



Material Safety Data Sheet

材料安全数据表

No: MSDS-202602-00216

Date: 2026-02-28

Version: 01

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Section 1 - Labelling of chemical products and enterprises 第一节 - 化工产品和企业标识					
Product Name:	电池类型:	Rechargeable Li-ion Battery 可充电锂离子电池			
Product Model	产品型号:	351044PF9			
Cell code	电芯编码:	110101351044			
Battery code	成品编码:	100100351044			
Nominal Voltage	额定电压:	3.92	V		
Minimal Capacity	最小容量:	210.00	mAh		
Watt-hour	瓦 时:	0.8240	Wh		
公司名称	重庆市紫建电子股份有限公司 Manufacturer's Name:Chongqing VDL Electronics Co., Ltd.				
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Section 2 - Hazards summarizing

第二节-危险性概述

Lithium-ion batteries are classified as Class IX dangerous goods. Not dangerous with normal use. Do not dismantle, open or shred the battery ingredients contained within or their ingredients products could be harmful.

锂离子电池属于第九类危险品。正常使用没有危险，不能拆解、打开或分解电池，里面的材料或成分是有毒的。

Primary Route s of Exposure: inhalation, ingestion, Skin contact and Eye contact.

接触途径: 吸入、食入、皮肤接触、眼睛接触。

Potential Health Effects: 潜在健康影响:

• inhalation:

Vapors or mists from a ruptured battery may cause respiratory irritation.

• 吸入:

破裂的电池散发出来的气雾会引起呼吸道刺激。

• Ingestion:

The battery ingredients contained within or their ingredients products can cause serious chemical burns of mouth, esophagus, and gastrointestinal tract.

• 食入:

电池的组成成分或原料可以导致嘴、食道和胃肠道的严重化学烧伤。

• Skin:

Skin contact with contents of an open battery can cause severe irritation or burns to the skin.

• 皮肤:

皮肤接触到电池的内部化学材料可能会导致严重的刺激或烧伤皮肤。

• Eye:

Eye contact with contents of an open battery can cause severe irritation or burns to the eye.

• 眼睛:

眼睛接触到电池的内部化学材料可能会导致严重的刺激或烧伤眼睛。

Section 3 - Composition / Information on Ingredients 第三节-组成/成分信息

Ingredient Name 成分名称	Concentration 含量	CAS No. CAS号
Lithium Cobalt Oxide 钴酸锂	30%~50%	12190-79-3
Nylon 尼龙	0.5%~5%	25038-54-4
Carbon Black 炭黑	0.5%~1%	1333-86-4
Polyvinylidene Fluoride PVDF	0.5%~1%	24937-79-9
Aluminium 铝	5%~10%	7429-90-5
Graphite 石墨	15%~25%	7782-42-5
Styrene-Butadiene Rubber SBR	0.2%~1%	9003-55-8
Carboxy methyl cellulose CMC	0.2%~1%	9004-32-4
Copper 铜	5%~15%	7440-50-8
Nickel 镍	0.5%~1.5%	7440-02-0
Lithium Hexafluorophosphate 六氟磷酸锂	2%~7%	21324-40-3
Ethylene carbonate 碳酸乙烯酯EC	1%~9%	96-49-1
1,3-Propanesultone 1,3-丙烷磺酸内酯	0.075%~0.6%	1120-71-4
Propionic acid ethyl ester 丙酸乙酯	3%-6%	105-37-3
Polyethylene 聚乙烯	1%~5%	9002-88-4
PET	0.5%~5%	25038-59-9
Other 其他	0.5-5%	—

Section 4 - First Aid Measures 第四节-急救措施

If the battery case is ruptured, chemical contact with the human body can be hazardous. In the event of exposure, the following emergency measures should be taken:

如果电池外壳破裂，化学物质接触人体会产生危害，一旦发生接触，应采取以下应急措施：

• Inhalation:

Remove from exposure to fresh air immediately, give oxygen if breathing is difficult, seek medical attention immediately.

• 吸入:

需要立即从有害物质暴露处移至空气清新处，如果呼吸困难给予输氧，立即就医。

• Ingestion:

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

• 摄入:

摄入电池内容物是非常有害的。电池的成分会导致口腔、食道和胃肠道严重的化学烧伤。如果您摄入电池或拆解电池，请勿催吐或进食或饮料。立即就医。

- Skin contact:

Remove contaminated clothes and rinse skin with plenty of water or shower for 15 minutes. Get medical aid.

- 皮肤接触:

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。

- Eye contact:

Do not rub eyes. Immediately flush eyes with water continuously for at least 15 minutes. Seek medical attention.

- 眼睛接触:

不要擦拭眼睛。立即用清水冲洗眼睛至少15分钟, 寻求医疗援助。

Section 5 - Fire Fighting Measures

第五节-消防措施

- Suitable extinguishing media:

Plenty of water, carbon dioxide gas, nitrogen gas, chemical powder fire extinguishing medium and fire foam.

- 合适的灭火媒介:

大量的水, 二氧化碳气体, 氮气, 化学干粉灭火介质或泡沫介质。

- Specific hazards:

Corrosive gas may be emitted during fire.

- 具体危害:

火灾期间可能释放腐蚀性气体 一氧化碳, 二氧化碳, 锂氧化物烟气等。

- Specific fire extinguishing measures:

when the battery and other combustible materials are burned, the fire extinguishing mode can be taken corresponding to the combustible materials. Put out the fire on the upwind whenever possible.

- 具体灭火措施:

当电池和其他可燃物燃烧的同时可采取与可燃物相对应得灭火方式.尽可能在上风向进行灭火。

- Special protective equipment for firefighters:

1. Respiratory protection: Respiratory equipment of a gas cylinder style or protection-against-dust mask Hand protection; 2. Protective gloves Eye protection; 3. Goggle or protective glasses ; 3.designed to protect against liquid splashes Skin and body protection: Protective clothes.

- 消防人员的特殊防护设备:

1.呼吸防护: 气瓶式呼吸设备或防尘口罩手防护; 2.护眼防护手套; 3.护目镜或防护眼镜; 4.用于防止液体飞溅皮肤和身体防护: 防护服。

Section 6 - Accidental Release Measures

第六节-泄漏应急处理

Emergency Procedures应急程序:

- Minor Spills of Cell Materials

- 电池材料的轻微泄露

Remove all ignition sources.

移除所有点火源。

Clean up all spills immediately.

迅速清理所有泄露。

Avoid contact with skin and eyes.

避免接触皮肤和眼睛。

Control personal contact by using protective equipment.

使用防护设备控制个人接触。

Use dry clean up procedures and avoid generating gas or volatile.

使用干式清洁程序，避免产生气体或挥发性物质。

Ventilate the storage area.

给储藏区通风。

Discharge the cell to Zero Voltage by a over 5 Ohm resistance, before place into waste container.

在放入废物容器之前，通过超过5欧姆的电阻将电池放电至零电压。

Place in a suitable labeled container for waste disposal.

放置在适当的贴有标签的容器中进行废物处理。

- Major Spills of Cell Material

- 电池材料的重大泄漏

Clean up all spills immediately.

迅速清理所有泄露。

Wear protective clothing, safety glasses, dust mask, gloves.

穿戴防护服、安全眼镜、防尘口罩、手套。

Secure load if safe to do so. Collect recoverable product.

如果安全的话，固定负载。收集可回收产品。

Use dry clean up procedures and avoid generating gas or volatile.

使用干式清洁程序，避免产生气体或挥发性物质。

Ventilate the storage area.

给储藏区通风。

Discharge the cell to Zero Voltage by a over 5 Ohm resistance, before place into waste container.

在放入废物容器之前，通过超过5欧姆的电阻将电池放电至零电压。

Collect remaining material in containers with covers for disposal.

将剩余材料收集在带盖子的容器中进行处理。

Flush spill area with water.

用水冲洗溢出区域。

- Protective Actions for Spill

- 泄露的保护措施

Measures to be taken in the event of a material leak or spill: The preferred response is to leave the area and allow the cell to cool and the vapours to dissipate. Avoid skin and eye contact or inhalation of vapours. Remove spilled liquid with absorbent and incinerate.

材料泄漏或溢出时应采取的措施：首选的反应是离开该区域，让电池冷却，蒸汽消散。避免皮肤和眼睛接触或吸入蒸汽。用吸收剂清除溢出的液体并焚烧。

Section 7 - Handling and storage

第七节-操作处置与储存

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-charge, throw to fire. Do not crush or puncture the battery, or immerse in liquids.

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。

Operation Disposition:

Don't handing the batteries in manner that allows terminals to short circuit. Do not open, disassemble, crush or burn battery.

操作处置：

不要以让接头短路的方式对电池进行操作。不要打开，分解，挤压或燃烧电池。

Precautions in storage:

储存中的防范措施：

Battery storage conditions: 1. Within three months: $-20^{\circ}\text{C} \leq \text{temperature} \leq +45^{\circ}\text{C}$, humidity: $\leq 75\%$; 2. After three months: $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$, humidity: $\leq 75\%$. Try to isolate it from organic solvents and toxic and corrosive substances. If it cannot be isolated due to conditions, avoid contact between the battery and any toxic, corrosive substances or organic solvents (including gas contact). It is forbidden to store batteries at high temperatures, contact heating equipment, avoid direct sunlight, etc.

电池存储条件: 1.在三个月内: $-20^{\circ}\text{C} \leq \text{温度} \leq +45^{\circ}\text{C}$, 湿度: $\leq 75\%$; 2.超出三个月后: $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$, 湿度: $\leq 75\%$ 。尽量与机溶剂及有毒、有腐蚀性的物质隔离, 如受条件限制不能隔离, 应避免电池与任何有毒、有腐蚀性物质或有机溶剂接触(包括气体接触)。禁止将电池高温储存、接触加热设备、避免阳光直射等。

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.

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。

Keep out of reach of children.

储存在小孩接触不到的地方。

Section 8 - Exposure Controls, Personal Protection 第八节-接触控制/个体防护

Personal protective equipment

个人防护设施

Respiratory protection: Respirator with air cylinder, dust mask.

呼吸防护: 带气瓶的呼吸器、防尘口罩。

Hand protection: Protective gloves.

接触防护: 防护手套。

Eye protection: Goggle or protective glasses designed to protect against liquid splashes.

眼睛防护: 设计用于防止液体飞溅的护目镜或防护眼镜。

Skin and body protection: long sleeves, trousers, work clothes.

皮肤和身体防护: 长袖、长裤、工作服。

Section 9 - Physical And Chemical Properties 第九节-理化特性

Physical state :Solid

物理状态: 固态

Odor: Odorless

气味: 无气味

pH: NA

酸碱度: 不适用

Specific temperatures/temperature ranges where changes in physical state occur: No useful information on mixture products.

具体温度/物理状态发生变化的温度范围: 没有关于混合物产品的有用信息。

Flash point: NA

闪点: 不适用

Explosion properties: NA

爆炸特性: 不适用

Density: NA

稠度: 不适用

Solubility, with indication of the solvent(s): Insoluble in water

溶解性, 有溶剂指示: 不溶于水。

Section 10 - Stability and Reactivity 第十节-稳定性和反应性

Stability: Stable under normal conditions of use

稳定性: 在正常使用条件下稳定

- Conditions to avoid: Hazardous reactions occurring under specific conditions.
- 避免的条件: 在特定条件下发生的危险反应。
- Conditions to avoid: When cell is exposed to an external short-circuit, crushes, deformation, high temperature above 100 degree C, it will cause heat generation and ignition. Avoid direct sunlight and high humidity.
- 应避免的条件: 当电池暴露在外外部短路、挤压、变形、温度高于100摄氏度时, 会导致发热和点火。避免阳光直射和高湿度。
- Materials to avoid: Conductive materials, water, seawater, strong oxidizers and strong acids.
- 避免使用的材料: 导电材料、水、海水、强氧化剂和强酸。
- Toxic Fumes, and may form peroxides.
- 有毒烟雾, 并可能形成过氧化物。

If leaked, forbidden to contact with strong oxidizers, mineral acids, strong alkalis, halogenated hydrocarbons.

如果发生泄露, 避免与强氧化剂, 无机酸, 强碱, 卤代烃接触。

Section 11 - Toxicological Information 第十一节-毒理学信息

Lithium cobalt Oxide - LiCoO₂ 钴酸锂 - LiCoO₂

- Acute toxicity: No applicable data.
- 急性毒性: 无适用数据。
- Reference: cobalt: LDLo, oral - Guinea pig 20mg/kg
- 参考: 钴: LDLo, 口服-豚鼠20mg/kg
- Local effects: Unknown.
- 局部效应: 未知。
- Sensitization: The nervous system of respiratory organs may be stimulated sensitively.
- 致敏: 呼吸器官的神经系统可能受到敏感刺激。
- Chronic toxicity/Long term toxicity: By the long-term inhalation of coarse particulate or vapor of cobalt, it is possible to cause the serious respiratory-organs disease. Skin reaction or a lung disease for allergic or hypersensitive person may be caused.
- 慢性毒性/长期毒性: 长期吸入粗颗粒物或钴蒸气, 有可能导致严重的呼吸器官疾病。过敏或过敏症患者可能会出现皮肤反应或肺部疾病。
- Skin causticity: Although it is very rare, the rash of the skin and allergic erythema may result.
- 皮肤腐蚀性: 虽然非常罕见, 但可能会导致皮肤皮疹和过敏性红斑。

Manganese 锰

- When manganese's concentration is 0.1 mg/L in water, make BOD5 reduced.
- 当锰在水中的浓度为0.1mg/L时, 使BOD5降低。
- Mainly for chronic poisoning, damage to the central nervous system especially.
- 主要用于慢性中毒, 尤其是对中枢神经系统的损害。
- Extrapyramidal system 锥体外系: LD50: 9000 mg/kg (through the rats mouth), LC50: No data LD50: 9000 mg/kg 通过鼠口腔, LC50: 无数据。

Aluminum 铝

- Local effects: Aluminum itself has no toxicity. When it goes into a wound, dermatitis may be caused.
- 局部效应: 铝本身没有毒性。当它进入伤口时, 可能会引起皮炎。
- Chronic toxicity/Long term toxicity: By the long-term inhalation of coarse particulate or fume, it is possible to cause lung damage (aluminum lungs).
- 慢性毒性/长期毒性: 长期吸入粗颗粒物或烟雾可能导致肺损伤 铝肺。

Copper铜

- Acute toxicity: 60-100mg sized coarse particulate causes a gastrointestinal disturbance with nausea and inflammation. TDLo, hypo dermic - Rabbit 375mg/kg
- 急性毒性: 60-100mg大小的粗颗粒会引起胃肠道紊乱, 伴有恶心和炎症。TDLo, 皮下注射-兔子375mg/kg
- Local effects: Coarse particulate stimulates nose and tracheal. When it goes into one' s eyes, reddening and pain may occur.
- 局部影响: 粗颗粒刺激鼻子和气管。当它进入眼睛时, 可能会变红和疼痛。
- Sensitization: Sensitization of the skin may be caused by long-term or repetitive contact.
- 致敏: 皮肤的致敏可能是由长期或反复接触引起的。
- Reproductive toxicity: TDLo, oral - Rat 152mg/kg.
- 生殖毒性: TDLo, 口服-大鼠 152mg/kg.

Nickel镍

- Local effects: Through the pores and sebaceous glands penetrate into the skin, causing skin allergies inflammation, Its clinical manifestations is dermatitis and eczema.
- 局部效应: 皮脂腺通过毛孔渗入皮肤, 引起皮肤过敏性炎症, 其临床表现为皮炎和湿疹。

Graphite石墨

- Acute toxicity: Unknown.
- 急性毒性: 未知。
- Local effects: When it goes into one' s eyes, it stimulates one' s eyes; conjunctivitis, thickening of corneal epithelium or edematous inflammation palpebra may be caused.
- 局部效应: 当它进入眼睛时, 刺激眼睛; 可能引起结膜炎、角膜上皮增厚或眼睑水肿性炎症。
- Chronic toxicity/Long term toxicity: Long-term inhalation of high levels of graphite coarse particulate may cause lung disease or a tracheal disease.
- 慢性毒性/长期毒性: 长期吸入高水平的石墨粗颗粒可能导致肺部疾病或气管疾病。
- Carcinogenicity: 致癌性:
- Graphite is not recognized as a cause of cancer. 石墨不被认为是致癌的原因。

Organic Electrolyte有机电解液

- Acute toxicity: LD50, oral - Rat 2,000mg/kg or more HLD(half lethal dose), 2,000mg/kg or more take orally ;60-100mg copper particles can cause stomach sicchasia and inflammation.
- 急性毒素: LD50,口服-大鼠 2,000mg/kg 或更多HLD 半致死剂量 , 2,000mg/kg 或更多 口服 ;60-100mg铜颗粒可导致胃干燥和炎症。
- Local effects: Unknown.
- 局部效应: 未知。
- Skin irritation study: Rabbit - Mild.
- 皮肤刺激性研究: 兔子-轻度。
- Eye irritation study: Rabbit - Very severe.
- 眼睛刺激性研究: 兔子 - 重度。

Section 12 - Ecological Information 第十二节-生态信息

Marine Pollutant: Not Determined.No data for Polymer Lithium-ion Battery.

海洋污染物: 未确定。没有聚合物锂离子电池的数据。

Kindly Reminder: Disallow material discharge or abandon a natural environment that have no government's permission .

温馨提醒: 不允许物质排放或放弃未经政府许可的自然环境。

The lithium ion battery disposal must in accordance with professional treatment,Enterprise treat hazardous waste and transport the waste must accord with the laws and regulations and local government requirements, Don't allow individuals to burn the battery.

锂离子电池的处置必须按照专业处理, 企业处理危险废物和运输废物必须符合法律法规和当地政府的要求, 不允许个人焚烧电池

Section 13 - Disposal Consideration 第十三节-废弃处置

Waste disposal must be in accordance with the applicable regulations. Disposal of the lithium ion battery/cell should be performed by permitted, professional disposal Page, firms knowledgeable in State or Local requirements of hazardous waste treatment and hazardous waste transportation. Incineration must ultimately be carried out by trained professionals using batteries in authorized facilities with appropriate gases and fumes, but should not be processed by users.

废物处理必须符合适用法规。锂离子电池/电池的处置应由许可的专业处置机构进行，了解州或地方危险废物处理和危险废物运输要求的公司。焚烧最终得由经过培训的专业人员在具有适当气体和烟雾的授权设施中使用电池进行，但不应由用户进行处理。

Section 14 - Transport Information

第十四节-运输信息

1. Air Transportation per IATA Dangerous Goods Regulations, 67th Edition.

根据国际航空运输协会危险品条例，第67版。

UN No. and Shipping name: UN 3480 Lithium ion batteries/UN 3481 Lithium ion batteries packed with equipment.

UN编号及运输专有名称: UN 3480锂离子电池/UN 3481与设备包装在一起的锂离子电池

Label for conveyance: Battery Mark, class 9 lithium battery or sodium ion battery hazard label (Only for UN3480), Cargo Aircraft Only Label (Only for UN3480)

运输标签: 电池标记, 第9类锂电池或钠离子电池危险品标签 只适用UN3480, 仅限货机标签 只适用 UN3480

Packaging Class: N/A

包装等级: 不适用

Hazard Class: Class 9

危险等级: 等级9

Packaging requirement: PACKING INSTRUCTION 965 of section IB/PACKING INSTRUCTION 966--967 of section II

包装要求: 第IB节包装规范965/第II节包装规范966 - 967

2. Sea transportation, according to IMO IMDG Code

2. 海运, 根据国际海事组织IMDG规则

UN No. and Shipping name: UN 3480 Lithium ion batteries/UN 3481 Lithium ion batteries packed with equipment.

UN编号及运输专有名称: UN 3480锂离子电池/UN 3481与设备包装在一起的锂离子电池

Hazard Class: Not Restricted

危险等级: 无限制

Special provision: SPI88

特殊规定: SPI88

Package instruction: Not-restricted goods

包装说明: 非限制货物

EmS No./EmS: F-A, S-I

Marine pollutants: No 海洋污染物: 无

ICAO/IATA	根据国际民用航空组织(ICAO),国际航空协会(IATA), DGR包装说明PI 965 IB, PI 966 II, PI 967 II相关规定进行空运。 Airfreight in accordance with the International Civil Aviation Organisation (ICAO), International Air Transport Association (IATA), DGR packing instructions PI 965 IB, PI 966 II, PI 967 II.	DGR 67 th (2026) ICAO (2025-2026 edition)
IMDG CODE 'People's Republic of China Import and Export Commodity Inspection Law'	When the battery is less than 20Wh, it is transported according to the relevant provisions of the International Maritime Dangerous Goods Code (IMDG CODE) Special Provision 188 当电池小于20Wh, 根据《国际海运危险货物规则》(IMDG CODE)特殊规定188条款相关规定运输。)	IMDG CODE (Amdt. 42-24

Section 15 - Regulatory information

第十五节-法规信息

Law information

法律信息

Dangerous Goods Regulations

《危险品规则》

'Recommendations on the Transport of Dangerous Goods Model Regulations'

《关于危险货物运输的建议书 规章范本》

'International Maritime Dangerous Goods Code'

《国际海运危险货物规则》

'Guidance on the compilation of safety data sheet for chemical products'

《化学品安全技术说明书编写指南》

'Globally Harmonized System of Classification and Labeling of Chemicals (GHS)'

《全球化学品统一分类和标签制度 全球统一制度》

'People's Republic of China Import and Export Commodity Inspection Law'

《中华人民共和国进出口商品检验法》

Section 16 - Other information

第十六节-其他信息

For more information please contact:

获取更多信息请联系:

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Fax:传真: +86-23-52675969

Web网站: www.gdvd.com

Remark: The batteries are safe for transportation, and it is advised to use dry powder fire extinguisher in case of explosion or inflammation.

备注: 电池运输安全, 建议使用干粉灭火器, 以防爆炸或燃烧。

Production Department: Quality Department, Process Department, Safety and Environment Department

制作部门: 研发部、品质部、计划部、安环部