

Material Safety Data Sheet

1. Chemical Product and Company Identification

Product name: Li-Ion Cells or Battery Pack

Product description: Lithium Iron Phosphate Chemistry

Application of the substance / the preparation: Consumable

Manufacturer: YUNTONG Power Co., Ltd

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2. Composition/Information on Ingredients

Ingredient Name	CAS#	Concentration
Lithium Iron Phosphate (LiFePO ₄)	15365-14-7	30-33%
Carbon, as Graphite	7440-44-0	15-17%
Organic Carbonates(EC/EMC/DEC)	N/A	15-20%
Polyvinylidene Fluoride(PVDF)	24937-79-9	1-6%
PP+PE	9003-07-0 9002-88-4	4-6%
Copper(Cu)	7440-50-8	7-10%
Aluminum(Al)	7429-50-5	5-8%
Nickel	7440-02-0	0.5-1%

3. Hazards identification

Lithium Ion batteries described in this MSDS data sheet are hermetically sealed and designed to withstand temperatures and pressures encountered during normal use. Under normal conditions of use, there is no physical danger of ignition, explosion or chemical danger of hazardous materials leakage. The materials contained in this battery may only represent a hazard if the integrity of the battery is compromised or if the battery is mechanically, thermally or electrically abused.

Caution: Do not open or disassemble the batteries. Do not expose the batteries to fire or open flame. Do not mix batteries of varying sizes, chemistries, or types. Do not short circuit, puncture, incinerate, crush, over-charge, over discharge, or expose the batteries to temperatures above the declared limit. Abuse of the batteries will result in the risk of fire or explosion, which could release hydrogen fluoride gas.

Human Health Hazard: Electrolyte may irritate skin and eyes. In the event of a battery rupture, electrolyte fumes/gases can cause serious damage to the eye and can cause sensitization and irritation to the respiratory tract.

4. First Aid measures

General advice: Burning and disassembly batteries may emit acrid smoke, irritating fumes, and toxic fumes of hazardous oxides of carbons, hydrofluoric acid and other toxic by-products.

Inhalation: Remove to fresh air, if breathing difficulty or discomfort occurs and persists, see a medical doctor. If breathing stopped, give artificial respiration and see a medical doctor immediately.

Skin contact: Remove contaminated clothing and thoroughly wash with soap and plenty of water. If irritation persists, consult a physician.

Eye contact: Rinse thoroughly with plenty of water for at least 15 minutes. If symptoms persist, call a physician. Ingestion: Swallowing a battery can be harmful. Contents of an open battery can cause serious chemical burns of mouth, esophagus, and gastrointestinal tract. If open battery is ingested, do not induce vomiting or give food or drink. Seek medical attention immediately.

5. Fire-fighting Measures

Hazardous combustion products: When burned, hazardous products of combustion including fumes of carbon monoxide, carbon dioxide, and fluorine can occur.

Extinguishing media: Water, carbon dioxide, dry chemical or foam.

Basic fire-fighting procedures: In the event of fire, wear self-contained breathing apparatus and protective clothing to avoid fume inhalation.

Unusual fire & explosion hazards: This material does not represent an unusual fire or explosion hazard.

Flash point: N/A

Auto ignition temperature: N/A

Flammability limits in air, lower: N/A

Flammability limits in air, upper: N/A

6. Accidental Release Measures

Personal precautions: Evacuate personnel to safe areas, ventilate the area. Refer to protective measure listed in section 7 and 8.

Environment precautions: Sweep up and place in a suitable container, dispose or waste according to local, state and federal laws and regulations.

7. Handling and Storage

Handling

Battery charge: Charge according to manufacture's specifications.

Battery disassembly: The batteries should never be disassembled, or mechanically abused. Should a battery unintentionally crushed or opened, thus releasing its content, rubber gloves should be used to handle battery components. The inhalation of any vapor that may be emitted should be avoided.

Short circuiting of a battery: As with any battery, short circuit causes heating. In addition, short circuit reduces the life of the battery and can lead to ignition of surrounding materials. Physical contact with to short-circuited battery can cause skin burns.

Reverse polarity: Avoid revering the battery polarity within a battery pack, this can cause the battery or the battery to be damaged or flame.

Storage

Storage preferably in cool, dry and ventilated area, don't place the battery near heating equipment, nor expose to direct sunlight for long periods. Elevated temperatures can result in shortened battery life and degrade performance.

8. Exposure Controls/Personal Protection

Respiratory protection: No necessary under normal use. In case electrolyte leakage from battery, protect hand with chemical resistant rubber gloves. If battery is burning, leave the area immediately. In abuse, use NIOSH approved acid gas filter mask or self-contained breathing apparatus.

Ventilation: No necessary under normal use. In case of abuse, use adequate mechanical ventilation for battery that vent gas or fumes.

Protective gloves: None under normal use. In case of spill use PVC, neoprene or nitrile gloves of 15 mils(0.015 inch) or thicker.

Eye protection: None required under normal conditions. Use ANSI approved chemical work safety goggles or face shield, if handling a leaking or rupture battery.

Skin protection: No necessary under normal use. Use rubber apron and protective working in case of handling of a rupture battery.

Other protective equipment: Chemical resistance clothing is recommended along with eye wash station and safety shower should be available meeting ANSI design criteria.

Work hygienic practice: Use good chemical hygiene practice. Wash hands after use and before drinking, eating or smoking. Wash hands thoroughly after cleaning-up a battery spill caused by leaking battery. No eating, drinking, or smoking in battery storage area. Launder contaminated cloth before reuse.

Supplementary safety and health data: If the battery is broken or leaked the main hazard is the electrolyte. The electrolyte is mainly solution of LiPF₆, EC, EMC and DEC.

9. Physical and Chemical Properties

Physical state: Solid-article

Freezing point: N/A

Boiling point: N/A

Density: N/A

Vapor pressure: N/A

Vapour density: N/A

Flash point: N/A

Evaporation rate: N/A

10. Stability and reactivity

Stability: Stable during normal operation conditions.

Conditions/materials to avoid: Incompatible with water, moisture, strong oxidizing agents, reducing agents, acids and bases.

Hazardous decomposition or byproducts: None under normal operating conditions. Carbon dioxide and hydrogen fluoride gas may be generated during combustion of battery.

Ventilation requirements: Not necessary under normal conditions of use.

11. Toxicological Information

There is no available data for the product itself. The information for the internal cell materials are as follows:

Irritancy: The electrolytes contained in the battery can irritate eyes with any contact. Prolonged contact with skin or mucus membrane may cause irritation.

Sensitization: The nervous system of respiratory organs may be stimulated sensitively.

Carcinogenicity: No information is available at this time.

Reproductive toxicity: No information is available at this time.

Teratogenicity: No information is available at this time.

Mutagenicity: No information is available at this time.

12. Ecological Information

- a.** When properly used or disposed, the YUNTONG batteries do not present environmental hazard.
- b.** The battery does not contain mercury, cadmium or lead.
- c.** Do not let internal components enter marine environment. Avoid release to waterways, wastewater or groundwater.

13. Disposal Considerations

- a.** Waste disposal must be in accordance with the applicable regulations.
- b.** Disposal of the YUNTONG lithium rechargeable batteries should be performed by permitted, professional disposal firms knowledgeable in federal, state or local requirements of hazardous waste treatment and hazardous waste transportation.
- c.** Incineration should never be performed by battery use.
- d.** The YUNTONG batteries contained recyclable materials. Recycling options available in your local area should be considered when disposing of this product, through licensed waste carrier.
- e.** The YUNTONG batteries should have their terminal insulated in order to prevent short circuits during transportation to the disposal site.

14. Transportation Information

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

- a.** The International Civil Aviation Organization (ICAO) Technical Instructions, Packing Instruction 965, Section I B or II (2020-2021 Edition)
- b.** The International Air Transport Association (IATA) Dangerous Goods Regulations, Packing Instruction 965, Section I B or II (62th Edition, 2021)
- c.** The International Maritime Dangerous Goods (IMDG) Code (2021 Edition).
[Special provision 188, 230]
- d.** US Hazardous Materials Regulations 49 CFR (Code of Federal Regulations) Sections 173.185 batteries and cells.
- e.** The UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria 38.3 Lithium batteries, Revision 3, Amendment 1 or any subsequent revision and amendment applicable at the date of the type (latest version is Revision 5, Amendment 2)
- f.** UN No. 3480

Special shipping information:

These batteries should be placarded and labeled as defined in DOT, IATA and IMDG regulations based on mode of transportation.

This consignment have passed UN 38.3 test report.

Emergency contact no.86-760-23699088,contact person: Danny Guo

The consignment does not contains any recalled and defective batteries.

15. Regulatory Information

- 1.** The transportation of the lithium batteries is regulated by the United Nations."Model Regulations on Transport of Dangerous Goods".
- 2.** Lithium batteries and cells are subjected to shipping requirements exceptions under 49 CFR 173.185.
- 3.** Shipping of lithium batteries in aircrafts are regulated by the international civil aviation organization(ICAO) ad the international air transport association (IATA) requirements inspecial provision"A88"
- 4.** Shipping of lithium batteries on sea are regulated the international maritime dangerous goods(IMDG) requirements of UN3480.

16. Other Information

The information and recommendations set forth are made in good faith and are believed to be accurate at the date of preparation. YUNTONG makes no warranty expressed or implied with respect to this information and recommendations and disclaims all liability from reliance on it."Equivalent lithium content" information is available from YUNTONG on request.

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