Panasonic

Feb. 1, 2024

No. SDS-PT BA 202402 E

Electrics Works Company

Explanatory sheet about safety of products

1. Basic item

Product name	Li- ion Battery Pack
Product code (Model No.)	Refer to Table 1.and 2
Manufacture	Panasonic Corporation
Address	1668, fujikata, Tsu, Mie, 514-8555, Japan
Phone number	+81-59-228-1141
E-mail	pt-tr-001@ml.jp.panasonic.com

2. Product information

Basic composition of the product

This product is a battery which consists of such main component as core battery pack assembled with some Lithium ion cells. And it consists of any combination of plastic casing, tube casing, protection circuit boards, safety devices and interface terminals.

Table 1

No.	Product code (Model No.)	Lot No. / Serial No.	Product Number	Cell Number	Wh Rating
1	EZ9L10	～210630	UR18650W2	1	6 Wh
2	EZ9L10	210701～	18650HB6	1	5.4Wh
3	EY9L10	～2103** （Including 210909～210929）	UR18650W2	1	6 Wh
4	EY9L10	210402～ （Excluding 210909～210929）	18650HB6	1	5.4Wh
5	EY9L10 for Taiwan	210402～ （Excluding 210909～210929）	18650HB6	1	5.0Wh
6	EZ9L20	～2106****	UR18650W2	2	11 Wh
7	EZ9L20	21070000～	18650HB6	2	11 Wh
8	EY9L20	～2103****	UR18650W2	2	11 Wh
9	EY9L20	21040000～	18650HB6	2	11 Wh
10	EZ9L21	～210630	UR18650W2	2	11 Wh
11	EZ9L21	210701～	18650HB6	2	11 Wh
12	EY9L30 / EZ9L30	—	CGR26650A	3	27 Wh
13	EY9L31 / EZ9L31	—	CGR26650B	3	34 Wh
14	EY9L32 / EZ9L32	—	UR18650W2	3	17 Wh
15	EY9L40 / EZ9L40	—	CGR26650A	4	44 Wh
16	EY9L41 / EZ9L41	—	CGR26650B	4	45 Wh
17	EY9L42 / EZ9L42	—	CGR18650K	4	22 Wh
18	EY9L44 / EZ9L44	—	CGR18650KA	8	48 Wh
19	EY9L45 / EZ9L45	—	NCR18650E	8	61 Wh
20	EY9L46 / EZ9L46	—	UR18650W2	8	44 Wh
21	EY9L47 / EZ9L47	—	UR18650RX	4	29 Wh
22	EY9L48 / EZ9L48	—	UR18650NSX	8	72 Wh
23	EY9L50 / EZ9L50	—	CGR18650KA	10	60 Wh
24	EY9L51 / EZ9L51	—	NCR18650E	10	76 Wh
25	EY9L52 / EZ9L52	—	UR18650RX	5	36 Wh

Table 2

No.	Product code (Model No.)	Lot No. / Serial No.	Product Number	Cell Number	Wh Rating
26	EY9L53 / EZ9L53	—	NCR20650A	5	54 Wh
27	EY9L54 / EZ9L54	—	UR18650NSX	10	90 Wh
28	EY9L61 / EZ9L61	—	CGR26650B	6	67Wh
29	EY9L62 / EZ9L62	—	NCR18650E	12	91 Wh
30	EY9L82 / EZ9L82	—	UR18650W2	16	87 Wh
31	EY9L84 / EZ9L84	—	NCR2070C	8	98 Wh
32	EY9L64 / EZ9L64	—	UR18650RX	12	86Wh
33	EY9L49 / EZ9L49	—	UR18650RX	8	58Wh
34	EY9L49 for Korea	—	UR18650RX	8	57Wh
35	EZFB30	～21040015	UR18650W2	6	33 Wh
36	EZFB30	21040016～	18650HB6	6	32.4Wh
37	EYFB30	～21070510 (Including 21090024～21090433)	UR18650W2	6	33 Wh
38	EYFB30	21070511～ (Excluding 21090024～21090433)	18650HB6	6	32.4Wh
39	EYFB31 / EZFB31	—	CGR18650K	3	17 Wh
40	EYFB32 / EZFB32	—	UR18650RX	6	22 Wh
41	EYFB40	—	CGR18650KA	8	48 Wh
42	EYFB41	—	UR18650RX	4	29 Wh
43	EYFB42	—	NCR18650E	8	61 Wh
44	EYFB50	—	UR18650NSX	10	90 Wh
45	EYFB51	—	NCR20650A	5	54 Wh
46	EYFB60	—	NCR18650E	12	91 Wh
47	EY9L20 / EZ9L20	—	UR18650W2	2	11 Wh
48	EYFB43	—	UR18650RX	8	58Wh
49	EYFB43 for Korea	—	UR18650RX	8	57Wh
50	EYFB61	—	UR18650RX	12	86Wh
51	EYFB61 for Korea for India	—	UR18650RX	12	85Wh
52	EZ8L1020FA	—	UR18650RX	3	22Wh
53	EZ8L1038HA	—	ICR18650/20P	6	42Wh

3. TRANSPORT INFORMATION

Regarding cautions under transportation, it is according to the related clause in the annexed or attached 'Safety data sheet for product of Lithium ion rechargeable battery cell '.

*Note : Check the latest version of transportation regulation because it is frequently revised.

Hideki Matsuoka

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Panasonic Corporation

Panasonic ENERGY

Dec,04,2023
No. SDS-BAH-08118

Explanatory sheet about safety of product for transportation (Safety Data Sheet for transportation)

1. Basic item

Product name:	Lithium ion rechargeable battery (including lithium polymer battery)
Product identification:	Refer to Table 1.
Manufacturer:	Panasonic Energy Co., Ltd.
Address:	1-1 Matsushita-cho, Moriguchi City, Osaka 570-8511, Japan
Phone number:	+81-80-8932-7972
E-mail:	transport-sds@ml.jp.panasonic.com

2. Product information
   - The UN number of this product is 3480.
   - This product is "cell" may be accompanied by outer case or tube covering, protective device, input / output terminal, and the like.
   - The watt-hour rating of this product does not exceed 20 Wh.
   - Panasonic Energy guarantee that this product has passed the test of the UN Manual of Tests and Criteria Part III, sub-section 38.3.
   - Panasonic Energy manufacture this product under the quality management program required by UN Model Regulations 2.9.4 (e).
   - At the time of shipment from Panasonic Energy, the package of this product satisfies the following conditions.
     - Capable of withstanding a 1.2 m drop test.
     - The gross mass of one package does not exceed 30 kg.
     - Marked and labeled according to requirement of special provision 188 stated in UN Model Regulations and IMDG Code.
     - Products identified as damaged or defective for safety reasons are not included. Also, products recovered for disposal or recycling are not included.

3. Transportation guidelines
   - Guidelines for using packages shipped from Panasonic Energy are as follows.
     - In ocean and ground transportation, it is necessary to ship according to UN Model Regulations and IMDG Code. But the package is not subject to the fully regulated requirements for Dangerous Goods (refer Special Provision 188 etc.).

4. Appendix
   Cell's safety data sheet for product

Y. Inaba Senior Manager
Department of Development strategy
Corporate of Development strategy
Cell Development Division
Panasonic Energy Co., Ltd.

Table 1

No.	Customer Product number	Global product code	Cell number	Wh rating
1	NCR18650E	BJ-A300004AA	1	7.6
2	UR18650W2	BJ-A000816AA	1	5.6
3	UR18650RX	BJ-A110035AA	1	7.1
4	UR18650NSX	BJ-A100563AA	1	8.9
5	NCR20650A	BJ-AK00005AA	1	11
6	NCR2070C	BJ-AM00026AA	1	13

＊This document has been prepared taking into account regulations as of January 1, 2024

Safety data sheet for product

- This product is an "article" used with the contents sealed. Therefore, issuing and providing SDS is not required by the GHS or any law based on GHS.
- This document has been prepared not to satisfy requirements such as GHS, but for the purpose of providing safety information to customers.
- Refer the other document issued by the shipper, when you want to know whether your current packaging and content comply with transport regulations.

1. PRODUCT AND COMPANY IDENTIFICATION

- Product name: Lithium ion rechargeable battery cell
- Product code: None
- Company name: Panasonic Energy Co., Ltd.
- Address: 1-1 Matsushita-cho, Moriguchi City, Osaka 570-8511, Japan
- Telephone number: +81-80-8932-7972
- Emergency telephone number: +81-6-6994-4933

2. HAZARDS IDENTIFICATION

For the battery cell, chemical materials are stored in a hermetically sealed metal or metal laminated plastic case, designed to withstand temperatures and pressures encountered during normal use. As a result, during normal use, there are no physical hazards such as ignition, explosion and chemical hazards due to leakage of battery contents.

However, if exposed to a fire, added mechanical shocks, decomposed, added electric stress by miss-use, the gas release vent will be operated. The battery cell case will be breached at the extreme, hazardous materials may be released.

Also, if it is heated strongly by surrounding fires or the like, there is a possibility that irritating or harmful gas may be generated.

- GHS classification: Not available
  (This product is outside the scope of GHS system since it's considered as an "article".)

- Most important hazard and effects
  Human health effects:
  Inhalation: The steam of the electrolyte has an anesthesia action and stimulates a respiratory tract.
  Skin contact: The steam of the electrolyte stimulates a skin. The electrolyte skin contact causes a sore and stimulation on the skin.
  Eye contact: The steam of the electrolyte stimulates eyes. The electrolyte eye contact causes a sore and stimulation on the eye. Especially, substance that causes a strong inflammation of the eyes is contained.
  Environmental effects: Since a battery cell remains in the environment, do not throw out it into the environment.

- Specific hazards:
  If the electrolyte contacts with water, it will generate detrimental hydrogen fluoride.
  Since the leaked electrolyte is inflammable liquid, do not bring close to fire.

3. COMPOSITION / INFORMATION ON INGREDIENTS

- Substance or preparation: Preparation
- Information about the chemical nature of product: [a]

Portion	Material name	CAS No.	Concentration range (wt %)
Positive electrode	Lithium transition metal oxidate ($Li[M]_m[O]_n$ [b])	12190-79-3 12031-65-1 12057-17-9 182442-95-1 207803-51-8	20~60
Positive electrode's base	Aluminum	7429-90-5	1~10
Negative electrode	Carbon	7782-42-5 7440-44-0	10~30
Negative electrode's base	Copper	7440-50-8	1~15
Electrolyte	Ethyl methyl carbonate Diethyl carbonate Ethylene carbonate Lithium hexafluorophosphate	623-53-0 105-58-8 96-49-1 21324-40-3	5~25
Outer case	Aluminum, iron, aluminum laminated plastic	7429-90-5 7439-89-6	1~30

a Not every product includes all of these materials.

b The letter M means transition metal and candidates of M are Co, Mn, Ni and Al. One compound includes one or more of these metals and one product includes one or more of the compounds. The letter m and n means the number of atoms.

4. FIRST-AID MEASURES

Spilled internal cell materials

- Inhalation:
  Make the victim blow his/her nose, gargle. Seek medical attention if necessary.
- Skin contact:
  Remove contaminated clothes and shoes immediately. Wash extraneous matter or contact region with soap and plenty of water immediately.
- Eye contact:
  Do not rub one's eyes. Immediately flush eyes with water continuously for at least 15 minutes. Seek medical attention immediately.

A battery cell and spilled internal cell materials

- Ingestion:
  Wash out mouth thoroughly. Do not make the victim vomit, unless instructed by medical personnel. Seek medical attention immediately.

5. FIRE-FIGHTING MEASURES

- Suitable extinguishing media: Plenty of water, carbon dioxide gas, nitrogen gas, chemical powder fire extinguishing medium and fire foam.
- Specific hazards: Corrosive gas may be emitted during fire.
- Specific methods of fire-fighting: When the battery burns with other combustibles simultaneously, take fire-extinguishing method which correspond to the combustibles. Extinguish a fire from the windward as much as possible.
- Special protective equipment for firefighters: Refer to Section 8-EXPOSURE CONTROLS / PERSONAL PROTECTION (WHEN THE ELECTROLYTE LEAKS)

6. ACCIDENTAL RELEASE MEASURES

Spilled internal cell materials, such as electrolyte leaked from a battery cell, are carefully dealt with according to the followings.

- Precautions for human body:
  Remove spilled materials with protective equipment (refer to Section 8-EXPOSURE CONTROLS / PERSONAL PROTECTION (WHEN THE ELECTROLYTE LEAKS)). Do not inhale the gas as much as possible. Moreover, avoid touching with as much as possible.
- Environmental precautions: Do not throw out into the environment.
- Method of cleaning up: The spilled solids are put into a container. The leaked place is wiped off with dry cloth.
- Prevention of secondary hazards: Avoid re-scattering. Do not bring the collected materials close to fire.

7. HANDLING AND STORAGE

- Handling suggestions
  - Do not connect the positive terminal to the negative terminal with electrical wire or chain.
  - Avoid polarity reverse connection when installing the battery to an instrument.
  - Do not wet the battery with water, seawater, drink or acid; or expose to strong oxidizer.
  - Do not damage or remove the external tube.
  - Keep the battery away from heat and fire.
  - Do not disassemble or reconstruct the battery; or solder the battery directly.
  - Do not give a mechanical shock or deform.
  - Do not use unauthorized charger or other charging method. Terminate charging when the charging process doesn't end within specified time.
- Storage
  - Do not store the battery with metalware, water, seawater, strong acid or strong oxidizer.
  - Make the charge amount less than or equal to 50% then store at -20~40 degree C in a dry (humidity: 45~85%) place.
    Since deterioration will be faster in the high temperature range than in the low temperature range, so do not keep it in the high temperature range beyond the period that is specified by the seller or owner.
  - Use insulative and adequately strong packaging material to prevent short circuit between positive and negative terminal when the packaging breaks during normal handling. Do not use conductive or easy to break packaging material.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION (WHEN THE ELECTROLYTE LEAKS)

- Control parameters
  ACGIH has not been mentioned control parameter of electrolyte.
- Personal protective equipment
  Respiratory protection: Respirator with air cylinder, dust mask
  Hand protection: Protective gloves
  Eye protection: Goggles or protective glasses designed to protect against liquid splashes
  Skin and body protection: Working clothes with long sleeve and long trousers

9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance

Physical state	: Solid
Form	: Cylindrical or Prismatic or Pouch (laminated)
Color	: Metallic color or black (without tube if it has tube)
Odor	: No odor
Density	: N/A
Boiling Point	: N/A
Melting Point	: N/A
Evaporation Rate	: N/A
Vapor Pressure	: N/A
Molecular Weight	: N/A
Solubility	: N/A
pH	: N/A
Viscosity	: N/A
Other Information	; N/A

10. STABILITY AND REACTIVITY

- Stability: Normally stable unless a strong shock is applied or heated strongly
- Possibility of hazardous reactions: Damage to the container may cause leakage of contents. Contents may leak or ignite due to temperature rise.
- Conditions to avoid: Crushing or deformation, use and storage at 80 degree C or higher or at high humidity. Usage at a voltage or a current outside the rating and external short circuit.
- Incompatible materials: Conductive material such as water or metal pieces. Oxidizing agent such as bleach.
- Hazardous decomposition products: Irritating or harmful gases are released if a leakage or fire occurs.

11. TOXICOLOGICAL INFORMATION

Organic Electrolyte

- Acute toxicity:
  LD_{50}, oral - Rat 2,000mg/kg or more
- Irritating nature: Irritative to skin and eye

12. ECOLOGICAL INFORMATION

- Persistence/degradability:
  Since a battery cell and the internal materials remain in the environment, do not bury or throw out into the environment.

13. DISPOSAL CONSIDERATIONS

- Recommended methods for safe and environmentally preferred disposal:

Product (waste from residues)

Specified collection or disposal of lithium ion battery is required by the law like as "battery control law" in several nations. Collection or recycle of the battery is mainly imposed on battery's manufacturer or importer in the nations recycle is required.

Contaminated packaging

Neither a container nor packing is contaminated during normal use. When internal materials leaked from a battery cell contaminates, dispose as industrial wastes subject to special control.

14. TRANSPORT INFORMATION

In the case of transportation, avoid exposure to high temperature and prevent the formation of any condensation. Take in a cargo of them without falling, dropping and breakage. Prevent collapse of cargo piles and wet by rain. The container must be handled carefully. Do not give shocks that result in a mark of hitting on a cell. Please refer to Section 7-HANDLING AND STORAGE also.

The table mentioned below is applied to only the lithium ion rechargeable battery cell described in Section 1-PRODUCT AND COMPANY IDENTIFICATION.

	LAND TANSPORT (ADR)	SEA TRANSPORT (IMDG Code)	AIR TRANSPORT (IATA DGR/ICAO TI)
UN Number [a]	3480	3480	3480
Proper Shipping Name [a]	LITHIUM ION BATTERIES (including lithium ion polymer batteries)	LITHIUM ION BATTERIES (including lithium ion polymer batteries)	LITHIUM ION BATTERIES (including lithium ion polymer batteries)
Hazard Class	9	9	9
Packing Group [b]	II	II	II

[a] UN Number is 3481 in case of the battery is contained in equipment or packed with equipment, and Proper Shipping Name is “lithium ion batteries contained in equipment” or “lithium ion batteries packed with equipment”.
UN Number is 3171 in case of the battery is contained in vehicle which is only powered by the battery, and Proper Shipping Name is "Battery-powered vehicle".

[b] Lithium ion rechargeable battery cell is not assigned to packing groups, and the packaging performance level is set out in the applicable packing instruction. Packing group II is often set out.

15. REGULATORY INFORMATION

・Regulations specifically applicable to the product:
Wastes Disposal and Public Cleansing Law [Japan]
Law for Promotion of Effective Utilization of resources [Japan]
US Department of Transportation 49 Code of Federal Regulations [USA]

** About overlapping regulations, please refer to Section 14-TRANSPORT INFOMATION.*

16. OTHER INFORMATION

・This safety data sheet is offered an agency who handles this product to handle it safely.
・The agency should utilize this safety data sheet effectively (put it up, educate person in charge) and take proper measures.
▪ ***The information contained in this Safety data sheet is based on the present state of knowledge and current legislation.***
・This safety data sheet provides guidance on health, safety and environmental aspects of the product and should not be construed as any guarantee of technical performance or suitability for particular applications.

Reference

Dangerous Goods Regulations – 65th Edition Effective 1 January 2024: International Air Transport Association (IATA)
IMDG Code – 2022 Edition: International Maritime Organization (IMO)
Agreement concerning the International Carriage of Dangerous Goods by Road – 2023(ADR): The United Nations Economic Commission for Europe (UNECE)

First edition:	Apr. 28, 2010
Prepared and approved by:	Department of Development strategy Corporate of Development strategy Cell Development Division Panasonic Energy Co., Ltd.

MATERIAL SAFETY DATA SHEET

Model LG18650HB6 Lithium Ion Rechargeable Battery

LG CHEMICAL LTD

1. Chemical Product and Company Identification

Product Identification

LG CHEM LG18650HB6 Lithium-Ion Battery

Manufacturer

LG Chemical Ltd.
Twin Tower
Youido-Dong 120, Youngdeungpo-Ku
Seoul, Korea

Emergency Telephone Number

82-2-3773-7618

2. Composition Information

Hazardous Ingredients	%	CAS Number
Aluminum Foil	2-10	7429-90-5
Metal Oxide (proprietary)	20-50	
Polyvinylidene Fluoride (PVDF)	<5	24937-79-9
Copper Foil	2-10	7440-50-8
Carbon (proprietary)	10-30	7440-44-0
Electrolyte (proprietary)	10-20	
Stainless steel, Nickel and inert materials	Remainder	N/A

* Equivalent Lithium content: 0.45g, Electric Power Capacity: 5.48 Wh

3. Hazards Identification

Emergency Overview

May explode in a fire, which could release hydrogen fluoride gas.
Use extinguishing media suitable for materials burning in fire.

Primary routes of entry

Skin contact	:	NO
Skin absorption	:	NO
Eye contact	:	NO
Inhalation	:	NO
Ingestion	:	NO

Symptoms of exposure

Skin contact

No effect under routine handling and use.

Skin absorption

No effect under routine handling and use.

Eye contact

No effect under routine handling and use.

Inhalation

No effect under routine handling and use.

Reported as carcinogen

Not applicable

4. First Aid Measures

Inhalation
Not a health hazard.

Eye contact
Not a health hazard.

Skin contact
Not a health hazard.

Ingestion
If swallowed, obtain medical attention immediately.

IF EXPOSURE TO INTERNAL MATERIALS WITHIN CELL DUE TO DAMAGED OUTER CASING, THE FOLLOWING ACTIONS ARE RECOMMENDED ;

Inhalation
Leave area immediately and seek medical attention.

Eye contact
Rinse eyes with water for 15 minutes and seek medical attention.

Skin contact
Wash area thoroughly with soap and water and seek medical attention.

Ingestion
Drink milk/water and induce vomiting; seek medical attention.

5. Fire Fighting Measures

General Hazard
Cell is not flammable. Combustion products include, but are not limited to hydrogen fluoride, carbon monoxide and carbon dioxide.

Extinguishing Media
Use extinguishing media suitable for the materials that are burning.

Special Firefighting Instructions
If possible, remove cell(s) from fire fighting area. If heated above 160°C, cell(s) may explode/vent.

Firefighting Equipment
Use NIOSH/MSHA approved full-face self-contained breathing apparatus (SCBA) with full protective gear.

6. Accidental Release Measures

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

In Water
If possible, remove from water and call local fire/police department.

7. Handling and Storage

Handling
No special protective clothing required for handling individual cells.

Storage
Store in a cool, dry place.

8. Exposure Controls / Personal Protection

Engineering controls

Keep away from heat and open flame. Store in a cool dry place.

Personal Protection

Respirator

Not required during normal operations. SCBA required in the event of a fire.

Eye/face protection

Not required beyond safety practices of employer.

Gloves

Not required for handling of cells.

Foot protection

Steel toed shoes recommended for large container handling.

9. Physical and Chemical Properties

State	Solid
Odor	N/A
PH	N/A
Vapor pressure	N/A
Vapor density	N/A
Boiling point	N/A
Solubility in water	Insoluble
Specific gravity	N/A
Density	N/A

10. Stability and Reactivity

Reactivity
None

Incompatibilities
None during normal operation. Avoid exposure to heat, open flame, and corrosives.

Hazardous Decomposition Products
None during normal operating conditions. If cells are opened, hydrogen fluoride and carbon monoxide may be released.

Conditions To Avoid
Avoid exposure to heat and open flame. Do not puncture, crush or incinerate.

11. Toxicological Information

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

Sensitization	Teratogenicity	Reproductive toxicity	Acute toxicity
NO	NO	NO	NO

If the cells are opened through misuse or damage, discard immediately. Internal components of cell are irritants and sensitizers.

LG chem. Confirms that the below 5 chemicals are not used in cell.

1) FORMALDEHYDE
(INCLUDING: FORMALDEHYDE - RELEASING PRESVATIVES)

2) BISPHENOL A (BPA) & BISPHENOL S (BPS)

3) PARABENS
4) PHTHALATES
5) TOXIC FLAME RETARDANT IN FOAM PRODUCTS
(including TDCPP or chlorinated tris; and TBB and TBPH in Firemaster 550)

12. Ecological Information

Some materials within the cell are bioaccumulative. Under normal conditions, these materials are contained and pose no risk to persons or the surrounding environment.

13. Disposal Considerations

California regulated debris

RCRA Waste Code : Nonregulated

Dispose of according to all federal, state, and local regulations.

14. Transport Information

Lithium batteries are classified in Class 9 – Miscellaneous dangerous goods as:

- UN 3480, Lithium ion batteries
- UN 3481, Lithium ion batteries contained in equipment; or
- UN 3481, Lithium ion batteries packed with equipment.

With regard to transport of the product, the following regulations are cited and considered:

- The International Civil Aviation Organization (ICAO) Technical Instructions,
- The International Air Transport Association (IATA) Dangerous Goods Regulations
- The International Maritime Dangerous Goods (IMDG) Code,
- US Hazardous Materials Regulations 49 CFR(Code of Federal Regulations) Sections 173-185 Lithium batteries and cells,

- The UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria 38.3 Lithium batteries,

If those lithium-ion batteries are packed with or contained in an equipment, then it is the responsibility of the shipper to ensure that the consignment are packed in compliance to the latest edition of the IATA Dangerous Goods Regulations SectionⅡ of either Packing Instruction 966 or 967 in order for that consignment to be declared as NOT RESTRICTED (non-hazardous/non-Dangerous). If those lithium-ion batteries are packed with or contained in an equipment, UN No. is UN3481

Each cell or battery is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria, Part III, subsection 38.3;

15. Regulatory Information

OSHA hazard communication standard (29 CFR 1910.1200)

_____Hazardous ____✔__Non-hazardous

16. Other Information

Hazardous Materials Information Label (HMIS)
Health: 0
Flammability: 0
Physical Hazard: 0

NFPA Hazard Ratings
Health: 0
Flammability: 0
Reactivity: 0
Unique Hazard:

Report Representative

LG Chem.

三帕认证
CPUP TECHNOLOGY&SERVICE

真伪查询

Material Safety Data Sheet

化学品安全技术说明书

Sample Name： **样品名称：**	Lithium-ion Rechargeable Cell 锂离子可充电电芯
Model： **型号：**	ICR18650/20P
Applicant： **申请商：**	EVE Energy Co., Ltd. 惠州亿纬锂能股份有限公司
Report No.： **报告编号：**	HZYW20231207MSDS02
Category： **报告类别：**	MSDS

广州三帕认证技术服务有限公司

Guangzhou CPUP Certification Technology Service Co., Ltd.

Section 1 - Chemical and Company Identification 第一部分-化学品及企业标识		
Sample Name 样品名称		Lithium-ion Rechargeable Cell 锂离子可充电电芯
Model/型号		ICR18650/20P
Ratings/额定参数		3.6V, 2.0Ah, 7.2Wh
Applicant 申请商		EVE Energy Co., Ltd. 惠州亿纬锂能股份有限公司
Applicant address 申请商地址		No. 38, Hui Feng 7th Road, Zhongkai Hi-Tech Zone, Huizhou, Guangdong, P.R. China 广东省惠州市仲恺高新区惠风七路 38 号
Manufacturer 制造商		EVE POWER Co.,Ltd. 湖北亿纬动力有限公司
Manufacturer Contact information 制造商联系信息	address 地址	NO.68, Jingnan Avenue, Hi-Tech Zone, Duodao Zone, Jingmen City, Hubei, P.R.China 湖北省荆门高新区掇刀区荆南大道 68 号
	Tel./应急电话	86-18588408301
	Email/邮箱	056349@evebattery.com

Section 2 - Hazards Identification
第二部分-危险性概述

Hazards Identification：危险性描述

Not dangerous with normal use. Do not dismantle, open or shred the battery ingredients contained within or their ingredients products could be harmful.

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害的。

Primary Route (s) of Exposure: 接触途径

inhalation, ingestion, Skin contact and Eye contact.

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 第三部分-成分/组成信息		
Chemical Name **化学名称**	**CAS Number** **CAS 号（化学文摘登记号）**	**Concentration or concentration ranges (%)** **浓度或浓度范围(%)**
Lithium Cobalt Oxide	12190-79-3	35.05
Graphite	7782-42-5	15.98
Carbon black	1333-86-4	0.79
Hexafluoropropylene-vinylidene fluoride copolyme	9011-17-0	9.87
Dimethyl carbonate	616-38-6	4.38
Ethyl methyl carbonate	623-53-0	2.29
Lithium hexafluorophosphate	21324-40-3	2.95
Ethylene carbonate(EC)	96-49-1	6.34
Diethyl carbonate(DEC)	105-58-8	2.76
Propylene carbonate(PC)	108-32-7	1.11
Copper	7440-50-8	8.39
Styrene-butadiene rubber(SBR)	61789-96-6	0.71
Aluminum	7429-90-5	9.38
Note: CAS number is Chemical Abstract Service Registry Number. 注意：CAS 号是化学文摘服务注册号。 N/A= Not applicable. N/A=不适用		

Section 4- First Aid Measure 第四部分-急救措施	
Inhalation **吸入**	Remove source of contamination or move victim to fresh air. Obtain medical advice. 移除污染源或者将受害者移至新鲜空气处。寻求医生建议。
Ingestion **食入**	Please rinse mouth thoroughly with water, induce vomiting under the guidance of professional personage. Please seek medical treatment in time. 立即用清水漱口，在专业人士的指导下催吐，速就医。
Skin contact **皮肤接触**	Remove contaminated clothes and rinse skin with plenty of water or shower for 15 minutes. Get medical aid. 脱下已污染衣服，用大量的水冲洗至少 15 分钟，速就医。
Eye contact **眼睛接触**	Irrigate with flowing water for 15 minutes. If irritation persists, consult a physician. 用流动水冲洗 15 分钟，如刺激持续发生，请求助于医生。

Section 5- Fire Fighting Measures 第五部分-消防措施	
Characteristics of Hazard **危险特性**	Toxic fumes, gases or vapors may evolve on burning. 火灾时可释放有害浓烟、气体或者蒸汽。
Hazardous Combustion Products **燃烧产生的危险物品**	Carbon monoxide, carbon dioxide, lithium oxide fumes and so on. 一氧化碳，二氧化碳，锂氧化物烟气等。
Fire-extinguishing Methods and Extinguishing Media **灭火方法及灭火剂**	Please use water, dry sand and other proper fire extinguishing media. 请使用水，干沙等合适的灭火介质。
Attention in Fire-extinguishing **灭火注意事项**	The firemen should put on antigas masks and full fire-fighting suits. 消防人员须佩戴防毒面具、穿全身消防服。

Section 6- Accidental Release Measure 第六部分-泄漏应急处理	
Personal Precautions, protective equipment, and emergency procedures **个人预防措施、防护装备和应急程序**	Restrict access to area until completion of clean-up. Do not touch the spilled material. Wear adequate personal protective equipment as indicated in Section 8. 限制区域，直到完成清理工作。请勿触摸泄漏的材料。穿戴适当的个人防护设备，如第 8 部分所示。
Environmental Precautions **环境保护措施**	Prevent material from contaminating soil and from entering sewers or waterways. 防止物质污染土壤和进入下水道或水道。
Methods and materials for Containment **方法和材料控制**	Stop the leak if safe to do so. Contain the spilled liquid with dry sand or earth. Clean up spills immediately. 出于安全，阻止泄漏，可以用干沙或沙土来遏制液体泄露，立即清理泄漏。
Methods and materials for cleaning up **清理的方法和材料**	Absorb spilled material with an inert absorbent (dry sand or earth). Scoop contaminated absorbent into an acceptable waste container. Collect all contaminated absorbent and dispose of according to directions in Section 13. Scrub the area with detergent and water; collect all contaminated wash water for proper disposal. 用惰性吸收剂(干沙或沙土)吸收溢出的材料。污染物转移到可吸收废物的容器。收集所有受污染的吸收剂和根据第 13 部分的指令处置。用洗涤剂和水清洁污染区域,收集所有受污染的洗涤水进行适当处置。

Section 7- Handling and Storage 第七部分-操作处置与储存	
Handling **操作**	Don't handing the batteries in manner that allows terminals to short circuit. Do not open, disassemble, crush or burn battery. 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。
Storage **储存**	if the battery is subject to storage for such a long term as more than 3 months, it is recommended to recharge the battery periodically.

	如果电池长期存放超过 3 个月，建议定期对电池充电。 Long period storage: 25±5°C, 60±25%R.H 长期存储：25±5°C,相对湿度 60±25% Do not storage the battery haphazardly in a box or drawer where they may short-circuit each other or be short-circuited by other metal objects. 不要将电池随意丢在盒子或抽屉里，以免电池之间或电池与其他金属物质发生短路。 Keep out of reach of children. 储存在小孩接触不到的地方。 Do not expose the battery to heat or fire. Avoid storage in direct sunlight. 不要将电池暴露在火源和热源附近，避免在阳光直射下存储。 Do not store together with oxidizing and acidic materials. 不要与氧化和酸性物质存储在一起。

Section 8 - Exposure Controls/Personal Protection 第八部分-接触控制和个体防护	
Engineering Controls 工程控制	No engineering controls are required for handling batteries that have not been damaged. Personal protective equipments for damaged batteries should include chemical resistant gloves and safety glasses. 操作未破损的电池，没有工程控制要求。对于破损的电池，个人防护用品应包括化学品防护手套和安全眼镜。
Personal Protective Equipment 个人防护设备	Respiratory Protection: in case of battery venting, provide as much ventilation as possible. Avoid confined areas with venting cell cores. Respiratory Protection is not necessary under conditions of normal use. Not necessary under conditions of normal use. 呼吸保护：当电池排气阀打开时，应尽量使通风设备开至最大，避免将打开排气阀的电芯局限在某一狭窄空间内。正常操作条件下，呼吸保护是不必要的。正常使用条件下不必考虑。 Protective Gloves: Not necessary under conditions of normal use. 防护手套：正常使用条件下不必考虑。 Other Protective Clothing or Equipment: Not necessary under conditions of normal use. 其他防护服装或设备：正常使用条件下不必考虑。 Personal Protection is recommended for venting battery: Respiratory Protection, Protective Gloves, Protective Clothing and safety glass with side shields. 当电池排气阀打开时，应做好个人防护。呼吸防护，防护手套，防护服装和有护边的安全玻璃罩都是要准备的。

Section 9- Physical and Chemical Properties 第九部分-理化特性
Appearance: Green **外观颜色：**绿色
Physical state: Solid **物理状态：**固体
Form: Approximate Cylinder

形状：近圆柱体
Melting Point ℃: >300℃ **熔点℃：**>300℃
Odor: Odorless **气味：**无气味
Solubility: Partial soluble in water **溶解度：**部分溶于水

Section 10 - Stability and Reactivity **第十部分-稳定性和反应性**	
Stability **稳定性**	Stable under normal temperatures and pressures. 常温常压下稳定。
Conditions to Avoid **应避免的条件**	Heat above 70°C or Incinerate, Deform, Mutilate, Crush, Disassemble, Overcharge, Short circuit, Expose over a long period to humid conditions. 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。
Hazardous Decomposition Products **危害分解物**	Toxic Fumes, and may form peroxides. 有毒烟雾，并可能形成过氧化物。
Possibility of Hazardous Reaction **危险反应的可能性**	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 **第十一部分-毒理学信息**	
Irritation **刺激**	In the event of exposure to internal contents, vapor fumes may be very irritating to the eyes and skin. 内部物质暴露的情况下，蒸汽烟雾可能对眼睛和皮肤产生刺激性。
Sensitization **致敏**	Not applicable. 不适用
Reproductive Toxicity **再生毒性**	Not applicable. 不适用
Toxicologically Synergistic Materials **协同材料毒理学**	Not applicable. 不适用

Section 12-Ecological Information **第十二部分-生态学信息**	
General note **通用信息**	Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system. 不允许未稀释或大量的产品到达地下水、水道或污水系统。
Anticipated behavior of a chemical product in environment/possible	Not applicable. 不适用

environmental impact/ ecotoxicity **化学产品在环境/可能的环境预 期的行为的一种生态毒性**	
Mobility in soil **土壤中移动性**	Not applicable. 不适用
Persistence and Degradability **持久性和降解性**	Not applicable. 不适用

Section 13 - Disposal Considerations **第十三部分-废弃处置**	
Waste Treatment **废弃处置方法**	Recycle or dispose of in accordance with government, state & local regulations. 建议遵照国家和地方法规处置或再利用。
Attention for Waste Treatment **废弃注意事项**	Deserted batteries couldn't be treated as ordinary trash. Couldn't be thrown into fire or placed in high temperature. Couldn't be dissected, pierced, crushed or treated similarly. Best way is recycling. 废电池不能被当做普通垃圾。不能扔进火中或置于高温下。不能解体， 刺穿，破碎或类似的处理。最好的办法是回收利用。

Section 14 - Transport Information
第十四部分-运输信息

The battery shall be passed the test items of the UNITED NATIONS “Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria" section 38.3 and meet the requirements of UNITED NATIONS “Recommendations on the Transport of Dangerous Goods, model Regulations "
该电池必须通过联合国《关于危险货物运输的建议书 试验和标准手册》第 38.3 章节的测试项目和满足联合国《关于危险货物运输的建议书 规章范本》的要求。

The battery shall be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to short circuit;
该电池必须做好防短路保护。包括防止与同一封装内的导电材料接触可能导致的短路。

The packaging shall be adequate to avoid mechanical damage during transport, handling and stacking.
包装应足以避免在运输，处理和堆放期间的机械损坏。

The package must be handled with care and that a flammability hazard exists if the package is damaged. 包装必须小心处理，如果包装损坏，存在易燃危险。

With regard to transport, the following regulations are cited and considered:
关于运输，引用和考虑了以下法规：
-The international Civil Aviation Organization (ICAO) Technical Instructions.
-国际民用航空组织(ICAO)技术细则。
-The international Air transport Association (IATA) Dangerous Goods Regulations.
-国际航空运输协会(IATA)危险物品规则。
The battery can be shipped by air in according to PACKING INSTRUCTION 965 Section IB, or PACKING INSTRUCTION 966～967 Section II of the 2024 IATA Dangerous Goods regulations 65th Edition.

该电池可以根据 2024 年 IATA 危险物品规则第 65 版包装指令 965 第 IB 部分或包装指令 966～967 第 II 部分运输。
UN number: UN3480 or UN3481;
UN 编号：UN3480 或 UN3481:
UN Proper shipping name/Description (technical name): Lithium ion batteries or Lithium ion batteries packed with equipment or Lithium ion batteries contained in equipment;
UN 合适的运输名称/描述(技术名称)：锂离子电池或锂离子电池与设备包装在一起或锂离子电池内置于设备中;
UN Classification (Transport hazard class): Class 9 (PI965 Section IB) or Not applicable (PI966～967 Section II)
UN 分类(运输危险类别): 9 类危险品(包装指令 965 第 IB 部分)或者不适用(包装指令 966～967 第 II 部分)
UN Packing Group: Not applicable
UN 包装类别：不适用

-The international Maritime Dangerous Goods (IMDG) Code.
-国际海运危险货物(IMDG)规则。
UN number: UN3480 or UN3481;
UN 编号：UN3480 或 UN3481；
UN Proper shipping name/Description (technical name): Lithium ion batteries or Lithium ion batteries packed with equipment or Lithium ion batteries contained in equipment;
UN 合适的运输名称/描述(技术名称)：锂离子电池或锂离子电池与设备包装在一起或锂离子电池内置于设备中;
UN Classification (Transport hazard class): Not applicable
UN 分类(运输危险类别)：不适用
UN Packing Group: Not applicable
UN 包装类别：不适用
The battery is not restricted according to IMO IMDG Code (inc. Amendment 41-22) Special Provision188.
海运按照国际海事组织《国际海运危险货物规则》(41-22 版)特殊规定 188 不受限制。

Section 15 - Regulatory Information
第十五部分-法规信息

International Civil Aviation Organization (ICAO) Technical Instructions
ICAO 国际民用航空组织(ICAO)技术细则:
1.Unless be exempted according to ICAO TI, the lithium ion cell/batteries (UN 3480，PI 965) and lithium metal cell/batteries (UN 3090，PI 968) are forbidden for carriage on passenger aircraft.
除非依据《技术细则》的相关要求取得豁免，单独包装的锂离子电池（芯）(UN 3480,PI 965）和锂金属电池（芯）（UN 3090，PI 968）货物禁止使用客机运输。
2.Unless be approved according to ICAO TI, Lithium ion cells/batteries (UN 3480，PI 965) must be offered for transport at a state of charge (SoC) not exceeding 30% of their rated design capacity.
除非依据《技术细则》的相关要求取得特别批准，按照包装说明 965 要求运输的锂离子电池（芯）货物，交运时锂离子电池（芯）的荷电状态不得超过其额定容量的 30%。

Section 16 - Additional Information
第十六部分-附加信息

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Other Information 其他信息:

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