时间</b>	Dec. 13, 2019- Dec. 31, 2019
<b>Test No. 测试编号</b>	<b>Test item 测试项目</b>	<b>Conclusion 结论</b>	
T1	Altitude simulation 高度模拟	Pass 合格	
T2	Thermal test 温度试验	Pass 合格	
T3	Vibration 振动	Pass 合格	
T4	Shock 冲击	Pass 合格	
T5	External short circuit 外部短路	Pass 合格	
T6	Impact/Crush 撞击/挤压	Pass 合格	
T7	Overcharge 过度充电	Pass 合格	
T8	Forced discharge 强制放电	Pass 合格	
<b>Test Reference</b> <b>测试依据</b>	UNITED NATIONS "Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria" (ST/SG/AC.10/11/Rev.6/Amend.1 Section 38.3) 联合国《关于危险货物运输的建议书 实验和标准手册》第六修订版修正 1 第 38.3 节。		
<b>Assembled Battery Description</b> <b>集成电池组说明</b>	-----		
<b>Test Laboratory</b> <b>测试实验室</b>	Shenzhen NCT Testing Technology Co., Ltd. 深圳诺测检测技术有限公司		
<b>Test Lab's Address</b> <b>测试实验室地址</b>	1 / F, No. B Building, Mianshang Younger Pioneer Park, Hangcheng Road, Gushu Xixiang Street, Baoan District, Shenzhen, Guangdong, China 中国广东省深圳市宝安区西乡街道固航城大道绵商青年创业园 B 栋第 1 层		
<b>Test Lab's Phone</b> <b>测试实验室电话</b>	+86-755-27790922		
<b>Test Lab's Email</b> <b>测试实验室邮箱</b>	sales@nct-testing.com		
<b>Test Lab's Website</b> <b>测试实验室网址</b>	http://www.nct-testing.cn		
<b>Tested by</b> <b>主检人</b>	<i>Michael Lei</i> <b>Test Engineer</b> <b>测试工程师</b>		
<b>Inspected by</b> <b>审核人</b>	<i>Hely Wang</i> <b>Technical Manager</b> <b>技术经理</b>		
<b>Approved by</b> <b>批准人</b>	<i>Billy Tse</i> <b>General Manager</b> <b>总经理</b>		

# UN38.3 检测报告

## UN38.3 Test Report

<b>Client</b> 委托方	Guangzhou shundi Ming electronics technology co., LTD 广州市顺迪铭电子科技有限公司
<b>Add. of Client</b> 委托方地址	3 floor No.78, new Dun Road, Xintang, Zengcheng, Guangzhou 广州市增城市新塘新墩路 78 号 3 楼
<b>Samples Description</b> 样品名称	Rechargeable lithium-ion battery 可充电锂离子电池
<b>Model/Type</b> 型号规格	18650 3.7V 4000MAH
<b>Testing Laboratory</b> 测试机构	Shenzhen NCT Testing Technology Co., Ltd. 深圳诺测检测技术有限公司 1 / F, No. B Building, Mianshang Younger Pioneer Park, Hangcheng Road, Gushu Xixiang Street, Baoan District, Shenzhen, Guangdong, China 中国广东省深圳市宝安区西乡街道固戍航城大道绵商青年创业园 B 栋第 1 层 Phone number 电话号码: +86-755-27790922 Email 邮箱: sales@nct-testing.com Website 网址: http://www.nct-testing.cn
<b>Report No.</b> 报告编号	NCT19050563XB1-1
<b>Issued Date</b> 发行日期	Jan. 08, 2020
<b>Test Conclusion</b> 测试结论: Shown in the Conclusion of test report. 见检测报告结论页。	

Tested by 主检人: Michael Lei

Approved by 批准人:

Inspected by 审核人: Hedy Wang

Seal of NCT 报告单位 盖章

Date of Issue 签发日期: 2020. 01. 08





### I、Sample Description 样品描述

<b>Product Name</b> 产品名称	Rechargeable lithium-ion battery 可充电锂离子电池		<b>Sample Model</b> 样品型号	18650 3.7V 4000MAH	
<b>Manufacturer</b> 制造商	Guangzhou shundi Ming electronics technology co., LTD 广州市顺迪铭电子科技有限公司				
<b>Address</b> 地址	3 floor No.78, new Dun Road, Xintang, Zengcheng, Guangzhou 广州市增城市新塘新墩路 78 号 3 楼				
<b>Factory</b> 工厂	Guangzhou shundi Ming electronics technology co., LTD 广州市顺迪铭电子科技有限公司				
<b>Address</b> 地址	3 floor No.78, new Dun Road, Xintang, Zengcheng, Guangzhou 广州市增城市新塘新墩路 78 号 3 楼				
<b>Manufacturer's contact information</b> 制造商联系信息	<b>Phone number</b> 电话号码		<b>Email address</b> 电子邮箱地址		<b>Website</b> 网址
	+86-13500006519		1336951420@qq.com		----
<b>Trade Mark</b> 商标	----	<b>Cell Shape</b> 电芯形状	Cylindrical 圆柱形	<b>Battery Size</b> 电池尺寸 (L×W×T)	(67.5×37.5×20.0)mm
<b>Nominal Voltage</b> 标称电压	3.7V	<b>Rated Capacity</b> 额定容量	4000mAh 14.8Wh	<b>Limited Charge Voltage</b> 充电限制电压	4.2V
<b>Standard Charge Current</b> 标准充电电流	800mA	<b>Maximum Continuous Charge Current</b> 最大持续充电电流	4000mA	<b>End Charge Current</b> 结束充电电流	80mA
<b>Cut-off Voltage</b> 放电截止电压	3.0V	<b>Standard Discharge Current</b> 标准放电电流	800mA	<b>Maximum Discharge Current</b> 最大放电电流	4000mA
<b>Cells Number</b> 组成电芯数量	2PCS		<b>Cell Model</b> 电芯型号	18650 3.7V 2000MAH	
<b>Sample Mass</b> 样品重量	94.0g		<b>Sample Physical description</b> 样品物理形态	Blue, Prismatic, Solid 蓝色, 棱柱形, 固体	
<b>Receiving Date</b> 接收日期	Dec. 13, 2019		<b>Completing Date</b> 完成日期	Dec. 31, 2019	

### II、Standard 标准

UNITED NATIONS "Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria" (ST/SG/AC.10/11/Rev.6/Amend.1 Section 38.3)

联合国《关于危险货物运输的建议书 实验和标准手册》第六修订版修正 1 第 38.3 节。

### III、Test Item 测试项目

- |   |   |
|---|---|
| T.1. <input checked="" type="checkbox"/> Altitude simulation 高度模拟 | T.5. <input checked="" type="checkbox"/> External short circuit 外部短路                  |
| T.2. <input checked="" type="checkbox"/> Thermal test 温度试验        | T.6. <input checked="" type="checkbox"/> Impact 撞击/ <input type="checkbox"/> Crush 挤压 |
| T.3. <input checked="" type="checkbox"/> Vibration 振动             | T.7. <input checked="" type="checkbox"/> Overcharge 过充电                               |
| T.4. <input checked="" type="checkbox"/> Shock 冲击                 | T.8. <input checked="" type="checkbox"/> Forced discharge 强制放电                        |

### IV、Test Method and Requirement 测试方法和要求

Tests T.1 to T.5 shall be conducted in sequence on the same cell or battery. Tests T.6 and T.8 shall be conducted using not otherwise tested cells. 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.

用相同的电芯或电池按照顺序进行试验 T.1 至 T.5。试验 T.6 至 T.8 用没有进行其他试验的电芯。试验 T7 可以使用原先在试验 T1 至 T5 中使用过的未损坏的电池进行，以便测试交替充电放电的电池。

Batteries of B1#~B4# 、B9#~B12# are full charged after one cycle;

Batteries of B5#~B8# 、B13#~B16# are full charged after twenty-five cycles;

Component cells of C1#~C5# are 50% charged after one cycle;

Component cells of C6#~C10# are 50% charged after twenty-five cycles;

Component cells of C11#~C20# are full discharged after one cycle;

Component cells of C21#~C30# are full discharged after twenty-five cycles;

Test environment condition: ambient temperature: 15-25℃, ambient humidity: 40-70%

电池 B1#~B4# , B9#~B12# 为 1 次循环满电状态;

电池 B5#~B8# , B13#~B16# 为 25 次循环满电状态;

组成电芯 C1#~C5# 为 1 次循环后 50% 充电状态;

组成电芯 C6#~C10# 为 25 次循环后 50% 充电状态;

组成电芯 C11#~C20# 为 1 次循环完全放电状态;

组成电芯 C21#~C30# 为 25 次循环完全放电状态;

试验环境条件: 环境温度: 15-25℃, 环境湿度: 40-70%

In order to quantify the mass loss, the following procedure is provided:

$$\text{Mass loss (\%)} = (M1-M2)/M1 \times 100$$

质量损失的量化值, 可用以下公式计算:

$$\text{质量损失(\%)}=(M1-M2)/M1 \times 100$$

Where M1 is the mass before the test and M2 is the mass after the test. When mass loss does not exceed the values in Table below, it shall be considered as "no mass loss".

式中: M1 是试验前的质量, M2 是试验后的质量。如果质量损失不超过下表所列的数值, 应视为“无质量损失”。

Mass M of cell or battery 电芯或电池的质量	Mass loss limit 质量损失限值
---------------------------------------	---------------------------



M < 1g	0.5%
1g ≤ M ≤ 75g	0.2%
M > 75g	0.1%

Leakage means the visible escape of electrolyte or other material from a cell or battery or the loss of material (except battery casing, handling devices or labels) from a cell or battery such that the loss of mass exceeds the values in Table above.

渗漏系指可以看到的电解液或者其他物质从电芯或者电池中漏出，或电芯或电池中的物质损失（不包括电池外壳、搬运装置、或标签），失去的质量超过上表所列的数值。

In test T.1 to T.4, cells and 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 cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

在测试 T.1 至 T.4 中，电芯和电池须满足无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电芯或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%。

### **T.1. Altitude simulation 高度模拟**

#### **Test method 测试方法**

Test cells and batteries are stored at a pressure of 11.6 kPa or less for at least six hours at ambient temperature (20±5°C).

试验电芯和电池被放置在压力等于或低于 11.6 kPa 和环境温度(20±5°C)下存放至少 6 小时。

#### **Requirement 要求**

Cells and 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 cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure.

电芯和电池须无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电芯或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%。

### **T.2. Thermal test 温度试验**

#### **Test method 测试方法**

Test cells and batteries are to be stored for at least six hours at a test temperature equal to 72±2°C, followed by storage for at least six hours at a test temperature equal to -40±2°C. The maximum time interval between test temperature extremes is 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°C). For large cells and batteries the duration of exposure to the test temperature extremes should be at least 12 hours.

试验电芯和电池放置在试验温度等于 72±2°C 的条件下存放至少 6 小时，接着再在试验温度等于 -40±2°C 的条件下存放至少 6 小时。两个极端试验温度之间的最大时间间隔为 30 分钟。此程序重复进行，共完成 10 次循环，接着将所有试验电芯和电池在环境温度(20±5°C)下存放 24 小时。对于大型电芯和电池，暴露于极端试验温度的时间至少应为 12 小时。

#### **Requirement 要求**

Cells and 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 cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure.

电芯和电池须无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电芯或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%。

### **T.3. Vibration 振动**

**Test method 测试方法**

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 positions of the cell. One of the directions of vibration must be perpendicular to the terminal face.

电芯和电池紧固于振动台台面，但不得造成电芯变形，并能准确可靠地传播振动。振动应是正弦波形，对数扫描频率在 7 Hz 和 200 Hz 之间，再回到 7 Hz，跨度为 15 分钟。这一振动过程须对三个互相垂直的电芯安装方位的每一方向重复进行 12 次，总共为时 3 小时。其中一个振动方向必须与端面垂直。

The logarithmic frequency sweep shall differ for cells and batteries with a gross mass of not more than 12 kg (cells and small batteries), and for batteries with a gross mass of more than 12 kg (large batteries).

作对数式频率扫描，对电芯和总质量不超过 12 千克的电池（电芯和小型电池），和对质量超过 12 千克的电池（大型电池）有所不同。

For cells and small batteries : 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 50 Hz). A peak acceleration of 8 gn is then maintained until the frequency is increased to 200 Hz.

对电芯和小型电池：从 7 Hz 开始，保持 1 gn 的最大加速度，直到频率达到 18 Hz。然后将振幅保持在 0.8mm（总位移 1.6mm），并增加频率直到峰值加速度达到 8 gn（频率约为 50 Hz）。将峰值加速度保持在 8 gn 直到频率增加到 200 Hz。

For large batteries : 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 2 gn occurs (approximately 25 Hz). A peak acceleration of 2 gn is then maintained until the frequency is increased to 200 Hz.

对大型电池：从 7 Hz 开始，保持 1 gn 的最大加速度，直到频率达到 18 Hz。然后将振幅保持在 0.8mm（总位移 1.6mm），并增加频率直到峰值加速度达到 2 gn（频率约为 25Hz）。将峰值加速度保持在 2 gn 直到频率增加到 200 Hz。

**Requirement 要求**

Cells and 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 cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure.

电芯和电池须无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电芯或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%。

**T.4. Shock 冲击****Test method 测试方法**

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.

试验电芯和电池用刚性支架紧固在试验装置上，支架支撑着每个试验电池的所有安装面。

Each cell 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 subjects to a half-sine shock of peak acceleration of 50 gn and pulse duration of 11 milliseconds.

每个电芯须经受峰值加速度 150 gn 和脉冲持续时间 6 ms 的半正弦波冲击。不过，大型电芯须经受峰值加速度 50 gn 和脉冲持续时间 11 ms 的半正弦波冲击。

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.

每个电池须经受半正弦波冲击，峰值加速度需要根据电池的重量来决定。小型电池的脉冲持续时间为 6 ms，大型电池的脉冲持续时间为 11ms。下面的公式是用来计算合适的最小峰值加速度。



Battery	Minimum peak acceleration	Pulse duration
Small batteries	150 g <sub>n</sub> or result of formula $Acceleration(g_n) = \sqrt{\left(\frac{100850}{mass^*}\right)}$ whichever is smaller	6 ms
Large batteries	50 g <sub>n</sub> or result of formula $Acceleration(g_n) = \sqrt{\left(\frac{30000}{mass^*}\right)}$ whichever is smaller	11 ms

\* Mass is expressed in kilograms.

电池	最小峰值加速度	脉冲持续时间
小型电池	150 gn 或计算结果中取最小的值 $加速度(g_n) = \sqrt{\left(\frac{100850}{mass}\right)}$	6ms
大型电池	50 gn 或计算结果中取最小的值 $加速度(g_n) = \sqrt{\left(\frac{30000}{mass}\right)}$	11 ms

Each cell or battery shall be 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.

每个电芯或电池须在三个互相垂直的电芯或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。

### Requirement 要求

Cells and 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 cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure.

电芯和电池须无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电芯或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%。

## T.5. External short circuit 外部短路

### Test method 测试方法

The cell or battery to be tested shall be heated for a period of time necessary to reach a homogeneous stabilized temperature of 57±4°C, measured on the external case. This period of time depends on the size and design of the cell or battery and should be assessed and documented. If this assessment is not feasible, the exposure time shall be at least 6 hours for small cells and small batteries, and 12 hours for large cells and large batteries. Then the cell or battery at 57±4°C shall be subjected to one short circuit condition with a total external resistance of less than 0.1 ohm.

试验电芯或电池需要加热一段时间，以使其外壳温度均匀稳定地达到 57±4°C。加热时间的长短是由电芯或电池的尺寸和设计来决定的，这个加热时间需要评估并记录。如果这个加热时间不好评估的话，对于小电芯和小电池需要在此温度下放置至少 6 个小时，对于大电芯和大电池至少放置 12 个小时。然后使电芯或电池在 57±4°C 下经受总外电阻小于 0.1Ω 的短路条件。

This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to 57±4°C, 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.

短路测试持续到电芯或电池外壳温度回到 57±4°C 后至少持续 1 小时，针对大电池，外壳温度需要下降到

测试过程中监控到的最大温度的一半以下。

The short circuit and cooling down phases shall be conducted at least at ambient temperature.

短路测试和冷却阶段至少应该在环境温度下进行。

#### **Requirement 要求**

Cells and batteries meet this requirement if their external temperature does not exceed 170°C and there is no disassembly, no rupture and no fire during the test and within six hours after test.

电芯和电池外壳温度不超过 170°C，并且在试验过程中及试验后 6 小时内无解体、无破裂，无起火。

### **T.6. Impact / Crush 撞击/挤压**

#### **Test procedure – Impact** (applicable to cylindrical cells not less than 18.0 mm in diameter)

**测试步骤 – 撞击**（适用于直径大于等于 18.0 毫米以上的圆柱形电芯）

The test sample cell or component cell is to be placed on a flat smooth surface. A 15.8 mm  $\pm$  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  $\pm$  0.1 kg mass is to be dropped from a height of 61  $\pm$  2.5 cm at the intersection of the bar and sample in a controlled manner using a near frictionless, 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.

试样电芯或电芯组件放在平坦光滑表面上，一根 316 型不锈钢棒横放在试样中心，钢棒直径 15.8 毫米 $\pm$ 0.1 毫米，长度至少 6 厘米，或电芯最长端的尺度，取二者之长者。将一块 9.1 千克 $\pm$ 0.1 千克的重锤从 61 $\pm$ 2.5 厘米高度跌落到钢棒和试样交叉处，使用一个几乎没有摩擦的、对落体重锤阻力最小的垂直轨道或管道加以控制。垂直轨道或管道用于引导落锤沿与水平支撑表面呈 90 度落下。

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  $\pm$  0.1mm diameter curved surface lying across the centre of the test sample. Each sample is to be subjected to only a single impact.

受撞击的试样，纵轴应与平坦表面平行并与横放在试样中心的直径 15.8 $\pm$ 0.1 毫米弯曲表面的纵轴垂直。每一试样只经受一次撞击。

#### **Test procedure – Crush** (applicable to prismatic, pouch, coin/button cells and cylindrical cells less than 18.0 mm in diameter)

**测试步骤 – 挤压**（适用于棱柱形，袋状，硬币/纽扣电芯和圆柱形电芯直径小于 18.0 毫米）

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.

将电芯或电芯组件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 cm/s。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  $\pm$  0.78 kN;
  - (b) The voltage of the cell drops by at least 100 mV;
  - (c) The cell is deformed by 50% or more of its original thickness.
- (a)施加的力达到 13 kN  $\pm$  0.78 kN;
- (b)电芯的电压下降至少 100mV;
- (c)电芯形变达到原始厚度的 50%或更多。

Once the maximum pressure has been obtained, the voltage drops by 100 mV or more, or the cell is deformed by at least 50% of its original thickness, the pressure shall be released.

一旦达到最大压力、电压下降 100mV 或更多，或电芯形变至少达到原始厚度的 50%，即可解除压力。

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.

棱柱形或袋装电芯须从最宽的面施压。纽扣/硬币形电芯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。

Each test cell or component cell is to be subjected to one crush only. The test sample shall be observed for a further 6 h. The test shall be conducted using test cells or component cells that have not previously been subjected to other tests.

每个试样电芯或电芯组件只做一次挤压试验。试样须继续观察 6 小时。试验须使用之前未做过其他试验的试样电芯或电芯组件进行。

#### **Requirement 要求**

Cell and component cells meet this requirement if their external temperature does not exceed 170°C and there is no disassembly and no fire during the test and within six hours after test.

电芯和电芯组件外壳温度不超过 170°C，并且在试验过程中及试验后 6 小时内无解体，无起火。

### **T.7. Overcharge 过充电**

#### **Test method 测试方法**

The charge current shall be twice the manufacturer's recommended maximum continuous charge current. The minimum voltage of the test shall be as follows:

充电电流为制造商推荐的最大持续充电电流的两倍。试验的最小电压如下：

- (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.
- (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.

(a) 制造商推荐的充电电压不大于 18 伏时，试验的最小电压应是电池最大充电电压的两倍或 22 伏两者中的较小者。

(b) 制造商推荐的充电电压大于 18 伏时，试验的最小电压应是电池最大充电电压的 1.2 倍。

Tests are to be conducted at ambient temperature. The duration of the test shall be 24 hours.

试验应在环境温度下进行。进行试验的时间应为 24 小时。

#### **Requirement 要求**

Rechargeable batteries meet this requirement if there is no disassembly and no fire during the test and within seven days after the test.

充电电池应在试验过程中和试验后 7 天内无解体，无起火。

### **T.8. Forced discharge 强制放电**

#### **Test method 测试方法**

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 by the manufacturer.

每个电芯在环境温度下与 12V 直流电电源串联在起始电流等于制造商给定的最大放电电流的条件下强制放电。

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 is forced discharged for a time interval (in hours) equal to its rated capacity divided by the initial test current (in ampere).

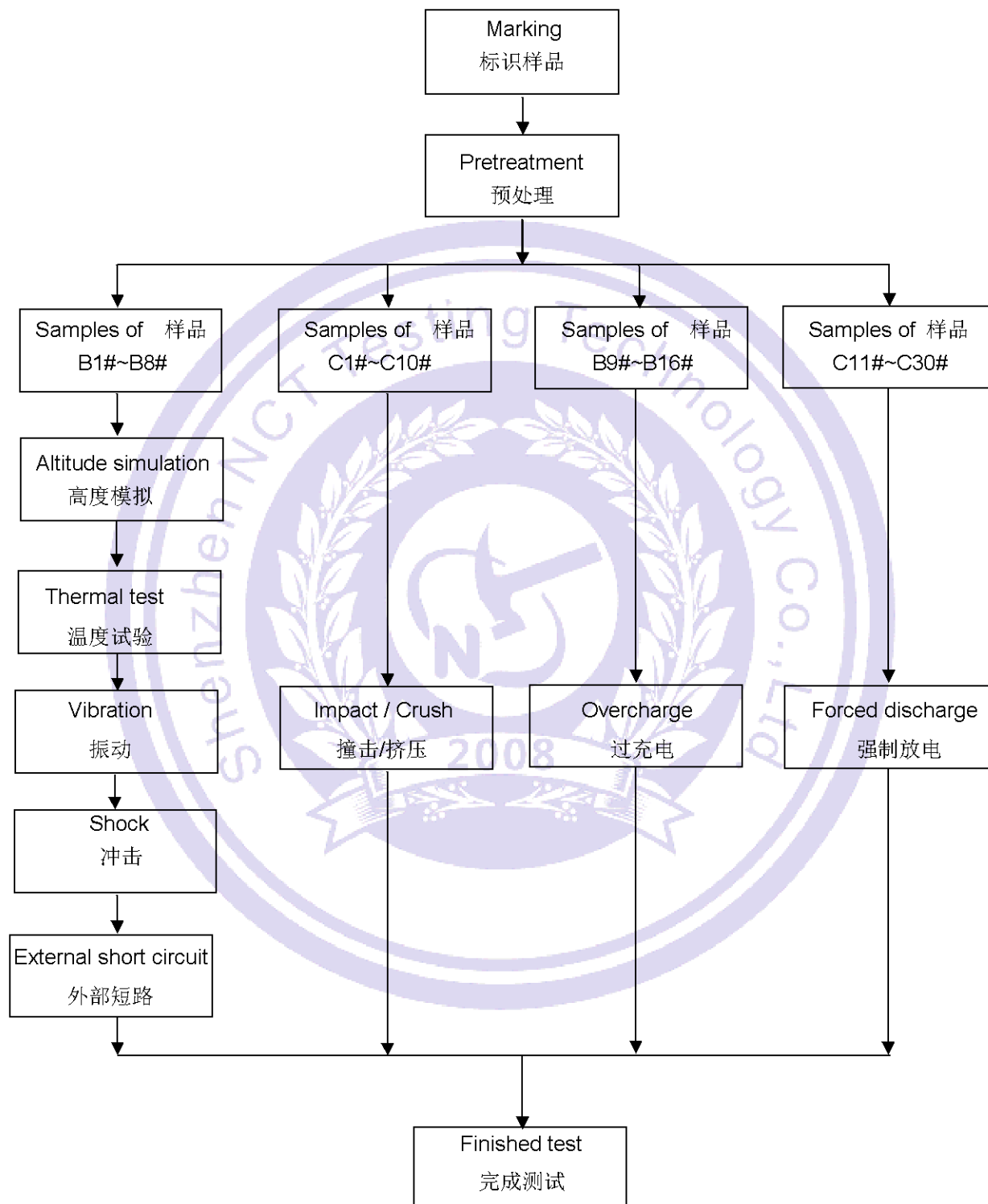
试样电芯与一个适当大小的电阻负载串联以调节到规定大小的放电电流。每个电芯的放电时间（单位为 h）等于电芯的额定容量除以试验初始放电电流（单位 A）。

#### **Requirement 要求**

Primary or rechargeable cells meet this requirement if there is no disassembly and no fire during the test and within seven days after the test.

原电芯或充电电芯应在试验过程中和试验后 7 天内无解体，无起火。

## V、Test Procedure 测试流程





### VI、Main Test Apparatus 主要测试仪器

Serial No. 设备编号	Name of Equipment 设备名称	Model 型号	Calibration Date /Due Date 校准日期/到期日
NCT-011	Charge and discharge testing system 充放电测试系统	R2D6-20V-10A	2019. 01. 11
			2020. 01. 10
NCT-012	Low-pressure high-altitude simulation test chamber 低压高空模拟试验箱	GX-3020-Z	2019. 01. 11
			2020. 01. 10
NCT-017	Constant temperature and humidity test chamber 恒温恒湿试验箱	GX-3000-150LT	2019. 01. 11
			2020. 01. 10
NCT-021	Vibration test instrument 振动测试仪器	ES-3-150	2019. 01. 11
			2020. 01. 10
NCT-022	Shock test instrument 冲击测试仪器	SY10-2	2019. 06. 28
			2020. 06. 27
NCT-018	Battery short circuit test instrument 电池短路测试仪器	BE-1000W	2019. 01. 11
			2020. 01. 10
NCT-019	Impact test instrument 撞击测试仪器	BE-5066	2019. 01. 11
			2020. 01. 10
NCT-026	Electronic Load 电子负载	8511	2019. 01. 11
			2020. 01. 10
NCT-033	DC regulated power supply 直流稳压电源	PS1540	2019. 01. 11
			2020. 01. 10
NCT-016	Battery anti-explosion chamber 电池防爆箱	GX-FB-200	--
			--
NCT-003	Electronic Scale 电子秤	JC-223S	2019. 01. 11
			2020. 01. 10
NCT-001	Digital Multimeter 数字万用表	17B+	2019. 01. 11
			2020. 01. 10
NCT-029	Temperature recorder 温度记录仪	34970A	2019. 01. 11

### VII、Test Data 测试数据

#### T.1. Altitude simulation 高度模拟

The state of cells 样品状态	No. 编号	Pre-test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压(%)	Status 结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
Full charged after one cycle 1 次循环后满电状态	B1#	94.153	4.195	94.149	4.192	0.004	99.928	Pass 合格
	B2#	93.416	4.193	93.414	4.192	0.002	99.976	Pass 合格
	B3#	94.234	4.194	94.230	4.191	0.004	99.928	Pass 合格
	B4#	93.879	4.193	93.877	4.190	0.002	99.928	Pass 合格
Full charged after twenty-five cycles 25 次循环后满电状态	B5#	93.689	4.196	93.687	4.195	0.002	99.976	Pass 合格
	B6#	94.108	4.195	94.106	4.194	0.002	99.976	Pass 合格
	B7#	93.698	4.194	93.694	4.191	0.004	99.928	Pass 合格
	B8#	93.991	4.192	93.987	4.191	0.004	99.976	Pass 合格
<b>Notes 注释:</b> Atmospheric pressure 大气压强: $1.013 \times 10^5 \text{Pa}$ , Ambient temperature 环境温度: $23.5^\circ\text{C}$ After the test, there is no leakage, no venting, no disassembly, no rupture and no fire. 测试后, 电池未渗漏、未泄气、未解体、未破裂和未起火。								

#### T.2. Thermal test 温度试验

The state of cells 样品状态	No. 编号	Pre-test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压(%)	Status 结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
Full charged after one cycle 1 次循环后满电状态	B1#	94.149	4.192	94.141	4.149	0.008	98.974	Pass 合格
	B2#	93.414	4.192	93.406	4.151	0.009	99.022	Pass 合格
	B3#	94.230	4.191	94.225	4.149	0.005	98.998	Pass 合格
	B4#	93.877	4.190	93.869	4.147	0.009	98.974	Pass 合格
Full charged after twenty-five cycles 25 次循环后满电状态	B5#	93.687	4.195	93.682	4.155	0.005	99.046	Pass 合格
	B6#	94.106	4.194	94.098	4.151	0.009	98.975	Pass 合格
	B7#	93.694	4.191	93.686	4.151	0.009	99.046	Pass 合格
	B8#	93.987	4.191	93.982	4.148	0.005	98.974	Pass 合格
<b>Notes 注释:</b> Atmospheric pressure 大气压强: $1.013 \times 10^5 \text{Pa}$ , Ambient temperature 环境温度: $23.6^\circ\text{C}$ After the test, there is no leakage, no venting, no disassembly, no rupture and no fire. 测试后, 电池未渗漏、未泄气、未解体、未破裂和未起火。								



### T.3. Vibration 振动

The state of cells 样品状态	No. 编号	Pre-test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压 (%)	Status 结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
Full charged after one cycle 1 次循环后满电状态	B1#	94.141	4.149	94.139	4.147	0.002	99.952	Pass 合格
	B2#	93.406	4.151	93.404	4.150	0.002	99.976	Pass 合格
	B3#	94.225	4.149	94.223	4.147	0.002	99.952	Pass 合格
	B4#	93.869	4.147	93.868	4.145	0.001	99.952	Pass 合格
Full charged after twenty-five cycles 25 次循环后满电状态	B5#	93.682	4.155	93.680	4.153	0.002	99.952	Pass 合格
	B6#	94.098	4.151	94.097	4.150	0.001	99.976	Pass 合格
	B7#	93.686	4.151	93.684	4.149	0.002	99.952	Pass 合格
	B8#	93.982	4.148	93.981	4.147	0.001	99.976	Pass 合格
<b>Notes 注释:</b> Atmospheric pressure 大气压强: $1.013 \times 10^5$ Pa, Ambient temperature 环境温度: 23.3°C After the test, there is no leakage, no venting, no disassembly, no rupture and no fire. 测试后, 电池未渗漏、未泄气、未解体、未破裂和未起火。								

### T.4. Shock 冲击

The state of cells 样品状态	No. 编号	Pre-test 试验前		After test 试验后		Mass loss 质量损失 (%)	Voltage after test/Voltage pre-test 试验后电压/试验前电压 (%)	Status 结果
		Mass 质量 (g)	Voltage 电压 (V)	Mass 质量 (g)	Voltage 电压 (V)			
Full charged after one cycle 1 次循环后满电状态	B1#	94.139	4.147	94.137	4.145	0.002	99.952	Pass 合格
	B2#	93.404	4.150	93.403	4.148	0.001	99.952	Pass 合格
	B3#	94.223	4.147	94.221	4.146	0.002	99.976	Pass 合格
	B4#	93.868	4.145	93.867	4.144	0.001	99.976	Pass 合格
Full charged after twenty-five cycles 25 次循环后满电状态	B5#	93.680	4.153	93.678	4.151	0.002	99.952	Pass 合格
	B6#	94.097	4.150	94.096	4.148	0.001	99.952	Pass 合格
	B7#	93.684	4.149	93.682	4.148	0.002	99.976	Pass 合格
	B8#	93.981	4.147	93.980	4.145	0.001	99.952	Pass 合格
<b>Notes 注释:</b> Atmospheric pressure 大气压强: $1.013 \times 10^5$ Pa, Ambient temperature 环境温度: 23.1°C After the test, there is no leakage, no venting, no disassembly, no rupture and no fire. 测试后, 电池未渗漏、未泄气、未解体、未破裂和未起火。								

### T.5. External short circuit 外部短路

The state of cells 样品状态	No. 编号	External Peak temperature(°C) 电池表面最高温度(°C)	Status 结果
Full charged after one cycle 1 次循环后满电状态	B1#	57.6	Pass 合格
	B2#	57.8	Pass 合格
	B3#	58.1	Pass 合格
	B4#	58.3	Pass 合格
Full charged after twenty-five cycles 25 次循环后满电状态	B5#	57.9	Pass 合格
	B6#	58.2	Pass 合格
	B7#	58.2	Pass 合格
	B8#	57.7	Pass 合格

**Notes 注释:** Atmospheric pressure 大气压强:  $1.013 \times 10^5 \text{ Pa}$ , Ambient temperature 环境温度:  $23.2^\circ\text{C}$   
There is no disassembly, no rupture and no fire during the test and within six hours after test.  
电池在测试中和测试后 6 小时内未解体、未破裂、未起火。

### T.6. Impact 撞击

The state of cells 样品状态	No. 编号	External Peak temperature(°C) 电池表面最高温度(°C)	Status 结果
50% charged after one cycle 1 次循环后 50% 充电状态	C1#	116.9	Pass 合格
	C2#	120.8	Pass 合格
	C3#	123.7	Pass 合格
	C4#	124.3	Pass 合格
	C5#	117.5	Pass 合格
50% charged after twenty-five cycles 25 次循环后 50% 充电状态	C6#	119.6	Pass 合格
	C7#	119.2	Pass 合格
	C8#	120.7	Pass 合格
	C9#	118.6	Pass 合格
	C10#	117.5	Pass 合格

**Notes 注释:** Atmospheric pressure 大气压强:  $1.013 \times 10^5 \text{ Pa}$ , Ambient temperature 环境温度:  $23.4^\circ\text{C}$   
There is no disassembly and no fire during the test and within six hours after test.  
电芯在测试中和测试后 6 小时内未解体、未起火。



### T.7. Overcharge 过充电

The state of cells 样品状态	No. 编号	Status 结果
Full charged after one cycle 1 次循环后满电状态	B9#	Pass 合格
	B10#	Pass 合格
	B11#	Pass 合格
	B12#	Pass 合格
Full charged after twenty-five cycles 25 次循环后满电状态	B13#	Pass 合格
	B14#	Pass 合格
	B15#	Pass 合格
	B16#	Pass 合格
<b>Notes</b> 注释: Atmospheric pressure 大气压强: $1.013 \times 10^5 \text{ Pa}$ , Ambient temperature 环境温度: $23.2^\circ\text{C}$ There is no disassembly and no fire during the test and within seven days after the test. 电池在测试中和测试后 7 天内未解体, 未起火。		

### T.8. Forced discharge 强制放电

The state of cells 样品状态	No. 编号	Status 结果
Full discharged after one cycle 1 次循环完全放电状态	C11#	Pass 合格
	C12#	Pass 合格
	C13#	Pass 合格
	C14#	Pass 合格
	C15#	Pass 合格
	C16#	Pass 合格
	C17#	Pass 合格
	C18#	Pass 合格
	C19#	Pass 合格
	C20#	Pass 合格
Full discharged after twenty-five cycles 25 次循环完全放电状态	C21#	Pass 合格
	C22#	Pass 合格
	C23#	Pass 合格
	C24#	Pass 合格
	C25#	Pass 合格
	C26#	Pass 合格
	C27#	Pass 合格

	C28#	Pass 合格
	C29#	Pass 合格
	C30#	Pass 合格

**Notes** 注释: Atmospheric pressure 大气压强:  $1.013 \times 10^5 \text{Pa}$ , Ambient temperature 环境温度:  $23.4^\circ\text{C}$   
There is no disassembly and no fire during the test and within seven days after the test.  
电芯在测试中和测试后 7 天内未解体, 未起火。





### VIII、Conclusion 结论

No. 编号	Test item 测试项目	Sample number 样品数量	Test reference 测试参考	Conclusion 结论
1	Altitude simulation 高度模拟	B1#~B8#	UN Manual of Test and Criteria, part III, subsection 38.3.4.1 UN 试验和标准手册,第III部分,第 38.3.4.1 节	Pass 合格
2	Thermal test 温度试验		UN Manual of Test and Criteria, part III, subsection 38.3.4.2 UN 试验和标准手册,第III部分,第 38.3.4.2 节	Pass 合格
3	Vibration 振动		UN Manual of Test and Criteria, part III, subsection 38.3.4.3 UN 试验和标准手册,第III部分,第 38.3.4.3 节	Pass 合格
4	Shock 冲击		UN Manual of Test and Criteria, part III, subsection 38.3.4.4 UN 试验和标准手册,第III部分,第 38.3.4.4 节	Pass 合格
5	External short circuit 外部短路	C1#~C10#	UN Manual of Test and Criteria, part III, subsection 38.3.4.5 UN 试验和标准手册,第III部分,第 38.3.4.5 节	Pass 合格
6	Impact/Crush 撞击/挤压		UN Manual of Test and Criteria, part III, subsection 38.3.4.6 UN 试验和标准手册,第III部分,第 38.3.4.6 节	Pass 合格
7	Overcharge 过度充电	B9#~B16#	UN Manual of Test and Criteria, part III, subsection 38.3.4.7 UN 试验和标准手册,第III部分,第 38.3.4.7 节	Pass 合格
8	Forced discharge 强制放电	C11#~C30#	UN Manual of Test and Criteria, part III, subsection 38.3.4.8 UN 试验和标准手册,第III部分,第 38.3.4.8 节	Pass 合格

The submitted samples were complied with the stated requirements of UN manual of test and criteria, part III, subsection 38.3

经检测，提交的测试样品均符合 UN38.3 的要求，测试结论为合格。

## IX、Photo of The Sample 样品图片

Model 型号: 18650 3.7V 4000MAH



Photo 1 Front 正面



Photo 2 Rear 反面



Photo 3 Internal Cell 内部电芯

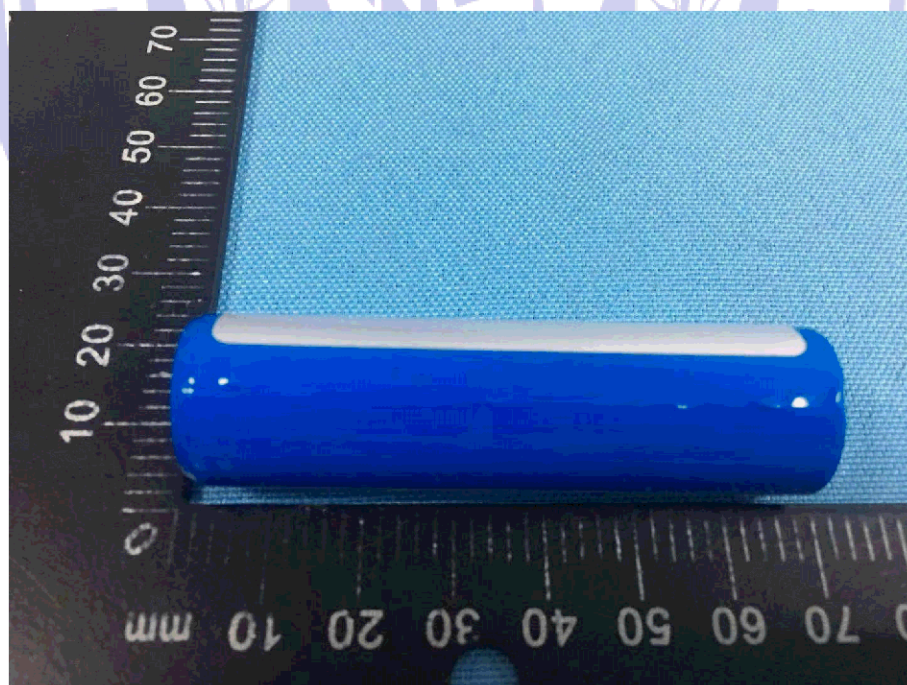


Photo 4 Internal Cell 内部电芯



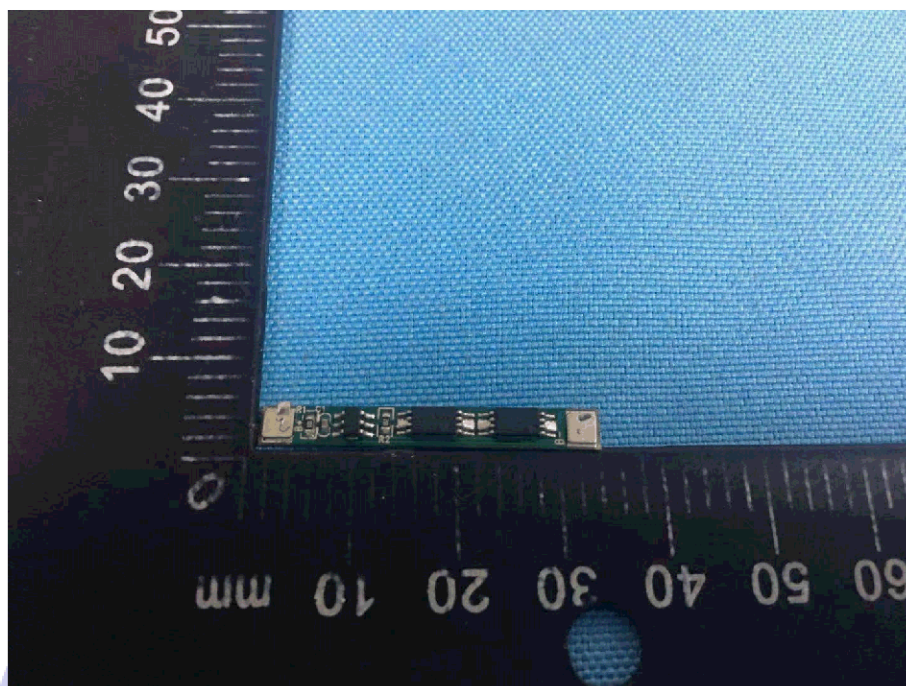


Photo 5 Protection board 保护板

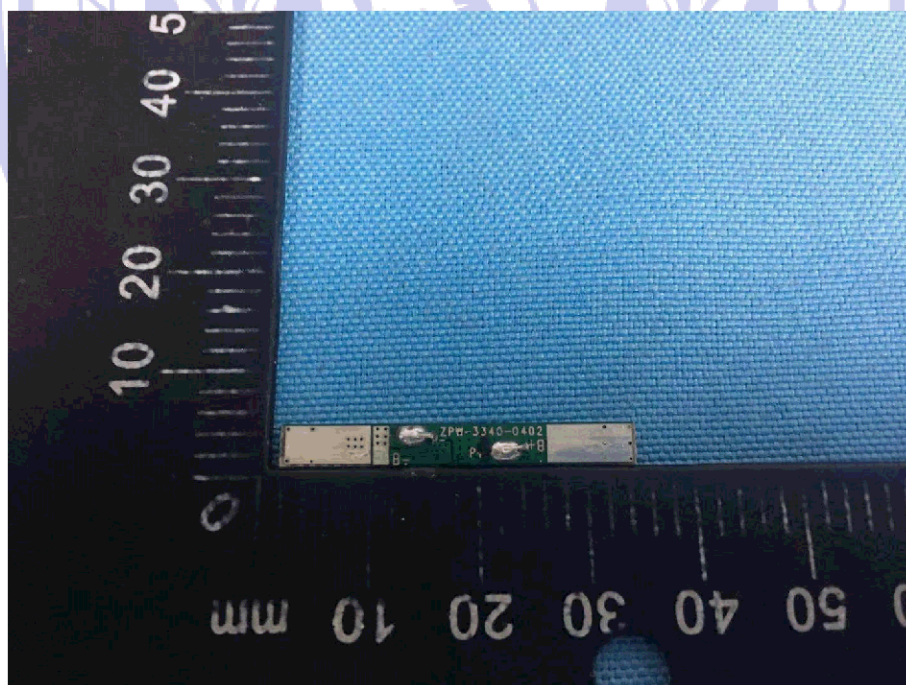


Photo 6 Protection board 保护板

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\*\*\*\*\*End of Report 报告结束\*\*\*\*\*