

MATERIAL SAFETY DATA SHEET(MSDS)

1. Chemical product and company Identification

Product name: Lithium Secondary Battery

Product Designation: Lithium ion All LIR Type Coin Button Secondary Batteries

Nominal Voltage: 3.6V

Chemical system: Lithium ion

Designed for recharge: Yes ✓

Company Name: Power Xtra Groupe Limited Battery Co., Ltd.

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2. Hazards Identification

GHS Classification : Not applicable

Toxicity : Vapor generated from burning batteries, may irritate eyes, skin and throat .

Hazard : Electrolyte and lithium metal are inflammable.

Risk of explosion by fire if batteries are disposed in fire or heated above 100 degrees C.

Stacking or jumbling batteries may cause external short circuits, heat generation, fire or explosion.

3. Composition/Information of Ingredients

Component	Material	CAS No.	Content (%)
Positive electrode	Lithium Cobalt Oxide (LiCoO_2)	12190-79-3	10~50
Negative electrode	Graphite (C)	7440-50-8	2~22
Electrolyte	Ethylene Carbonate ($\text{C}_3\text{H}_4\text{O}_3$)	96-49-1	Total 5~15
	Ethyl Methyl Carbonate	623-53-0	
	Dimethyl Carbonate	616-38-6	
	Lithium Hexafluorophosphate	21324-40-3	
Others (Steel or Plastic parts)	Stainless Steel	12597-68-1	25~80
	PE Separator	90989-93-8	1.0~5
	Polypropylene	9003-07-0	0.5~10

Battery list and specification

Model	Nominal Voltage (V)	Nominal Capacity (mAh)	Watt Hour (Wh)*	Model	Nominal Voltage (V)	Nominal Capacity (mAh)	Watt Hour (Wh)*
LIR840	3.6	18	0.065	LIR1654	3.6	120	0.432
LIR854	3.6	23	0.083	LIR2016	3.6	18	0.065
LIR940	3.6	25	0.090	LIR2025	3.6	25	0.090
LIR1025	3.6	6	0.022	LIR2032	3.6	45	0.162
LIR1040	3.6	35	0.126	LIR2032H	3.6	70	0.252
LIR1054	3.6	45	0.162	LIR2050	3.6	80	0.288
LIR1154	3.6	55	0.198	LIR2425	3.6	55	0.198
LIR1220	3.6	8	0.029	LIR2430	3.6	60	0.216
LIR1240	3.6	50	0.180	LIR2450	3.6	120	0.432
LIR1254	3.6	68	0.245	LIR2450H	3.6	200	0.720
LIR1454	3.6	90	0.324	LIR2477	3.6	200	0.720
LIR1620	3.6	16	0.058	LIR3032	3.6	180	0.648
LIR1632	3.6	20	0.072	LIR3048	3.6	280	1.008

* Nominal voltage x Nominal capacity

4. First Aid Measures (in case of electrolyte leakage from the battery)

- Eye contact : Flush the eyes with plenty of clean water for at least 15 minutes immediately, without rubbing. Get immediate medical treatment. If appropriate procedures are not taken, this may cause eye injury.
- Skin contact : Wash the contact areas off immediately with plenty of water and soap. If appropriate procedures are not taken, this may cause sores on the skin.
- Inhalation : Remove to fresh air immediately. Get medical treatment immediately.

5. Fire Fighting Measures

- Fire extinguishing agent : Alcohol-resistant foam and dry sand are effective.
- Extinguishing method : Be sure on the windward to extinguish the fire, since vapor may make eyes, nose and throat irritate, Wear the respiratory protection equipment in some cases.

6. Accidental Release Measures (in case of electrolyte leakage from the battery)

- Take up with absorbent cloth, treat cloth as inflammable.
- Move the battery away from the fire.

7. Handling and Storage

Handling:

- When packing the batteries, do not allow battery terminals to contact each other, or contact with other metals. Be sure to pack batteries by providing partitions in the packaging box, or in a separate plastic bag so that the single batteries are not mixed together.
- Use strong material for packaging boxes so that they will not be damaged by vibration, impact, dropping and stacking during their transportation.
- Do not short-circuit, recharge, deform, throw into fire or disassemble.
- Do not mix different type of batteries.
- Do not solder directly onto batteries.
- Insert the battery correctly in electrical equipment.

Storage:

- The batteries will be stored at room temperature, charged to about 70% of capacity.
- Do not let water penetrate into packaging boxes during their storage and transportation
- Do not store the battery in places of the high temperature or under direct sunlight
- Please also avoid the places of high humidity. Be sure not to expose the battery to condensation, rain or frozen condition.

8. Exposure Controls and Personal Protection

Acceptable concentration : Not specified about Lithium Battery.

Facilities : Nothing in particular.

Protective Equipment (in case of electrolyte leakage from the battery)

Respiratory Protection : For most condition no respiratory protection.

Hand Protection : Safety glove.

Respiratory Protection : Safety goggle.

9. Physical and Chemical Properties

Appearance : Coin shape

Voltage : 3.6 V

10. Stability and Reactivity

Since batteries utilize a chemical reaction they are actually considered a chemical product.

As such, battery performance will deteriorate over time even if stored for a long period of time without being used. In addition, the various usage conditions such as discharge, ambient temperature, etc. are not maintained within the specified ranges the life expectancy of the battery may be shortened or the device in which the battery is used may be damaged by electrolyte leakage.

11. Toxicological Information

Swallowing can lead to chemical burns, perforation of soft tissue, and death. Severe burns can occur within 2 hours of ingestion. Seek medical attention immediately.

12. Ecological Information

In case of the worn out battery was disposed in land, the battery case may be corroded, and leak electrolyte.

However, there is no environmental impact information.

Mercury (Hg), Cadmium (Cd) and Lead (Pb) are not used in cell.

13. Disposal Considerations

When the battery is worn out, dispose of it under the ordinance of each local government.

14. Transport Information

During the transportation of a large amount of batteries by ship, trailer or railway, do not leave them in the places of high temperatures and do not allow them to be exposed to condensation.

During the transportation do not allow packages to be fallen down or damaged.

Proper shipping Name : Lithium ion batteries.

UN Number, UN Class : UN3480, Class 9 (for the Air transport by PI 965 Section IA or IB)
: Exemption (for the Marine transport SP188 and the Air transport by Section II of PI 966 or 967).

Even though the cells are classified as lithium metal batteries (UN3480 or UN3481), they are not subject to some requirements of Dangerous Goods Regulations because they meet the following:

1. For cells, the Watt-hour rating is not more than 20 Wh;
2. Each cell is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria, Part III, sub-section 38.3.
3. Each cell is manufactured in ISO9001 certified factory.

Please refer to the following reference information about concrete ways of transportation. Actual content of packaging label and shipping documents varies by shipping companies. Make sure to confirm in advance with your shipping company.

Information of reference

	Reference	Packing Instruction (PI)/ Special provision (SP)	UN Number	Note
Air transport	IATA DGR	PI 965 Section I A	UN3480	Cells: SOC ≤ 30%, Cargo Aircraft only; Net quantity per package Max. 35kg
		PI 965 Section I B		Cells: SOC ≤ 30%, Cargo Aircraft only; Net quantity per package Max. 10kg
		PI 966 Section II	UN3481	Cells packed with equipment
		PI 967 Section II		Cells contained in equipment
Marine transport	IMDG Code	SP188		IMO/IMDG: not regulated.

15. Regulatory Information

- IATA Dangerous Goods Regulations 65th Edition (IATA DGR)
- IMO International Maritime Dangerous Goods Code 2022 Edition (IMDG Code)
- UN Recommendations on Transportation of Dangerous Goods, Model Regulations
- UN Recommendations on Transportation of Dangerous Goods, Manual of Tests and Criteria
- EU Battery Directive (EU) /2023/1542
- Regulation (EC) No. 1907/2006 on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)
- Act on Preventing Environmental Pollution of Mercury (China)

16. Other Information

This MSDS is provided to customers as reference information in order to handle batteries safely.

It is necessary for the customer to take appropriate measures depending on the actual situation such as the individual handling, based on this information.

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