



Pony Testing International Group

Report No.: MOI16AFJ60898716

MSDS Report

2021年1月1日生效

Sample Name
& Model

Cylindrical Lithium ion Cell SZNS18650-2500

Applicant

Shenzhen Zhuoneng New Energy Corporation Limited

Address

Block A2, A3, A4(2/3/4floor), A5, No.6 Fuping middle road,
Pingdi Street, Longgang District, Shenzhen

No.: MOI16AFJ60898716

Code: mu3G8

PONY
©Hotline 400-819-5688

谱尼测试
Pony Testing International Group
www.ponytest.com

北京实验室: (010)83055000

上海实验室: (021)64851999

青岛实验室: (0532)88706866

天津实验室: (022)23607888

苏州实验室: (0512)62997900

长春实验室: (0431)85150908

大连实验室: (0411)87336618

哈尔滨实验室: (0451)58627755

郑州实验室: (0371)69350670

新疆实验室: (0991)6684186

石家庄实验室: (0311)85376660

西安实验室: (029)89608785

呼和浩特实验室: (0471)3450025

杭州实验室: (0571)85806807

宁波实验室: (0574)87977185

武汉实验室: (027)83997127

合肥实验室: (0551)63843474

广州实验室: (020)89224310

厦门实验室: (0592)5568048

成都实验室: (028)87702708

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北京实验室: (010) 83055000	武汉实验室: (027) 83997127	哈尔滨实验室: (0451)58627755
上海实验室: (021) 64851999	长春实验室: (0431)85150908	石家庄实验室: (0311)85376660
青岛实验室: (0532)88706866	大连实验室: (0411)87336618	乌鲁木齐实验室: (0991) 6684186
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天津实验室: (022) 23607888	西安实验室: (029) 89608785	杭州实验室: (0571)85806807
苏州实验室: (0512)62997900	太原实验室: (0351) 7555762	宁波实验室: (0574)87977185
		温州实验室: (0577)88271060
		合肥实验室: (0551)63843474
		广州实验室: (020) 89224310
		厦门实验室: (0592)5568048
		成都实验室: (028) 87702708



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Material Safety Data Sheet

Reference to ST/SG/AC.10/30/Rev.8 (GHS)

Section 1 - Chemical Product and Company Identification

Chemical Product Identification

Sample Name: Cylindrical Lithium ion Cell**Sample Model:** SZNS18650-2500**Recommended Uses:** N/A**Restrictions on Use:** N/A**Supplier Name:** Shenzhen Zhuoneng New Energy Corporation Limited**Address:** Block A2, A3, A4(2/3/4floor), A5, No.6 Fuping middle road, Pingdi Street, Longgang District, Shenzhen**Phone Number:** 0755-84072583**FAX:** 0755-84090966**E-mail:** renzheng@szznp.com**Emergency Phone Number:** 0755-84072583

Section 2 - Hazards Identification

Emergency overview: This product is a battery. Intended use of the product should not result in exposure to the chemical substance. In case of rupture the below hazards exist.

Classification according to GHS

Acute toxicity, oral (4)

Skin corrosion/irritation (2)

Serious eye damage/eye irritation (2A)

Specific target organ toxicity, single exposure; Respiratory tract irritation (3)

Label elements

Hazard pictogram(s):**Signal word:**

Warning

Hazard statement(s):

H302 Harmful if swallowed

H315 Causes skin irritation

H319 Causes serious eye irritation

H335 May cause respiratory irritation



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Precautionary statement(s):
Prevention:

- P264 Wash skin and clothing thoroughly after handling.
 P270 Do not eat, drink or smoke when using this product.
 P280 Wear protective gloves, protective clothing, eye protection, face protection.
 P261 Avoid breathing dust, fume, gas, mist, vapours, spray.
 P271 Use only outdoors or in a well-ventilated area.

Response:

- P301 + P312 IF SWALLOWED: Call a POISON CENTER if you feel unwell.
 P330 Rinse mouth.
 P302 + P352 IF ON SKIN: Wash with plenty water.
 P321 Specific treatment (See additional emergency instructions).
 P333 + P313 If skin irritation or rash occurs: Get medical advice.
 P362 + P364 Take off contaminated clothing and wash it before reuse.
 P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P337 + P313 If eye irritation persists: Get medical advice.
 P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
 P312 Call a POISON CENTER, if you feel unwell.

Storage

- P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
 P405 Store locked up.

Disposal:

- P501 Send contents to approved waste treatment plants.

Other hazards
Physical and chemical hazards: See Section 10

Human health hazards: See Section 11

Environmental hazards: See Section 12

Section 3 – Composition/Information on Ingredients

Chemical characterization: Mixture

Chemical Composition	CAS No.	EC#	Weight (%)
LiNi _x Co _y Mn _z O ₂	---	---	30-37
Graphite	7782-42-5	231-955-3	15-20
Carbon black	1333-86-4	215-609-9	0-1



Polyvinylidene fluoride resin	24937-79-9	607-458-6	0-1
Phosphate(1-), hexafluoro-, lithium	21324-40-3	244-334-7	12-16
Polypropylene	9003-07-0	618-352-4	6-10
Aluminium	7429-90-5	231-072-3	2-5
Copper	7440-50-8	231-159-6	5-10
Iron	7439-89-6	231-096-4	10-15

Section 4 - First Aid Measures

Description of first aid measures

General information No special measures required.

After eye contact

Flush eyes with plenty of water for several minutes while holding eyelids open. Get medical attention if irritation persists.

After skin contact

Remove contaminated clothing and shoes. Immediately wash with water and soap and rinse thoroughly. Wash clothing and shoes before reuse. If irritation occurs, get medical attention.

After inhalation

Remove victim to fresh area. Administer artificial respiration if breathing is difficult. Seek medical attention.

After swallowing

Do not induce vomiting. Get medical attention.

Personal protective equipment for first-aid responders: No data available.

Most important symptoms/effects, acute and delayed: No data available.

Indication of immediate medical attention and special treatment needed: Treat symptomatically.

Section 5 - Fire Fighting Measures

Suitable extinguishing media:

Small Fire: Dry chemical, CO₂, water spray or regular foam. Large Fire: Water spray, fog or regular foam. Move containers from fire area if you can do it without risk.

Unsuitable extinguishing media:

No data available.

Specific Hazards arising from the chemical:

Special hazards arising from the substance or mixture

Battery may burst and release hazardous decomposition products when exposed to a fire situation.



Lithium ion batteries contain flammable electrolyte that may vent, ignite and produce sparks when subjected to high temperature (>150°C (302°F)), when damaged or abused (e.g. mechanical damage or electrical overcharging); may burn rapidly with flare-burning effect; may ignite other batteries in close proximity.

Specific protective actions for fire-fighters:

Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection.

Section 6 - Accidental Release Measures

Personal precautions:

As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75 feet) in all directions. Keep unauthorized personnel away. Stay upwind, uphill and/or upstream. Ventilate closed spaces before entering. Large Spill: Consider initial downwind evacuation for at least 100 meters (330 feet).

Protective equipment:

No data available.

Emergency procedures:

ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Do not touch or walk through spilled material. Absorb with earth, sand or other non-combustible material. Leaking batteries and contaminated absorbent material should be placed in metal containers.

Environmental precautions:

Do not allow material to be released to the environment without proper governmental permits.

Methods and materials for containment and cleaning up:

For all waste handling must refer to United Nations, National and Local Regulations for disposal.

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

Section 7 - Handling and Storage

Precautions for safe handling:

Avoid short circuiting the battery. Avoid mechanical damage of the battery. Do not open or disassemble. Batteries may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures. Do not short or install with incorrect polarity. Avoid all personal contact, including inhalation. Wear protective clothing when risk of exposure occurs. Use in a well-ventilated area. Prevent concentration in hollows and sumps.

Conditions for safe storage, including any incompatibilities:

Store in a cool, dry, well-ventilated place. Keep away from heat, avoiding the long time of sunlight.



Section 8 - Exposure Controls/Personal Protection

Control parameters

CAS No.	ACGIH	NIOSH	OSHA
7782-42-5	TLV-TWA 2mg/m ³	REL-TWA 2.5mg/m ³	PEL-TWA 15mppcf PEL-TWA 20mppcf
1333-86-4	TLV-TWA 3mg/m ³	REL-TWA 3.5mg/m ³	PEL-TWA 3.5mg/m ³
24937-79-9	N/A	N/A	N/A
21324-40-3	N/A	N/A	N/A
9003-07-0	N/A	N/A	N/A
7429-90-5	TLV-TWA 1mg/m ³	REL-TWA 2mg/m ³ REL-TWA 5mg/m ³ REL-TWA 10mg/m ³	PEL-TWA 5mg/m ³ PEL-TWA 15mg/m ³
7440-50-8	TLV-TWA 0.2mg/m ³ TLV-TWA 1mg/m ³	REL-TWA 1mg/m ³ REL-TWA 0.1mg/m ³	PEL-TWA 0.1mg/m ³ PEL-TWA 1mg/m ³
7439-89-6	N/A	N/A	N/A

Appropriate engineering controls:

The usual precautionary measures for handling chemicals should be followed.

Keep away from foodstuffs, beverages and feed.

Remove all soiled and contaminated clothing immediately.

Wash hands before breaks and at the end of work.

Personal Protective Equipment:

Respiratory protection: Wear suitable protective mask. For a large large number of battery leakages, wear chemical protective clothing, including self-contained breathing apparatus.

Hand Protection: Wear appropriate protective gloves to reduce skin contact.

Eye Protection: Wear safety goggles or eye protection combined with respiratory protection.

Skin and Body Protection: Working environment required, wear suitable protective clothing to minimize contact with skin. The type of protective equipment must be according to the concentration and the content of certain hazardous substances in the workplace.

Section 9 - Physical and Chemical Properties

Information on basic physical and chemical properties

Colour: Green.

Physical State: Cylindrical.



Odour:	Not available.
Odour threshold:	Not available.
pH:	Not available.
Melting point/freezing point:	Not available.
Initial boiling point and boiling range:	Not available.
Flash Point:	Not available.
Evaporation rate:	Not available.
Flammability (solid, gas):	Not available.
Explosion Limits (vol% in air):	Not available.
Vapour pressure, kPa at 20°C:	Not available.
Vapor density:	Not available.
Density/Relative density (water = 1):	Not available.
Solubility(ies):	Not available.
Partition coefficient: n-octanol/water:	Not available.
Auto-ignition temperature:	Not available.
Decomposition temperature:	Not available.
Viscosity:	Not available.
Other information:	
Voltage	3.6V
Electric capacity	2500mAh
Electric Energy	9.0Wh

Section 10 - Stability and Reactivity

Reactivity: No data available.

Chemical stability: Stable.

Possibility of hazardous reactions: No data available.

Conditions to Avoid: Flames, sparks, and other sources of ignition, incompatible materials.

Incompatible materials: Oxidizing agents, acid base.

Hazardous decomposition products: Carbon monoxide, carbon dioxide, lithium oxide fumes.

Section 11 - Toxicological Information

Acute Toxicity:

CAS No.	LC50/LD50
7782-42-5	No data available.
1333-86-4	No data available.



24937-79-9	No data available.
21324-40-3	No data available.
9003-07-0	No data available.
7429-90-5	No data available.
7440-50-8	No data available.
7439-89-6	No data available.

Skin corrosion/irritation: No data available.

Serious eye damage/irritation: No data available.

Respiratory or Skin sensitization: No data available.

Germ Cell mutagenicity: No data available.

Carcinogenicity: No data available.

Reproductive toxicity: No data available.

Specific target organ toxicity-Single exposure: No data available.

Specific target organ toxicity-Repeated exposure: No data available.

Aspiration hazard: No data available.

Information on the likely routes of exposure: No data available.

Eye: No data available.

Skin: No data available.

Ingestion: No data available.

Inhalation: No data available.

Section 12 - Ecological Information

Ecological Toxicity: No data available.

Persistence and degradability: No data available.

Bioaccumulative Potential: No data available.

Mobility in Soil: No data available.

Other adverse effects: No data available.

Section 13 - Disposal Considerations

Disposal methods:

Recommendation:


Consult state, local or national regulations to ensure proper disposal.

Uncleaned packaging

Recommendation: Disposal must be made according to official regulations.



Section 14 - Transport Information

UN or ID Number	
IATA	UN3480 UN3481
IMDG	UN3480 UN3481
Proper Shipping Name/Description	
IATA	Lithium ion batteries Lithium ion batteries contained in equipment
IMDG	LITHIUM ION BATTERIES LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT
Class or Div. (Sub Hazard)	
IATA	9
IMDG	9
Packing Group	
IATA	N/A
IMDG	N/A
Hazard Label	
IATA	965:  / 967: N/A
IMDG	N/A
Environmental hazards	
Marine pollutant:	No
Special precautions for user	No information available.

Transport information: The Cylindrical Lithium ion Cell SZNS18650-2500 has passed the test UN38.3, according to the report ID: MLI6XC5U81029721.

Exceeds the standard of Table 965- II , so it belongs to dangerous goods. According to the Packing Instruction 965 section IB of IATA DGR 62nd Edition for transportation, Cargo aircraft only.

According to the Packing Instruction 967 section II of IATA DGR 62nd Edition for transportation.

According to the special provision 188 of IMDG (39-18), the goods are not subject to other provision of this code.

Separate batteries to prevent short-circuiting. and they should be packed in strong package during transport. Lithium cell or battery should incorporate a safety venting device or be designed



to prevent a violent rupture under normal transport conditions. Keep away from high temperature and open flames.

Note: State of Charge (SoC) not exceeding 30% of their rated capacity. (By air, Lithium ion batteries)

Batteries weight in the package < 5kg. (By air, Batteries installed in equipment)

Transport Fashion: By air, by sea.

Section 15 - Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture

CAS No.	TSCA	IECSC	DSL/NDSL	EINECS/ ELINCS/ NLP
7782-42-5	Listed	Listed	Listed DSL	Listed
1333-86-4	Listed	Listed	Listed DSL	Listed
24937-79-9	Listed	Listed	Listed DSL	Listed
21324-40-3	Listed	Listed	Listed DSL	Listed
9003-07-0	Listed	Listed	Listed DSL	Listed
7429-90-5	Listed	Listed	Listed DSL	Listed
7440-50-8	Listed	Listed	Listed DSL	Listed
7439-89-6	Listed	Listed	Listed DSL	Listed

Section 16 - Other Information

Issue Date: 2020-12-24

Issue Department: Technical department

Modification record:

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Other Information:



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CAS: (Chemical Abstracts Service);
 EC: (European Commission);
 ACGIH: (American Conference of Governmental Industrial Hygienists);
 NIOSH: (US National Institute for Occupational Safety and Health);
 OSHA: (US Occupational Safety and Health);
 TLV: (Threshold Limit Value)
 TWA: (Time Weighted Average);
 STEL: (Short Term Exposure Limit);
 PEL: (Permissible Exposure Level);
 REL: (Recommended Exposure Limit);
 PC-STEEL: (Permissible concentration-short time exposure limit);
 PC-TWA: (Permissible concentration-time weighted average);
 LC50: (Lethal concentration, 50 percent kill);
 LD50: (Lethal dose, 50 percent kill);
 IARC: (International Agency for Research on Cancer);
 EC50: (Median effective concentration);
 BCF: (Bioconcentration Factor);
 BOD: (Biochemical oxygen demand);
 NOEC: (No observed effect concentration);
 NTP: (US National Toxicology Program);
 RTECS: (Registry of Toxic Effects of Chemical Substances);
 IATA: (International Air Transport Association);
 IMDG: (International Maritime Dangerous Goods);
 TDG: (Recommendations on the TRANSPORT OF DANGEROUS GOODS Model Regulations);
 TOC: (Total Organic Carbon);
 TSCA: (Toxic Substances Control Act of USA);
 DSL: (the Domestic Substances List of Canada);
 NDSL: (the Non-domestic Substances List of Canada)

End of report

UN38.3 试验概要

UN38.3 Test Summary

单位信息 Company information			
委托方 Client	深圳市卓能新能源股份有限公司 Shenzhen Zhuoneng New Energy Corporation Limited		
地址 Address	深圳市龙岗区坪地街道坪东社区富坪中路6号A2厂101, A2栋, A3栋, A4栋二层、三层、四层, A5栋 Block A2, A3, A4 (2/3/4 floor), A5, No. 6 Fuping middle road, Pingdi Street, Longgang District, Shenzhen		
联系方式 Contact information	+86-14776515362	renzheng@szznp.com	www.szznp.com
制造商 Manufacturer	深圳市卓能新能源股份有限公司 Shenzhen Zhuoneng New Energy Corporation Limited		
地址 Address	深圳市龙岗区坪地街道坪东社区富坪中路6号A2厂101, A2栋, A3栋, A4栋二层、三层、四层, A5栋 Block A2, A3, A4 (2/3/4 floor), A5, No. 6 Fuping middle road, Pingdi Street, Longgang District, Shenzhen		
联系方式 Contact information	+86-14776515362	renzheng@szznp.com	www.szznp.com
生产厂 Factory	深圳市卓能新能源股份有限公司 Shenzhen Zhuoneng New Energy Corporation Limited		
地址 Address	深圳市龙岗区坪地街道坪东社区富坪中路6号A2厂101, A2栋, A3栋, A4栋二层、三层、四层, A5栋 Block A2, A3, A4 (2/3/4 floor), A5, No. 6 Fuping middle road, Pingdi Street, Longgang District, Shenzhen		
联系方式 Contact information	+86-14776515362	renzheng@szznp.com	www.szznp.com
测试实验室 Test laboratory	深圳诚测检测技术有限公司 Shenzhen CCJC Technology Co., Ltd.		
地址 Address	广东省深圳市宝安区沙井街道后亭社区第三工业区新宝益工贸大厦B幢1楼A座1/F., Building B, Xinbaoyi Industry and Trade Building, Houting, Shajing, Bao'an District, Shenzhen, Guangdong, China		
联系方式 Contact information	+86-755-23707853	sales@ccjctek.com	www.ccjctek.com
电池信息 Battery information			
名称 Name	锂离子可充电电芯 Lithium-ion Rechargeable Cell	商标 Brand	/
型号 Model	SZNS18650-2500mAh	原始测试型号 Original tested model	/
标称电压 Nominal voltage	3.6V	容量 Rated Capacity	2500mAh, 9.0Wh
描述 Description	锂离子电芯 Li-ion Cell	锂含量 Lithium Content	/
质量 Mass	44.7g	外观 Appearance	绿色近圆柱体电池 Green almost cylinder battery

测试信息 Test information			
UN38.3 报告编号 UN38.3 report No.	CCJC2020A206801	测试报告日期 Test report date	2020-04-15
测试标准 Test criteria	联合国《关于危险货物运输的建议书 试验和标准手册》 ST/SG/AC.10/11/Rev.6/Amend.1 38.3 UNITED NATIONS "Recommendations in the TRANSPORT OF DANGEROUS GOODS" Manual of Tests and Criteria ST/SG/AC.10/11/Rev.6/Amend.1 38.3		
T.1 高度模拟 T.1 Altitude simulation	合格 Pass		
T.2 温度测试 T.2 Thermal test	合格 Pass		
T.3 振动 T.3 Vibration	合格 Pass		
T.4 冲击 T.4 Shock	合格 Pass		
T.5 外部短路 T.5 External short circuit	合格 Pass		
T.6 撞击 T.6 Impact	合格 Pass		
T.7 过度充电 T.7 Overcharge	不适用 N/A		
T.8 强制放电 T.8 Forced discharge	合格 Pass		
38.3.3(f)	/		
38.3.3(g)	/		
结论 Conclusion	经测试，样品符合联合国《关于危险货物运输的建议书 试验和标准手册》 ST/SG/AC.10/11/Rev.6/Amend.1 38.3 标准要求。 The sample has passed the test items of UNITED NATIONS "Recommendations in the TRANSPORT OF DANGEROUS GOODS" Manual of Tests and Criteria ST/SG/AC.10/11/Rev.6/Amend.1 38.3.		
备注 Remark	/		
签名 Signature 职务 Title			签发日期 Issued date 2020-04-15 
	技术负责人 Technical director	程鹏	





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检测
TESTING
CNAS L9856

UN38.3 测试报告

UN38.3 Test Report

样品名称及型号	锂离子可充性电芯 SZNS18650-2500mAh
Sample name &Model	Lithium-ion Rechargeable Cell SZNS18650-2500mAh
委托单位	深圳市卓能新能源股份有限公司
Consignor	Shenzhen Zhuoneng New Energy Corporation Limited

深圳诚测检测技术有限公司
Shenzhen CCJC Technology Co., Ltd



样品名称 Sample Name	锂离子可充电性电芯 Lithium-ion Rechargeable Cell		样品型号 Sample Model	SZNS18650-2500mAh	
委托单位 Consignor	深圳市卓能新能源股份有限公司 Shenzhen Zhuoneng New Energy Corporation Limited				
制造商 Manufacturer	深圳市卓能新能源股份有限公司 Shenzhen Zhuoneng New Energy Corporation Limited				
生产厂 Factory	深圳市卓能新能源股份有限公司 Shenzhen Zhuoneng New Energy Corporation Limited				
标称电压 Normal Voltage	3.6V	额定容量 Rated Capacity	2500mAh 9.0Wh	充电限制电压 Limited Charge Voltage	4.2V
充电电流 Charge Current	1250mA	最大连续充电电流 Max Continuous Charge Current	1500mA	充电截止电流 End Charge Current	25mA
终止电压 Cut-off Voltage	2.75V	最大放电电流 Max Discharge Current	2500mA	电芯额定容量 Cell Rated Capacity	2500mAh
内含电芯个数 Cells Number	1pc	电芯型号 Cell Model	SZNS18650 -2500mAh	商标 Trademark	--
测试方法和判定标准 Test method and criterion	联合国《关于危险货物运输的建议书 试验和标准手册》 ST/SG/AC.10/11/Rev.6/Amend.1 38.3 UNITED NATIONS "Recommendations in the TRANSPORT OF DANGEROUS GOODS" Manual of Tests and Criteria ST/SG/AC.10/11/Rev.6/Amend.1 38.3				
样品接收日期 Accepted date	2020-03-26		测试起讫日期 Test date	2020-03-26~2020-04-15	
测试项目 Test items	高度模拟、温度试验、振动、冲击、外部短路、撞击、强制放电。 Altitude simulation, Thermal test, Vibration, Shock, External short circuit, Impact, Forced discharge.				
测试结论 Conclusion	经测试, 样品符合联合国《关于危险货物运输的建议书 试验和标准手册》 ST/SG/AC.10/11/Rev.6/Amend.1 38.3 标准要求。 The sample has passed the test items of UNITED NATIONS "Recommendations in the TRANSPORT OF DANGEROUS GOODS" Manual of Tests and Criteria ST/SG/AC.10/11/Rev.6/Amend.1 38.3.				
签发日期(Issue date): 2020-04-15					
编制 Compiler:		审核 Checker:		批准 Approver:	

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

Test items	Sample Number
T.1: 高度模拟/Altitude simulation	C01 – C10
T.2: 温度测试/ Thermal test	
T.3: 振动/ Vibration	
T.4: 冲击/ Shock	
T.5: 外短路/External short circuit	
T.6: 挤压/ Crush or 撞击/Impact	C11 – C20
T.7 过充电/ Overcharge	N/A
T.8: 强制放电/ Forced discharge	C21 – C40

样品状况良好。

The sample's status is good.

样品编号 C01~C05 为第一次循环充放电周期完全充电状态的电池组。

The conditions of the cells of samples No. C01 to C05 are at first cycle, in fully charged states.

样品编号 C06~C10 为二十五次循环充放电周期后完全充电状态的电池组。

The conditions of the cells of samples No. C06 to C10 are after 25 cycles ending in fully charged states.

样品编号 C11~C15 为第一次循环充放电周期充电至标称容量的 50%状态的电池。

The conditions of the cells of samples No. C11 to C15 are at first cycle at 50% of the design rated capacity.

样品编号 C16~C20 为第二十五次循环充放电周期充电至标称容量的 50%状态的电池。

The conditions of the cells of samples No. C16 to C20 are at 25 cycles at 50% of the design rated capacity.

样品编号 C21~C30 为第一次循环充放电周期完全放电状态的电池。

The conditions of the cells of samples No. C21 to C30 are at first cycle, in fully discharged states.

样品编号 C31~C40 为二十五次循环充放电周期后完全放电状态的电池。

The conditions of the cells of samples No. C31 to C40 are after 25 cycles ending in fully discharged states.

测试步骤:
Test Procedure:

1. 每一种类型的电池均应进行 T.1 至 T.8 项试验。电池必须按顺序在相同的一组电池上进行试验 T.1 至 T.5。试验 T.6 和 T.8 应使用未另外试验过的电池。试验 T.7 可以使用先前在试验 T.1 至 T.5 中使用过的未损坏电池进行，以便测试进行在循环过的电池上。

Each battery type is subjected to tests T.1 to T.8. Tests T.1 to T.5 are conducted in sequence on the same battery. Tests 6 and 8 are conducted using not otherwise tested batteries. Test T.7 may be conducted using undamaged batteries previously used in Tests T.1 to T.5 for purposes of testing on cycled batteries.

2. 为了量化质量损失，可用以下公式计算：质量损失(%)=(M1-M2)/M1×100

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

$$\text{Mass loss(\%)} = (M_1 - M_2) / M_1 \times 100$$

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”。

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 is considered as "no mass loss".

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

3. 在测试 T.1 至 T.4 中，电池须满足无渗漏、无泄气、无解体、无破裂和无起火，并且每个试验电池在试验后的开路电压不小于其在进行这一试验前电压的 90%。

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

4. 备注 Remark:

测试判定： Possible test case verdicts:	
判定不适用于测试对象 Test case does not apply to the test object..... :	N/A
测试符合规定 Test object does meet the requirement..... :	P (Pass)
测试不符合规定 Test object does not meet the requirement..... :	F (Fail)

UN 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
38.3.4.1	Test T.1: 高度模拟/Altitude simulation		P
	试验电池和电池组应在压力等于或低于 11.6 千帕和环境温度 (20°C±5°C) 下存放至少 6 小时。/Test cells and batteries shall be stored at a pressure of 11.6 kPa or less for at least six hours at ambient temperature (20±5°C)		P
	电池和电池组无渗漏、无排气、无解体、无破裂和无起火, 并且每个试验电池或电池组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%。有关电压的要求不适用于完全放电状态的试验电池和电池组。/Cells and batteries meet this requirement if there is no mass loss, 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.	无渗漏、无排气、无解体、无破裂和无起火现象。 No leakage, no venting, no disassembly, no rupture and no fire. 测试数据见表 1。 The data see table 1.	P
38.3.4.2	Test T.2: 温度试验/Thermal test		P
	试验电池和电池组应先在试验温度等于 72°C±2°C 的条件下存放至少 6 小时, 接着再在试验温度等于 -40°C±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, 接着将所有试验电池和电池组在环境温度 (20°C±5°C) 下存放 24 小时。/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 10 times, after which all test cells and batteries are to be stored for 24 hours at ambient temperature (20 ±5°C).		P
	对于大型电池和电池组, 暴露于极端试验温度的时间至少应为 12 小时。/For large cells and batteries the duration of exposure to the test temperature extremes should be at least 12 hours.		N/A
	电池和电池组无渗漏、无排气、无解体、无破裂和无起火, 并且每个试验电池或电池组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%。有关电压的要求不适用于完全放电状态的试验电池和电池组。/Cells and batteries meet this requirement if there is no mass loss, 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.	无渗漏、无排气、无解体、无破裂和无起火现象。 No leakage, no venting, no disassembly, no rupture and no fire. 测试数据见表 2。 The data see table 2.	P

UN 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
38.3.4.3	Test T.3: 振动/Vibration		P
	<p>电池和电池组紧固于振动机平台，但不得造成电池变形，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 7Hz 和 200Hz 之间，再回到 7Hz，跨度为 15 分钟。这一振动过程须对三个互相垂直的电池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。/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.</p>		P
	<p>作对数式频率扫描，对总质量不足 12 千克的电池和电池组（电池和小型电池组），和对 12 千克及更大的电池组（大型电池组）有所不同。/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).</p>		P
	<p>对电池和小型电池组：从 7Hz 开始，保持 $1g_n$ 的最大加速度，直到频率达到 18Hz。然后将振幅保持在 0.8 毫米（总偏移 1.6 毫米），并增加频率直到最大加速度达到 $8g_n$（频率约为 50Hz）。将最大加速度保持在 $8g_n$ 直到频率增加到 200 Hz。/For cells and small batteries: from 7 Hz a peak acceleration of $1g_n$ 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 $8g_n$ occurs (approximately 50 Hz). A peak acceleration of $8g_n$ is then maintained until the frequency is increased to 200 Hz.</p>		P
	<p>对大型电池组：从 7Hz 开始，保持 $1g_n$ 的最大加速度，直到频率达到 18Hz。然后将振幅保持在 0.8 毫米（总偏移 1.6 毫米），并增加频率直到最大加速度达到 $2g_n$（频率约为 25Hz）。将最大加速度保持在 $2g_n$ 直到频率增加到 200Hz。/For large batteries: from 7 Hz to a peak acceleration of $1g_n$ 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 $2g_n$ occurs (approximately 25 Hz). A peak acceleration of $2g_n$ is then maintained until the frequency is increased to 200 Hz.</p>		N/A

UN 38.3														
Clause	Requirement + Test	Result - Remark	Verdict											
	<p>电池和电池组试验中和试验后无渗漏、无排气、无解体、无破裂和无起火，并且每个试验电池或电池组在第三个垂直安装方位上的试验后测得的开路电压不小于在进行这一试验前电压的 90%。有关电压的要求不适用于完全放电状态的试验电池和电池组。/Cells and batteries meet this requirement if there is no leakage, no venting, no disassembly, no rupture and no fire during the test and after the test and if the open circuit voltage of each test cell or battery directly after testing in its third perpendicular mounting position 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.</p>	<p>无渗漏、无排气、无解体、无破裂和无起火现象。 No leakage, no venting, no disassembly, no rupture and no fire.</p> <p>测试数据见表 3。 The data see table 3.</p>	P											
38.3.4.4	Test T.4: 冲击/Shock		P											
	<p>试验电池和电池组用坚硬支架紧固在试验装置上，支架支撑着每个试验电池组的所有安装面。/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.</p>		P											
	<p>每个电池必须经受最大加速度 150g_n 和脉冲持续时间 6 毫秒的半正弦波冲击。针对大型电池必须经受最大加速度 50g_n 和脉冲持续时间 11 毫秒的半正弦波冲击。/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 subjected to a half-sine shock of peak acceleration of 50 gn and pulse duration of 11 milliseconds</p>		P											
	<p>每个电池组应根据电池组的质量而受到峰值加速度的半正弦冲击。对于小型电池组的脉冲持续时间应为 6 毫秒，对于大型电池组的脉冲持续时间应为 11 毫秒。下面的公式用于计算适当的最小峰值加速度。/Each battery shall be subjected to a half-sine shock of peak acceleration depending on the mass of 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.</p> <table border="1" data-bbox="311 1668 917 1993"> <thead> <tr> <th>Battery</th> <th>Minimum peak acceleration</th> <th>Pulse duration</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Small batteries</td> <td>150 g_n or result of formula $Acceleration(g_n) = \sqrt{\left(\frac{100850}{mass^*}\right)}$</td> <td rowspan="2">6 ms</td> </tr> <tr> <td>whichever is smaller</td> </tr> <tr> <td rowspan="2">Large batteries</td> <td>50 g_n or result of formula $Acceleration(g_n) = \sqrt{\left(\frac{30000}{mass^*}\right)}$</td> <td rowspan="2">11 ms</td> </tr> <tr> <td>whichever is smaller</td> </tr> </tbody> </table> <p>* Mass is expressed in kilograms.</p>	Battery	Minimum peak acceleration	Pulse duration	Small batteries	150 g _n or result of formula $Acceleration(g_n) = \sqrt{\left(\frac{100850}{mass^*}\right)}$	6 ms	whichever is smaller	Large batteries	50 g _n or result of formula $Acceleration(g_n) = \sqrt{\left(\frac{30000}{mass^*}\right)}$	11 ms	whichever is smaller		N/A
Battery	Minimum peak acceleration	Pulse duration												
Small batteries	150 g _n or result of formula $Acceleration(g_n) = \sqrt{\left(\frac{100850}{mass^*}\right)}$	6 ms												
	whichever is smaller													
Large batteries	50 g _n or result of formula $Acceleration(g_n) = \sqrt{\left(\frac{30000}{mass^*}\right)}$	11 ms												
	whichever is smaller													

UN 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
	每个电池或电池组须在三个互相垂直的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。/ 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.		P
	电池和电池组无渗漏、无排气、无解体、无破裂和无起火，并且每个试验电池或电池组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%。有关电压的要求不适用于完全放电状态的试验电池和电池组。/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.	无渗漏、无排气、无解体、无破裂和无起火现象。 No leakage, no venting, no disassembly, no rupture and no fire. / 测试数据见表 4。 The data see table 4.	P
38.3.4.5	Test T.5: 外部短路/External short circuit		P
	待测试的电池或电池组应加热一段时间，以使其外表面温度达到均匀稳定的 $57\pm 4^{\circ}\text{C}$ 的温度。加热时间取决于电池或电池组的大小和设计，并应进行评估和记录。如果这种评估是不可行的，对于小型电池和小型电池组至少在 $57\pm 4^{\circ}\text{C}$ 的环境下存放 6 小时，对于大型电池和大型电池组至少在 $57\pm 4^{\circ}\text{C}$ 的环境下存放 12 小时。然后，电池或电池组在 $57\pm 4^{\circ}\text{C}$ 的环境中，应接受一个外部总电阻小于 0.1 欧姆的短路条件。/The cell or battery to be tested shall be heated for a period of time necessary to reach a homogeneous stabilized temperature of $57\pm 4^{\circ}\text{C}$, 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 $57\pm 4^{\circ}\text{C}$ shall be subjected to one short circuit condition with a total external resistance of less than 0.1 ohm.		P
	这一短路条件应在电池或电池组外壳温度回到 $57\pm 4^{\circ}\text{C}$ 后继续短路 1 小时，或对于大型电池组其外壳温度已下降了一半的最大温升，并保持低于该值。短路和冷却过程至少在环境温度中进行。/This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to $57\pm 4^{\circ}\text{C}$, 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. The short circuit and cooling down phases shall be conducted at least at ambient temperature.		P

UN 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
	电池和电池组外壳温度不超过 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。/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 the test.	在测试过程中以及之后 6 个小时内，外表温度不超 170°C，并且无解体，无破裂，无起火现象发生。 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 the test. 测试数据见表 5。 The data see table 5.	P
38.3.4.6	Test T.6: 撞击/挤压/Impact / Crush		P
	撞击(适合于直径大于或等于 18mm 的圆柱形电芯)/Test procedure – Impact (applicable to cylindrical cells greater than or equal to 18 mm in diameter)	直径等于 18mm 的圆柱形电芯/ Cylindrical cells equal to 18 mm in diameter	P
	试样电池或元件电池放在平坦光滑的表面上，一根 316 型不锈钢棒横放在试样中心，钢棒直径 15.8 毫米 ± 0.1 毫米，长度至少 6 厘米，或电池最长端的尺度，取二者之长者。将一块 9.1 千克 ± 0.1 千克的重锤从 61 ± 2.5 厘米高处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 sample cell or component cell is to be placed on a flat smooth surface. A 15.8 mm±0.1mm diameter, at least 6 cm long, or the longest dimension of the cell, whichever is greater, Type 316 stainless steel bar is to be placed across the centre of the sample. A 9.1 kg±0.1 kg mass is to be dropped from a height of 61±2.5 cm at the intersection 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.		P
	接受撞击的试样，纵轴应与平坦表面平行并与横放在试样中心的直径 15.8 ±0.1 毫米弯曲表面的纵轴垂直。每一试样只经受一次撞击。 /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.		P
	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）/Test Procedure – Crush (applicable to prismatic, pouch, coin/button cells and cylindrical cells not more than 18 mm in diameter).	直径等于 18mm 的圆柱形电芯/ Cylindrical cells equal to 18 mm in diameter	N/A

UN 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
	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 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.		N/A
	(a) 施加力达到 13kN±0.78kN The applied force reaches 13kN±0.78kN		N/A
	(b) 样品的电压下降至少 100mV The voltage of the cell drops by at least 100 mV		N/A
	(c) 电池变形达原始厚度的 50%以上。 The cell is deformed by 50% or more of its original thickness.		N/A
	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。圆柱形电池应从与纵轴垂直的方向施压。/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.		N/A
	每个试样电池或元件电池只做一次挤压试验。试样应继续观察 6 小时。试验应使用之前未做过其他试验的电池或元件电池进行。/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.		N/A
	电芯满足要求：在测试过程中以及之后 6 个小时内，外表温度不超过 170°C，并且无解体和无起火现象发生。/Cells 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 this test.	无解体，无起火现象发生。 No disassembly and no fire. 测试数据见表 6。 The data see table 6.	P
38.3.4.7	Test T.7: 过充电/Overcharge		N/A
	充电电流必须是制造商建议的最大持续充电电流的两倍。试验的最小电压如下：/The charge current shall be twice the manufacturer's recommended maximum continuous charge current. Tests are to be conducted at ambient temperature. The duration of the test shall be 24 hours. The minimum voltage of the test shall be as follows:		N/A

UN 38.3			
Clause	Requirement + Test	Result - Remark	Verdict
	(a) 制造商建议的充电电压不大于 18 伏时, 试验的最小电压应是电池组最大充电电压的两倍或 22 伏两者中的较小者/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.		N/A
	(b) 制造商建议的充电电压大于 18 伏时, 试验的最小电压应为最大充电电压的 1.2 倍。/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.		N/A
	充电电池组在试验过程中和试验后 7 天内无解体, 无起火。/Rechargeable batteries meet this requirement if there is no disassembly and no fire during the test and within seven days after the test.		N/A
38.3.4.8	Test T.8: 强制放电/Forced discharge		P
	每个电池应在环境温度下与 12 伏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。/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.		P
	将适当大小和额定值的电阻负荷与试验电池串联, 计算得出给定的放电电流。对每个电池进行强制放电, 放电时间 (小时) 应等于其额定容量除以初始试验电流 (安培)。/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).		P
	原电池或充电电池在试验过程中和试验后 7 天内无解体, 无起火/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.	无解体, 无起火现象发生。 No disassembly and no fire. 测试数据见表 8 The data see table 8.	P

表 1 Table 1		高度模拟 Altitude simulation					
样品编号 Sample No	测试前 Before		测试后 After		质量损失 Mass loss (%)	电压损失 Voltage loss (%)	测试结果 Test result
	电池质量 m_1 (g)	开路电压 V_1 (V)	电池质量 m_2 (g)	开路电压 V_2 (V)			
C01	44.667	4.19	44.662	4.19	0.011	0.00	P
C02	44.838	4.20	44.834	4.19	0.009	0.24	P
C03	44.752	4.19	44.749	4.18	0.007	0.24	P
C04	44.804	4.20	44.801	4.19	0.007	0.24	P
C05	44.815	4.20	44.809	4.19	0.013	0.24	P
C06	44.696	4.19	44.692	4.19	0.009	0.00	P
C07	44.758	4.19	44.753	4.19	0.011	0.00	P
C08	44.734	4.20	44.730	4.19	0.009	0.24	P
C09	44.813	4.20	44.808	4.19	0.011	0.24	P
C10	44.350	4.19	44.345	4.19	0.011	0.00	P

表 2 Table 2		温度试验 Thermal test					
样品编号 Sample No	测试前 Before		测试后 After		质量损失 Mass loss (%)	电压损失 Voltage loss (%)	测试结果 Test result
	电池质量 m_1 (g)	开路电压 V_1 (V)	电池质量 m_2 (g)	开路电压 V_2 (V)			
C01	44.662	4.19	44.648	4.13	0.031	1.43	P
C02	44.834	4.19	44.819	4.13	0.033	1.43	P
C03	44.749	4.18	44.735	4.13	0.031	1.20	P
C04	44.801	4.19	44.786	4.13	0.033	1.43	P
C05	44.809	4.19	44.793	4.12	0.036	1.67	P
C06	44.692	4.19	44.680	4.13	0.027	1.43	P
C07	44.753	4.19	44.739	4.13	0.031	1.43	P
C08	44.730	4.19	44.714	4.12	0.036	1.67	P
C09	44.808	4.19	44.794	4.13	0.031	1.43	P
C10	44.345	4.19	44.332	4.12	0.029	1.67	P

表 3 Table 3		振动 Vibration					
样品编号 Sample No	测试前 Before		测试后 After		质量损失 Mass loss (%)	电压损失 Voltage loss (%)	测试结果 Test result
	电池质量 m_1 (g)	开路电压 V_1 (V)	电池质量 m_2 (g)	开路电压 V_2 (V)			
C01	44.648	4.13	44.647	4.13	0.002	0.00	P
C02	44.819	4.13	44.819	4.12	0.000	0.24	P
C03	44.735	4.13	44.735	4.13	0.000	0.00	P
C04	44.786	4.13	44.786	4.12	0.000	0.24	P
C05	44.793	4.12	44.792	4.12	0.002	0.00	P
C06	44.680	4.13	44.680	4.13	0.000	0.00	P
C07	44.739	4.13	44.739	4.12	0.000	0.24	P
C08	44.714	4.12	44.713	4.12	0.002	0.00	P
C09	44.794	4.13	44.794	4.13	0.000	0.00	P
C10	44.332	4.12	44.332	4.12	0.000	0.00	P

表 4 Table 4		冲击 Shock					
样品编号 Sample No	测试前 Before		测试后 After		质量损失 Mass loss (%)	电压损失 Voltage loss (%)	测试结果 Test result
	电池质量 m_1 (g)	开路电压 V_1 (V)	电池质量 m_2 (g)	开路电压 V_2 (V)			
C01	44.647	4.13	44.647	4.12	0.000	0.24	P
C02	44.819	4.12	44.819	4.12	0.000	0.00	P
C03	44.735	4.13	44.734	4.13	0.002	0.00	P
C04	44.786	4.12	44.786	4.12	0.000	0.00	P
C05	44.792	4.12	44.792	4.12	0.000	0.00	P
C06	44.680	4.13	44.680	4.13	0.000	0.00	P
C07	44.739	4.12	44.738	4.12	0.002	0.00	P
C08	44.713	4.12	44.713	4.12	0.000	0.00	P
C09	44.794	4.13	44.794	4.12	0.000	0.24	P
C10	44.332	4.12	44.332	4.12	0.000	0.00	P

表5 Table5	外部短路 External short circuit									
样品编号 Sample No	C01	C02	C03	C04	C05	C06	C07	C08	C09	C10
温度 (°C) Temp (°C)	80.6	82.3	84.6	87.3	85.9	86.1	89.4	85.3	82.6	86.0

表6 Table6	撞击 Impact									
样品编号 Sample No	C11	C12	C13	C14	C15	C16	C17	C18	C19	C20
试验前电压(V) OCV prior to test	3.67	3.68	3.68	3.67	3.67	3.68	3.68	3.67	3.68	3.67
温度 (°C) Temp (°C)	119.7	125.6	124.2	120.5	123.4	126.0	125.8	118.4	124.3	127.9

表7 Table7	电池过充试验 Overcharge Test of batteries									
样品编号 Sample No	--	--	--	--	--	--	--	--	--	--
试验前电压(V) OCV prior to test	--	--	--	--	--	--	--	--	--	--

表8 Table8	强制放电 Forced discharge									
样品编号 Sample No	C21	C22	C23	C24	C25	C26	C27	C28	C29	C30
试验前电压(V) OCV prior to test	3.36	3.34	3.33	3.35	3.36	3.32	3.36	3.35	3.34	3.33
样品编号 Sample No	C31	C32	C33	C34	C35	C36	C37	C38	C39	C40
试验前电压(V) OCV prior to test	3.32	3.35	3.36	3.32	3.35	3.36	3.34	3.33	3.35	3.33

样品图片
Sample photos

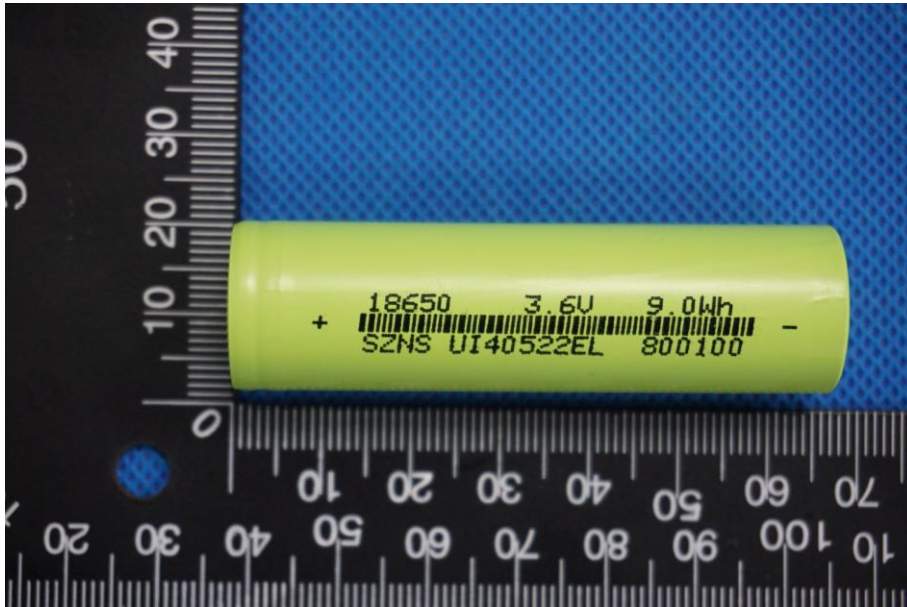


Fig. 1 – Front view of Cell

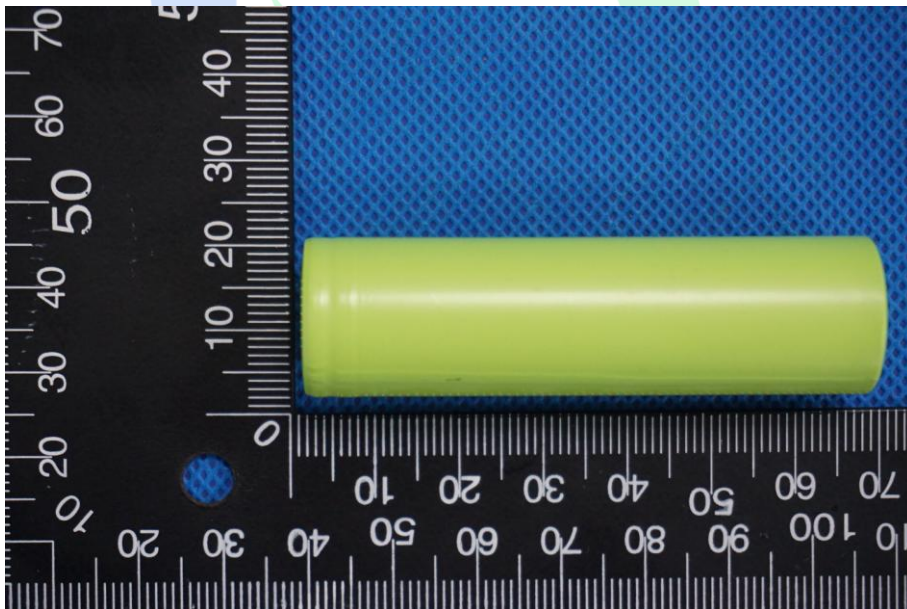


Fig.2 – Back view of Cell

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--End of test report--