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SAFETY DATA SHEET

1 Product & Company Identification

Product Identification

Chinese Name	锂离子电池
English Name	Lithium Ion Battery
Proper Shipping Name	Lithium Ion Battery
Product Description	Rechargeable lithium ion battery
NVT Model Name	PF46 / 556379
NVT PN	31900FQ60001
UN No.	UN3480
UN38.3 Report No.	WT22062207
Capacity	4.45Ah
Nominal voltage	3.89V
Watt-hour	17.31Wh
Equivalent lithium content	1.34g
Approximate Weight	66.5g

Safety Data Sheet Provider Information

Manufacturer	Dongguan NVT Technology Co.,Ltd
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Postcodes	523448
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Fax	+86-769 89086589
E-mail Address	EHS02@nvtpower.com

Emergency call

Emergency call	+86-769 38826188

2 Hazardous Identification

As a whole, the battery is not dangerous in the correct use.	
Explosive risk	This article does not belong to the explosion dangerous goods
Flammable risk	This article does not belong to the flammable material

Oxidation risk	This article does not belong to the oxidation of dangerous goods
Toxic risk	This article does not belong to the toxic dangerous goods
Radioactive risk	This article does not belong to the radiation of dangerous goods
Mordant risk	This article does not belong to the corrosion of dangerous goods

3 Composition /Information on Ingredients

Important note: The battery should not be opened or burned. Exposure to the ingredients contained within or their combustion products could be harmful.

PACK Composition

MATERIAL OR INGREDIENT	%/wt.
Container, Steel Support and Control System （Note: Non-dangerous chemical ）	35-45
Batteries（The composition of the battery reference to the following table 3.2.）	55-65

Composition of battery（Note: The percent in following table is only for the weight of battery）

Component	CAS No.	EC No.	%/wt.
Cobalt lithium dioxide	12190-79-3	235-362-0	15-40
Ethyl propionate	105-37-3	203-291-4	15-40
Copper foil	7440-50-8	231-159-6	10-30
Aluminum foil	7429-90-5	231-072-3	10-30
Graphite	7782-42-5	231-955-3	7-25
Ethylene Carbonate	96-49-1	202-510-0	0-15
Propylene Carbonate	108-32-7	203-572-1	0-15
Lithium Hexafluorophosphate(1-)	21324-40-3	244-334-7	0-15
1,3-propanesultone	1120-71-4	214-317-9	0-1
Separator	9002-88-4	618-339-3	0-5

4 First Aid Measures

First Aid Measures

Under normal conditions of use, the battery is hermetically sealed.

Eye Contact	The ingredients in the battery can cause severe allergies and chemical burns. Open the upper and lower eyelids immediately and rinse the eyes with water for more than 15 minutes until no chemical remains. Then seek medical attention immediately.

Skin Contact	The ingredients in the battery may cause skin irritation or chemical burns. Remove contaminated clothing and wash skin with soap and water. Seek medical attention if chemical burns or irritation persists.
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.
Inhalation	Ingredients in the battery may cause respiratory allergies, and inhalation of vapor may cause upper respiratory tract and lung allergies. Breathe fresh air and seek medical attention immediately.

5 Fire Fighting Measures

Extinguishing media

Suitable fire extinguishing medium	Water or water mist, sand, fire blanket, dry powder or carbon dioxide fire extinguisher
Inappropriate extinguishing medium	None

Special hazards arising from this substance or mixture

1	In transportation and test engineering, risk factors such as electric box drop, extrusion, puncture, metal short circuit, liquid immersion may occur, and electric shock and fire risk may occur;
2	If in a confined space, there may be a risk of gas explosion.
3	Liquids leaking from accidents, including improper handling of fire water, pose a risk of environmental pollution.

Material prepare & training

Material prepare	
1	Water mist fire extinguisher: use 1 9-liter water mist fire extinguisher or 2 6-liter water mist fire extinguishers per 500KWH, which can extinguish ABCE fire (solid, non-flammable liquid, gas, electrical fire under 36KV). Or carry electric or manual sprayers as water mist extinguishers. Suspension type water - based fire extinguisher can be hung above the two cargoes.
2	Waterproof supplies: raincoat, rain boots, rubber gloves; Plastic wrap. Rags.
3	PPE: mask, high temperature gloves, safety glasses, half mask.
4	Smoke exhaust tools: every 20 meters 1 wall smoke exhaust fan, or mobile smoke exhaust fan. The vehicle has ventilation holes.
5	Explosion-proof tools: keep open, such as open environment, vehicles/equipment not airtight. The test must be closed equipment, such as high temperature furnace, high and low temperature impact test

	instrument. Copper foil with a diameter of 200mm and a thickness of 8 microns shall be placed on the equipment as pressure relief film. Room wall every 20 meters to have a fan, fan displacement at least 5,000 cubic meters per hour.
6	Neutralizing materials: prepare 10 kg of lime powder every 500KWH to neutralize the outflow electrolyte. The electrolyte will form HF at 8% of the weight when encountering water. Neutralize with alkaline materials.
7	Voltage measurement: multi-meter. Physically seal the current protection to avoid explosion of instrument by mistake.
Training skills	
1	Turn on or move fan to exhaust smoke
2	Put out the fire with water mist extinguisher after wearing waterproof appliance. Measure the voltage with multi-meter after the battery is dried. After the test voltage is normal, wrap the insulation with plastic wrap, and then transport it.
3	The leaked electrolyte is neutralized with lime or NaOH powder at a ratio of 8% by weight
4	Use multi-meter to test voltage, pay special attention not to use the wrong gear (to physically close the current block), to prevent instrument explosion

Fire extinguishing precautions and protective measures

1	Alarm immediately when battery smoke or combustion is detected
2	Wear protective equipment, including respirators and masks. If water is used, PPE should include raincoats, rain boots, insulated gloves, etc.
3	Cut off the power supply
4	Using solid fire extinguishers, it is recommended to use fire extinguishers in the following order: water or mist, sand, fire blanket, dry powder, carbon dioxide fire extinguishers;
5	Exhaust smoke through fans or air circulation.
6	Drying, neutralizing. Dry by fan, if water is used, neutralize with calcium hydroxide.



Figure1water based fire extinguisher
(Could be used for 36KV electrical



Figure2waters prayers to fire extinguisher (Wear PPE to avoid electrical shock)

6 Accidental Release Measures

On-site: Place the material a suitable container and alert the local police.

In water: When the battery pack is in water, there is a risk of slight electric shock; when electrolyzing water, hydrogen will be generated. Ventilation must be maintained to prevent hydrogen accumulation and explosion in closed space. If possible, remove the batteries or modules from the water and alert the local police.

7 Handling & Storage

One of the most important risks in the transportation of batteries and battery power equipment is the short circuit of batteries caused by contact between the two poles of batteries with other batteries, metal objects or other conductors. Therefore, packaged batteries and battery cells must be separated in an appropriate way to prevent short circuit and electrode damage. In addition, batteries and battery cells must be packaged in strong external packaging or installed in equipment.

Handling

1	Do not make excessive physical impact or vibration on batteries.
2	Short circuit should be avoided, although a few seconds of short circuit will not have a serious impact on the battery. A long short circuit can cause the battery to lose energy quickly and generate enough heat to burn the shell.
3	The sources of short circuit include the random placement of batteries in bulk containers or various metal objects used in battery assembly on equipment. In order to minimize the risk of short circuit of batteries, the protection measures of batteries should be provided when the batteries are transported and stored.

4	Batteries cannot be disassembled or deformed.
5	Do not expose the battery to water when it breaks. Operators need insulation protection when handling battery packs that exceed 50V.

Storage

1	When lithium-ion batteries are stored for a long time, their charging capacity should be between 25% and 75%.
2	Store in a cool, dry and well ventilated area.
3	Excessive temperature can lead to a series of battery problems, such as leakage or rust.
4	Do not put batteries in open fire.

8 Exposure Control/Personal Protection

Important note: The lithium battery is normally sealed and the powder has no fluidity and will not pose a danger to the contact person. It is strictly forbidden for non-professionals to dismantle batteries or cores without permission. Do not touch the leaked electrolyte if it is not necessary. If you need to actively contact the electrolyte, you need to wear chemical-resistant gloves.

Engineering Control

Keep away from heat sources and fires and store in dry and cool areas.

9 Physical/Chemical Properties

Physical/Chemical Properties

Physical state	Solid
Color	Not Applicable
Odor	No Odor
Flash point	Not Applicable
Solubility in ethanol soluble	Not Applicable
Boiling Point	Not Applicable
Solubility in water:	Not Applicable
Vapor pressure	Not Applicable
Explosion limit	Not Applicable
Auto flammability	Not Applicable
Melting Point	Not Applicable

Freezing Point	Not Applicable

10 Stability & Reactivity

Stability & Reactivity

Stability	Good stability at standard temperature.
Reactivity	None
Notice	Do not touch water or acidic substances. Products after decomposition: If the aluminum foil packaging of the battery is damaged, then do not contact strong oxidants, acidic substances and high temperature environment, and the electrolyte may volatilize to form hydrogen fluoride.

11 Toxicological information

No toxic substances will be produced during routine operation and use.

Caution: according to the harmonized classification and labelling (CLP00) approved by the European Union, 1,3 Propanesultone may cause cancer, is harmful if swallowed and is harmful in contact with skin. This substances meeting the criteria for classification in the hazard class reproductive toxicity category 1A or 1B, adverse effects on sexual function and fertility or on development in accordance with section 3.7 of Annex I to Regulation(EC) No 1272/2008.

12 Ecological information

If batteries are to be scrapped, they should be selected and disposed of by professional companies.

13 Disposal considerations

Batteries cannot be discarded directly into sewers or directly discharged into the environment. They should be recycled and treated in accordance with local laws and regulations.

14 Transport Information

Air transportation

The lithium battery should accord with the International Air Transport Association (IATA DGR 64th Edition) requirements for transportation. The battery or cell should be packed and signed as following table.

UN NO.	Proper Shipping Name	Power	Package requirements	Label which need to paste
UN3480	lithium ion batteries	Cells＞20Wh Batteries＞100Wh	PI965 Section IA **Limit per package:** Pax A/C=Forbidden CAO ≤35 kg	Class9 lithium battery hazard label Cargo Aircraft Only label 
		Cells≤20Wh Batteries≤100Wh	PI965 Section IB **Limit per package:** Pax A/C=Forbidden CAO ≤10 kg	Class9 lithium battery hazard label lithium battery sign Cargo Aircraft Only label 
UN3481	Lithium ion batteries contained in equipment	Cells＞20Wh Batteries＞100Wh	PI967 Section I **Limit per package:** Pax A/C ≤5 kg CAO ≤35 kg	Class9 lithium battery hazard label 
		Cells≤20Wh Batteries≤100Wh	PI967 Section II **Limit per package:** ≤2 batteries or ≤4 cells，and≤2 packages per consignment Pax A/C ≤ 5 kg CAO ≤5 kg	\
			PI967 Section II **Limit per package:** ＞2 batteries or ＞4 cells，or ＞2 packages per consignment Pax A/C ≤ 5 kg CAO ≤5 kg	lithium battery mark 
UN3481	lithium ion batteries packed with equipment	Cells＞20Wh Batteries＞100Wh	PI966 Section I **Limit per package:** Pax A/C ≤5 kg CAO ≤35 kg	Class9 lithium battery hazard label 
		Cells≤20Wh	PI966 Section II	lithium battery mark

		Batteries≤100Wh	**Limit per package:** Pax A/C ≤5 kg CAO ≤5 kg	

Notes

1	Cells and/or batteries at a SOC of greater than 30% of their rated capacity may only be shipped with the approval of the State of Origin and the State of the Operator under the written conditions established by those authorities.
2	After receiving the lithium battery, if the mark is lost, fallen off or difficult to identify, the operator must replace the label according to the information provided in the "shipper's dangerous goods declaration form".
3	The lithium core and battery goods required by the packaging specification PI965 shall not be packed in the same outer package as other dangerous goods.
4	Ban lithium ion battery (UN 3480, PI965 Section IA or IB) with category 1 explosive material (except ammunition) 1.4, 2.1 flammable gas, flammable liquid, 4.1 3 flammable solid, 5.1 class antioxidant and other dangerous goods packaging in the same package.
5	Ensure that the equipment cannot be moved in the outer packing; If there are more than one piece of equipment in the package, it must be packed tightly together to prevent damage caused by contact with other equipment in the package.
6	Do not damage or mishandle this package. If package is damaged, batteries must be quarantined, inspected, and repacked.
7	Cells and 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.
8	Waste lithium batteries and lithium batteries being shipped for recycling or disposal are prohibited from air transport unless approved by the appropriate national authority of the State of origin and the State of the operator.
9	The lithium battery should pass the UN38.3 test, if the battery cannot pass the testing, it cannot transport, should redesign.
10	The new lithium battery operating mark allows to be 100mm x 100mm square, the minimum mark size is 100mm x70mm.
11	PI 966 and PI 969—Have been revised to clarify the packing options for Section I, which are: ● the lithium cells or batteries are packed in a UN specification packaging, then placed with the equipment in a strong rigid outer packaging; or ● the cells or batteries are packed with the equipment in a UN specification packaging. The packing options in Section II have been deleted, as there is only one option available given that there is no requirement for UN specification packaging.

12	Lithium ion battery UN3480 PI965 Section IB, each package must withstand 3m stacking test.
13	In UN3481 PI 966 Section II, 967 Section II, when the package is put into the overpack, the package must be fixed in the overpack, and the overpack shall not affect the expected function of each package.

Ocean shipping

- Transportation refers to the IMDG CODE 40-20 Edition, which are managed according to UN NO 3480/3481 and packaged in the second category. Firm installation, isolation from each other, short circuit prevention, packages with more than 24 lithium cells or 12 lithium batteries: special procedures to be followed when damaged must be marked; special procedures document to be followed when damaged is available on board.
- The clause 188 of IMDG CODE 40-20 Edition required:

(1) The watt-hour rating of lithium ion cell is less than 20 Wh and the watt-hour rating of lithium-ion battery is less than 100 Wh is not classified as dangerous cargo,but each package shall be marked with below lithium battery mark.

(2) For cells and battery or those packed with equipment (not applicable when contained in equipment)，the cells and battery must be packed in inner packagings，which shall completely enclose the cell and battery. Must be protected so as to prevent short circuits, including preventing short circuits caused by contact with conductive materials in the same container. Inner packagings (and equipment (if any))shall be packed in strong outer packagings that in accordance with < Model Regulation>4.1.1.1、4.1.1.2、4.1.1.5.

- The clause 230 of IMDG CODE 40-20 Edition required:

(1) The model of each lithium ion cell and battery should meets all testing requirements under Part III, subsection 38.3 of <UN Manual of Tests and Criteria>.

(2) Shall be equipped with safe exhaust equipment, prevent violent rupture under normal transportation conditions.

(3) Shall be equipped with effective devices to prevent external short circuit.

15 Regulatory Information

Regulatory Information	See ACGIH exposure limits information as noted in Section3
US	This SDS meets/exceeds OSHA requirements.
International	This SDS conforms to European Union (UN), the International Standards Organization (ISO) and the International Labor Organization (ILO) and as documental in ANSI (American National Standards Institute) Standard Z400.1-2010.

Air transportation	According to Civil aviation industry standard MH/T1020-2018 Lithium Battery Air Transport Standard and IATA DGR and ICAO. The international transport and commodity inspection is used this standard at the moment (IMDG CODE),
Ocean shipping	According to International Maritime Dangerous Goods Code to transport and According to the requirements of UN NO 3480/3481 to management the goods.
Land transportation	According to List of Dangerous Goods (GB12268).
Avoid electrical shock	According to Standard for Electrical Safety in the Workplace, NFPA-70E.

16 Other Information

Charging and labeling

Charging	The battery can be recharged repeatedly. Please use the original battery charger. Do not use modified or damaged battery chargers. When the charge exceeds the prescribed charging time, the charge can be stopped to prevent the battery from overcharging. Charging temperature should be between 0 and 45 (32 °F and 113 °F). There is normal heating phenomenon in the process of battery charging.
Charging Voltages and Currents	When the voltage exceeds the specified value, it is limited by the internal protection circuit of the battery. If the protective circuit is damaged, please stop using it. Please charge and discharge under specified voltage and current. If the battery voltage drops below the specified minimum voltage, please stop using it.
Warning	Chargers provided by the equipment manufacturer shall be used and used in accordance with the operating guidelines. It is forbidden to open the battery, close to the source of fire, and short circuit, which may cause fire, explosion, leakage and personal injury.
Disposal	Disposal shall be carried out in accordance with the relevant regulations of the United Nations, the state and the local authorities.

Declaration

The information contained here is completed without any authorization. This information is only a reference. Users should customize an independent system based on the complete and reliable information they actually collect, so as to ensure the proper use and handling of the safety and health of employees and customers.

安全技术说明书(SDS)

1 产品及企业标识

产品标识

产品中文名称	锂离子电池
产品英文名称	Lithium Ion Battery
运输名称	锂离子电池
产品类型	可充电锂离子电池
NVT 产品型号	PF46 / 556379
NVT PN	31900FQ60001
UN 号	UN3480
UN38.3 报告编号	WT22062207
额定容量	4.45Ah
额定电压	3.89V
瓦时数	17.31Wh
当量锂含量	1.34g
约计重量	66.5g

安全技术说明书提供者信息

企业名称	东莞新能德科技有限公司
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传真	+86-769 89086589
电子邮箱	EHS02@nvtpower.com

企业应急电话

企业应急电话	+86-769 38826188

2 危险性概述

电池作为一个整体，在正确的使用下是不具有危险性。	
爆炸危险性	该物品不属于爆炸危险品
易燃危险性	该物品不属于易燃危险品
氧化危险性	该物品不属于氧化危险品
毒害危险性	该物品不属于毒害危险品

放射危险性	该物品不属于放射危险品
腐蚀危险性	该物品不属于腐蚀危险品

3 成分/组成信息

重要提示：电池不能拆开或燃烧，暴露电池中所在成分或燃烧产物是有害的。

PACK 成分表

成分	重量百分比
集装箱、金属支架及控制系统（非危险化学品）	35-45
电池（电池成分见下表 3.2）	55-65

电池成分表（注：下表的重量百分比仅针对电池重量）

组分	CAS No.	EC No.	含量百分比
钴酸锂	12190-79-3	235-362-0	15-40
丙酸乙酯	105-37-3	203-291-4	15-40
铜箔	7440-50-8	231-159-6	10-30
铝箔	7429-90-5	231-072-3	10-30
k 石墨	7782-42-5	231-955-3	7-25
碳酸乙烯酯	96-49-1	202-510-0	0-15
碳酸丙烯酯	108-32-7	203-572-1	0-15
六氟磷酸锂	21324-40-3	244-334-7	0-15
1,3 丙烷磺酸内酯	1120-71-4	214-317-9	0-1
隔离膜	9002-88-4	618-339-3	0-5

4 急救措施

急救措施描述

在常规条件下使用，电池是密封的。

眼睛接触	电池里的成分可能会引起严重的过敏和化学烧伤。万一接触，立刻翻开上下眼睑，用清水冲洗眼睛 15 分钟以上，直到没有化学物质残留。然后立刻就医。
皮肤接触	电池里的成分可能会引起皮肤过敏或化学烧伤。万一接触，除去污染的衣物并用肥皂和水清洗皮肤，如果发生化学烧伤或持续刺激，立刻就医。
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。

吸入	电池里的成分可能会引起呼吸道过敏，吸入蒸汽可能引起上呼吸道和肺过敏。应马上呼吸新鲜空气并就医。

5 消防措施

灭火介质

合适的灭火介质	水或水雾、沙、灭火毯、干粉或二氧化碳灭火器
不合适的灭火介质	无

源于此物质或混合物的特别危害

1	在运输和测试过程中，可能发生电池（芯）跌落、挤压、刺破、金属短路、液体浸泡等危险因子，可能发生触电、起火风险。
2	如果在密闭空间，可能有气体爆炸风险。
3	事故泄露的液体，包括消防水处理不当有污染环境的风险。

物资准备和人员训练

物资准备	
1	水雾灭火器：每 500KWH 用 1 个 9 升的水基型水雾灭火器或者 2 个 6 升的水基型水雾灭火器，可扑灭 ABCE 类火灾（固体、非易燃液体、气体、低于 36KV 的电气火灾）。或者携带电动喷雾器、手动喷雾器当水雾灭火器。车辆、货物上方可悬挂悬挂式水基灭火器。
2	防水用品：雨衣、雨靴、橡胶手套；保鲜膜；抹布。
3	个人保护用品（PPE）：口罩、高温手套、安全眼镜、半面罩。
4	排烟工具：每 20 米 1 个墙壁排烟风机，或移动排烟风机。车辆有通风孔。
5	防爆工具：保持敞开，如开放环境，车辆/设备不密闭。测试中一定要密闭设备，如高温炉、高低温冲击测试仪器等。设备上要放置直径 200 毫米、厚度 8 微米的铜箔当泄压膜。房间墙壁每 20 米要有 1 个风机，风机排量至少每小时 5000 立方米。
6	中和物资：每 500KWH 准备 10 公斤石灰粉末用于中和流出的电解液，电解液遇到水会按照重量的 8%形成 HF,要用碱性物资中和。
7	电压测量：万用表。物理密封住电流档，避免误操作仪表爆炸。
训练技能	
1	开启风机或者移动风机排烟。
2	穿戴防水用具后用水雾灭火器灭火，待电池晾干后，用万用表测量电压，测试电压正常后用保鲜膜缠绕绝缘，再运输处理。
3	对泄漏的电解液以重量的 8%比例洒石灰、或者 NaOH 粉末中和液体。
4	会用万用表测试电压，特别留意别用错档位（要物理封闭电流挡），防仪表爆炸。

灭火流程

1	发现电池冒烟或燃烧时立即报警。
2	穿着防护用品，包括呼吸器、口罩，如果用水还应包括雨衣、雨鞋、绝缘手套等。
3	切断电源。
4	使用固体类灭火器材，推荐按以下顺序使用灭火器材：水或水雾、沙、灭火毯、干粉、二氧化碳灭火器。
5	通过风扇或空气流通排烟。
6	干燥、中和。通过风扇干燥，如果使用了水用氢氧化钙中和。



图片 1 水基灭火器
（可使用灭 36KV 下的电气火灾）



图片 2 水雾灭火器
（穿着 PPE 防止触电）

6 泄露应急处理

<u>现场</u>：将物质置于合适的容器中，然后向当地警方报警。

<u>在水中</u>：当电池组在水中时，有微弱电击的风险；在电解水时会产生氢气，必须保持通风以防止氢气集聚，防止氢气在密闭空间爆炸。如果可以，将电池或模组从水中拿出然后向当地警方报警。

7 操作处置与储存

电池和电池动力设备运输时，最主要的风险之一就是电池两极接触其他电池、金属物体或其他导电体而引起的电池短路。因此，必须将包装好的电池（芯）和电池使用适当的方式隔开，以防止发生短路和电极破损。此外，电池和电池（芯）还必须包装在坚固的外包装内，或者安装在设备中。

操作注意事项

1	请勿对电池进行过度的物理冲击或振动。
2	应避免短路，虽然几秒钟的短路不会对电池造成严重的影响。长时间的短路会导致电池迅速失去能量，可以产生足够的热量将外壳烧着。
3	短路的来源包括将电池胡乱放在散装容器中、或在设备上进行电池装配时使用的各种金属物品。为了将电池短路的风险降低到最小，在电池运输和存储时，应该提供电池的保护措施。
4	不能将电池拆解或使电池变形。
5	电芯破裂时，不要将其接触到水。操作处理超过 50V 的电池组时，操作人员需要绝缘防护。

储存注意事项

1	当锂离子电池长时间储存时，其充电容量应在 25% 和 75%之间。
2	应储存在干燥凉爽且通风较好的区域。
3	温度过高会导致电池发生一系列的问题，如泄漏或生锈。
4	请勿将电池置于明火中。

8 接触控制/个体防护

重要提示：锂电池正常处于密封状态，粉料无流动性，不会给接触人员带来危险性。非专业人员严禁私自拆解电芯/电池。无必要请勿接触泄露的电解液，若需主动接触电解液，需佩戴防化手套。

工程控制方法

远离热源和明火，存储于干燥凉爽的区域。

9 理化特性

理化特性

物料状态	固体
颜色	不适用
气味	无
闪电	不适用
在乙醇中的溶解度	不适用
沸点	不适用
在水中的溶解度	不适用
蒸气压力	不适用

爆炸极限	不适用
自燃性	不适用
熔点	不适用
凝固点	不适用

10 稳定性和反应活性

稳定性和反应活性

稳定性	在标准温度下稳定性很好。
反应作用	无
注意	不要接触到水或酸性物质。 分解后产物：如果电池的铝箔包装破损，那么就不要接触强氧化剂、酸性物质和高温环境，且电解液可能挥发形成氟化氢。

11 毒理学资料

常规操作和使用时，不会产生有毒物质。

注意：根据欧盟批准的统一分类和标签（CLP00），1,3 丙烷磺酸内酯可能致癌，吞咽有害，皮肤接触有害。符合法规(EC)No 1272/2008 附件 I 第 3.7 节规定的危险等级生殖毒性 1A 或 1B 类、对性功能和生育力或发育的不利影响分类标准的物质。

12 生态学资料

如果电池要报废，那么应当由专业公司进行挑选和处理。

13 废弃处置

不能直接将电池丢弃至下水道或直接排放到环境中，应当基于当地的法律法规进行回收和处理。

14 运输信息

空运要求

锂离子电池芯或电池应根据国际航空运输协会 IATA DGR 第 64 版相关要求进行运输。锂离子电池芯或电池按国际航空运输协会危险物品的规定，应依照下表要求进行包装和粘贴标签。

UN 号	运输品	功率	包装要求	需粘贴的标签
UN3480	锂离子电池	电池芯＞20Wh 电池＞100Wh	PI965 Section IA 每个包装件限量： 客机禁运 全货机≤35kg	第 9 类危险性标签-锂电池 仅限货机标签 
		电池芯≤20Wh 电池≤100Wh	PI965 Section IB 每个包装件限量： 客机禁运 全货机≤10Kg	第 9 类危险性标签-锂电池 锂电池标记 仅限货机标签 
UN3481	锂离子电池安装在设备中	电池芯＞20Wh 电池＞100Wh	PI967 Section I 每个包装件限量： 客机≤5kg 全货机≤35kg	第 9 类危险性标签-锂电池 
		电池芯≤20Wh 电池≤100Wh	PI967 Section II 每个包装件限量： ≤2 电池或≤4 电池芯，且≤2 包装件/票货物 客机≤5kg 全货机≤5kg	\
			PI967 Section II 每个包装件限量： ＞2 电池或＞4 电池芯，或＞2 包装件/票货物 客机≤5kg 全货机≤5kg	锂电池标记 
UN3481	锂离子电池与设备包装在一起	电池芯＞20Wh 电池＞100Wh	PI966 Section I 每个包装件限量： 客机≤5kg 全货机≤35kg	第 9 类危险性标签-锂电池 
		电池芯≤20Wh 电池≤100Wh	PI966 Section II 每个包装件限量： 客机≤5kg 全货机≤5kg	锂电池标记 

注意事项

1	如果电池（芯）或电池的电荷载量大于 30%的荷电容量上限，需要获得原产地和运营商主管当局批准。

2	锂电池收运后，标志丢失、脱落或难以辨识时，经营人必须按照“托运人危险品申报单”提供的信息更换标签。
3	符合包装说明 PI965 要求的锂电芯和电池货物不得与其它危险品装入同一个外包装中。
4	禁止锂离子电池（UN 3480、PI965 Section IA or IB）与包括第 1 类爆炸物质（除第 1.4 类弹药）、第 2.1 类易燃气体、第 3 类易燃液体、第 4.1 类易燃固体、第 5.1 类氧化剂等危险品货物包装在同一个外包装中。
5	必须确保设备在外包装中不能移动；如包装中有多件设备的必须包装牢固在一起，以防止与包装中的其他设备接触而造成损坏。
6	不能损坏或错误处理电芯，如果电芯损坏，必须隔离、检查和重新包装。
7	禁止运输被厂商确定为出于安全原因的缺陷、已损坏、有潜在产生发热、着火或短路危险的电芯和电池。
8	除非经原产地国家相关的国家机关批准，禁止空运废锂电池（芯）和锂电池去回收或处理。
9	锂离子电池需经过 UN38.3 测试，如果未通过该测试，则不能运输，需重新设计。
10	使用新的锂电池操作标记，允许此标记为 100 x 100mm 正方形，最小的标记尺寸为 100x70mm。
11	PI966 和 PI969，已修订，以澄清第一节的包装选项：锂电芯或锂电池包装在 UN 箱中，然后与设备一起放入坚固外包装；或锂电芯或锂电池与设备一起包装在 UN 箱中。 第 II 部分的包装选择被删除，因只有一种包装方式，没有 UN 箱的要求。
12	锂离子电池 UN3480 PI965 Section IB，每个包裹须承受 3 米堆码试验。
13	UN3481 PI 966 Section II, 967 Section II 中，当包装放入合成包装内时,包件必须固定在合成包装中，且合成包装不得影响每个包装件预期应有的功能

海运要求

运输参考《国际海运危险货物规则》(第 40-20 版)，按 UN NO 3480/3481 的要求管控，采用第 II 类包装。安装牢固，互相隔离，防止短路，装有多于 24 个锂电池或 12 个锂电池组的包件：须标记说明破损时遵守的特殊程序；随船备有一份破损时遵守的特殊程序说明文件。

《国际海运危险货物规则》(第 40-20 版)第 188 条规定：

（1）对于锂离子电池瓦特-小时的额定值不超过 20Wh，锂离子电池组瓦特-小时的额定值不超过 100Wh，不作为危险货物运输。但须在外壳标明瓦特-小时的额定值。

（2）对于电池和电池组或与设备一起包装的电池和电池组（安装在设备内的除外），应使用内容器包装，将电芯和电池组完全包裹。应防止电池和电池组发生短路，包括防止在同一容器内与导电材料接触而导致的短路。内容器（与设备（如果有））应放置于符合《规章范本》4.1.1.1、4.1.1.2 和 4.1.1.5 规定的坚固外容器内。

《国际海运危险货物规则》(第 40-20 版)第 230 条规定：

（1）每个电池或电池组的型号应符合联合国《试验和标准手册》第三部分第 38.3 节的各项试验的要求。

（2）电池和电池组装有安全的排气装置，在正常运输条件下，其设计能防止发生剧烈破裂现象。

（3）电池和电池组装有防止外部短路的有效装置。

15 法规信息

法规信息	见 ACGIH 第三部分规定暴露限值信息。
美国	本物质安全数据资料符合 OSHAS 相关要求。
国际	本物质安全数据资料符合欧盟（联合国），国际标准化组织（ISO）和国际劳工组织（ILO）和美国（美国国家标准协会）标准 Z400.1-2010。
空运	参考民航行业规范 MH/T1020-2018《锂电池航空运输规范》与 IATA DGR、ICAO 的要求是一致的。目前国际运输及商检都是采用的这个标准。
海运	运输参考《国际海运危险货物规则》，按 UN NO 3480/3481 的要求管理。
陆运	参考《危险货物品名表》（GB12268-2012）。
防触电	参照工作场所电气安全标准 NFPA-70E。

16 其他信息

其他信息

充电	本电池可多次重复充电。请使用原装电池充电器。不要使用改装或损坏的电池充电器。当充电超过规定的充电时间可停止充电，来防止电池过充。充电温度应在 0℃-45℃，电池充电过程中有正常的发热现象。
充电电压和电流	当电压超过规定的值后受到电池内部保护电路限制。如果出现保护电路受损情况，请停止使用。请在规定的电压和电流下充、放电。如果电池的电压下降到低于规定的最低电压时，请停止使用。
警告	应使用设备制造商提供的充电器并按操作指南使用。禁止将电池打开，靠近火源，以及短路，可能引起着火、爆炸、泄漏造成人身伤害。
处置	依照联合国、国家、地方相应规程进行处置。

声明

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