中国认可
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检验
INSPECTION
CNAS IB0551

Report No.:
报告编号：GDFLS2F2301SDS01

MATERIAL SAFETY DATA SHEET

材料安全数据表

Product 产品	Lithium iron phosphate battery 磷酸铁锂电池
Type/Model 型号	FLA48500
Issue Date 签发日期	2025-03-11
Validity 有效期	2025-03-11 ～ 2025-12-31
Compiler 编写	
Reviewer 审核	
Approver 批准	

广州邦禾检测技术有限公司

Guangzhou MCM Certification & Testing Co., Ltd.

Material Safety Data Sheet
材料安全数据表

SECTION 1 - CHEMICAL AND COMPANY IDENTIFICATION
第1节—化学品和公司标识

Product **产品**	Lithium iron phosphate battery 磷酸铁锂电池
Type/Model: **型号**	FLA48500
Parameter **参数**	51.2V, 500Ah, 25kWh
Usage **用途**	Used in Energy Storage System 用于储能系统
Company **公司**	Guangzhou Felicity Solar Technology Co., Ltd 广州菲利斯太阳能科技有限公司
Address **地址**	No.2, Donghua Huaye Road, Renhe Town, Baiyun Area, Guangzhou 广州市白云区人和镇东华华业路2号
Fax 传真	--
Zip code 邮编	--
E-mail 电子邮箱	hailin.wu@felicitysolar.com
Emergency Tel. **紧急联系电话**	020-36719118
Manufacturer **制造单位**	Guangzhou Felicity Solar Technology Co., Ltd 广州菲利斯太阳能科技有限公司
Address **地址**	No.2, Donghua Huaye Road, Renhe Town, Baiyun Area, Guangzhou 广州市白云区人和镇东华华业路2号
Factory **生产单位**	Guangzhou Felicity Solar Technology Co., Ltd 广州菲利斯太阳能科技有限公司
Address **地址**	No.2, Donghua Huaye Road, Renhe Town, Baiyun Area, Guangzhou 广州市白云区人和镇东华华业路2号

SECTION 2 - HAZARDS IDENTIFICATION
第2节—危害识别

Classification 分类：

According to Regulation (EC) No 1272/2008 (CLP), the goods are not considered dangerous goods and therefore no SDS is required. **The hazards mentioned in this document are in the case of a ruptured battery (Electrolyte leakage).**

根据法规(EC) No 1272/2008 (CLP)，该货物不被视为危险货物，因此不需要提供SDS。

本文件提到的危险是针对电池破裂（电解液泄漏）的情况。

Acute toxicity, Category 3, oral; H301 急毒性-类别3口服；H301
Skin corrosion, Category 1A; H314 皮肤腐蚀-类别1A；H314
Serious eye damage, Categories I; H318 严重眼损伤-类别1；H318
Specific target organ toxicity following repeated exposure, Categories I; H372 特定目标器官毒性 重复接触-类别1；H372

Label elements 标签要素：

Hazard pictograms 象形图	
Signal Word 警示词	**Danger** **危险**
Hazard Statements 风险声明	
H301	Toxic if swallowed 吞咽会中毒
H314	Causes severe skin burns and eye damage 造成严重皮肤灼伤和眼损伤
H372	Causes damage to organs through prolonged or repeated exposure 长期或反复接触会对器官造成损害
Precautionary Statements – Prevention **预防说明—预防**	
P270	Do not eat, drink or smoke when using this product 使用本产品时不要进食、饮水或吸烟
P280	Wear protective gloves/protective clothing/eye protection/face protection/hearing protection 戴防护手套/穿防护服/戴防护眼罩/戴防护面具/戴听力保护装置
Precautionary Statements – Response **预防声明—响应**	
P301+P330+P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. 如误吞咽：漱口。不要诱导呕吐
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse affected areas with water [or shower]. 如皮肤（或头发）沾染：立即脱掉所有沾染的衣服。用水清洗患处[或淋浴]。
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing 如误吸入：将人转移到空气新鲜处，保持呼吸舒适体位
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing 如进入眼睛：用水小心冲洗几分钟。如戴隐形眼镜并可方便地取出，取出隐形眼镜。继续冲洗。
Precautionary Statements – Storage **预防声明—存储**	
P405	Store locked up 存放处须加锁
Precautionary Statements – Disposal **预防声明—处置**	
P501	Dispose of contents/container, in accordance with local/regional/national/international regulations 处置内装物/容器，根据当地/地区/国家/国际要求

Hazards not otherwise classified (HNOC) 未分类的危险

Not applicable 不适用

Other information 其他信息

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
对水生生物有害，可能对水生环境造成长期不利影响。

Interactions with other chemicals与其他化学物质的相互作用

Use of alcoholic beverages may enhance toxic effect.
使用酒精饮料可能会增强毒性作用

SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENT
第3节—成分信息

Ingredient 成分	Molecular formula 分子式	CAS No. CAS 号	Weigh 含量
Lithium Iron Phosphate /磷酸铁锂	$LiFePO_4$	15365-14-7	38.8%
Graphite /石墨	C	7782-42-5	19.8%
Polyethylene /聚乙烯	$(C_2H_4)_n$	9002-88-4	2.2%
Aluminum /铝	Al	7429-90-5	11.4%
Styrene Butadiene Rubber /聚苯乙烯丁二烯共聚物	$(C_8H_8 \cdot C_4H_6)_n$	9003-55-8	0.8%
Lithium Hexafluorophosphate /六氟磷酸锂	$LiPF_6$	21324-40-3	2.3%
Ethylene Carbonate /碳酸乙烯酯	$C_3H_4O_3$	96-49-1	5.6%
Ethyl Methyl Carbonate /碳酸甲乙酯	$C_4H_8O_3$	623-53-0	4.6%
Dimethyl Carbonate /碳酸二甲酯	$C_3H_6O_3$	616-38-6	5.6%
Copper /铜	Cu	7440-50-8	6.7%
Polyvinylidene Fluoride /聚偏二氟乙烯	$(C_2H_2F_2)_n$	24937-79-9	0.8%
Others /其他	--	--	1.4%

SECTION 4 - FIRST AID MEASURES
第4节—急救措施

Eye Exposure 眼睛接触

In case of contact with eyes, flush with copious of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.
如果与眼睛接触，用大量的水冲洗至少15分钟。用手指分开眼睑，确保充分的冲洗。寻求医生。

Skin Exposure 皮肤接触

If the internal battery materials of an opened battery cell come into contact with skin, immediately flush with plenty of water or soap.
如果打开的电池的内部电池材料接触到皮肤，立即用大量的水或肥皂冲洗。

Inhalation Exposure 吸入

In case of inhaling gas volatilized from inside of the battery, seek immediate medical attention.
如果吸入了电池内部挥发的气体，请立即就医。

Ingestion Exposure 吞咽

If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.
如果吞咽，请就医。除非医务人员指示，否则不要催吐。

SECTION 5 - FIRE FIGHTING MEASURES
第5节—消防措施

Danger characteristic 危险特性

Exposure to excessive heat can cause venting of the liquid electrolyte.
暴露在过热的环境中会导致液体电解质的释放。
Battery may burst and release hazardous decomposition products when exposed to a fire situation.
当暴露在火灾环境中时，电池可能会爆裂并释放出危险的分解产物。

Hazardous combustion products 有害危险产物

Corrosive and toxic gas may be emitted during fire.
着火期间可能会排放腐蚀性和有毒气体。

Fire-Fighting method 灭火措施

The staff must equip with filtermask (full mask) or isolated breathing apparatus.
员工必须配备过滤器面罩或隔离式呼吸器。
The staff must wear the clothes which can defense the fire in the upwind direction.
工作人员必须穿能在逆风方向防火的衣服。
Remove the container to the open space as soon as possible.
尽快将容器移到空地上。
Spray water on the containers in the fireplace to keep them cool until finish extinguishment.
把水喷在壁炉里的容器上，使其降温，直到熄灭。

Fire-Fighting media 灭火介质

Plenty of water, dry chemical powder or carbon dioxide.
大量的水，干粉或二氧化碳。

SECTION 6 - ACCIDENTAL RELEASE MEASURES
第6节—意外泄漏措施

Emergency treatment 紧急处理

If the battery material is released, remove personnel from area until the batteries cool down and fumes dissipate.
如果电池材料被释放，请将人员从该区域撤离，直到电池冷却和烟雾消散。
Provide maximum ventilation to clear out hazardous gases and avoid skin and eye contact or inhalation of vapors.
提供最大的通风以清除有害气体和避免皮肤和眼睛接触或吸入蒸汽。
Remove spilled liquid with absorbent and incinerate waste.
用吸收剂除去溢出的液体并焚烧废物。

SECTION 7 - HANDLING AND STORAGE
第7节—处理和储存

Handling 处理

This battery system is a high voltage and high risk device, and all processing operations need to be completed by multiple professionals in accordance with the corresponding operation specifications.
本电池系统为高压高危险系数的装置，所有处理操作都需要由多个专业人员按照相应的操作规范共同协作完成。

Storage 储存

1. The battery system should be placed in an open environment with good ventilation and sprinklers, and there should be sufficient clearance between the battery system and the battery system. The storage area of the battery system should be far away from residential areas.
   电池系统应放置在通风良好、有洒水装置的开阔环境中，电池系统和电池系统之间应有足够的间隙。电池系统存放区域应远离居民区。
2. Place the battery system in a cool, dry and well-ventilated place (temperature -30~45°C, humidity ≤80%). Avoid prolonged exposure to direct sunlight. Keep away from fire and heat sources. Start the air conditioning system when necessary to ensure that the temperature and humidity in the system are within the appropriate range.
   将电池系统置于阴凉、干燥、通风良好的地方（温度-30~45℃，湿度≤80%）。不要长时间暴露在阳光直射下。

远离火源和热源。必要时启动空调系统以保障系统内温湿度维持在相应范围内。

3. Equipped with appropriate type and quantity of fire extinguishing equipment. Placement sites should be equipped with appropriate masking materials for leakage treatment.
配备相应种类和数量的灭火器材。安置场所应配备适当的掩蔽材料，以便进行泄漏处理。

SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION
第8节—暴露控制与个人防护措施

Engineering Control 工程控制

Keep away from heat and open flame. Supply with sufficient partial air exhaust. Store in a cool, dry place.
远离热源和明火。提供足够的局部排气。存放在阴凉干燥的地方。

Respiratory Protection 呼吸保护

Not necessary under conditions of normal use. Wear self-contained breathing filtermask if the density exceed in the air. Wear breathing apparatus under the condition of emergency rescue or evacuation.
在正常使用条件下不需要。如果环境内气体密度超过空气中的密度，请佩戴自给式呼吸过滤器。在紧急救援或疏散的情况下，佩戴呼吸器。

Eyes Protection 眼睛保护

Not necessary under conditions of normal use. Wear protective glasses if handling a leaking or ruptured battery.
在正常使用条件下不需要。如果处理泄漏或破裂的电池，请戴上防护眼镜。

Skin and Body Protection 皮肤和身体保护

Not necessary under conditions of normal use. Wear fireproofing, gas defense clothes in case of handling a leaking or ruptured battery.
在正常使用条件下不需要。在处理泄漏或破裂的电池时，穿上防火防毒服。

Hands Protection 手部保护

Not necessary under conditions of normal use. Wear chemical resistant rubber glove.
在正常使用条件下不需要。耐磨耐化学腐蚀橡胶手套。

Other Protections 其他保护

No smoking, dining and drinking water in the workplace. Keep good habit of hygiene.
工作场所禁止吸烟、就餐和饮水。保持良好的卫生习惯。

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES
第9节—理化性质

Appearance and properties 外观与性状	Black, Approximate Cuboid, Solid 黑色近长方体固体		
Smell 气味	Odorless 无特殊气味	pH value (indicate concentration) pH值（指明浓度）	NA
Melting/freezing point 熔点/凝固点	NA	(initial)boiling point & boiling range （初）沸点和沸程	NA
Relative vapor density (air =1) 相对蒸气密度(空气=1)	ND	Saturated vapor pressure 饱和蒸气压	NA
Odor threshold 气味临界值	ND	Evaporation rate 蒸发速率	NA
Relative density (water =1) 相对密度(水=1)	ND	Flash point 闪点	NA
Viscosity 黏度	NA	Decomposition temperature 分解温度	ND
Partition coefficient: n-octanol/water n-辛醇/水分配系数	NA	Upper explosion limit 爆炸上限	NA
Ignition temperature 引燃温度	ND	Lower explosion limit 爆炸下限	NA

Solubility 溶解性	Insoluble in water 不溶于水	Flammability 易燃性	ND
Remark NA= Not applicable；ND= No Data 备注 NA=不适用；ND=无信息			

SECTION 10 - STABILITY AND REACTIVITY
第10节—稳定性与反应性

Stability 稳定性

Stable under normal temperature and pressure.
常温常压下稳定。

Distribution of Ban 禁配物

Explosives, inflammables, strong oxidants and corrosives.
爆炸品、易燃物、强氧化剂和腐蚀剂。

Conditions to Avoid 应避免的条件

Fire source, heating source, disassemble, external short circuit, crushes, deformation, high temperature above 100°C, direct sunlight and high humidity, immerse in water or overcharge.
火源、热源、拆卸、外部短路、压碎、变形、100°C 以上高温、阳光直射、高湿度、浸水或过充。

Hazardous Polymerization 危险聚合

Will not occur.
不会发生。

Hazardous Decomposition Products 有害分解产物

Metal oxides, carboxyl compound such as CO, CO_2, etc.
金属氧化物，碳化合物例如一氧化碳、二氧化碳，等等。

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SECTION 11 - TOXICOLOGICAL INFORMATION 第11节—毒理学信息	
Acute Toxicity 急性毒性	No Data 无信息
Sub-acute and Chronic Toxicity 亚急性和慢性毒性	No Data 无信息
Skin irritation or corrosion 皮肤刺激性或腐蚀性	No Data 无信息
Eye irritation or corrosion 眼睛刺激或腐蚀	No Data 无信息
Skin sensitization 皮肤致敏	No Data 无信息
Respiratory sensitization 呼吸致敏	No Data 无信息
Germ cell mutation 生殖细胞突变性	No Data 无信息
Reproductive toxicity 生殖毒性	No Data 无信息
Specific target organ system toxicity - one exposure 特异性靶器官系统毒性--一次接触	No Data 无信息
Specific target organ system toxicity - repeated exposure 特异性靶器官系统毒性--反复接触	No Data 无信息
Inhalation hazard 吸入危害	No Data 无信息
Other effects on the organism 其他对生物体的影响	No Data 无信息

SECTION 12 - ECOLOGICAL INFORMATION 第12节—生态信息	
Acute aquatic toxicity 急性水生毒性	No Data 无信息
Chronic aquatic toxicity 慢性水生毒性	No Data 无信息
Durability and degradability 持久性和降解性	No Data 无信息
Potential bioaccumulation 潜在的生物累积性	No Data 无信息
Migration in soils 土壤中的迁移性	No Data 无信息
Other effects on the ecosphere 其他对生态的影响	No Data 无信息

SECTION 13 - DISPOSAL CONSIDERATIONS
第13节—处置注意事项

Appropriate Method of Substance 物质处理方法

The battery should be completely discharged prior to disposal in order to prevent short circuit.
为了防止短路，在处理前应将蓄电池完全放电。
The battery contains recyclable materials, and it is suggested recycle.
电池含有可回收材料，建议回收利用。
Refer to National or Local regulations before handling.
操作前请参阅国家或地方法规。
Disposal of the battery should be performed by permitted, professional disposal firms knowledgeable in National or Local regulations of hazardous waste treatment and hazardous waste transportation.
电池的处理应由获得国家或地方法规的许可的具有危险废物处理和危险废物运输的专业处理公司进行。

SECTION 14 - TRANSPORT INFORMATION
第14节—运输信息

The battery has passed the test items of UN Manual of Test and Criteria Section 38.3, and
Report No.: GDFLS2F2301U01
电池已通过联合国《试验和标准手册》第38.3节的测试项目，报告编号：GDFLS2F2301U01

General packaging requirement 一般包装要求:

1. The cells or batteries must be protected so as to prevent short circuits.
电芯或电池必须加以保护，以防止短路。
2. The cells or batteries or equipment must be packed in suitable strong outer packaging.
电芯或电池或设备必须包装在合适的坚固的外包装中。
3. If batteries contained in equipment, equipment must be secured against movement within the outer packaging and be packed so as to prevent accidental activation.
如果电池包含在设备中，设备必须在外包装内固定，防止移动，并进行包装，以防止意外激活。

No. 序号	**UN numbers & Proper Shipping Name**, if applicable **联合国编号及运输专用名**，如适用		
(1)	UN 3480_LITHIUM ION BATTERIES UN 3480_锂离子电池		
(2)	/		
No. 序号	**Hazard Class** **危险等级**	**Packing Group** **包装类别**	**Packaging requirement** **包装要求**
☐	**Air transportation, according to IATA-DGR 66th Edition (Effective 1 January-31 December 2025)** **空运，依据IATA-DGR第66版（2025年1月1日至12月31日生效）**		
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☒	**Maritime transportation, according to IMO IMDG Code (Edition 42-24)** **海运，依据IMO IMDG Code (42-24版)**		
(1)	Class 9 第九类危险货物	PG II II级包装	Packing Instruction P903; EmS No.: F-A,S-I; Not Marine pollutant 包装说明 P903；应急处理代码：F-A,S-I；非海洋污染物
☒	**Road transportation, according to ADR-2025** **公路运输，依据ADR-2025**		
(1)	Class 9 第九类危险货物	PG II II级包装	Packing Instruction P903 包装说明 P903
☐	**Railway transportation, according to RID-2025** **铁路运输，依据RID-2025**		
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Remark备注	//		

SECTION 15 - REGULATORY INFORMATION
第15节—监管信息

Dangerous Goods Regulation (DGR)
Recommendations on the Transport of Dangerous Goods Model Regulations
International Maritime Dangerous Goods (IMDG)
Occupational Safety and Health Act (OSHA)
Toxic Substances Control Act (TSCA)
Code of Federal Regulations (CFR)
Technical Instructions for the Safe Transport of Dangerous Goods
California Proposition 65
Superfund Amendments and Reauthorization Act Title III (302/311/312/313) (SARA)
Globally Harmonized System of Classification and Labeling of Chemicals(GHS)
In accordance with all Federal, State and local laws. 符合所有联邦、州和地方法律。

SECTION 16 - ADDITIONAL INFORMATION
第16节—附加信息

According standard 标准依据:

GB/T 16483-2008 Safety data sheet for chemical products Content and order of sections
ISO 11014:2009(E) Safety data sheet for chemical products – Content and order of sections

Editing date 编辑日期:

2025-03-06

Department 编写机构

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Other Information 其他信息

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Sample Reference Photo
样品照片

Model: FLA48500, 51.2V, 500Ah, 25kWh





--End of the report--