MATERIAL SAFETY DATA SHEET

Issue: 2020-A Doc No.: 2020-A-084 Issue Date: 11/9/2020

1. Product & Company Identification

Product Description:	Rack ESS	**CATL Model Name:**	O852280-E/P-I/U-1
Manufacturer:	Contemporary Amperex Technology Co. ,Limited	**Approximate Weight:**	3300Kg
Capacity	280Ah	**Equivalent lithium content**	34944g
Nominal voltage	1331.2V	**Nominal power**	372736Wh
UN No：	3480	**Proper Shipping Name**	Rack ESS
Address:	No.2 Xingang Road,Zhangwan Town,Jiaocheng Distric,Ningde City, Fujian Province,P.R of China,352100		
Telephone:	+86-593-2582114	**Fax:**	+86-593-2583667

2. Hazardous Identification

2.1 CAS-No/EINECS NO.: N/A

INCI CTFA-Description: Lithium ion batteries contained in equipment.

2.2 The product is classified and labeled according to Regulation (EC) No. 1272/2008.

• Hazard pictograms

GHS05 GHS07 GHS08

Signal word: Danger

· Hazard statements

H314 Causes severe skin burns and eye damage.

H317 May cause an allergic skin reaction.

· Precautionary statements

P101 If medical advice is needed, have product container or label at hand.

P102 Keep out of reach of children.

P103 Read label before use.

P260 Do not breathe dust/fume/gas/mist/vapors/spray.

P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P310 Immediately call a POISON CENTER/doctor.

P405 Store locked up.

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

2.3 Other hazards:

Results of PBT and vPvB assessment.

PBT: Not applicable.

vPvB: Not applicable.

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.

3.1 Composition of Rack ESS

MATERIAL OR INGREDIENT	%/wt.
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

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

MATERIAL OR INGREDIENT	CAS No. / EC No.	GHS LABELS	%/wt.
Graphite	CAS# 7782-42-5 EC#231-955-3	None established	7-25
Lithium iron Phosphate	CAS# 15365-14-7 EC# 476-700-9	None established	15-40
Hexafluoropropylene-vinylidene fluoride Copolymer	CAS# 9011-17-0 EC# 618-470-6	Hazardous，H411	3-15

Lithium Hexafluorophosphate	CAS# 21324-40-3 EC#235-362-0	Acute Tox. 3, H311; Skin Corr. 1B, H314; Acute Tox. 4, H302	0-5
Acetylene Black	CAS# 1333-86-4 EC#215-609-9	None established	0-2
Diethyl Carbonate	CAS# 105-58-8 EC#203-311-1	Flam. Liq. 3, H226	0-15
Dimethyl Carbonate	CAS# 616-38-6 EC# 210-478-4	Inflammable，H225	0-15
Ethyl Methyl Carbonate	CAS# 623-53-0 EC# 433-480-9	Inflammable，H225	0-15
Propylene Carbonate	CAS# 108-32-7 EC#203-572-1	Eye Irrit. 2, H319	0-15
Ethylene Carbonate	CAS# 96-49-1 EC#202-510-0	Eye Irrit. 2, H319	0-15

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.

5. Fire Fighting Measures

5.1 Hazard Analysis (electrical shock, fire, explosion, population)

The voltage of LIB cell is about 3.2V, there is no risk of electric shock. The voltage of the electric box is about 64V, and the voltage of the Rack ESS is about 1088V. The operation shall be strictly in accordance with the product technical specifications to prevent electrical shock accidents.

During the shipment or testing process for Rack ESS, there are danger factors like drop, crush, broken, metal short circuit, liquid immersion, the factors will lead to the hazard like electrical shock, catch fire. If the Rack ESS is in well-sealed box, there is gas exploding hazard; if the Rack ESS is in open space or space with good ventilation, there is no explode hazard. Liquids leaked from the accident, including improperly treated fire water, are at risk of polluting the environment.

5.2Material 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 Rack ESS. 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.

2） **Water protection sets**: Raincoat, galoshes, and 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） **Gases explode tools**: Open condition for devices & rooms. Some devices like high or low temperature ovens must be sealed; there is 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**: For every 500KWH, 10 kg of Ca(OH)2 powder is prepared for neutralizing the effluent electrolyte. The electrolyte will form HF according to 8% by weight when it encounters water. It must be neutralized with alkaline materials.

7） **Voltage measure**: Multimeter. Physically seal the current file to avoid misoperation of the instrument.

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 after fire fighting or dry with gloves → Wrap cling film for insulation. (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） Immediate alarm when the battery is found to be smoking or burning.

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

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

4） Use solid fire extinguishing equipment, it is recommended to use fire extinguishing equipment in the following order: water or water mist fire blanket, dry powder, carbon dioxide fire extinguisher.

5） Exhaust smoke through fans or air circulation.

6） Dry and neutralize. Dry 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

For guidance on the selection of PPE, see Section 8 of the MSDS. For disposal information, see Section 13. Comply with all applicable local and international regulations.

The following measures apply to the leakage of internal components of the battery:

Personal protective measures, protective equipment, emergency measures: Use personal protective equipment. Avoid direct contact with leaks.

Environmental precautions: Where safety is ensured, measures can be taken to prevent further leakage or spillage. Do not allow product to enter drains.

Disposal materials for containment and removal methods of spilled chemicals: Adsorb spilled electrolyte with an inert material (dry sand, etc.). Sweep and shovel. Put in a suitable closed container for processing. Please refer to Section 13 for disposal.

In the water:When the battery pack is in water, there is a risk of weak electric shock; hydrogen will be generated when electrolyzing water, and ventilation must be maintained to prevent hydrogen accumulation and prevent hydrogen from exploding in confined spaces. If possible, remove the battery or module from the water and call the local police.

7. Handling & Storage

Before the Rack ESS is transported, the MSD plug of the electric box should be unplugged to ensure that each battery in the device is in an open circuit state to ensure no risk of electric shock.

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 Hazard 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 area.

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.

Hand Protection: 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: Product is stable under conditions described in Section 7.

Conditions to Avoid: Heat above 70°C or incinerate, deform, mutilate, crush, disassemble, overcharge, short circuit, expose over a long period to humid conditions.

Materials to Avoid: Oxidant, alkalis, water.

Hazardous Decomposition Products: Toxic fumes, and may form oxides.

Hazardous Polymerization: N/A.

If leaked, forbidden to contact with strong oxidants, mineral acids, strong alkalies, halogenated hydrocarbons.

11. Toxicological information

Signs & Symptoms: None, unless battery ruptures.

In the event of exposure to internal contents, vapour fumes may be very irritating to the eyes and skin.

Inhalation: Lung irritant.

Skin Contact: Skin irritant.

Eye Contact: Eye irritant.

Ingestion: Poisoning if swallowed.

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

and kidneys.

12. Ecological information

Mammalian Effects: None known at present.

Eco-toxicity: None known at present.

Bioaccumulation Potential: Slowly Bio-degradable.

Environmental Fate: None known environmental hazards at present.

13. Disposal considerations

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. Transport Information

According to the International Maritime Dangerous Goods Code (IMDG 38th) for transportation, and according to the requirements of UN NO. 3481 to management the goods. The lithium-ion batteries in the equipment must be installed firmly and isolated from each other to prevent short circuits. The outside must be marked with a special procedure to be followed in case of damage; a special procedure instruction document to be followed in case of damage must be provided with the ship.

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 38th requires the lithium battery testing should meets all requirements under UN Manual of Tests and Criteria Part III, subsection 38.3.

15. Regulatory Information

See ACGIH exposure limits information as noted in Section 3.

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 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 Rack ESS 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 CATL 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 sea the labeling according to IMDG 38th, the requirement as follow,

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.

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	柜式储能系统	**CATL 产品型号**	O852280-E/P-I/U-1
制造商	宁德时代新能源科技股份有限公司	**约计重量**	3300Kg
容量	280Ah	**当量锂含量**	34944g
标称电压	1331.2V	**瓦时数**	372736Wh
UN 号	3480	**运输名称**	装在设备中的锂离子电池
地址	中国福建省宁德市蕉城区漳湾镇新港路 2 号 352100		
电话	+86-593-2582114	**传真**	+86-593-2583667

2. 危险性概述

2.1 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：无

2.2 本产品根据欧盟法规 (EC) No. 1272/2008 进行了分类及标记。

• 图 示

GHS05 GHS07 GHS08

• 信号词: 危险

• 危险字句

H314 引起严重的皮肤灼伤和眼睛损伤

H317 可能引起皮肤过敏性反应

• 防范说明

P101 如需医嘱：请将产品容器或标签备放在手边。

P102 放在儿童伸手不及之处。

P103 使用前请读标签。

P260 不要吸入粉尘/烟/气体/烟雾/蒸气/喷雾。

P303+P361+P353 如皮肤(或头发)沾染：立即脱掉所有沾染的衣服。用水清洗皮肤/淋浴。

P305+P351+P338 如进入眼睛 ： 用水小心冲洗几分钟 。 如戴隐型眼镜并可方便地取出 ， 取出隐型眼镜。继续冲洗。

P310 立即呼叫解毒中心/医生

P405 存放处须加锁。

P501 按照本地 / 地区 / 国家 / 国际规例处理内含物 / 容器。

2.3 其它危害：

PBT (残留性、生物浓缩性、毒性物质) 及 vPvB (高残留性、高生物浓缩性物质) 评价结果

PBT (残留性、生物浓缩性、毒性物质)：不适用的

vPvB (高残留性、高生物浓缩性物质)：不适用的

3. 成分/组成信息 重要提示：系统内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。

3.1 柜式储能系统成分表

成分	重量百分比
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

3.2 电池成分表（注：下表的重量百分比仅针对电池重量）

原料或配料	CAS No. / EC No.	化学品 GHS 安全标签	重量百分比
石墨	CAS# 7782-42-5 EC#231-955-3	未被归类	7-25
磷酸铁锂	CAS# 15365-14-7 EC# 476-700-9	未被归类	15-40
氟丙烯亚乙烯基氟聚合物	CAS# 9011-17-0 EC# 618-470-6	Hazardous，H411	3-15
六氟磷酸锂	CAS# 21324-40-3 EC#235-362-0	Acute Tox. 3, H311; Skin Corr. 1B, H314; Acute Tox. 4, H302	0-5

乙炔炭黑	CAS# 1333-86-4 EC#215-609-9	未被归类	0-2
碳酸二乙酯	CAS# 105-58-8 EC#203-311-1	Flam. Liq. 3, H226	0-15
碳酸二甲酯	CAS# 616-38-6 EC# 210-478-4	Inflammable，H225	0-15
碳酸甲乙酯	CAS# 623-53-0 EC# 433-480-9	Inflammable，H225	0-15
碳酸丙烯酯	CAS# 108-32-7 EC#203-572-1	Eye Irrit. 2, H319	0-15
碳酸亚乙酯	CAS# 96-49-1 EC#202-510-0	Eye Irrit. 2, H319	0-15

4. 急救措施

在常规条件下使用，系统内电池是密封的

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。

5. 消防措施

5.1 危险特性：触电、起火、爆炸、污染

系统中单个组成的电芯电压约为 3.2V（安全电压），没有电击的危险，电箱电压约为 64V，柜式储能系统电压约为 1088V，应严格参照产品技术规格书操作，防止电击事故发生。

在运输和测试工程，可能发生柜式储能系统跌落、挤压、刺破、金属短路、液体浸泡等危险因子，可能发生触电、起火危险；如果在密闭空间，可能有气体爆炸危险，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危险。

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）。

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，灭火后晾干或者戴手套抹干，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

关于个人防护设备的选择指南，见安全技术说明书的第 8 章。关于处置信息，请参阅第 13 章。请遵从所有适用的地方及国际法规。

以下措施适用于电池内部成分泄露的情况：

个人防护措施、防护用具，紧急措施：使用个人防护设备。避免直接接触泄露物。

环境防范措施：如能确保安全，可采取措施防止进一步的泄漏或溢出。不要让产品进入下水道。

泄漏化学品的收容、清除方法所使用的处置材料：用惰性材料(干沙等)吸附溢出的电解质。扫掉和铲掉。放入合适的封闭的容器中待处理。丢弃处理请参阅第 13 章。

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

柜式储能系统运输前应将电箱 MSD 插头拔下，保证装置中每个电池内部都处于开路状态，确保无触电风险。

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。为了将电池短路的危险降低到最小，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。操作处理电箱时，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。存储于干燥凉爽的区域。

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：产品在第 7 节所述的条件下稳定。

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。

应避免的材料：氧化剂，碱，水。

危险分解物：有毒烟雾，并可能形成过氧化物。

聚合危害：不适用 如果发生泄露，避免与强氧化剂，无机酸，强碱，卤代烃接触。

11. 毒理学资料

标志及症状：无，除非电池破裂。

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。

吸入：对肺有刺激性。
皮肤接触：对皮肤刺激性。
眼睛接触：对眼睛有刺激性。
食入：吞下中毒。
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。

12. 生态学资料

对哺乳动物的影响：目前未知。

生态毒性：目前未知。

生物累积潜势：慢慢地生物降解。

环境危害：目前没有已知的环境危害。

13. 废弃处置

禁止焚烧电池，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。按照相应的地方性法规处理。

14. 运输信息

运输参考《国际海运危险货物规则》，按 UN 3481 装在设备中的锂离子电池要求管理。设备内锂离子电池需安装牢固，互相隔离，防止短路，外部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：对于锂离子电池，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：锂离子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。

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/T1020-2018 《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 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

17. 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。

标识：如果没有或看不清产品外露面标签的警示时，需联系相关人员提供封装和设备标签说明。柜式储能系统使用海运，外表面根据 IMDG 38th.相关要求需粘贴如下第九类危险品标识：

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。

说明：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。

附录：

Appendix：

正面照 Full Face Photo	正面开门照 Full Face Photo of Open