



LCIE

BV LCIE  
CHINA  
Number

N°2066AB04NVP34714

## ATTESTATION of conformity with European Directives

*Product* : **Callus Remover**  
*Reference* : **MT-510, M9, VPC-7810**  
*Trade mark* : **--**  
*Issued to* : **Wenzhou EMTEC Electrical Appliance Co., Ltd**  
*Address* : **79#, Xingguo Road, High Tech Industrial Zone, Wenzhou, China**  
*Manufacturer* : **Wenzhou EMTEC Electrical Appliance Co., Ltd**  
*Address* : **79#, Xingguo Road, High Tech Industrial Zone, Wenzhou, China**  
*Technical characteristics* : **DC 5V**

The submitted sample of the above equipment has been tested for **CE** marking according to following European Directive and following standards:

### Electromagnetic Compatibility Directive 2014/30/EU

Standards	Report number	Report date
EN 55014-1:2017 EN 55014-2:2015	NVP-ESH-P200410664B	23/04/2020

The referred test report(s) show that the product complies with standard(s) recognized as giving presumption of compliance with the essential requirements in the specified European Directive

This verification does not imply assessment of the production of the product  
The **CE** marking may be affixed if all relevant and effective European Directives with **CE** are applicable

Shanghai (P.R. China), Apr.23, 2020

Yi XU  
Expert



This document shall not be reproduced, except in full, without the written approval of LCIE China Company Limited.  
Information given in this document, are related to the tested specimen of the described electrical sample.

LCIE China Company Limited  
必维欧亚电气技术咨询服务(上海)有限公司  
Version 9/2019.1.10

Building 4, No. 518, Xin Zhuan Road,  
CaoHejing Songjiang High-Tech Park,  
Shanghai, CHINA

Tel: +86 21 6195 7000  
Fax: +86 21 6195 7001  
Email: [contact@cn.bureauveritas.com](mailto:contact@cn.bureauveritas.com)

TR No.: TCTTJ20201218258ZB-BR03

材料安全数据表  
Material Safety Data Sheet

产品名称.....:

锂离子电芯

Product.....:

Lithium ion cell

型号规格.....:

18650

Model.....:

3.7V\1500mAh\5.55Wh

委托单位.....:

安徽相源新能源有限公司

Applicant.....:

Anhui Xiangyuan New Energy Co.,LTD.

发行日期.....:

Issue date.....:

批准人员.....:

Approved by...:



Shenzhen Tiansu Calibration and Testing Co.,Ltd

深圳天溯计量检测股份有限公司

B/1/4, NO.2 Jinlong Road, Longgang District, Shenzhen, China

深圳市龙岗区宝龙街道锦龙大道 2 号 1 栋、4 栋

Web: www.tiansu.org

E-mail: tsjc@tiansu.org

Tel: 0755-89457984



TS(SZ)-J3-008-001-A1

Rep. No.: TCTTJ20201218258ZB-BR03

第 2 页 共 7 页

1-化学品及企业标识 Chemical Product and Company Identification	
样品名称..... Sample Name.....	锂离子电芯 Lithium ion cell
型号规格..... Type/Model.....	18650
委托单位..... Applicant.....	安徽相源新能源有限公司 Anhui Xiangyuan New Energy Co.,LTD.
委托单位地址..... Applicant Address.....	安徽省淮北经济开发区新区尚和路南唐山路东 East of Tangshan Road,South of Shanghe Road,New Area of Huaibei Economic Development Zone,Anhui Province.
制造单位..... Manufacture.....	安徽相源新能源有限公司 Anhui Xiangyuan New Energy Co.,LTD.
制造单位地址..... Manufacture Address.....	安徽省淮北经济开发区新区尚和路南唐山路东 East of Tangshan Road,South of Shanghe Road,New Area of Huaibei Economic Development Zone,Anhui Province.
额定参数 Rated parameters.....	3.7V\1500mAh\5.55Wh
紧急联系人..... Emergency contact.....	陈小姐 Ms Chen
应急联系电话 Emergency telephone.....	0561-5254999

2-成分和信息 Composition information		
材料及组分 Material or ingredient	CAS No.	重量/含量 Wt %
Lithium cobalt oxide	12190-79-3	40-45
Graphite	7782-42-5	20-23
Carbom nanotubes	1333-86-4	4-5
Methyl ethyl carbonate	623-53-0	2-3
Phosphate(1-),hexaf luoro-,lithium	21324-40-3	2-3
Copper	7440-50-8	6-8
Aluminium	7429-90-5	3-5
Nickel	7440-02-0	2-3
Poly(vinylidene flouride)	24937-79-9	2-3

**3-危险性概述 Hazards identification**

物品危险分类 Hazard label		非限制性货物 - 锂离子电芯 Lithium ion cell
爆炸危险性 Explosive risk	该物品不属于爆炸危险品。 This article does not belong to the explosion dangerous goods.	
易燃危险性 Flammable risk	该物品不属于易燃危险品。 This article does not belong to the flammable material.	
氧化危险性 Oxidation risk	该物品不属于氧化危险品。 This article does not belong to the oxidation of dangerous goods.	
毒害危险性 Toxic risk	该物品不属于毒害危险品。 This article does not belong to the toxic dangerous goods.	
放射危险性 Radioactive risk	该物品不属于放射危险品。 This article does not belong to the radiation of dangerous goods.	
腐蚀危险性 Mordant risk	该物品不属于腐蚀危险品。 This article does not belong to the corrosion of dangerous goods.	
其他危险性 Other risk	该电池属于锂离子电芯。 The battery belongs to Lithium ion cell.	

**4-急救措施 First aid measures**

眼睛：万一接触，立即用大量的清水冲洗至少 15 分钟，翻起上下眼睑，直到化学的残留物消失为止，迅速就医。  
Eye: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

皮肤：万一接触，用大量水冲洗至少 15 分钟，同时除去污染的衣物和鞋子，迅速就医。  
Skin: Remove contaminated clothes and rinse skin with plenty of water or shower for 15 minutes, get medical aid.

吸入：立即从暴露处移至空气清新处，如果呼吸困难给予输氧，立即就医。  
Inhalation: Remove from exposure and move to fresh air immediately. Use oxygen if available.

食入：引用两杯牛奶或水。如果当事人仍然清晰可以采取催吐的方法，并且立即就医。  
Ingestion: Give at least 2 glasses of milk or water. Induce vomiting unless patient is unconscious, Call a physician.

**5-消防措施 Fire-fighting measures**

燃点：不适用。  
Flash Point: N/A.

自燃温度：不适用。  
Auto-Ignition Temperature: N/A.

灭火介质：大量水（降温），二氧化碳。  
Extinguishing Media: Water, CO2.

特殊灭火程序：自给式呼吸器。  
Special Fire-Fighting Procedures: Self-contained breathing apparatus.

异常火灾或爆炸：当电芯暴露于过热的环境中时，安全阀可能会打开。  
Unusual Fire and Explosion Hazards: Cell may vent when subjected to excessive heat-exposing battery contents.

燃烧产生的危险物品：一氧化碳，二氧化碳，锂氧化物烟气。  
Hazardous Combustion Products: Carbon monoxide, carbon dioxide, lithium oxide fumes.

**6-泄露应急处理 Accidental release measures**

为防止电池材料泄露或释放采取的措施

如果电池内部材料泄露, 试验人员应立即撤离试验区直到烟气消散。将通风设备打开吹散危险性气体。用抹布擦净试验区, 清除溢出的液体, 将泄露电池放进塑料袋中, 然后放进钢制容器。避免皮肤和眼睛接触或吸入有害气体。

**Steps to be Taken in case Material is Released or Spilled**

If the battery material is released, remove personnel from area until fumes dissipate. Provide maximum ventilation to clear out hazardous gases. Wipe it up with a cloth, and dispose of it in a plastic bag and put into a steel can. The preferred response is to leave the area and allow the battery to cool and vapors to dissipate. Provide maximum ventilation. Avoid skin and eye contact or inhalation of vapors. Remove spilled liquid with absorbent and incinerate.

废弃物处置方法: 建议将电池完全放电, 消耗电池内部的锂金属, 并且深埋于土壤中。

Waste Disposal Method: It is recommended to discharge the battery to the end, to use up the metal lithium inside the battery, and to bury the discharged battery in soil.

**7-操作处置和储存 Handling and storage**

禁止打开、毁坏或焚烧电池, 因为电池有可能在这些处理过程中发生爆炸、破裂或泄露等事故。禁止将电池短路、过充、强制放电或扔入火中。禁止挤压刺穿电池或将电池浸入溶液中。

The battery should not be opened, destroyed or incinerate, since they may leak or rupture and release to the environment the ingredients that they contain in the hermetically sealed container. Do not short circuit terminals, or over charge the battery, forced over-discharge, throw to fire. Do not crush or puncture the battery, or immerse in liquids.

操作处置和储存中的防范措施

禁止物理或电滥用, 禁止高温储存, 最好将电池储存在阴凉、干燥、通风等温度变化较小的环境中。禁止将电池接触加热设备或将电池直接暴露与阳光中。

**Precautions to be taken in handling and storing**

Avoid mechanical or electrical abuse. Storage preferably in cool, dry and ventilated area, which is subject to little temperature change. Storage at high temperatures should be avoided. Do not place the battery near heating equipment, nor expose to direct sunlight for long periods.

拆解、挤压、直接放入火中或高温条件下, 电池可能发生爆炸和燃烧。禁止短接或将电池正负极错误的安装在设备中。

The battery may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures. Do not short or install with incorrect polarity.

**8-接触控制/个人防护 Exposure controls/personal protection**

呼吸防护: 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。

Respiratory Protection: 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.

通风条件: 正常使用条件下不需要。

Ventilation: Not necessary under conditions of normal use.

防护手套: 正常使用条件下不需要。

Protective Gloves: Not necessary under conditions of normal use.

其他防护服装或设备: 正常使用条件下不需要。

Other Protective Clothing or Equipment: Not necessary under conditions of normal use.

电池开阀试验时应做好个人防护: 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。

Personal Protection is recommended for venting battery: Respiratory Protection, Protective Gloves, Protective Clothing and safety glass with side shields.

**9-物理和化学特性 Physical and chemical properties**

外形：棱柱形。

Appearance: Prismatic.

气味：泄漏时，有醚的气味。

Odors: If leaking, smells of medical ether.

酸碱度：不适用。

pH: Not applicable as supplied.

燃点：除单个电芯暴露试验外其他不适用。

Flash Point: Not applicable unless individual components exposed.

可燃性：除单个电芯暴露试验外其他不适用。

Flammability: Not applicable unless individual components exposed.

相对密度：除单个电芯暴露试验外其他不适用。

Relative density: Not applicable unless individual components exposed.

溶解性（水溶性）：除单个电芯暴露试验外其他不适用。

Solubility (water): Not applicable unless individual components exposed.

溶解性（其他）：除单个电芯暴露试验外其他不适用。

Solubility (other): Not applicable unless individual components exposed.

**10-稳定性和反应活性 Stability and reactivity**

稳定性：产品在第 7 节所述的条件下稳定。

Stability: Product is stable under conditions described in Section 7.

应避免的条件：加热 70℃ 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。

Conditions to Avoid: Heat above 70℃ or incinerate, Deform, Mutilate, Crush, Disassemble, Overcharge, Short circuit, Expose over a long period to humid conditions.

应避免的材料：氧化剂，碱，水。

Materials to avoid: Oxidising agents, alkalis, water.

危险分解物：有毒烟雾，并可能形成过氧化物。

Hazardous Decomposition Products: Toxic Fumes, and may form peroxides.

聚合危害：不适用。

Hazardous Polymerization: N/A.

如果发生泄露，避免与强氧化剂，无机酸，强碱，卤代烃接触。

If leaked, forbidden to contact with strong oxidizers, mineral acids, strong alkalies, halogenated Hydrocarbons.

**11-毒理学资料 Toxicological information**

标志及症状：无，除非电池破裂。

Signs & symptoms: None, unless battery ruptures.

内部物质暴露的情况下，蒸汽烟雾可能对眼睛和皮肤的刺激性。

In the event of exposure to internal contents, vapour fumes may be very irritating to the eyes and skin.

吸入：对肺有刺激性。

Inhalation: Lung irritant.

皮肤接触：对皮肤刺激性。

Skin contact: Skin irritant.

眼睛接触：对眼睛有刺激性。

Eye contact: Eye irritant

食入：吞下中毒。

Ingestion: Poisoning if swallowed.

下列情况下健康状况会恶化：万一发生与电池内部材料接触的事故，轻微或严重的刺激，都可能使皮肤出现干燥和灼烧的感觉，并且损坏靶器官（肝脏，肾脏）的神经。

Medical conditions generally aggravated by exposure: In the event of exposure to internal contents, moderate to server irritation, burning and dryness of the skin may occur, Target Organs nerves, liver and kidneys.

## 12-生态学资料 Ecological information

对哺乳动物的影响：目前未知。

Mammalian effects: None known at present.

生态毒性：目前未知。

Eco-toxicity: None known at present.

生物体内积累：慢慢地生物降解。

Bioaccumulation potential: Slowly Bio-degradable.

环境危害：目前没有已知的环境危害。

Environmental fate: None known environmental hazards at present.

## 13-废弃处置 Disposal consideration

不要焚烧，或使电池温度超过 70℃，这种滥用可导致泄漏和/或电池爆炸。按照相应的地方性法规处理。

Do not incinerate, or subject cells to temperature in excess of 70℃, Such abuse can result in loss of seal leakage, and/or cell explosion. Dispose of in accordance with appropriate local regulations.

## 14-运输信息 Transport information

Scope of application: This report applies to by sea, by air and by land.

适用范围：本报告适用于海运、空运和陆运。

Label for conveyance: Lithium Battery Mark, Class 9 hazard label, Cargo Aircraft Only Label.

运输标签：锂电池标记、第九类危险品标识、仅限货机标签。

UN Number: UN3480 or UN3481.

UN 编号：UN3480 or UN3481.

Marine pollutant: No.

海洋污染物：无。

EmS NO: F-A, S-I.

EmS 编号：F-A, S-I.

Proper Shipping name: Lithium Ion Batteries;  
Lithium Ion Batteries Contained in Equipment;  
Lithium Ion Batteries Packed with Equipment.

正确的装运名称：锂离子电池；  
安装在设备中的锂离子电池；  
与设备包装在一起的锂离子电池。

Hazard Classification: The goods shall be complied with the requirements of Section IA\B\II of Packing Instructions 965 and Section III of Packing Instructions 966\967 of 62nd DGR Manual of IATA(2021 edition) or IMDG CODE(Amdt. 39-18)2018 Edition, including the passing of the UN38.3 test.

危险性分类：货物应遵守 IATA 第 62 版 DGR 手册包装说明 PI965 第 IA\B\II 节和 PI966\967 第 III 节之规定(2021 年版)和海运危险货物运输规则(Amdt. 39-18)2018 年版，包括通过 UN38.3 测试标准要求。

## 15-法规信息 Regulation information

法律信息

Law information

《危险物品规则》

《Dangerous Goods Regulations》

《对危险货物运输的有关规定的建议》

《Recommendations on the Transport of Dangerous Goods Model Regulations》

《国际海运危险货物规则》

《International Maritime Dangerous Goods》

《危险品安全运输技术指令》

《Technical Instructions for the Safe Transport of Dangerous Goods》

《危险货物分类和品名编号》

《Classification and code of dangerous goods》

《职业安全卫生法》  
《Occupational Safety and Health Act》(OSHA)  
《有毒物质控制法》  
《Toxic Substance Control Act》(TSCA)  
《消费产品安全法》  
《Consumer Product Safety Act》(CPSA)  
《联邦环境污染控制法》  
《Federal Environmental Pollution Control Act》(FEPCA)  
《石油污染法案》  
《The Oil Pollution Act》(OPA)  
《超级基金修正案和再授权法案III(302/311/312/313)》  
《Superfund Amendments and Reauthorization Act Title III (302/311/312/313)》(SARA)  
《资源保护及恢复法案》  
《Resource Conservation and Recovery Act》(RCRA)  
《安全饮用水法》  
《Safety Drinking Water Act》(CWA)  
《加州 65 提案》  
《California Proposition 65》  
《美国联邦法规》  
《Code of Federal Regulations》(CFR)  
根据所有联邦、州和地方法律。  
In accordance with all Federal State and local laws.

#### 16-其他信息 Other information

本文件仅对由委托方提供的，并由安徽相源新能源有限公司生产的电池（型号：18650）有效。该电池的成  
分信息由委托方提供并承诺其完整性和准确性。  
用户应仔细阅读此文件，并按照正确的方法使用电池，如因电池使用不当造成的损害或损失，深圳天溯计  
量检测股份有限公司不承担任何责任。

This file is only effective to the batteries (Model: 18650) provided by Applicant which manufactured by Anhui  
Xiangyuan New Energy Co.,LTD.. The Applicant provides the composition information of batteries, and  
promises its integrity and accuracy.

Users should read this file carefully, and use the batteries in correct method. Shenzhen Tiansu Calibration  
and Testing Co.,Ltd. Doesn't assume responsibility for any damage or loss because of misuse of batteries.

----- END -----



CONSUMER PRODUCTS SERVICES DIVISION

**WENZHOU EMTEC ELECTRICAL APPLIANCE CO., LTD**

**Review Report:** (9020)136-0118  
**Date Received:** MAY 15, 2020

MAY 15, 2020  
 Page 1 of 14

WENZHOU EMTEC ELECTRICAL APPLIANCE CO., LTD  
 XINGGUO ROAD, HIGH TECH INDUSTRIAL ZONE,  
 WENZHOU, CHINA

Sample Description:	CALLUS REMOVER	Sample Size:	N/A
Vendor:	WENZHOU EMTEC ELECTRICAL APPLIANCE CO., LTD		
Manufacturer:	N/A	Style No(s):	MT-510, M9, VPC-7810
Buyer:	N/A	SKN/SKU	N/A
		No.:	
Labeled Age Grade:	N/A	PO No.:	N/A
Appropriate Age Grade:	N/A	Ref #:	N/A
Client Specified Age	N/A	Assortment	N/A
Grade:		No.:	
Tested Age Grade:	N/A	Country of	EU
		Destination:	
Country of Origin:	CHINA	Color:	N/A
UPC Code:	N/A		

#	Test Item(s)	Reference Standard/Method	Result
1	Lead, Cadmium, Mercury, Hexavalent Chromium, PBBs, PBDEs, DBP, BBP, DEHP and DIBP EU RoHS Directive 2011/65/EU and its amendment directives (EU) 2015/863 (RoHS 2.0)	IEC 62321-3-1:2013 IEC 62321-4:2013+A1:2017 IEC 62321-5:2013 IEC 62321-6:2015 IEC 62321-7-1:2015 IEC 62321-7-2:2017 IEC 62321-8:2017	PASS

**BVCPS (SHANGHAI)-QINGDAO BRANCH CONTACT INFORMATION FOR THIS REPORT****Technical enquiry:**

Gaily Gong 86-532-58827971 gaily.gong@cn.bureauveritas.com

**General enquiry and invoicing:**

Chloe Wang 86-532-58827923 chloe.wang@cn.bureauveritas.com  
 Mandy Zhang 86-532-58827932 mandy.zhang@cn.bureauveritas.com

Bureau Veritas

Consumer Products Services (Shanghai)-Qingdao Branch

Anderson Zhang

Qingdao Hardline Reporting Manager

Bureau Veritas Consumer Products Services, Inc. (Shanghai), Qingdao Branch  
 No.3 building, GNDC Tech Base,  
 No.192 Zhuzhou Road, Laoshan District, Qingdao, China, 266101  
 Tel: 86-532-58827999 Fax: 86-532-88706839  
 Email: bvcpsinfor.qd@cn.bureauveritas.com  
 Website: cps.bureauveritas.com

This report is governed by, and incorporates by reference, CPS Conditions of Service as posted at the date of issuance of this report at <http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions/> and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.



WENZHOU EMTEC ELECTRICAL APPLIANCE CO., LTD

Review Report: **(9020)136-0118**

MAY 15, 2020

Page 2 of 14

### TEST RESULT

**1. EU RoHS Directive 2011/65/EU and its amendment directives on XRF  
IEC 62321-3-1:2013, Screening by X-ray Fluorescence Spectroscopy (XRF)**

Seq. No.	Tested Part(s)	Results				
		Pb	Cd	Hg	Cr	Br
1	White plastic, shell	BL	BL	BL	BL	BL
2	Golden coating	BL	BL	BL	BL	BL
3	White plastic, button	BL	BL	BL	BL	BL
4	Black powder	BL	BL	BL	BL	BL
5	Black plastic, lid	BL	BL	BL	BL	BL
6	White plastic, axis	BL	BL	BL	BL	BL
7	Silvery metal, lid	BL	BL	BL	BL	NA
8	Silvery metal, frame	BL	BL	BL	BL	NA
9	Silvery metal, ball	BL	BL	BL	BL	NA
10	Silvery metal, outer ring	BL	BL	BL	BL	NA
11	Silvery metal, inner ring	BL	BL	BL	BL	NA
12	Translucent black plastic, lid	BL	BL	BL	BL	BL
13	Translucent soft plastic, washer	BL	BL	BL	BL	BL
14	Silvery metal, contact pin	X	BL	BL	BL	NA
15	Black body, IC	BL	BL	BL	BL	BL
16	Black body, resistor	BL	BL	BL	BL	BL
17	Black body, diode	BL	BL	BL	BL	BL
18	Black body, audion	BL	BL	BL	BL	BL
19	Green PCB	BL	BL	BL	BL	X
20	Silvery metal, solder	BL	BL	BL	BL	NA
21	Silvery metal, contact plate	BL	BL	BL	BL	NA
22	Black soft plastic, washer	BL	BL	BL	BL	BL
23	White soft plastic, plug cover	BL	BL	BL	BL	BL



WENZHOU EMTEC ELECTRICAL APPLIANCE CO., LTD

Review Report: **(9020)136-0118**

MAY 15, 2020

Page 3 of 14

24	Coppery metal, contact pin	BL	BL	BL	BL	NA
25	Silvery metal, wire core	BL	BL	BL	BL	NA
26	Translucent plastic, flabellum	BL	BL	BL	BL	BL
27	Black soft plastic, washer	BL	BL	BL	BL	BL
28	Silvery metal, shell	BL	BL	BL	BL	NA
29	Coppery metal, washer of shell	BL	BL	BL	BL	NA
30	Black magnet	BL	BL	BL	BL	NA
31	Dull silvery metal wire	BL	BL	BL	BL	NA
32	White plastic, washer	BL	BL	BL	BL	BL
33	Silvery metal sheet	BL	BL	BL	BL	NA
34	Black magnet	BL	BL	BL	BL	NA
35	Silvery metal, solder	BL	BL	BL	BL	NA
36	Silvery metal sheet	BL	BL	BL	BL	NA
37	Yellow plastic sheet	BL	BL	BL	BL	BL
38	Coppery enamelled wire	BL	BL	BL	BL	BL
39	Silvery metal, axis	BL	BL	BL	BL	NA
40	White soft plastic, plug cover	BL	BL	BL	BL	BL
41	Silvery metal, plug cover	BL	BL	BL	BL	NA
42	White plastic, plug holder	BL	BL	BL	BL	BL
43	Golden metal, contact pin	BL	BL	BL	BL	NA
44	Silvery metal, solder	BL	BL	BL	BL	NA
45	White soft plastic, thick wire jacket	BL	BL	BL	BL	BL
46	White soft plastic, thin wire jacket	BL	BL	BL	BL	BL
47	Pink soft plastic, thin wire jacket	BL	BL	BL	BL	BL
48	Coppery metal, wire core	BL	BL	BL	BL	NA



WENZHOU EMTEC ELECTRICAL APPLIANCE CO., LTD

Review Report: **(9020)136-0118**

MAY 15, 2020

Page 4 of 14

Remark:

- (1) Results were obtained by XRF for primary screening, and further chemical testing by ICP (for Cd, Pb, Hg), UV-Vis (for Cr(VI)) and GC-MS (for PBBs, PBDEs) are recommended to be performed, if the concentration exceeds the below warning value according to IEC 62321-3-1:2013.

Element	Unit	Non-metal	Metal	Composite Material
Cd	mg/kg	$BL \leq 70 - 3\sigma < X < 130 + 3\sigma \leq OL$	$BL \leq 70 - 3\sigma < X < 130 + 3\sigma \leq OL$	$BL \leq 50 - 3\sigma < X < 150 + 3\sigma \leq OL$
Pb	mg/kg	$BL \leq 700 - 3\sigma < X < 1300 + 3\sigma \leq OL$	$BL \leq 700 - 3\sigma < X < 1300 + 3\sigma \leq OL$	$BL \leq 500 - 3\sigma < X < 1500 + 3\sigma \leq OL$
Hg	mg/kg	$BL \leq 700 - 3\sigma < X < 1300 + 3\sigma \leq OL$	$BL \leq 700 - 3\sigma < X < 1300 + 3\sigma \leq OL$	$BL \leq 500 - 3\sigma < X < 1500 + 3\sigma \leq OL$
Cr	mg/kg	$BL \leq 700 - 3\sigma < X$	$BL \leq 700 - 3\sigma < X$	$BL \leq 500 - 3\sigma < X$
Br	mg/kg	$BL \leq 300 - 3\sigma < X$	--	$BL \leq 250 - 3\sigma < X$

Note:

BL = Below Limit

OL = Over Limit

X = Inconclusive

NA = Not Applicable

- (2) The XRF screening test for RoHS elements – The reading may be different to the actual content in the sample be of non-uniformity composition.
- (3) The maximum permissible limit is quoted from the document 2011/65/EU and its amendment directives (EU) 2015/863 :

RoHS Restricted Substances	Maximum Concentration Value (mg/kg) (by weight in homogenous materials)
Cadmium (Cd)	100
Lead (Pb)	1000
Mercury (Hg)	1000
Hexavalent Chromium (Cr(VI))	1000
Polybrominated biphenyls (PBBs)	1000



WENZHOU EMTEC ELECTRICAL APPLIANCE CO., LTD

Review Report: **(9020)136-0118**

MAY 15, 2020

Page 5 of 14

Polybrominated diphenyl ethers (PBDEs)	1000
--	------

(4) Disclaimers:

This XRF Screening report is for reference purposes only. The applicant shall make its/his/her own judgment as to whether the information provided in this XRF screening report is sufficient for its/his/her purposes. The result shown in this XRF screening report will differ based on various factors, including but not limited to, the sample size, thickness, area, surface flatness, equipment parameters and matrix effect(e.g. plastic, rubber, metal, glass, ceramic etc.). Further wet chemical pre-treatment with relevant chemical equipment analysis are required to obtain quantitative data.

- (5) The selection of test portions was recommended by the client and the conclusion of chemical test is only for the selected portions.

2. **Lead Content (Pb)**  
**IEC62321-5:2013, acid digested and determined by ICP-OES**

Compound		Material	Limit (mg/kg)	RL (mg/kg)
		14		
1	Lead (Pb)	28011	1000	10
	<b>Conclusion</b>	<b>PASS*</b>	-	-

Remark(s): (a) \* = Copper alloy containing up to 4% lead by weight  
(b) mg/kg: milligrams per kilogram  
(c) RL: Report limit  
(d) N.D.: Not detected (result is less than RL)



WENZHOU EMTEC ELECTRICAL APPLIANCE CO., LTD

Review Report: **(9020)136-0118**

MAY 15, 2020

Page 6 of 14

**3. Polybrominated Biphenyls and Polybrominated Diphenyl Ethers (PBBs and PBDEs)**  
**IEC 62321-6:2015, solvent extract and determined by GC/MS**

Compound		Material	Limit (mg/kg)	RL (mg/kg)
		19		
1	Monobromo biphenyl	N.D.	-	50
2	Dibromo biphenyl	N.D.	-	50
3	Tribromo biphenyl	N.D.	-	50
4	Tetrabromo biphenyl	N.D.	-	50
5	Pentabromo biphenyl	N.D.	-	50
6	Hexabromo biphenyl	N.D.	-	50
7	Heptabromo biphenyl	N.D.	-	50
8	Octabromo biphenyl	N.D.	-	50
9	Nonabromo biphenyl	N.D.	-	50
10	Decabromo biphenyl	N.D.	-	50
11	Monobromo diphenyl ether	N.D.	-	50
12	Dibromo diphenyl ether	N.D.	-	50
13	Tribromo diphenyl ether	N.D.	-	50
14	Tetrabromo diphenyl ether	N.D.	-	50
15	Pentabromo diphenyl ether	N.D.	-	50
16	Hexabromo diphenyl ether	N.D.	-	50
17	Heptabromo diphenyl ether	N.D.	-	50
18	Octabromo diphenyl ether	N.D.	-	50
19	Nonabromo diphenyl ether	N.D.	-	50
20	Decabromo diphenyl ether	N.D.	-	50
21	Sum of PBBs	N.D.	1000	-



WENZHOU EMTEC ELECTRICAL APPLIANCE CO., LTD

Review Report: **(9020)136-0118**

MAY 15, 2020

Page 7 of 14

22	Sum of PBDEs	N.D.	1000	-
	<b>Conclusion</b>	<b>PASS</b>	-	-

Remark(s): (a) mg/kg: milligram per kilogram  
 (b) RL: Report limit  
 (c) N.D.: Not detected (result is less than RL)

**4. Phthalates – (DBP, BBP, DEHP, DIBP)**  
**IEC 62321-8:2017, Solvent extract and determined by GC/MS**

Compound			Material				Limit (%)	RL(%)
			1+3+5	2	6+12+26	13		
1	DBP	Dibutylphthalate CAS# 84-74-2	N.D.	N.D.	N.D.	N.D.	0.1	0.005
2	BBP	Benzylbutylphthalate CAS# 85-68-7	N.D.	N.D.	N.D.	N.D.	0.1	0.005
3	DEHP	Diethylhexylphthalate CAS# 117-81-7	N.D.	N.D.	N.D.	N.D.	0.1	0.005
4	DIBP	Diisobutylphthalate CAS# 84-69-5	N.D.	N.D.	N.D.	N.D.	0.1	0.005
	<b>Conclusion</b>		<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	-	-

Compound			Material				Limit (%)	RL(%)
			15+16	17+18	19	22		
1	DBP	Dibutylphthalate CAS# 84-74-2	N.D.	N.D.	N.D.	N.D.	0.1	0.005
2	BBP	Benzylbutylphthalate CAS# 85-68-7	N.D.	N.D.	N.D.	N.D.	0.1	0.005
3	DEHP	Diethylhexylphthalate CAS# 117-81-7	N.D.	N.D.	N.D.	0.0179	0.1	0.005



WENZHOU EMTEC ELECTRICAL APPLIANCE CO., LTD

Review Report: **(9020)136-0118**

MAY 15, 2020

Page 8 of 14

4	DIBP	Diisobutyl phthalate CAS# 84-69-5	N.D.	N.D.	N.D.	N.D.	0.1	0.005
<b>Conclusion</b>			<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	-	-

Compound			Material				Limit (%)	RL(%)
			23	27	32+37+42	38		
1	DBP	Dibutylphthalate CAS# 84-74-2	N.D.	N.D.	N.D.	N.D.	0.1	0.005
2	BBP	Benzylbutylphthalate CAS# 85-68-7	N.D.	N.D.	N.D.	N.D.	0.1	0.005
3	DEHP	Diethylhexylphthalate CAS# 117-81-7	N.D.	N.D.	N.D.	N.D.	0.1	0.005
4	DIBP	Diisobutyl phthalate CAS# 84-69-5	N.D.	N.D.	N.D.	N.D.	0.1	0.005
<b>Conclusion</b>			<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	-	-

Compound			Material				Limit (%)	RL(%)
			40	45	46	47		
1	DBP	Dibutylphthalate CAS# 84-74-2	N.D.	N.D.	0.0408	N.D.	0.1	0.005
2	BBP	Benzylbutylphthalate CAS# 85-68-7	N.D.	N.D.	N.D.	N.D.	0.1	0.005
3	DEHP	Diethylhexylphthalate CAS# 117-81-7	N.D.	N.D.	0.0309	0.0303	0.1	0.005
4	DIBP	Diisobutyl phthalate CAS# 84-69-5	N.D.	N.D.	N.D.	N.D.	0.1	0.005
<b>Conclusion</b>			<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	<b>PASS</b>	-	-

Remark(s): (a) RL: Report limit

(b) N.D.: Not detected (result is less than RL)



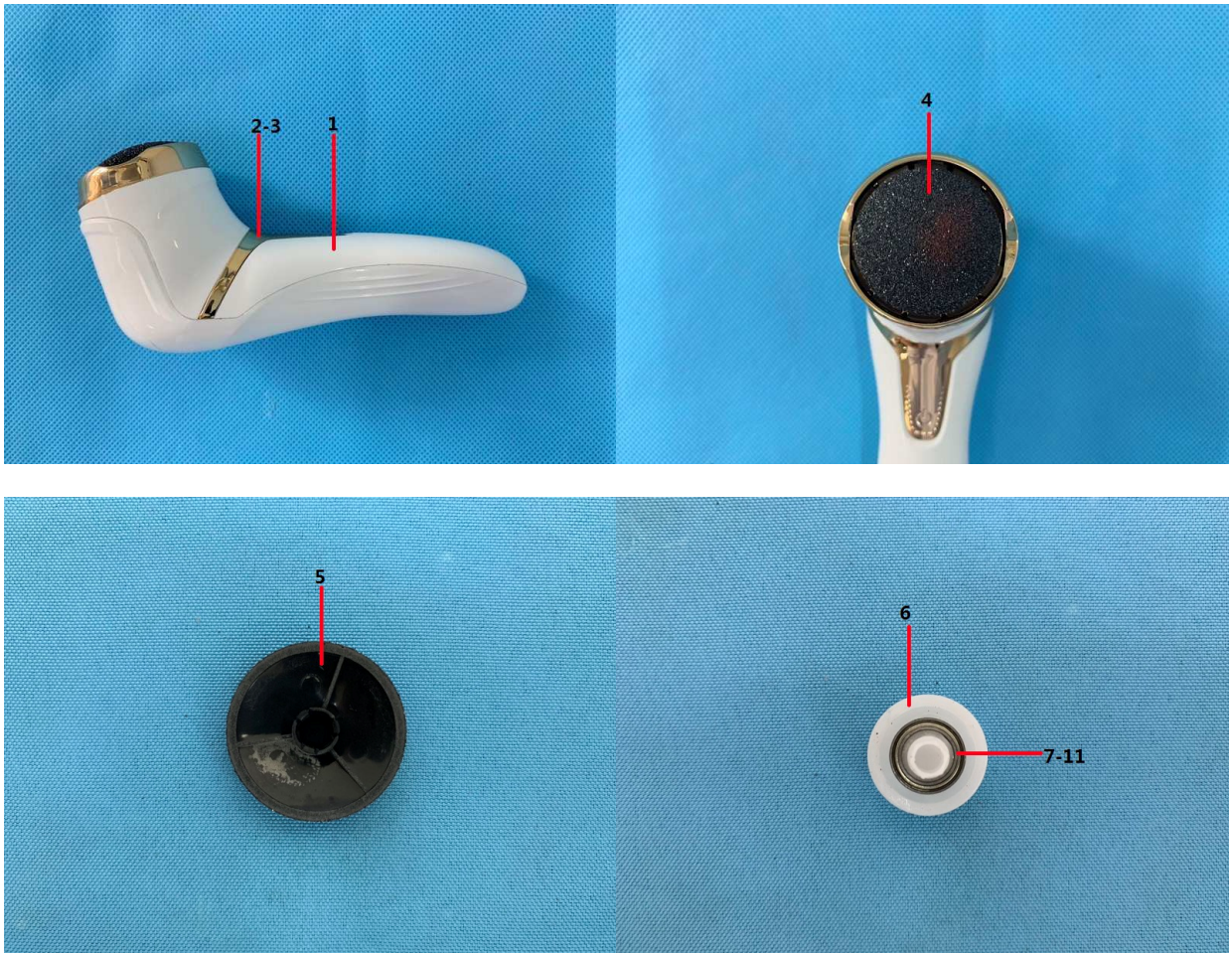
WENZHOU EMTEC ELECTRICAL APPLIANCE CO., LTD

Review Report: **(9020)136-0118**

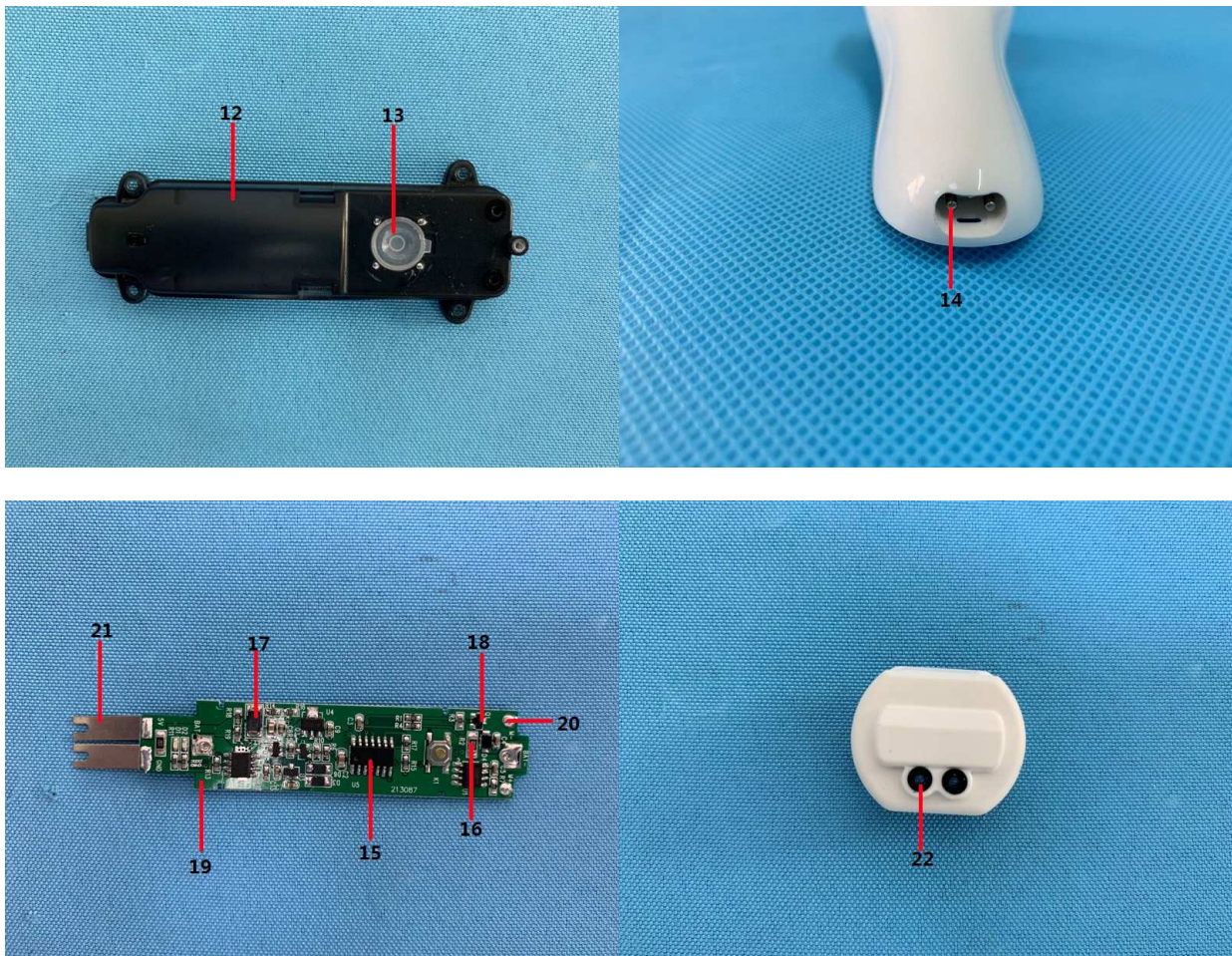
MAY 15, 2020

Page 9 of 14

<ATTACHMENT 1>



<ATTACHMENT 2>





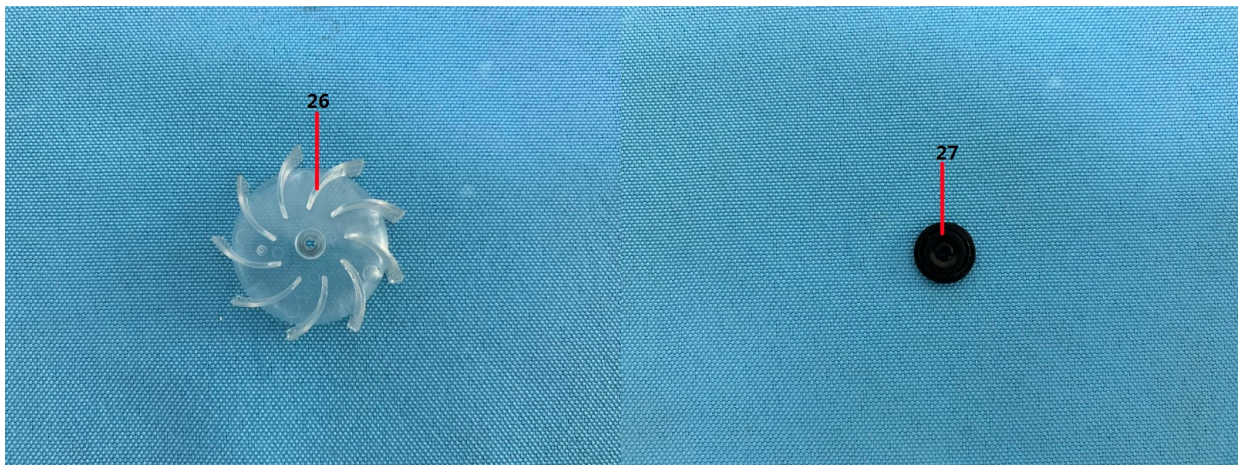
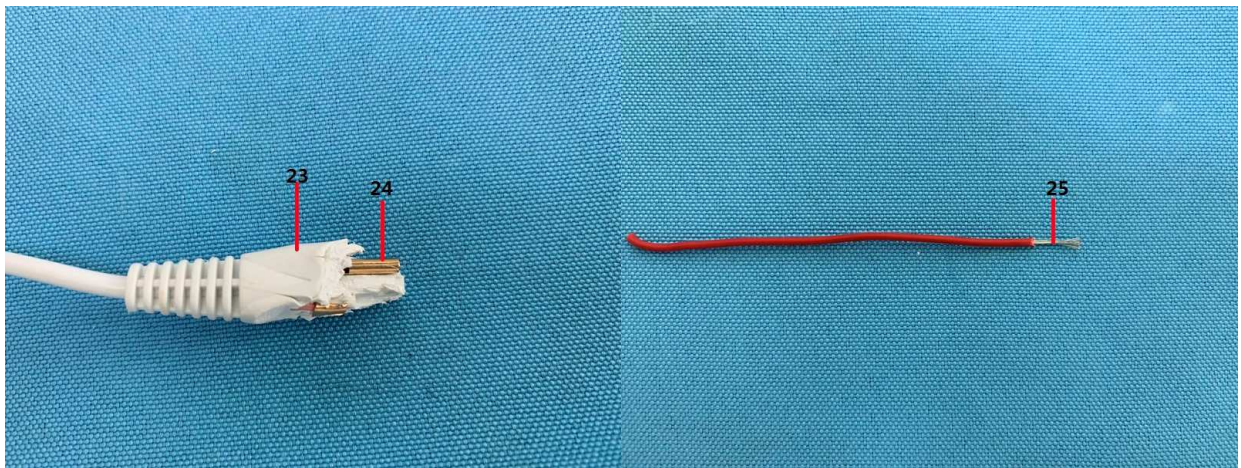
WENZHOU EMTEC ELECTRICAL APPLIANCE CO., LTD

Review Report: **(9020)136-0118**

MAY 15, 2020

Page 11 of 14

<ATTACHMENT 3>





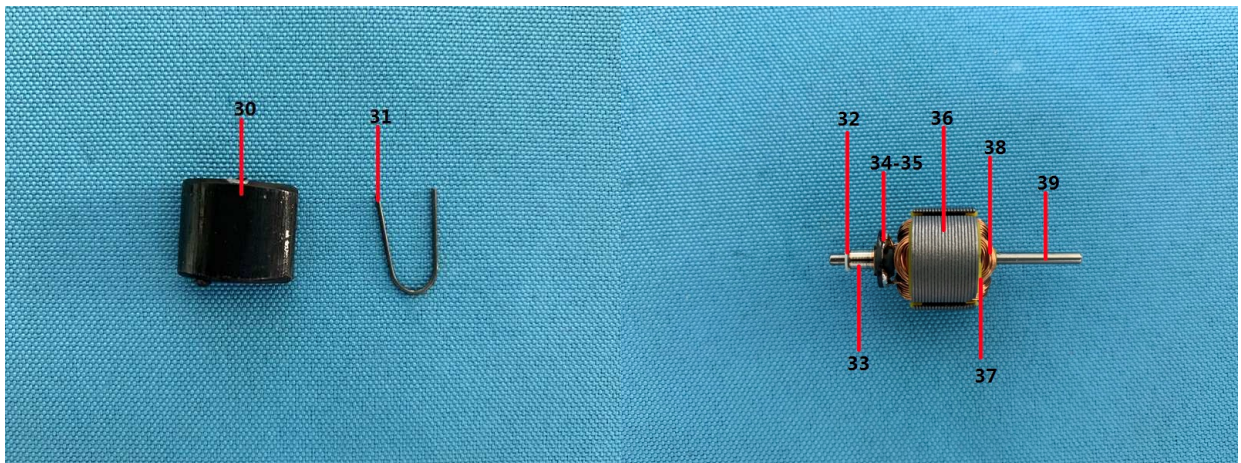
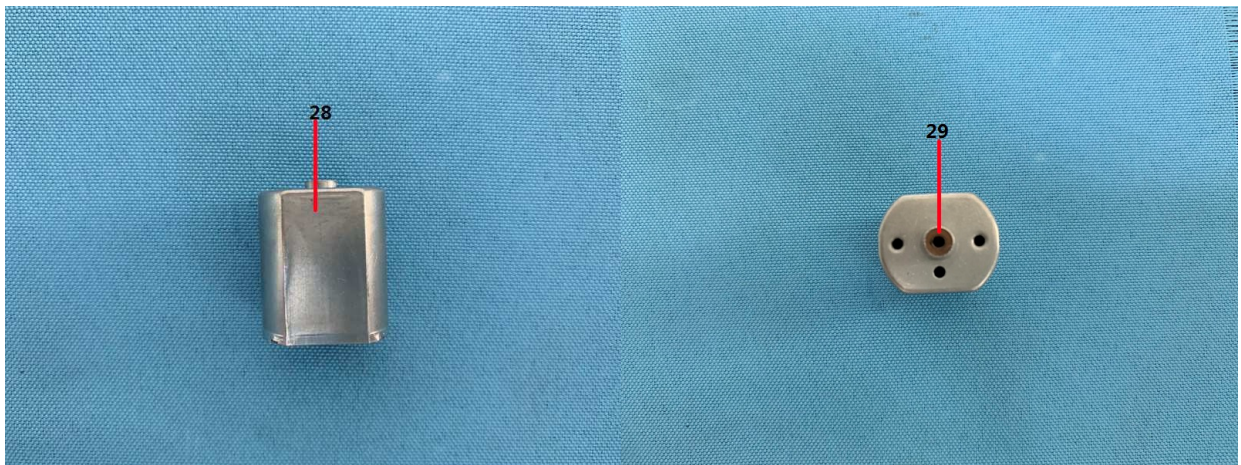
WENZHOU EMTEC ELECTRICAL APPLIANCE CO., LTD

Review Report: **(9020)136-0118**

MAY 15, 2020

Page 12 of 14

<ATTACHMENT 4>





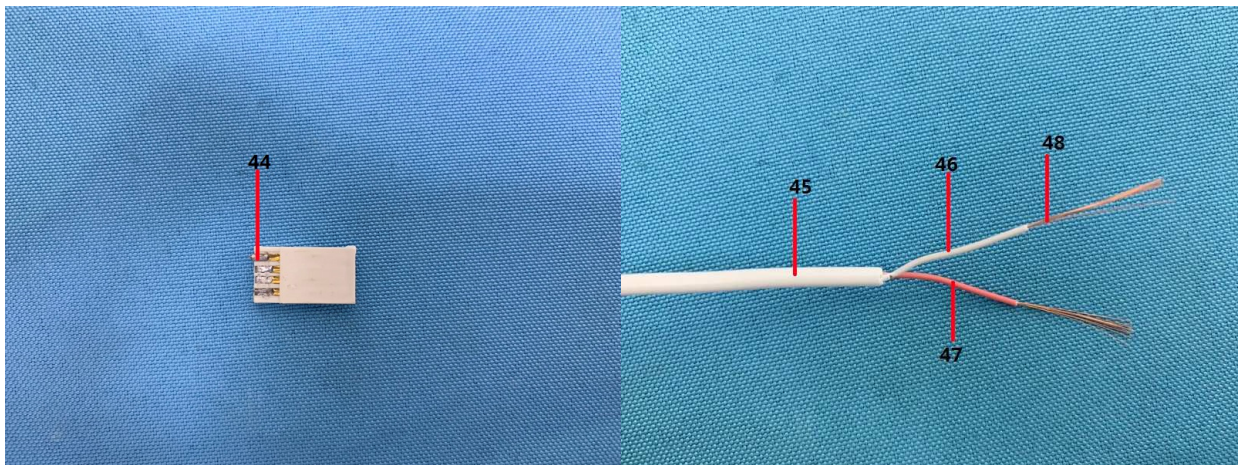
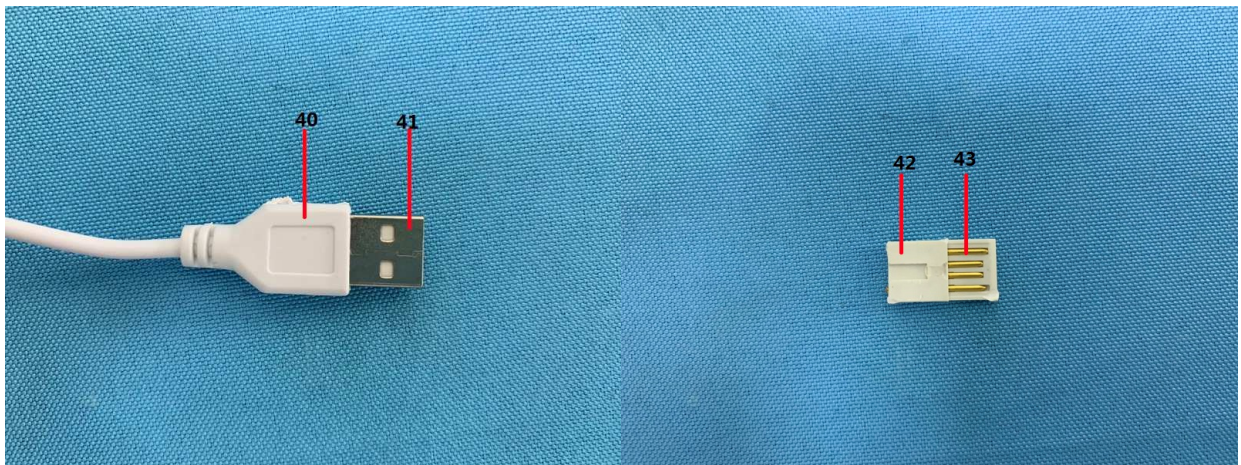
WENZHOU EMTEC ELECTRICAL APPLIANCE CO., LTD

Review Report: **(9020)136-0118**

MAY 15, 2020

Page 13 of 14

<ATTACHMENT 5>





WENZHOU EMTEC ELECTRICAL APPLIANCE CO., LTD

Review Report: **(9020)136-0118**

MAY 15, 2020

Page 14 of 14

### Original Sample



**90201360118**

**END**

天溯  
Tian Su



深圳天溯计量检测股份有限公司  
ShenZhen Tiansu Calibration and Testing Co.,Ltd.



中国认可  
国际互认  
检测  
TESTING  
CNAS L5138

TR No.: TCTTJ20201218258ZB-BR01

第 1 页 共 14 页

# UN38.3 检测报告

## UN38.3 TEST REPORT

产品名称.....

锂离子电芯

Product .....

Lithium ion cell

型号规格.....

18650

Model .....

3.7V\1500mAh\5.55Wh

委托单位.....

安徽相源新能源有限公司

Applicant .....

Anhui Xiangyuan New Energy Co.,LTD.

检测类别.....

委托检测

Classification..:

Request examination

Shenzhen Tiansu Calibration and Testing Co.,Ltd

深圳天溯计量检测股份有限公司

B/1/4, NO.2 Jinlong Road, Longgang District, Shenzhen, China

深圳市龙岗区宝龙街道锦龙大道2号1栋、4栋

Web: www.tiansu.org

E-mail: tsjc@tiansu.org

Tel: 0755-89457984



TS(SZ)-J3-008-001-A1

Rep. No.: TCTTJ20201218258ZB-BR01

第 2 页 共 14 页

样品名称.....	锂离子电芯																																																										
Sample Name.....	Lithium ion cell																																																										
型号规格.....	18650																																																										
Type/Model.....																																																											
委托单位.....	安徽相源新能源有限公司																																																										
Applicant.....	Anhui Xiangyuan New Energy Co.,LTD.																																																										
委托单位地址.....	安徽省淮北经济开发区新区尚和路南唐山路东																																																										
Applicant Address.....	East of Tangshan Road,South of Shanghe Road,New Area of Huaibei Economic Development Zone,Anhui Province.																																																										
制造单位.....	安徽相源新能源有限公司																																																										
Manufacture.....	Anhui Xiangyuan New Energy Co.,LTD.																																																										
制造单位地址.....	安徽省淮北经济开发区新区尚和路南唐山路东																																																										
Manufacture Address.....	East of Tangshan Road,South of Shanghe Road,New Area of Huaibei Economic Development Zone,Anhui Province.																																																										
制造商联系电话(Phone).....	0561-5254999																																																										
制造商联系邮箱(Email).....	tyg@ahxyxny.cn																																																										
制造商网址(Website).....	-																																																										
样品参数.....	<table border="1"> <tr> <td>额定信息</td> <td>3.7V\1500mAh\5.55Wh</td> <td>样品颜色</td> <td>蓝色</td> </tr> <tr> <td>Rated info.</td> <td></td> <td>Sample color</td> <td>Blue</td> </tr> <tr> <td>样品形状</td> <td>棱柱形</td> <td>样品尺寸(mm)</td> <td>18.06*65.01</td> </tr> <tr> <td>Shape</td> <td>Prismatic</td> <td>Sample size</td> <td></td> </tr> <tr> <td>充电限制电压</td> <td>4.2V</td> <td>放电截止电压</td> <td>2.75V</td> </tr> <tr> <td>Limiting voltage</td> <td></td> <td>Cut-off voltage</td> <td></td> </tr> <tr> <td>标准充电电流</td> <td>300mA</td> <td>标准放电电流</td> <td>300mA</td> </tr> <tr> <td>Standard charge current</td> <td></td> <td>Standard discharge current</td> <td></td> </tr> <tr> <td>最大持续充电电流</td> <td>1500mA</td> <td>最大持续放电电流</td> <td>7500mA</td> </tr> <tr> <td>Max continuous charge current</td> <td></td> <td>Max continuous discharge current</td> <td></td> </tr> <tr> <td>组成电芯数量</td> <td>N/A</td> <td>电芯型号</td> <td>N/A</td> </tr> <tr> <td>Cell quantity</td> <td></td> <td>Cell model</td> <td></td> </tr> <tr> <td>接样日期</td> <td>2021/1/3</td> <td>测试完成日期</td> <td>2021/1/12</td> </tr> <tr> <td>Receiving date</td> <td></td> <td>Completion date</td> <td></td> </tr> </table>			额定信息	3.7V\1500mAh\5.55Wh	样品颜色	蓝色	Rated info.		Sample color	Blue	样品形状	棱柱形	样品尺寸(mm)	18.06*65.01	Shape	Prismatic	Sample size		充电限制电压	4.2V	放电截止电压	2.75V	Limiting voltage		Cut-off voltage		标准充电电流	300mA	标准放电电流	300mA	Standard charge current		Standard discharge current		最大持续充电电流	1500mA	最大持续放电电流	7500mA	Max continuous charge current		Max continuous discharge current		组成电芯数量	N/A	电芯型号	N/A	Cell quantity		Cell model		接样日期	2021/1/3	测试完成日期	2021/1/12	Receiving date		Completion date	
额定信息	3.7V\1500mAh\5.55Wh	样品颜色	蓝色																																																								
Rated info.		Sample color	Blue																																																								
样品形状	棱柱形	样品尺寸(mm)	18.06*65.01																																																								
Shape	Prismatic	Sample size																																																									
充电限制电压	4.2V	放电截止电压	2.75V																																																								
Limiting voltage		Cut-off voltage																																																									
标准充电电流	300mA	标准放电电流	300mA																																																								
Standard charge current		Standard discharge current																																																									
最大持续充电电流	1500mA	最大持续放电电流	7500mA																																																								
Max continuous charge current		Max continuous discharge current																																																									
组成电芯数量	N/A	电芯型号	N/A																																																								
Cell quantity		Cell model																																																									
接样日期	2021/1/3	测试完成日期	2021/1/12																																																								
Receiving date		Completion date																																																									
Sample parameters.....																																																											
测试参数.....																																																											
Test parameters.....																																																											
检测依据.....	联合国关于危险货物运输的建议书-试验和标准手册第六版修正 1 第 38.3 节																																																										
Testing basis.....	ST/SG/AC.10/11/Rev.6/Amend.1/Section38.3.																																																										
检测结论.....	经测试,该样品符合联合国《关于危险货物运输的建议书 试验和标准手册》第六版修正 1 第 38.3 节标准要求。																																																										
Test conclusion.....	The sample has passed the test items of UNITED NATIONS "Recommendations on the TRANSPORT OF DANGEROUS GOODS",Manual of Test and Criteria (ST/SG/AC.10/11/Rev.6/Amend.1/Section38.3).																																																										
签发日期.....	2021/1/12																																																										
Test conclusion.....																																																											

批准

Approved by

授权签字人

Authorized Signatory

审批

Reviewed by

项目主管

Project Supervisor

主检

Tested by

测试工程师

Test Engineer



Rep. No.: TCTTJ20201218258ZB-BR01

第 3 页 共 14 页

## Sample information and other instructions:

样品信息及其他说明:

Test item 测试项目	Sample No. 样品编号	State 状态	Remark 备注
T.1~T.5	C01~C05	At first cycle in fully charged states; 在第一个循环完全充电;	/
	C06~C10	After 25 cycles ending in fully charged states; 在第二十五个循环完全充电;	
T.6	C11~C15	At first cycle at 50% of the design rated capacity; 在第一个循环充电 50%的额定容量;	/
	C16~C20	After 25 cycles ending in fully charged at 50% of the design rated capacity; 在第二十五个循环充电 50%的额定容量;	
T.7	/	/	/
	/	/	
T.8	C21~C30	At first cycle in fully discharged states; 在第一个循环完全放电;	/
	C31~C40	After 25 cycles ending in fully discharged states; 在第二十五个循环完全放电;	

## Description of the sampling procedure:

取样程序的说明:

无(N/A)

## Laboratory subcontract test instructions:

实验室分包测试说明:

无(N/A)

## Description of report revision :

报告修订的说明:

无(N/A)

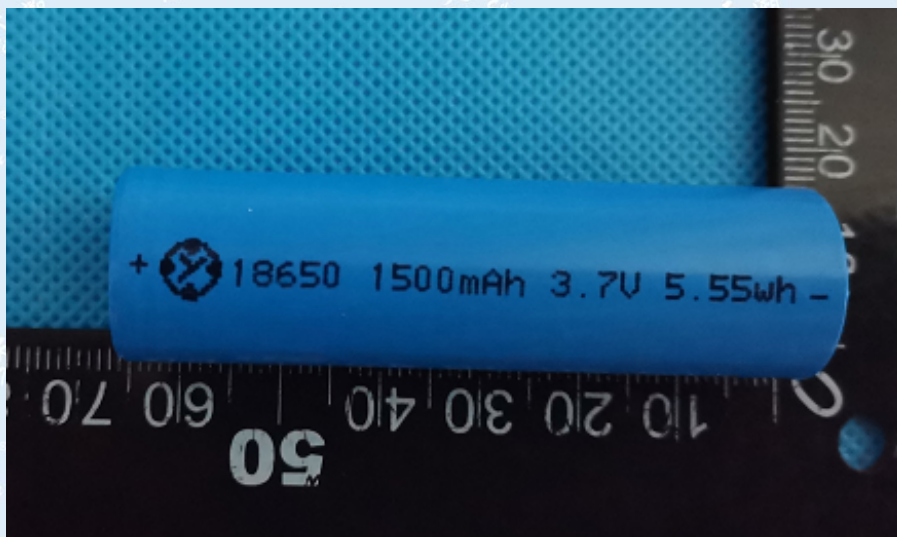
## Remarks:

备注:

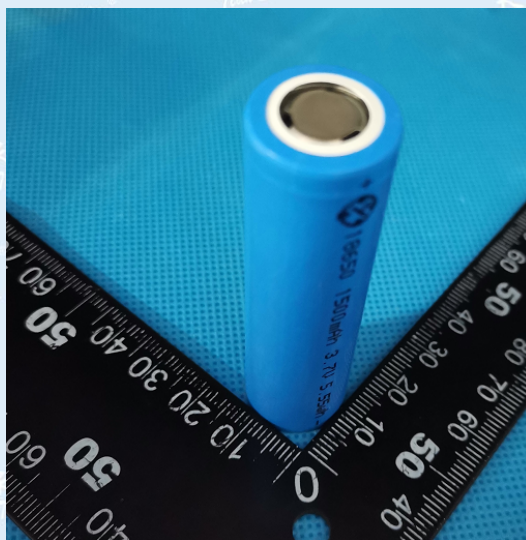
样品类型: 锂离子电芯

Sample type: Lithium ion cell

电池图片 Photos of Battery



电池正面图 Front view of battery



电池背面图 Back view of battery

Rep. No.: TCTTJ20201218258ZB-BR01

第 5 页 共 14 页

38.3.4	Procedure/测试步骤							
38.3.4.1	Test 1: Altitude simulation/测试 1：高度模拟							
	Test cells and batteries shall be stored at a pressure of 11.6kPa or less for at least six hour at ambient temperature (20°C±5°C) . 将电芯和电池在温度为 20°C±5°C，大气压力为不大于 11.6kPa 的环境中贮存不少于 6 个小时。							
	Requirement/标准要求： 1.Cells and batteries Mass loss limit: ≤ 0.2%. 样品质量损失≤ 0.2%。 2.Open circuit voltage not less than 90%, The requirement relating to voltage is not applicable to test cells and batteries at full discharged states. 样品试验后开路电压应不低于试验前开路电压的 90%,此要求不适用于完全放完电的电芯和电池。 3.No leakage, no venting, no disassembly, no rupture and no fire. 样品应无漏液、无排气、无解体、无破裂以及无着火现象的发生。							
Result 测试结果	样品编号 No.	测试前 Before Test		测试后 After Test		质量损失 Mass loss(%)	剩余电压 Residual OCV(%)	测试结果 Test result
		样品质量 m <sub>1</sub> (g)	开路电压 V <sub>1</sub> (V)	样品质量 m <sub>2</sub> (g)	开路电压 V <sub>2</sub> (V)			
	C01	41.772	4.171	41.772	4.171	0.00	100.00	P
	C02	41.781	4.171	41.776	4.170	0.01	99.98	P
	C03	41.772	4.162	41.772	4.162	0.00	100.00	P
	C04	41.789	4.166	41.779	4.166	0.02	100.00	P
	C05	41.758	4.165	41.758	4.165	0.00	100.00	P
	C06	41.757	4.172	41.757	4.172	0.00	100.00	P
	C07	41.758	4.186	41.758	4.185	0.00	99.98	P
	C08	41.795	4.165	41.786	4.165	0.02	100.00	P
	C09	41.781	4.173	41.781	4.173	0.00	100.00	P
	C10	41.772	4.163	41.772	4.163	0.00	100.00	P
其他补充:测试结果“P”代表判定该测试项目通过。 Other supplements :Test result "P" decides that the test item passes.								

38.3.4	Procedure/测试步骤							
38.3.4.2	Test 2: Thermal test/测试 2: 温度测试							
	<p>Test cells and batteries are to be stored for at least six hours at a test temperature equal to <math>72^{\circ}\text{C}\pm 2^{\circ}\text{C}</math>, followed by storage for at least six hours at a test temperature equal to <math>-40^{\circ}\text{C}\pm 2^{\circ}\text{C}</math>. The maximum time interval between test temperature extremes in 30 minutes, This procedure is to be repeated until 10 total cycles are complete, after which all test cells and batteries are to be stored for 24 hours at ambient temperature (<math>20^{\circ}\text{C}\pm 5^{\circ}\text{C}</math>).</p> <p>将电芯和电池在温度为 <math>72^{\circ}\text{C}\pm 2^{\circ}\text{C}</math> 的条件下贮存不少于 6 个小时, 然后在温度 <math>-40^{\circ}\text{C}\pm 2^{\circ}\text{C}</math> 条件下贮存不少于 6 个小时, 两个温度间的间隔最长为 30min, 重复操作上述步骤直到 10 次, 然后将其在环境温度为 <math>20^{\circ}\text{C}\pm 5^{\circ}\text{C}</math> 的条件下放置 24 个小时。</p>							
	<p>Requirement/标准要求:</p> <p>1.Cells and batteries Mass loss limit: <math>\leq 0.2\%</math>. 样品质量损失 <math>\leq 0.2\%</math>.</p> <p>2.Open circuit voltage not less than 90%, The requirement relating to voltage is not applicable to test cells and batteries at full discharged states. 样品试验后开路电压应不低于试验前开路电压的 90%, 此要求不适用于完全放完电的电芯和电池。</p> <p>3.No leakage, no venting, no disassembly, no rupture and no fire. 样品应无漏液、无排气、无解体、无破裂以及无着火现象的发生。</p>							
Result 测试结果	样品编号 No.	测试前 Before Test		测试后 After Test		质量损失 Mass loss(%)	剩余电压 Residual OCV(%)	测试结果 Test result
		样品质量 $m_1(\text{g})$	开路电压 $V_1(\text{V})$	样品质量 $m_2(\text{g})$	开路电压 $V_2(\text{V})$			
	C01	41.772	4.171	41.757	4.165	0.04	99.86	P
	C02	41.776	4.170	41.759	4.164	0.04	99.86	P
	C03	41.772	4.162	41.754	4.156	0.04	99.86	P
	C04	41.779	4.166	41.759	4.161	0.05	99.88	P
	C05	41.758	4.165	41.743	4.159	0.04	99.86	P
	C06	41.757	4.172	41.739	4.167	0.04	99.88	P
	C07	41.758	4.185	41.737	4.180	0.05	99.88	P
	C08	41.786	4.165	41.767	4.160	0.05	99.88	P
	C09	41.781	4.173	41.759	4.168	0.05	99.88	P
	C10	41.772	4.163	41.757	4.158	0.04	99.88	P
<p>其他补充:测试结果“P”代表判定该测试项目通过。 Other supplements :Test result "P" decides that the test item passes.</p>								

38.3.4	Procedure/测试步骤							
38.3.4.3	Test 3: Vibration/测试 3: 振动							
	Cells and batteries are firmly secured to the platform of the vibration machine without distorting the cells in such a manner as to faithfully transmit the vibration, The vibration shall be a sinusoidal wave form with a logarithmic sweep between 7 Hz and 200 Hz and back to 7 Hz traversed in 15 minutes, This cycle shall be repeated 12 times for a total of 3 hours for each of three mutually perpendicular mounting position of the cell. 将电芯和电池牢固地安装在振动台的台面上, 然后开始振动。振动以正弦波形式, 以 7Hz 增加至 200Hz, 然后再减少回到 7Hz 为一个循环, 一个循环持续 15 分钟的对数扫频。每个电芯和电池从三个互相垂直的方向上循环 12 次, 每个方向共 3 个小时。							
	Requirement/标准要求: 1.Cells and batteries Mass loss limit: $\leq 0.2\%$ . 样品质量损失 $\leq 0.2\%$ . 2.Open circuit voltage not less than 90%, The requirement relating to voltage is not applicable to test cells and batteries at full discharged states. 样品试验后开路电压应不低于试验前开路电压的 90%,此要求不适用于完全放完电的电芯和电池。 3.No leakage, no venting, no disassembly, no rupture and no fire. 样品应无漏液、无排气、无解体、无破裂以及无着火现象的发生。							
Result 测试结果	样品编号 No.	测试前 Before Test		测试后 After Test		质量损失 Mass loss(%)	剩余电压 Residual OCV(%)	测试结果 Test result
		样品质量 $m_1(g)$	开路电压 $V_1(V)$	样品质量 $m_2(g)$	开路电压 $V_2(V)$			
	C01	41.757	4.165	41.757	4.165	0.00	100.00	P
	C02	41.759	4.164	41.749	4.163	0.02	99.98	P
	C03	41.754	4.156	41.754	4.156	0.00	100.00	P
	C04	41.759	4.161	41.759	4.161	0.00	100.00	P
	C05	41.743	4.159	41.743	4.159	0.00	100.00	P
	C06	41.739	4.167	41.739	4.167	0.00	100.00	P
	C07	41.737	4.180	41.737	4.179	0.00	99.98	P
	C08	41.767	4.160	41.767	4.159	0.00	99.98	P
	C09	41.759	4.168	41.751	4.168	0.02	100.00	P
	C10	41.757	4.158	41.757	4.158	0.00	100.00	P
其他补充:测试结果“P”代表判定该测试项目通过。 Other supplements :Test result "P" decides that the test item passes.								

38.3.4	Procedure/测试步骤							
38.3.4.4	Test 4: Shock/测试 4: 冲击							
	<p>Test cells and batteries shall be secured to the testing machine, and each shall be subjected to a half-sine shock of peak acceleration of 150g<sub>n</sub> (or Acceleration(gn)=<math>\sqrt{\frac{100850}{mass}}</math>), which is smaller) and pulse duration of 6 milliseconds, large cells and large batteries shall be subjected to a half-sine of peak acceleration of 50gn (or Acceleration(gn)=<math>\sqrt{\frac{30000}{mass}}</math>), which is smaller) and pulse duration of 11 milliseconds. Each cell or battery shall be subjected to three shocks in the positive direction followed by three shocks in the negative direction of three mutually perpendicular mounting positions of the cell or battery for a total of 18 shocks.</p> <p>以稳固的托架固定住每个电芯和电池样品的全部配件表面。对每个电芯或电池以峰值为 150g<sub>n</sub> (或与<math>\sqrt{\frac{100850}{mass}}</math>中的较小值)的半正弦的加速度撞击,脉冲持续 6 毫秒,大型电池和大型电池组须经受最大加速度 50g<sub>n</sub> (或与<math>\sqrt{\frac{30000}{mass}}</math>中的较小值)和脉冲持续时间 11 毫秒的半正弦波冲击。每个电芯或电池须在三个互相垂直的电池安装方位的正方向经受三次冲击,接着在反方向经受三次冲击,总共经受 18 次冲击。</p>							
	<p>Requirement/标准要求:</p> <p>1.Cells and batteries Mass loss limit: ≤ 0.2%. 样品质量损失≤ 0.2%。</p> <p>2.Open circuit voltage not less than 90%, The requirement relating to voltage is not applicable to test cells and batteries at full discharged states. 样品试验后开路电压应不低于试验前开路电压的 90%,此要求不适用于完全放完电的电芯和电池。</p> <p>3.No leakage, no venting, no disassembly, no rupture and no fire. 样品应无漏液、无排气、无解体、无破裂以及无着火现象的发生。</p>							
Result 测试结果	样品编号 No.	测试前 Before Test		测试后 After Test		质量损失 Mass loss(%)	剩余电压 Residual OCV(%)	测试结果 Test result
		样品质量 m <sub>1</sub> (g)	开路电压 V <sub>1</sub> (V)	样品质量 m <sub>2</sub> (g)	开路电压 V <sub>2</sub> (V)			
	C01	41.757	4.165	41.757	4.165	0.00	100.00	P
	C02	41.749	4.163	41.749	4.163	0.00	100.00	P
	C03	41.754	4.156	41.754	4.155	0.00	99.98	P
	C04	41.759	4.161	41.749	4.161	0.02	100.00	P
	C05	41.743	4.159	41.743	4.159	0.00	100.00	P
	C06	41.739	4.167	41.739	4.167	0.00	100.00	P
	C07	41.737	4.179	41.737	4.178	0.00	99.98	P
	C08	41.767	4.159	41.758	4.159	0.02	100.00	P
	C09	41.751	4.168	41.751	4.168	0.00	100.00	P
	C10	41.757	4.158	41.757	4.158	0.00	100.00	P
<p>其他补充:测试结果“P”代表判定该测试项目通过。 Other supplements :Test result "P" decides that the test item passes.</p>								

Rep. No.: TCTTJ20201218258ZB-BR01

第 9 页 共 14 页

38.3.4	Procedure/测试步骤		
38.3.4.5	Test 5: External short circuit/测试 5: 外部短路		
	The cell or battery to be tested shall be temperature stabilized so that its external case temperature reaches $57^{\circ}\text{C}\pm 4^{\circ}\text{C}$ and then the cell or battery shall be subjected to a short circuit condition with a total external resistance of less than 0.1 ohm at $57^{\circ}\text{C}\pm 4^{\circ}\text{C}$ . This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to $57^{\circ}\text{C}\pm 4^{\circ}\text{C}$ , the cell or battery must be observed for a further six hours for the test to be concluded.		
	保持试验环境温度稳定在 $57^{\circ}\text{C}\pm 4^{\circ}\text{C}$ ，以使电芯或电池样品外表温度达到 $57^{\circ}\text{C}\pm 4^{\circ}\text{C}$ ，然后，在此温度下，将其正负极用小于 0.1 欧姆的线路短接，待电芯或电池的外表温度恢复到 $57^{\circ}\text{C}\pm 4^{\circ}\text{C}$ 之后再持续 1 小时以上，对电芯或电池必须进一步观察 6 个小时才能下结论。		
Result 测试结果	Requirement/标准要求:		
	1.Cells and batteries meet this requirement if their external temperature does not exceed $170^{\circ}\text{C}$ ;		
	电芯或电池的外表温度应不超过 $170^{\circ}\text{C}$ ;		
	2. No disassembly, no rupture and no fire during the test and within six hours after this test.		
	试验后 6 小时内无解体、无破裂、无起火。		
	样品编号 No.	样品表面最高温度 Max External Temperature( $^{\circ}\text{C}$ )	测试结果 Test result
	C01	112.3	P
	C02	109.8	P
	C03	109.8	P
	C04	110.4	P
	C05	118.6	P
	C06	101.1	P
	C07	118.2	P
	C08	108.8	P
	C09	106.2	P
	C10	118.1	P
其他补充:测试结果“P”代表判定该测试项目通过。 Other supplements :Test result "P" decides that the test item passes.			

38.3.4	Procedure/测试步骤
	<p><b>Test 6: Crush(Not applicable) \ Impact(Applicable)</b>  <b>测试 6: 挤压(不适用) \ 撞击(适用)</b></p> <p><b>Crush</b>          挤压          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.          (a) The applied force reaches 13kN±0.78kN;          (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.          Once the maximum pressure has been obtained, the voltage drops by 100mV or more, or the cell is deformed by at least 50% of its original thickness, the pressure shall be released.          电池芯或组成电池芯在两个平面间挤压, 挤压在第一个接触点以约 1.5cm/s 的速度慢慢进行, 直到下面三个选项之一达到为止:          (a)作用力达到 13kN±0.78kN;          (b)电池芯电压降至少达到 100mV;          (c)电池厚度和初始厚度相比变形至少 50%。          一旦达到最大压力, 电压降超过 100 mV 或者电池芯变形超过 50%, 压力应该解除。</p>
38.3.4.6	<p><b>Impact</b>          撞击          (applicable to cylindrical cells not less than 18mm in diameter)          The sample cell or component cell is to be placed on a flat smooth surface. A 15.8 mm ± 0.1 mm 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 61cm±2.5cm 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.          The test sample is to be impacted with its longitudinal axis parallel to the flat surface and perpendicular to the longitudinal axis of the 15.8mm±0.1mm diameter curved surface lying across the centre of the test sample. Each sample is to be subjected to only a single impact. 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.          (适用于直径不小于 18 毫米的圆柱形电池)将电池或元件电池样品平放在一个平面上, 其纵轴平行于测试台面, 将直径为 15.8 mm ± 0.1 mm 的 316 型不锈钢棒横放在样品中心位置。然后将质量为 9.1 kg ± 0.1 kg 的物体从 61cm±2.5 cm 的高度落向样品。样品在进行试验时, 其外表温度应不超过 170°C。且试验结束后 6 个小时之内, 样品应无解体、无起火现象发生。  <b>Requirements/标准要求:</b>          1.Cells and component cells meet this requirement if their external temperature does not exceed 170°C;          电芯的外表温度应不超过 170°C;          2. No disassembly, no fire during the test and within six hours after this test;          试验后 6 小时内无解体、无起火。</p>

\*续接下一页

Continued on next page;

Rep. No.: TCTTJ20201218258ZB-BR01

第 11 页 共 14 页

\*续接上一页

Continued from previous page:

Result 测试结果	样品编号 No.	试验前电压 OCV prior to test(V)	样品表面最高温度 Max external temperature(°C)	测试结果 Test result
	C11	3.709	115.45	P
	C12	3.721	107.5	P
	C13	3.726	117.6	P
	C14	3.728	116.5	P
	C15	3.699	109.6	P
	C16	3.695	115.7	P
	C17	3.727	110.3	P
	C18	3.736	107.6	P
	C19	3.719	108.5	P
	C20	3.725	113.8	P
其他补充:测试结果“P”代表判定该测试项目通过。 Other supplements :Test result "P" decides that the test item passes.				

38.3.4	Procedure/测试步骤		
38.3.4.7	Test 7: Overcharge/测试 7: 过度充电		
	When the manufacturer's recommended charge voltage is not more than 18V, the minimum voltage of the test shall be the lesser of two times the maximum charge voltage of the or 22V, whichever is less. When the manufacturer's recommended charge voltage is more than 18V, the charging voltage of the test shall be 1.2 times maximum charge voltage. The charging current is 2 times of the maximum charging current recommended by the manufacturer. 如果厂家推荐的充电电压不超过 18V, 本测试的最小充电电压应该是两倍的厂家标定最大充电电压或者是 22V, 取其中较小者。如果厂家推荐的充电电压超过 18V, 充电电压应该为 1.2 倍的厂家标定最大充电电压, 充电电流为厂家推荐的最大充电电流的 2 倍。		
	Requirements/标准要求: No disassembly and no fire during the test and within seven days after the test. 试验样品在试验中和试验后 7 天内, 应无解体和起火现象发生。		
Result 测试结果	样品编号 No.	试验前电压 OCV prior to test(V)	测试结果 Test result
	-		-
其他补充:测试结果"P"代表判定该测试项目通过。 Other supplements :Test result "P" decides that the test item passes.			

38.3.4	Procedure/测试步骤				
38.3.4.8	Test 8: Forced discharge/测试 8: 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 the manufacturer The specified discharge current is to be obtained by connecting a resistive load of the appropriate size and rating in series with the test cell, Each cell shall be forced discharged for a time interval(in hours) equal to its rated capacity divided by the initial test current(in ampere).				
	在 20°C±5°C 的环境温度下, 将单个电芯连接在 12V 的直流电源上进行强制放电, 此直流电源提供每个电芯初始电流为制造厂指定的最大放电电流, 放电时间为额定容量除以初始电流。				
Result 测试结果	Requirements/标准要求: No disassembly and no fire during the test and within seven days after the test. 试验样品在试验中和试验后 7 天内, 应无解体和起火现象发生。				
	样品编号 No.	试验前电压 OCV prior to test(V)	测试结果 Test result	样品编号 No.	试验前电压 OCV prior to test(V)
	C21	3.018	P	C31	3.143
	C22	3.076	P	C32	3.043
	C23	3.129	P	C33	3.029
	C24	3.022	P	C34	3.163
	C25	3.119	P	C35	3.129
	C26	3.181	P	C36	3.184
	C27	3.139	P	C37	3.039
	C28	3.089	P	C38	3.078
	C29	3.233	P	C39	3.059
	C30	3.236	P	C40	3.224
其他补充:测试结果“P”代表判定该测试项目通过。 Other supplements :Test result "P" decides that the test item passes.					

**STATEMENTS****声 明**

1. The test report is invalid without the official stamp of Tiansu.

本报告无检测单位印章无效。

2. Nobody is allowed to photocopy or partly photocopy this test report without written permission of Tiansu.

未经本实验室书面同意，不得部分地复制本报告。

3. The test report is invalid without the signatures of Approver, Reviewer and Testing engineer.

本报告无批准人、审核人及主检人签名无效。

4. The test report is invalid if altered.

本报告涂改无效。

5. Objections to the test report must be submitted to Tiansu within 15 workdays.

对检测报告若有异议，应于收到报告之日起十五个工作日内向检测单位提出。

6. The test report is valid for the tested samples only.

本报告仅与送检样品有关。

.....报告结束 End of report .....