



# 材料安全数据表

## Material Safety Data Sheet

报告编号 (Report No.) : G24-B1214

样品名称(Sample Name): 锂离子充电电池/电池组

LITHIUM-ION RECHARGEABLE  
CELL/BATTERY PACK

型号 (Model/Type) : FRE203FU-BAT

委托方(Client) : 苏州福田激光精密仪器有限公司  
SUZHOU FUKUDA LASER  
PRECISION INSTRUMENT  
CO.,LTD

广州赛西标准检测研究院有限公司

CESI (Guangzhou) Standards & Testing Institute Co., Ltd.

1. 化学品名称和制造商信息 Chemical Product & Company Information		
产品名称 Product Name	锂离子充电电池/电池组 LITHIUM-ION RECHARGEABLE CELL/BATTERY PACK	
型号规格 Model/Type	FRE203FU-BAT, 8000mAh, 3.7V, 29.6Wh	
委托方 Client	苏州福田激光精密仪器有限公司 SUZHOU FUKUDA LASER PRECISION INSTRUMENT CO.,LTD	
委托方地址 Client Address	苏州工业园区马塘湾路 16 号 NO.16 Matangwan Road, S.I.P Suzhou 215028 China	
制造商 Manufacturer	惠州市宇盟实业有限公司 Huizhou Yu Meng Industrial Co., LTD	
制造商地址 Manufacturer Address	惠州市仲恺高新区惠环段艾瑞克斯产业园一栋 8 楼 8 / F, Erix Industrial Park, Huihuan Section, Zhongkai High-tech Zone, Huizhou City, Guangdong Province	
应急电话 Emergency Telephone	13798535455	
试验 Tested by	何丽芳	日期 (Date) : 2025.01.16
审核 Checked by	朱岚娟	日期 (Date) : 2025.01.16
批准 Approved by	李俊豪	日期 (Date) : 2025.01.16

2. 危险性概述 Hazards Identification	
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



3. 成分/组成信息 Composition/Information on Ingredients			
化学成份 Chemical composition	化学式 Chemical Formula	CAS 号 CAS No.	重量百分比 in % by weight
镍钴锰酸锂 Lithium Cobalt Oxide	$\text{LiNi}_x\text{Co}_y\text{Mn}_{1-x-y}\text{O}_2$	182442-95-1	32.0
石墨 Graphite	C	7782-42-5	22.3
铝 Aluminum	Al	7429-90-5	6.78
铜 Copper	Cu	7440-50-8	9
聚乙烯 polyethylene	$(\text{C}_2\text{H}_4)_n$	9002-88-4	2.8
三氧化二铝 Aluminum oxide	$\text{Al}_2\text{O}_3$	1334-28-1	
镍 Nickel	Ni	7440-02-0	0.69
钢 Steel	——	12597-68-1	13.4
六氟磷酸锂 Phosphate(1-),hexafluoro-,lithium	$\text{LiPF}_6$	21324-40-3	12.8
二氟草酸硼酸锂 Lithium difluoro (oxalato) borate(1-)	$\text{LiBF}_2\text{C}_2\text{O}_4$	409071-16-5	
碳酸乙烯酯 Ethylene Carbonate	$\text{C}_3\text{H}_4\text{O}_3$	96-49-1	
碳酸甲乙酯 Ethyl Methyl Carbonate	$\text{C}_4\text{H}_8\text{O}_3$	623-53-0	
碳酸二甲酯 Dimethyl Carbonate	$\text{C}_3\text{H}_6\text{O}_3$	616-38-6	
碳酸亚乙烯酯 Vinylene carbonate	$\text{C}_3\text{H}_2\text{O}_3$	872-36-6	
氟代碳酸乙烯酯 4-Fluoro-1,3-dioxolan-2-one	$\text{C}_2\text{H}_2\text{FO}_2$	114435-02-8	
聚对苯二甲酸乙二酯 Polyethyleneterephthalate	$(\text{C}_{10}\text{H}_8\text{O}_4)_n$	25038-59-9	0.23

4. 急救措施 First Aid Measures
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**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:** 摄入电池是有害的。电池的成分可以导致嘴、食道、胃肠道严重的化学烧伤, 如果摄入电池或拆开的电池, 不要诱导呕吐或吃食物或饮料。应立刻就医。

**Ingestion:** Ingesting the battery is harmful. The composition of the battery can cause severe chemical burns in the mouth, esophagus and gastrointestinal tract. Do not induce vomiting or food or drink if you ingest the battery or disassemble the battery. Seek medical attention immediately.

5. 消防措施  
Fire Fighting Measures

**灭火介质:** 大量水 (降温), 二氧化碳  
**Extinguishing Media:** Water, CO<sub>2</sub>.

**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, 试验人员应立刻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 t



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、通风及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.

#### 其他要注意的防范措施

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。

#### Other Precautions:

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: 正常使用条件下不必考虑。

**Ventilation:** Not necessary under conditions of normal use.

防护手套: 正常使用条件下不必考虑。

**Protective Gloves:** Not necessary under conditions of normal use.

其他防护服装或设备: 正常使用条件下不必考虑。

**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: 方形。

**Appearance:** Square.

气味: 泄漏时, 有醚的气味。

**Odour:** If leaking, smells of medical ether.

酸碱度: 不适用

**pH:** Not applicable as supplied.

闪点: 针对单个组分暴露情况, 其他不适用。

**Flash Point:** Not applicable unless individual components exposed.

**易燃度:** 针对单个组分暴露情况, 其他不适用。

**Flammability:** Not applicable unless individual components exposed.

**相对密度:** 针对单个组分暴露情况, 其他不适用。

**Relative density:** Not applicable unless individual components exposed.

**溶解性 (水溶性):** 针对单个组分暴露情况, 其他不适用。

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

**溶解性 (其他):** 针对单个组分暴露情况, 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° C 以上或焚烧、变形、毁坏、粉碎、拆卸、过充电、短路, 长时间暴露在潮湿的条件下。

**Conditions to Avoid :** Heat above 70° C 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. 毒理学信息 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.

下列情况下会危险人员身体健康: 如果与电池内部材料直接接触, 皮肤可能会出现干燥、灼烧等轻微或严重的刺激, 并且损坏靶器官的神经, 肝脏和肾脏。

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

## 12. 生态学信息 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 Considerations

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

Do not incinerate, or subject cells to temperature in excess of 70° C, 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

**运输类别:** 锂离子电池单独运输

**Transport:** Lithium ion batteries alone transport

**运输专用名称:** 锂离子电池 (包括锂离子聚合物电池)

**Proper Shipping name:** Lithium ion batteries (including lithium ion polymer batteries)

**UN 编号:** UN 3480

**UN No.:** UN 3480

**运输标签:** 锂离子电池操作标签, 第 9 类危险品标识, 仅限货机标签 (空运时)

**Label for conveyance:** Li-ion battery handling label, Class 9 hazard label, Cargo aircraft only label (By air)

**货物运输条件鉴定书:** /

**Certification for Safe Transport of Chemical Goods:** /

**包装等级:** N/A

**Packaging Group:** N/A

**海洋污染物:** 无

**Marine pollutant:** No

**Ems 编号:** F-A, S-I

**Ems No.:** F-A, S-I

**包装要求:** 货物应遵守 IATA DGR (第 66 版) PI 965 第 IB 部分规定或特殊规定 188 海运危险货物规则 (Amdt. 42-24) 版, 包括通过 UN38.3 测试, UN38.3 测试结果见测试报告 S24-B1177-1。

**Packing requirements:** The goods shall be complied with the requirements of Section IB of PI 965 of the 66th edition DGR Manual of IATA or special provision 188 of IMDG CODE (Amdt. 42-24) Edition, including the passing of the UN38.3 test, UN38.3 test results see test report S24-B1177-1.

铁路/公路运输危规按照 GB 12268-2012 类项

National regulations for transport land GB 12268-2012

**运输类别:** 锂离子电池与设备一起包装运输

**Transport:** Lithium ion batteries packed with equipment transport

**运输专用名称:** 锂离子电池与设备一起包装 (包括锂离子聚合物电池)

**Proper Shipping name:** Lithium ion batteries packed with equipment (including lithium ion polymer batteries)

**UN 编号:** UN 3481

**UN No.:** UN 3481

**运输标签:** 锂离子电池操作标签

**Label for conveyance:** Li-ion battery handling label

**货物运输条件鉴定书:** /

**Certification for Safe Transport of Chemical Goods:** /

**包装等级:** N/A

**Packaging Group:** N/A

**海洋污染物:** 无

**Marine pollutant:** No

**Ems 编号:** F-A, S-I

**Ems No.:** F-A, S-I

**包装要求:** 货物应遵守 IATA DGR(第 66 版)PI 966 第 II 部分规定或特殊规定 188 海运危险货物规则(Amdt. 42-24) 版, 包括通过 UN38.3 测试, UN38.3 测试结果见测试报告 S24-B1177-1。

**Packing requirements:** The goods shall be complied with the requirements of Section II of PI 966 of the 66th edition DGR Manual of IATA or special provision 188 of IMDG CODE (Amdt. 42-24) Edition, including the passing of the UN38.3 test, UN38.3 test results see test report S24-B1177-1.

铁路/公路运输危规按照 GB 12268-2012 类项

National regulations for transport land GB 12268-2012

**运输类别:** 锂离子电池安装在设备中运输

**Transport:** Lithium ion batteries contained in equipment transport

**运输专用名称:** 锂离子电池安装在设备中运输 (包括锂离子聚合物电池)

**Proper Shipping name:** Lithium ion batteries contained in equipment (including lithium ion polymer batteries)

**UN 编号:** UN 3481

**UN No.:** UN 3481

**运输标签:** 锂离子电池操作标签

**Label for conveyance:** Li-ion battery handling label

**货物运输条件鉴定书:** /

**Certification for Safe Transport of Chemical Goods:** /

**包装等级:** N/A

**Packaging Group:** N/A

**海洋污染物:** 无

**Marine pollutant:** No

**Ems 编号:** F-A, S-I

**Ems No.:** F-A, S-I

**包装要求:** 货物应遵守 IATA DGR(第 66 版)PI 967 第 II 部分规定或特殊规定 188 海运危险货物规则(Amdt. 42-24) 版, 包括通过 UN38.3 测试, UN38.3 测试结果见测试报告 S24-B1177-1。

**Packing requirements:** The goods shall be complied with the requirements of Section II of PI 967 of the 66th edition DGR Manual of IATA or special provision 188 of IMDG CODE (Amdt. 42-24) Edition, including the passing of the UN38.3 test, UN38.3 test results see test report S24-B1177-1.

铁路/公路运输危规按照 GB 12268-2012 类项

National regulations for transport land GB 12268-2012



## 15. 法规信息 Regulatory 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 TitleIII (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苏州福田激光精密仪器有限公司提供的电池有效。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，广州赛西标准检测研究院有限公司不承担任何责任。

This file is only effective to the batteries provided by SUZHOU FUKUDA LASER PRECISION INSTRUMENT CO.,LTD. The commissioner 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. CESI (Guangzhou) Standards & Testing Institute Co., Ltd doesn't assume responsibility for any damage or loss because of misuse of batteries.

# 注 意 事 项

## NOTES

1. 本报告未经本实验室批准不得部分复印；

The test report shall not be reproduced except in full without the written approval of the Laboratory.

2. 本报告结果只对样品有效；

The results presented in this report is only valid to the samples.

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实验室地址(Address): 广东省广州市黄埔区茅岗路 828 号 10 号楼  
一至二层

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P.R.China

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