Amperex Technology Limited
新能源科技有限公司
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MATERIAL SAFETY DATA SHEET

Issue: 2017-A Doc No.: 2017-A-309

1.Product & Company Identification

Product Description	Lithium Ion Cell (Rechargeable type)	**ATL Model Name:**	802848
Manufacturer	Amperex Technology Limited	**Approximate Weight:**	40g
Capacity	1.05Ah	**Equivalent lithium content**	0.315 g
Nominal voltage	7.4V	**Watt-hour**	7.77Wh
UN No.	3480/3481	**Proper Shipping Name**	Lithium Ion Cell
Address	3503,Wharf Cable TV Tower, 9 Hoi Shing Road,Tsuen Wan,N.T, HongKong China		
Telephone:	852-2498-0908	**Fax**	852-2498-1101

2. 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.

MATERIAL OR INGREDIENT	PEL (OSHA)	TLV (ACGIH)	%/wt.
Graphite （CAS# 7782-42-5）	5 mg/m^3 TWA	2mg/m^3 TWA	7-25
Lithium cobalt （CAS# 12190-79-3）	0.1 mg/ m^3	0.02mg/ m^3	15-40
Lithium Hexafluorophosphate （CAS# 21324-40-3）	None established	None established	0-5
Acetylene Black （CAS# 1333-86-4）	3.5 mg/ m^3 TWA (as carbon black)	3.5 mg/ m^3 TWA (as carbon black)	0-2
Diethyl Carbonate （CAS# 105-58-8）	None established	None established	0-15
Dimethyl Carbonate （CAS# 616-38-6）	None established	None established	0-15

Ethyl Methyl Carbonate （CAS# 623-53-0）	None established	None established	0-15
Propylene Carbonate （CAS# 108-32-7）	None established	None established	0-15
Ethylene Carbonate （CAS# 96-49-1）	None established	None established	0-15

3.Hazardous Identification

Chemical Nature: N/A

CAS-No/EINECS NO.:N/A

INCI CTFA-Description: Lithium ion polymer rechargeable battery series

Ingestion: No effect under routine handling and use.

Inhalation: No effect under routine handling and use.

Skin contact: No effect under routine handling and use.

Eye contact: No effect under routine handling and use.

Skin absorption: No effect under routine handling and use.

Reported as carcinogen: Not applicable

4. First Aid Measures

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

Ingestion: Swallowing a battery can be harmful

Contents of an open battery can cause serious chemical burns of mouth, esophagus, and gastrointestinal tract. If battery or open battery is ingested, do not induce vomiting or give food or drink. Seek medical attention immediately.

Inhalation: Contents of an open battery can cause respiratory irritation. Inhalation of vapors may cause irritation of the upper respiratory tract and lungs. Provide fresh air and seek medical attention.

Skin Absorption: Ethylene carbonate, diethyl carbonate and dimethyl carbonate may be absorbed through the skin causing localized inflammation.

Skin Contact: Contents of an open battery can cause skin irritation and/or chemical burns. Remove contaminated clothing and wash skin with soap and water. If a chemical burn occurs or if irritation persists, seek medical attention.

Eye Contact: Contents of an open battery can cause severe irritation and chemical burns. Immediately flush eyes thoroughly with water for at least 15 minutes, lifting upper and lower lids, until no evidence of the chemical remains. Seek medical attention.

Note: Acetylene black and cobalt compounds are listed as possible carcinogens by the International Agency for Research on Cancer (IARC).

5.Fire Fighting Measures

5.1 **Risk Analysis (electrical shock, fire, explode, population)**

There was no electrical shock risk for single cell, or battery module which voltage was less than 50V DC (the safety voltage). But if the pack had the voltage was bigger than 50V DC, the electrical shock shall be protected.

During the shipment or testing process for LIB Pack or Module, there was danger factors like drop, crush, broken, metal short circuit, liquid immersion, the factors would lead the risk like electrical shock, catch fire. If pack was in well sealed box, there was gas explode risk; if the pack was in big room or fans, there was not explode risk. The released liquid was the environment population risk.

5.2 **Material prepare & people training**

1） **Water based sprayer fire extinguish**: 1 set of 9L or 2 sets of 6L water spray fire extinguishers per each 500KWh LIB pack or Modules. Or you could use portable electrical water sprayer or hang type water spray fire extinguisher (photo 1) . The water based spray fire extinguisher could be used for fire type ABCE = solid (A), flash point >60℃ liquid (B), gas (C), <36Kv electrical (E) fire. It was recommended to prepare water based sprayers in the trucks.

2） **Water protection sets**: raincoat, galoshes, rubber gloves. Plastic rollers. Rags.

3） **PPE**: breathing mask, safety glass, face mask, gloves for high temperature.

4） **Smoke escape**: fans in wall one per 20m or portable fans in rooms. Keep gas exchange hole in trucks.

5） **Gas explode tools**: open condition for devices & rooms. Some devices like high or low temperature ovens must be sealed, there was one copper film with the diameter 200mm & thickness 8um as the safety vent. The wall should have one fan per 20m, ≥5000m^3 per hour for flow rate.

6） **Neutralized material**: prepare 10kg $Ca(OH)_2$ powder per 500KWh LIB pack or modules, it was used for neutralized for release electrolyte. Because electrolyte met with water, 8% HF would be created.

7） **Voltage measure**. Multimeter. Please physical block the current measure function, the mistake would lead instrument exploding.

8） **People training**: (a) turn on fans or portable fans for smoke escape. (b) wear the water protection sets → use water spray fire extinguishers → dry by cloths with rubber gloves → insulated by plastic film. (c) neutralized by $Ca(OH)_2$ or NaOH for released electrolyte. (d) use multimeter to measure voltage. Take care of the mistake.

5.3 **Fire Extinguisher Flow Chart**

1） Alarm if you found the smoking or burning.

2） Wear PPE. (Breath mask, face mask. If using water, PPE should include the raincoat, galoshes, rubber gloves).

3） Turn Off power supply in devices or power supply.

4） Use any fire extinguishers for solid material fire, the recommended sequence was water or mist water, sand, fire extinguisher blanket, CO_2, powder.

5） Smoke Escape by turn on fans or open air environment.

6） Dry and neutralize. Drying by fans, Neutralization by $Ca(OH)_2$ powder if water was used.

Figure 1 water based fire extinguisher (Could be used for 36KV electrical fire)

Figure 2 water sprayers to fire extinguisher (Wear PPE to avoid electrical shock)

6. Accidental Release Measures

On hand: Place material into suitable containers and call local fire/police department.

In water: Low electrical shock risk when EV or battery pack in water, GM also shared the information. But H_2 gas was released by the electrolyzed water, you should keep good air flow to avoid the H_2 gas accumulated to prevent hydrogen explosion in enclosed space. If possible, remove

from water and call local fire/police department.

7. Handling & Storage

One of the major risks associated with the transport of batteries and battery-powered equipment is short-circuit of the battery as a result of the battery terminals coming into contact with other batteries, metal objects, or conductive surfaces. Packaged batteries or cells must be separated in a way to prevent short circuits and damage to terminals. They must be packed in a strong outer packaging or be contained in equipment.

Handling: Do not expose the battery to excessive physical shock or vibration. Short-circuiting should be avoided; however, accidental short-circuiting for a few seconds will not seriously affect the battery. Prolonged short circuits will cause the battery to rapidly lose energy, could generate enough heat to burn skin. Sources of short circuits include jumbled batteries in bulk containers, coins, metal jewelry, metal covered tables, or metal belts used for assembly of batteries in devices. To minimize risk of short-circuiting, the protective case supplied with the battery should be used to cover the terminals when transporting or storing the battery. Do not disassemble or deform the battery. Should an individual cell within a battery become ruptured, do not allow contact with water. When operators handle the battery which voltage more than 50v ,they must wear the insulation protection PPE.

Storage: The lithium ion battery should be between 25% and 75% of full charge when stored for a long period of time. Stored in a cool, dry, and well ventilated area. Elevated temperatures can result in loss of battery performance, leakage, or rust. Do not expose the battery to open flames.

8. Exposure Control/Personal Protection

Engineering Control: Keep away from heat and open flame. Stored in a cool dry place.

Personal Protection:

Respiratory Protection: Not necessary under normal conditions.

Eye/Face Protection: Not necessary under normal conditions. Wear safety glasses with side shields if handling an open or leaking battery.

Gloves: Not necessary under normal conditions. Use neoprene or natural rubber gloves if handling an open or leaking battery.

Foot Protection: Steel toed shoes recommended for large container handling.

9. Physical/Chemical Properties

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

10. Stability & Reactivity

Stability: Good stability at standard temperature.

Reactivity: None

Avoid contact with water and acids. Hazardous decomposition products: If Al package foil of battery is damaged, the battery should avoid to contact strong oxidizer, acids and high temperature, and the electrolyte will be formed HF.

11. Toxicological information

This product does not elicit toxicological properties during routine handling and use.

12. Ecological information

If the battery is scrapped, it should be selected and disposed by professional company.

13. Disposal considerations

Do not dispose of battery into environment or sewerage. It should be recycled and disposed basing on your local legislation and regulations.

14. Transport Information

14.1 The requirement of air transportation

The lithium battery should according with the International Air Transport Association (IATA

DGR 58edition) requirements for transportation. The battery or cell should be packed and signed as following table.（If the cell's power less than 20Wh or battery's power less than 100Wh and the package according with PI-965 SectionⅡ， it is not classified as dangerous cargo）.

UN NO.	Proper Shipping Name	Power	Package requirements	Label which need to paste
UN3480	lithium ion batteries	Cell≤20Wh Battery≤100Wh	PI965 Section IB	Class 9 hazard label and lithium battery handling label
		Cell＞20Wh Battery＞100Wh	PI965 Section IA	Class 9 hazard label
		Cell≤20Wh Battery≤100Wh	PI965 Section Ⅱ	lithium battery handling label
UN3481	lithium ion batteries contained in equipment	Cell＞20Wh Battery＞100Wh	PI967 Section I	Class 9 hazard label
		Cell≤20Wh Battery≤100Wh	PI967 Section Ⅱ	lithium battery handling label
UN3481	lithium ion batteries packed with equipment	Cell＞20Wh Battery＞100Wh	PI966 Section I	Class 9 hazard label
		Cell≤20Wh Battery≤100Wh	PI966 Section Ⅱ	lithium battery handling label

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.

Packages prepared according to SectionⅡof PI965 must be offered to the operator separately from other cargo and must not be loaded into a unit load device before being offered to the operator.

Do not damage or mishandle this package. If package is damaged, batteries must be quarantined, inspected, and repacked. **C**ells 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 .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.

The lithium battery should pass the UN38.3 test, if the battery can not pass the testing, it can not transport, should redesign. If the battery through the test, for the lithium battery only, follow the

UN3480 and the packing requirements for PI965, for the lithium battery which installed in equipment, follow the UN3481 and the packing requirements for PI967.

The lithium battery testing meets all requirements under UN Manual of Tests and Criteria Part III, subsection 38.3.

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	Forced Discharge	Pass	Only for Cell

14.2 The requirement of ocean shipping

According to International Maritime Dangerous Goods Code(IMDG 37th) to transport and according to the requirements of UN NO. 3480/3481 to management the goods, and require class II packaging. Firmly installation. mutual isolation. avoid short circuits. If the package contain more than 24 lithium batteries or more than 12 lithium battery packs, must provide the special program if package damage.

The clause 188 of IMDG require the Watt of lithium ion cell less than 20Wh is not classified as dangerous cargo and the Watt of lithium ion battery less than 100Wh is not classified as dangerous cargo but need marked the WHR ratio label. Otherwise, the battery and module should packed in a strong outer packaging or be contained in equipment.

The clause 230 of IMDG 37th require the lithium battery testing should meets all requirements under UN Manual of Tests and Criteria Part III, subsection 38.3.

For more information, Call: +86-13860395119.

15. Regulatory Information

See ACGIH exposure limits information as noted in Section3

US: This MSDS meets/exceeds OSHA requirements.

International: This MSDS 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 Z400.1-1993.

Air transportation: According to Civil aviation industry standard MH/T1020-2009 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. Charging and labeling

Charging: This battery is made to be charged many times. Use an Energizer approved battery charger. Never use a modified or damaged battery charger. A backup charge termination based on time is recommended to prevent overcharging. The charging temperature should be between 0 °C and 45 °C (32 °F and 113 °F). The battery pack will be normally warm during charging.

Charging Voltages and Currents: Charging voltages are prevented from exceeding the specified limits by an internal battery protection circuit. Never use a battery that shows signs of a damaged protection circuit or broken case. (Such damage to the protection circuit may be indicated by voltages at the battery terminals outside of their specified ranges.) Adhere to all specified charging and discharging voltages and currents. Do not use battery if its voltage drops below the specified minimum voltage.

Labeling: If the ATL label or package warnings are not visible, it is important to provide a package and/or device label stating.

If the lithium-ion battery or cell transported by air the labeling according the requirement of IATA 58th, the packages bear the Class 9 hazard label(**Figure 3**) or/and lithium battery handling label(**Figure 4**).

Figure 3 Class 9 hazard label

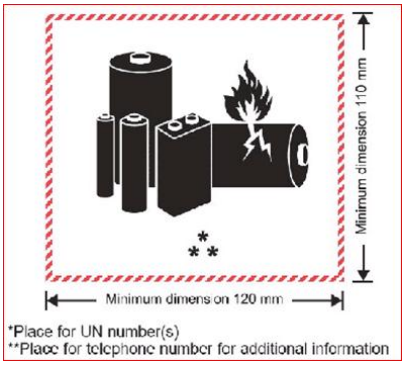

Figure 4 lithium battery handling label

If the lithium-ion battery or cell transported by sea the labeling according to IMDG 37th, the requirement as follow,

- Package, do not any indication.
- Need all the UN No.
- subassembly：do not any indication.
- Need the *LQ* label.

WARNING: CHARGE ONLY WITH SPECIFIED CHARGERS ACCORDING TO DEVICE MANUFACTURER'S INSTRUCTIONS. DO NOT OPEN BATTERY, DISPOSE OF IN FIRE, OR SHORT CIRCUIT - MAY IGNITE, EXPLODE, LEAK, OR GET HOT CAUSING PERSONAL INJURY.

Disposal: Dispose in accordance with all applicable federal, state and local regulations.

17. Other information

The information contained herein is furnished without warranty of any kind. Users should consider this data only as a supplement to other information gathered by them and must make independent determinations of the suitability and completeness of information form all sources to assure proper use and disposal of these materials and the safety and health of employees and customers.

物料安全技术说明书(MSDS)

1. 化学品及企业标识

产品类型	锂离子电芯 (可充电型)	**ATL 产品型号**	802848
制造商	新能源科技有限公司	**约计重量**	40g
容量	1.05Ah	**当量锂含量**	0.315g
标称电压	7.4V	**瓦时数**	7.77Wh
UN 号	3480/3481	**运输名称**	锂离子电芯
地址	香港新界荃湾海盛路 9 号有线电视大楼 35 楼 3 号单元		
电话	852-2498-0908	**传真**	852-2498-1101

2. 成分/组成信息

重要提示：电池不能拆开或燃烧，暴露电池中在成分或燃烧产物是有害的。

原料或配料	容许曝露限度	阈限值	重量百分比
石墨 (CAS# 7782-42-5)	5 mg/ m^3 时间加权平均值	2 mg/ m^3 时间加权平均值	7-25
钴酸锂(CAS# 12190-79-3)	0.1 mg/ m^3	0.02mg/ m^3	15-40
六氟磷酸锂 (CAS# 21324-40-3)	无数据	无数据	0-5
乙炔炭黑 (CAS# 1333-86-4)	3.5 mg/ m^3 时间加权平均值	3.5 mg/ m^3 时间加权平均值	0-2
碳酸二乙酯 (CAS# 105-58-8)	无数据	无数据	0-15
碳酸二甲酯 (CAS# 616-38-6)	无数据	无数据	0-15
碳酸甲乙酯 (CAS# 623-53-0)	无数据	无数据	0-15

碳酸丙烯酯 (CAS# 108-32-7)	无数据	无数据	0-15
碳酸亚乙酯 (CAS# 96-49-1)	无数据	无数据	0-15

3. 危险性概述

化学属性：不适用

美国化学文摘号/欧洲现有化学品目录号：无

国际标准化学名： 可充电式锂离子电池

摄取：常规操作和使用没有影响

吸入：常规操作和使用没有影响

皮肤接触：常规操作和使用没有影响

眼睛接触：常规操作和使用没有影响

皮肤吸收：常规操作和使用没有影响

致癌物报告：无

4. 急救措施

在常规条件下使用，电池是密封的

摄取：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。

皮肤吸收：碳酸亚乙酯、碳酸二乙酯、碳酸二甲酯可能会通过皮肤吸收导致局部炎症。

皮肤接触：电池里的成分可能会引起皮肤过敏和/或化学烧伤。消除污染的衣物并用肥皂和水清洗皮肤，如果发上化学烧伤或持续刺激，立刻就医。

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。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。

注意：乙炔炭黑和钴化合物被国际癌症研究机构列为可能致癌的物质。

5. 消防措施

5.1 危险特性：触电、起火、爆炸、污染

单个电芯、电池组的电压也小于 50V（安全电压），没有电击的风险，如果电池组的电压大于 50V，那么就应该控制电击的发生。

在运输和测试工程，可能发生电箱跌落、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；如果在密闭空间，可能有气体爆炸风险，通风良好或者敞开空间，不会有气体爆炸；事故泄露的液体，包括消防水处理不当有污染环境的风险。

5.2 物资准备和人员训练

1） 水雾灭火器： 每 500KWH 有 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。车俩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。 测试中一定要密闭的设备如高温炉、高低温冲击测试仪器等，设备上要放置直径 200 毫米的厚度 8 微米的铜箔当泄压膜，房间墙壁每 20 米要 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。

8） 训练技能：

a） 开启风机或者移动风机排烟；

b） 穿戴防水用具后用水雾灭火器灭火，灭火后晾干或者待手套抹干，测量电压正常，缠绕保鲜膜绝缘，再运输处理；

c） 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；

d） 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。

5.3 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

现场：将物质置于合适在容器中，然后向当地警方报警。

在水中：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：请勿对电池进行过度的物理冲击或振动。应避免短路，虽然几秒钟在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。短路的来源包括将电池胡乱放在在散装容器中、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，那么在电池运输和存储时，应该提供电池的保护措施。不能将电池拆解或使电池变形。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：当锂离子电池长时间储存时，其充电容量应在 25% 和 75%之间。应储存在干燥凉爽且通风较好的区域。温度过高会导致电池发生一系列的问题，如泄漏或生锈。请勿将电池置于明火中。

8. 接触控制/个体防护

工程控制：远离热源和明火。存储与干燥凉爽的区域

个人防护：

呼吸系统防护：正常条件下不需要防护

眼睛/脸部防护：正常条件下不需要防护。处理拆卸的或泄漏的电池，要佩戴有护边的安全眼镜。

手的防护：正常条件下不需要防护。处理拆卸的或泄漏的电池，应佩戴氯丁橡胶或天然橡胶手套。

脚的保护：在搬运大容器时，建议穿戴劳保鞋。

9. 理化特性

物理状态	固体	在水中的溶解度	不适用
颜色	不适用	蒸气压力	不适用
气味	无	爆炸极限	不适用
闪点	不适用	自燃性	不适用
在乙醇中的溶解度	不适用	熔点	不适用
沸点	不适用	凝固点	不适用

10. 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

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

在常规操作和使用时，不会产生有毒物质。

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

不能直接将电池处理到下水道或知道排放到环境中，应当基于当地的法律法规基础上进行回收和处理。

14. 运输信息

14.1 空运要求

锂离子电池或电池芯应根据国际航空运输协会 IATA DGR 第 58 版相关要求进行运输。锂离子电池或电池芯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装贴标签（如果电芯小于 20Wh，电池小于 100Wh 且包装满足 PI-965 第二部分的要求时，不属于危险物品。）。

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 IB	第 9 类危化品标识和安全操作标签
		电池芯＞20WH 电池＞100Wh	PI965 Section IA	第 9 类危化品标识
		电池芯≤20Wh 电池≤100Wh	PI965 Section Ⅱ	安全操作标签
UN3481	锂离子电池安装在设备中	电池芯＞20WH 电池＞100Wh	PI967 Section I	第 9 类危化品标识
		电池芯≤20Wh 电池≤100Wh	PI967 Section Ⅱ	安全操作标签
UN3481	锂离子电池与设备包装在一起	电池芯＞20WH 电池＞100Wh	PI966 Section I	第 9 类危化品标识
		电池芯≤20Wh 电池≤100Wh	PI966 Section Ⅱ	安全操作标签

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

符合包装说明 965 第Ⅱ节规定的包装件在提供给运营人之前，必须单独封装，而不能与其他货物混装。

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。禁止运输被厂商确定为出于安全原因的缺陷，或已损坏，有潜在产生发热、着火或短路危险的电芯和电池；废锂电池和锂电池被运往回收或处理，禁止空运除非经起源国相关的国家机关批准。

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。若通过测试，则对于锂离子电池：遵循 UN3480，包装要求为 PI965。锂离子电池安装在设备中的：遵循 UN3481，包装要求为 PI967。

电池测试满足联合国手册中第三部分测试标准 38.3 部分的所有要求（如下表）。

编号	项目	结果	备注
1	高度模拟试验	通过	测试 1 到 5 必须用相同的电芯或电池按顺序进行
2	加热风险	通过	
3	震动	通过	
4	冲击	通过	
5	外短路	通过	
6	碰撞	通过	
7	强制放电	通过	只针对电芯

14.2 海运要求

运输参考《国际海运危险货物规则》，按 UN NO 3480/3481 的要求管理，采用第二类包装。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》188 条规定：对于锂离子电芯，瓦特-小时的额值不超过 20Wh, 不作为危险货物运输。对于锂离子电池（组）瓦特-小时比率不超过 100Wh 的不作为危险货物运输，但需在外壳标明及瓦特-小时值。除装在设备中外，电池和电池组须装在完全将其密封的内包装箱内，电池或电池组须加以防护以免发生短路。

《国际海运危险货物规则》230条规定：电池或电池组的类型应满足联合国《实验和标准手册》第三部分第38.3小节的每项试验要求。

获取更多信息，请拨打联系电话： +86-13860395119。

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 Z400.1-1993。

空运：参考民航行业规范 MH/T1020-2009 《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. 充电和标识

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。

标识：如果没有或看不清标签或包装上的警告时，请联系相关人员提供封装和设备标签说明。如果锂电池或电池芯使用空运，包装上根据 IATA 58th 相关要求粘贴第 9 类危险性标签（如图 3）或/和锂电池操作标签（如图 4）。

图 3：第 9 类危险性标签

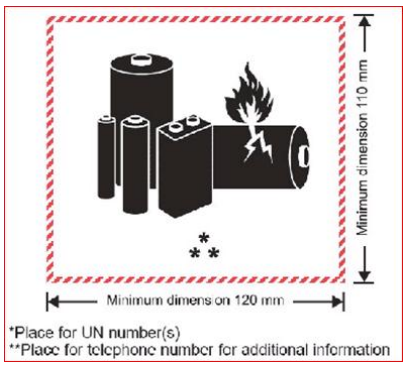

图 4：锂电池操作标签

如果锂电池或电池芯使用海运，包装上根据 IMDG 37th.相关要求如下

- 包件：不需任何标志；
- 不需正确运输名称；
- 需要所有的联合国编号；
- 组件：不需要标牌和标志；
- 需要标明“限量”字样。

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。

17. 其他信息

这里包含的信息是没有任何授权下完成的。该信息只作为一个参考，使用者应该根据自己实际搜集的完整可靠的信息来定制独立的体系，从而确保能够适当的使用并处理员工和顾客的安全及健康。