

## Material Safety Data Sheet

### 产品安全技术说明书

Shenzhen Shirui Battery Co., Ltd

MSDS No: 20 17-01-1

Product Name: Lithium Ion Battery

Issued and Revised Date: 2017-01-1

### Section 1 Chemical Product and Company Identification

第一部分：产品名称及企业标识

**Product information** 产品信息

**Shirui rechargeable Lithium-Ion battery** 时瑞锂离子充电电池

Model name:LIR18650

型号: LIR18650

Norminal Voltage: 3.7 V

额定电压: 3.7V

Rated Capacity: 2200mAh

容量: 2200mAh

Watt-hour Rating:8.14Wh

额定瓦特小时:8.14Wh

Manufacturer: Shenzhen Shirui Battery Co., Ltd

生产厂家: 深圳市时瑞电池有限公司

Address: No.25, Shuiwei 2nd Rd, Xinmu, Pinghu Town, Longgang District, Shenzhen

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### Section 2 Composition/Information on Ingredients

第二部分：成分/组成信息

INGREDIENTS 组分	Weight Percentage/%(about 重量百分比% (约))	CAS No. 化学物质登录号
Cobaltic lithium oxide 钴酸锂	35.05%	12190-79-3
Graphite powder 石墨	15.98%	7782-42-5
Rubber 橡胶类	10.36%	69028-37-1
Carbon black 导电炭黑	0.79%	1333-86-4
Styrene-butadiene rubber (SBR) 丁苯橡胶	0.71%	61789-96-6
Polypropylene 聚丙烯	1.74%	9003-07-0
Polyethylene 聚乙烯	1.27%	9002-88-4
Lithium hexafluorophosphate 六氟磷酸锂	1.27%	21324-40-3
Ethylene carbonate (EC) 碳酸乙烯酯	6.34%	96-49-1
Diethyl carbonate (DEC) 二甲基碳酸酯	4.76%	105-58-8
Propylene carbonate (PC) 丙烯碳酸酯	1.11%	108-32-7
Polycaprolactam (NYLON 6) 聚己内酰胺	1.11%	25038-54-4
Copper 铜	8.39%	7440-50-8
Aluminium 铝	11.12%	7429-90-5

公司网址: <http://www.srbattery.com.cn>

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### Section 3 Hazards Identification

#### 第三部分：危险性概述

The lithium ion batteries are not hazardous when used according to the instructions of manufacturer under normal conditions. In case of abuse, there's a risk of explode, rupture, fire, heat, leakage of internal components, which could cause casualty loss. Abuses include but not limited to the following cases: charge for a long time, short circuit, put into fire, whack with hard object, puncture with acute object, crush, break.

正常情况下，按照生产商提供的使用说明来使用，是不会有危险的。在滥用的情况下，可能会有内部物质泄漏、发热、着火、外壳开裂等情况发生造成人身伤害和财产损失。滥用情况包括但不限于以下情况：长时间充电、短路、放入火中、用硬物敲击、用尖锐的物体刺穿、挤压、弯曲折断等。

### Section 4 First-aid Measures

#### 第四部分：急救措施

The lithium batteries are not hazardous with eye and skin contact under normal circumstance. In case of fire or rupture, the leakage of internal hazardous substance and formation of hazardous substance would occur, take the following measures if contact with it:

在正常的情况下，眼睛接触、皮肤接触是不会有危害的。如果电芯着火或开裂，会泄漏内部有害物质和生成有害物质，如有接触，采取以下措施：

**Eye :** Immediately flush with plenty of clean water for 15 minutes, seek medical assistance;

眼睛接触后，立即用大量流动的清水冲洗15分钟，就医；

**Skin:** Immediately flush with plenty of clean water for 15 minutes; seek medical assistance if severe;

皮肤接触后，用大量流动的清水冲洗15分钟，如果情况严重，就医；

**Inhalation:** If inhaled, remove to fresh air immediately, seek medical assistance, and ventilate the contaminated area.

吸入后，立即转移到有新鲜空气的地方，就医，同时对受污染区域通风；

**Ingestion:** Rinse mouth with clean water immediately, activate vomit under the direction of expert, and seek medical assistance.

食入后，立即用大量清水漱口，在专业人士的指导下催吐，就医。

### Section 5 Fire-fighting Measures

#### 第五部分：消防措施

Extinguish with plenty of water, dry powder extinguishers, sands, earth. Combustion products and decomposed products by contact of water or air with internal substance include: carbon monoxide, carbon dioxide, hydrogen fluoride, phosphorus fluoride.

可用大量的水、干粉灭火器、砂子、土等灭火。燃烧产物和内部物质与空气和水接触的生成物包括：CO、CO<sub>2</sub>、HF、氟氧化磷等。

### Section 6 Accidental Release Measures

#### 第六部分：泄漏应急处理

When leakage of batteries happens, liquid could be absorbed with sands, earth or other inert substance, and the contaminated area should be ventilated meantime.

电芯/电池内部物质泄漏后，用砂子、土或其他惰性物质吸收，并及时通风。

## **Section 7 Handling and Storage**

### 第七部分：操作处置与储存

Don't handle and store batteries with metalwork. Store and use far away from heat, sparks, open flame, or any other ignition source, and under room temperature (<30°C) in ventilating and dehumidifying environments.

在操作和存放时不要使用金属器件和容器。电芯在常温下（<30°C）放置，通风除湿，远离火源和热源。

## **Section 8 Exposure Controls/Personal Protection**

### 第八部分：接触控制与个体防护

There is no need for protect under normal conditions. In engineering aspect, ventilation equipment should be installed. Gas mask, blinkers, gloves enduring chemical erosion and exposure suit are required when dealing with fire and leakage.

正常的情况下，个人不需要防护。在工程方面，需要有抽气通风设备。如有着火和内部物质泄漏，在处理时需要戴防毒面具、护目镜、耐化学腐蚀的手套和穿防护服装。

## **Section 9 Physical and Chemical Properties**

### 第九部分：理化特性

Batteries are not single chemical material; there are no specific physical and chemical properties such as melting point and boiling point.

电池不是一种单一的化学品，没有特定的理化性能如熔沸点等。

Main purpose of lithium batteries: used in portable and digital products.

主要用途：用于便携式移动、数码产品。

## **Section 10 Stability and Reactivity**

### 第十部分：稳定性和反应性

Batteries are safe under normal conditions. The following substance might appear after catching fire or leakage: organic carbonate, hydrogen fluoride, carbon monoxide, carbon dioxide, phosphorus fluoride.

在正常的情况下，电芯/电池是安全的。电芯/电池着火或者内部物质泄漏后，可能出现的物质有：有机碳酸酯、氟化氢、CO、CO<sub>2</sub>、氟氧化磷等。

## **Section 11 Toxicological Information**

### 第十一部分：毒理学资料

Batteries are not hazardous when used properly. If the batteries catch fire or the internal substance leaks, combustion products and decomposed products might have irritation and toxicity to skin, eye and respiratory systems. Toxicity data of some substance are listed following:

正常使用时，电池没有毒性。电池着火或者内部物质泄漏后，燃烧产物、其内部各组分及其与水份接触后的分解产物对人体皮肤、眼睛和呼吸系统有一定的刺激性和毒性。此处列举部分物质的毒理学数据。

Hydrogen fluoride 氟化氢

Extremely toxic. May be fatal if inhaled or ingested. Readily absorbed through the skin contact may be fatal. Possible mutagen. LCLo: 50 ppm/30m (human beings), LC50: 1276 ppm/1h (rats)。

较大的毒性。吸入或食入可致命，可通过皮肤吸收，可诱导突变。LCLo: 50 ppm/30m (人), LC50: 1276 ppm/1h (小白鼠)。

Carbon and graphite 碳和石墨

Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation. Causes chronic damage to upper respiratory tract and cardiovascular system.

皮肤接触有刺激性，吸入和食入有轻微的危害，对上呼吸道和心血管系统有慢性损害。

Copper: Dust may cause respiratory irritation.LD50: 3.5 mg kg-1(mouse).

铜：粉尘对呼吸系统有刺激。小白鼠LD50: 3.5 mg kg-1 。

Aluminium: There is no hazard.

铝：没有毒性。

## Section 12 Ecological Information

### 第十二部分：生态学资料

There is no influence to ecology and environment when used properly.

正常使用时，电芯/电池不会有生态和环境方面的影响。

## Section 13 Disposal

### 第十三部分：废弃处置

Deserted batteries couldn't be treated as ordinary trash. Be put to garbage box which recycle batteries after being placed into plastic bags or be dealt as special trash. Couldn't be thrown into fire or placed in high temperature. Couldn't be dissected, pierced, crushed or treated similarly. The package and plastic box which contain batteries could be treated as ordinary trash. Best way is recycling.

废弃电芯不能直接当作普通垃圾处理，用塑料袋装好密封放入回收电池的垃圾桶或当作特殊垃圾处理。废弃电池不能丢进火中和置于高温环境，不要拆卸，同时不能刺穿和挤压等等。电池的包装纸盒和塑料盒可作为普通垃圾处理。

## Section 14 Transport Information

### 第十四部分：运输信息

For the international transport of lithium batteries, they must comply with these regulations: the International Maritime Dangerous Goods (IMDG) Code by International Maritime Organization (IMO), Dangerous Goods Regulations (DGR) by International Air Transport Association (IATA) and Technical Instructions for the Safe Transport of Dangerous Goods by Air (TI) by International Civil Aviation Organization (ICAO). These regulations are based on the UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria.

本司生产的锂离子电池的国际运输满足以下组织制定的运输规则：国际海事组织 IMO 《国际海上危险货物运输规则》(IMDG Code)，国际航空运输协会 IATA 《危险品规则》，

国际民用航空组织 ICAO 《危险物品航空安全运输技术导则》(ICAO-TI)。以上规则均以《联合国关于危险货物运输的建议书，测试和标准手册》(简称《联合国建议书》)作为基础。

Lithium batteries which meet the requirements of UN38.3 (UN Manual of Tests and Criteria, Part III, subsection 38.3) could be transported by air and by sea as ordinary goods, otherwise should be transported according to Class 9, Packing Group 1 hazardous

goods. The Li-ion Battery (OP16HDVR) has passed the test UN38.3.

锂离子电池符合 UN38.3 (《联合国建议书》第三部分第 38.3条) 检测者, 可作为普通货物进行航空及海洋运输; 否则按第 9类危险品第 1类包装运输。锂电池 (OP16HDVR) 已经通过了测试UN38.3.

According to UN classification: However this product's shipping name is "lithium ion batteries"(or "Lithium ion Batteries packed with equipment" or "Lithium ion Batteries contained in equipment"), it is not recognized as "DANGEROUS GOODS" when its transport condition accords with "packing instruction 965 section II of IATA-DGR"(or "Packing instruction 966 section II" or "Packing instruction 967 section II") or "special provision 188 of IMO-IMDG Code".

本公司电芯/电池符合 IATA-DGR包装规范 965第二部分或包装规范 966第二部分或包装规范 967第二部分、IMO-IMDG特殊条款 188的要求, 不属于危险品:

1. For lithium ion batteries, UN ID number is 3480. For lithium ion batteries contained in equipment or lithium ion batteries packed with equipment, UN ID number is 3481.  
1. 锂离子电池的 UN编号为 3480; "装配在设备中的锂离子电池"或"同设备包装在一起的锂离子电池组", UN编号为 3481.
2. The consignment should be fully described by proper shipping name and packed, marked and in proper condition for carriage by air. The consignment is not classified as dangerous under the current edition of the IATA 58th Effective 01 January 2017, Dangerous goods regulation and all applicable carrier and government regulations.  
2. 货物要进行航空运输, 必须通过适当的名称、包装和标记进行充分说明。根据 2017年 1月 1日的 IATA第 58版本危险品运输规则, 该货物不属于危险品。
3. For transported by air, Lithium-ion Cells/Batteries shipped as "Not Restricted" Cargo: Must comply with Part II of PI965-PI967 accordingly; For cells, the Watt-hour rating should not be more than 20Wh; For batteries, the Watt-hour rating should not be more than 100Wh. Watt- hour rating must be marked on the outside of the battery case (marked by manufacturer),  
3. 锂离子电池在航空运输中要作为非限制性货物进行运输, 必须符合包装规范 965-967第二部分; 且电池芯的额定能量不超过 20Wh, 电池的额定能量不超过 100Wh。额定的瓦特小时必须在电池的外部标明。
4. Each consignment must be accompanied with a document such as an air waybill with an indication. For those Lithium ion cells/ batteries contained in equipment, the equipment must be equipped with an effective means of preventing accidental activation. The telephone number for additional information for Shenzhen Shirui Battery Co., Ltd battery is (86)755-61201160.  
4. 除了与设备组合的 4 个以下的单电池或包含 2 个以下电池组的各包装物以外, 均须提供警示标志和文件。深圳市时瑞电池有限公司生产的方形电池警示标识上提供的紧急联系电话为 (86)755-61201160
5. Quantity per package shall not exceed 10 kg.  
5. 每个包装箱须满足: ≤10kg毛重/包装箱。
6. Each package must be capable of withstanding a 1.2m drop test in any orientation without damage of cells or batteries contained therein.

- 6.每个包装件均可承受任意方向的 1.2m跌落测试。
7. Lithium batteries which meet the requirements of A154 could be transported by air, and the batteries manufactured by Shenzhen Shirui Battery Co., Ltd meet these requirements.( A154 Lithium batteries identified by the manufacturer as being defective for safety reasons, or that have been damaged, that have the potential of producing a dangerous evolution of heat, fire or short circuit are forbidden for transport. )
- 7.深圳市时瑞电池有限公司产品满足 ICAO、IATA追加的特别规定 A154 (仅限航空运输), 可以进行航空运输。(A154规定: 经生产者识别为缺陷产品的锂电池, 或者出现损伤的锂电池、有可能出现危险的发热、着火或短路的锂电池, 均属于禁止运输的范围。)
8. Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to short circuit.
- 8.锂电池或电池组在包装箱中必须带有防止短路的措施。如防止同一包装箱的电芯与导电物质接触而引起短路。
9. Transport condition should accord with “special provision 188 of IMO-IMDG Code”.
- 9.符合“第 188号 IMDG编码特殊规定”。
10. Conclusion.
- 10.测试结果。

No	ITEMS	RESULT	REMARKS
1	Altitude simulation	Pass	Test 1 to 5 must be conducted in sequence on the same cell or battery
2	Thermal test	Pass	
3	Vibration	Pass	
4	Shock	Pass	
5	External short circuit	Pass	
6	Impact	Pass	
7	Overcharge	Pass	Only battery do need this test item
8	Forced Discharge	Pass	

序号	项目	结果	REMARKS
1	高空模拟	Pass	测试 1 到 5 必须进行顺序相同的电池或电池组
2	高温试验	Pass	
3	震动	Pass	
4	撞击	Pass	
5	外部短路	Pass	
6	冲击测试	Pass	
7	过充电	Pass	只需要电池做此试验项目
8	过放电	Pass	

### Section 15 Regulatory Information

公司网址: <http://www.srbattery.com.cn>

地址: 深圳市平湖镇新木村水围路 25

第十五部分：法规信息

OSHA hazard communication standard (29 CFR 1910.1200)

美国安全卫生署(OSHA)的危害通识规定 (29 CFR 1910.1200)

\_\_\_\_\_ hazardous  Non-hazardous

\_\_\_\_\_ 危险品  非危险品

**Section 16 Other Information**

第十六部分：其它信息

This information is not effective to all the batteries manufactured by Shenzhen Shirui Battery Co., Ltd. This information comes from reliable sources, but no warranty is made to the completeness and accuracy of information contained. Shenzhen Shirui Battery Co., Ltd doesn't assume responsibility for any damage or loss because of misuse of batteries. Users should grasp the correct use method and be responsible for the use of batteries.

本MSDS 中的信息不对深圳时瑞电池有限公司生产的所有电芯有效。本文信息来源可靠，但深圳市时瑞电池有限公司不保证来源描述的完整性、精确性等。使用者须掌握正确使用电芯的方法并对电芯的使用负责，深圳市时瑞电池有限公司对由于电芯的滥用而造成的伤害和损失不承担责任。

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