

Production of MSDS proving UN manual of Tests and Criteria, Part III, sub-section 38.3 is met. The International Air Transport Association (IATA) Dangerous Goods Regulations 2024 65th Edition, comply to Section II/Section IB of PI965, or Section II of PI966-PI967 can be transported.

MATERIAL SAFETY DATA SHEET	24 Hour Emergency Contact +86-755-21005221 NOTE: National Response Center emergency number to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.
IMPORTANT: Provide this information to employees, customers, and users of this product. Read this MSDS before handling or disposing of Honcell LiFePO ₄ Batteries. It is covered by the OSHA Hazard Communication Standard and this document has been prepared in accordance with requirements of this standard.	

SECTION 1: Company Identification

Company: Shenzhen Honcell Energy Co.,Ltd.
Brands: HONCELL, is short as HCF.
Address: 612, Blog.A Weidonglong Mansion, #194 Meilong Ave.
Longhua New District, SZ, 518109, China
[T]: +86-755-21005221
[F]: +86-755-21000249
Emergency Contact: +86-755-21005221
Email: info@honcell.com
Website: www.honcell.com

SECTION 2: Product Identification

Product Name: Honcell LiFePO₄ Batteries
Battery Type: Rechargeable Lithium-iron Phosphate (Abbreviated as "LiFePO₄")
DOT Description: Lithium-iron(Phosphate);Secondary Battery;Rechargeable
Model Number: HCF18650ZC-2S2P, 6.4V, 4000mAh, 25.6Wh

SECTION 3: Hazardous Ingredients / Identity Information

Components	CAS No.	Approximate Percentage of Total Weight
LiFePO4	156-21-8	29.87%
Graphite	7782-42-5	13.92%
Al	7429-90-5	4.3%
Cu	7440-50-8	9.43%
LiPF6	21324-40-3	1.92%
Stell	12597-68-1	18.14%
DMC	616-38-6	6.72%
Others	N.A	15.7%

Note: CAS number is the Chemical Abstract Service Registry Number
 N.A= Not Apply.

SECTION 4: Physical/Chemical Characteristics

Appearance: Cylindrical solid object with silver outside covering and lead wires from battery pack [positive "P+" (red) and negative "P-" (black)] or steel mantle cover.

SECTION 5: Emergency and First Aid Procedures

In the event of accidental battery material contact due to a damaged or ruptured battery cell please follow these emergency guidelines:

Eye Contact: Immediately rinse eyes with water for 15 minutes and seek medical attention.

Skin Contac: Immediately wash affected area with soap and water. Remove contaminated clothing and shoes.

Inhalation of Gases: Immediately move affected victims to fresh air or well ventilated areas and seek medical attention.

Ingestion: Seek medical attention immediately.

Swallowing: Do not induce vomiting and get medical attention immediately.

SECTION 6: Fire Fighting Measures

Extinguishing Media: CO₂, Dry chemicals, water or Foam Extinguishers
Fire-Fighting Procedures: Use a positive pressure self-contained breathing apparatus if batteries are involved in a fire. Full protective clothing is necessary. During water application, caution is advised as burning pieces of flammable particles may be ejected from the fire.

Unusual Fire and Explosion Hazards: Toxic gases (HF, PF₆) will be formed if cells or battery are involved in a fire. Cells or battery may flame or leak potentially hazardous organic vapors if exposed to excessive heat, fire or over-voltage conditions. Damaged or opened cells or batteries may result in rapid heat and the release of flammable vapors. Vapors may be heavier than air and may travel along the ground or be moved by ventilation to an ignition source and flash back.

SECTION 7: Accidental Release Measures

The materials contained within the batteries can only be released under abusive conditions. Use a shovel or broom to cover the battery with dry sand and place in a non-flammable, well ventilated area.

SECTION 8: Handling and Storage

Batteries should never be opened, destroyed or incinerated as doing so may lead to leakage, rupture, or fire and the materials contained inside may be released.

Batteries should only be recharged using approved chargers and approved procedures.

Do not directly heat, throw in fire or solder directly.

Do not mix with other types of batteries or other battery sizes or capacities.

Batteries should be separated from other materials and stored in a non-combustible, non-flammable, well ventilated, sprinkler-protected structure with sufficient clearance between walls and batteries.

Do not place batteries near heating equipment, nor expose to direct sunlight for long periods of time.

Do not store batteries above 60°C or below -20°C. Store batteries in a cool (below 20°C, dry area that is subject to little temperature change. Elevated temperatures can result in reduced battery service life. Battery exposure to temperatures in excess of 130°C will result in the battery venting flammable liquid and gases.

Do not store batteries in a manner that allows terminals to short circuit. More than a momentary short circuit will cause temporary battery voltage loss until the battery is subjected to a charge.

SECTION 9: Personal Protection

No controls are required for handling batteries that have not been damaged.

Personal protective equipment for damaged batteries should include chemical resistant gloves and safety glasses. In the event of a fire, SCBA should be worn along with thermally protective outer garments.

SECTION 10: Reactivity and Stability Data

Extended short-circuiting creates high temperatures in the cell. High temperatures can cause burns in skin or cause the cell to flame.

Avoid reversing battery polarity within the battery assembly. To do so may cause cell to flame or to leak.

Do not heat above 60°C or incinerate.

Do not puncture, disassemble, short circuit, deform, crush or mutilate.

SECTION 11: Toxicological Information

Irritancy: The electrolytes contained in this battery can irritate eyes with any contact. Prolonged

contact with the skin or mucous membranes may cause irritation.

SECTION 12: Ecological Information

Not Known

SECTION 13: Transport Information

These batteries have been tested to Section 38.3 of 'UN Manual of Tests and Criteria'. The amount of Lithium contained in these batteries is below the limits set by the Department of Transportation (DOT) in Section 49CFR173.185 and IATA. These can be shipped with the following label:

LITHIUM IRON PHOSPHATE (LiFePO4) RECHARGEABLE BATTERIES INSIDE
(No Lithium Metal)

DO NOT DAMAGE OR MISHANDLE THIS PACKAGE
IF PACKAGE IS DAMAGED, BATTERIES MUST BE QUARANTINED, INSPECTED AND REPACKED.
FOR EMERGENCY INFORMATION, CALL HONCELL 24 HOUR EMERGENCY LINE +86-755-21005221

Transport Method	International Conventions	Ship As	Approved
Air	International Air Transportation Association (IATA)	Non- Hazardous	Yes
Sea	International Maritime Dangerous Goods (IMDG)	Non- Hazardous	Yes

Packing Instruction: The lithium ion battery with a Watt-hour rating not exceeding 100Wh or the cell with a Watt-hour rating is not exceeding of 20Wh. The lithium ion batteries according to Section II/Section IB of PACKING INSTRUCTION 965, or Section II of PACKING INSTRUCTION 966-967 of the 2022 Dangerous Goods regulation 63rd Edition may be transported.

PI968: Battery ≤ 2g lithium or Cell ≤ 1g lithium

UN number of lithium battery: UN3480 or UN3481.

UN Proper shipping name/Description(technical name): Lithium ion battery or lithium ion batteries contained in equipment or Lithium ion batteries packed with equipment.

SECTION 14: Regulatory Information

The international transportation of lithium cells and batteries is regulated by the International Civil Aviation Organization (ICAO) Technical Instructions and corresponding International Air

Transport Association (IATA) Dangerous Goods Regulations, and the International Maritime Dangerous Goods (IMDG) Code.

USA: This MSDS meets/exceeds OSHA requirements.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

International:

This MSDS conforms to European Union (EU), the International Standards Organization (ISO) and the International Labour Organization (ILO).

PRODUCT USAGE INSTRUCTIONS**SECTION 15: Safety During Use Instructions**

1. Always use a charger specifically designed for LiFePO4 batteries. Never use NiCd or NiMH type chargers to charge LiFePO4 batteries. Failure to do so will damage the batteries and may cause fire and personal injury.
2. Always charge batteries in a fire proof container. Do not charge batteries on wood, cloth, carpet, in your model, or on any other flammable material. Keep a chemical fire extinguisher nearby in case of fire.
3. Never leave batteries unattended while charging. Always observe batteries when charging so that you may react quickly to any problems that may occur.
4. If a battery is deformed, swollen or appears damaged, DO NOT CHARGE. Follow the disposal instructions below to properly and safely dispose the battery.
5. Any time you have an accident with your model or if the battery swells "balloons" or if the battery exceeds temperature guidelines, follow these safety steps:

- a. Immediately remove the battery pack from your model or charger.
 - b. Place the battery in a non-flammable, well ventilated area.
 - c. Observe the battery for 30 minutes from a safe distance.
 - d. After 30 minutes, if the pack appears stable, is not swollen and does not show any signs of damage, return the battery pack to normal use with caution.
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6. Do not let exposed battery wires touch each other. This may cause the battery to short and potentially cause a fire.
 7. Store your batteries in a cool, dry place between 40-80 F° / 4-26 °C
 8. Do not assemble unmatched or dissimilar LiFePO4 cells.
 9. Store battery packs out of the reach of children and pets.

SECTION 16: Safety During Charging Instructions

1. Honcell I LiFePO4 battery pack features a PCM protection measure that isolates the cell in a pack. This ensures the battery pack has the function of short circuit protection, over charge protection, over discharge protection, over current protection.
2. Charge each battery pack individually. Never charge battery packs in series. Charging packs in series may result in improper charger cell recognition and an improper charging rate that may lead to overcharging, cell damage and fire.
3. Always check to make sure that your charger settings match those listed on the battery pack label. Refer to the battery label for the proper cell count and charging amperage setting. Selecting a cell count or amperage charge rate other than the one listed on the battery pack will damage the battery and may cause a fire.
4. Make sure the battery connections are connected in the correct polarity. A wrong connection will damage the battery and may cause a fire.
5. Always check battery pack voltage before charging. Do not discharge LiFePO4 batteries below 2.5 Volts per cell. The voltage of a typical LiFePO4 cell at rest is 3.2 Volts. If the battery pack appears swollen or damaged, DO NOT attempt to charge it.
6. Do not charge at over 1C current. $C = \text{battery pack mAh capacity} \div 1000$. Divide the battery mAh capacity by 1000 to determine the proper charge rate. Example: $1200\text{mAh} \div 1000 = 1.20$ Amps. Charge Rate for Honcell LiFePO4 Battery Packs is always preferred at 1C, example:

- a. 800mAh Capacity = 0.80 Amps
- b. 1200mAh Capacity = 1.20 Amps
- c. 2000mAh Capacity = 2.00 Amps

7. Do not peak charge to more than 4.2 Volts per cell. Example: A 2S Battery Pack contains two cells, therefore the peak voltage should not exceed 8.4 Volts.

8. Battery Temperature is critical. Please use the following guidelines:

- a. Charge Temp Range: 0-45°C
- b. Discharge Temp Range: -20°C-60°C
- c. Recommended Storage Temp Range: -10°C-+35°C

For optimum performance in cold climates, warm to 23+/-2°C before use.

SECTION 17: Safety During New Battery Break-In

- 1. New LiFePO₄ battery packs may require 12 or more charge/discharge cycles before the battery's optimum performance is reached.
- 2. During this time, it is recommended that the battery pack is not discharged over 1C, which 1C = battery pack mAh capacity ÷ 1000.

Example: $[(1250\text{mAh} \div 1000) \times 1] = 1.25 \text{ Amps}$

Recommended Maximum Discharge Rates During Break-In Period is always preferred at 1C or less.

- a. 800mAh Capacity = 0.8 Amps
- b. 1200mAh Capacity = 1.2 Amps
- c. 2000mAh Capacity = 2.0 Amps

SECTION 18: Safety During Discharging

- 1. Never discharge a LiFePO₄ battery pack at more than the manufacturers recommended discharge rate.

2. The discharge rate is: Battery pack capacity (mAh) ÷ 1000 x Pack C rating
 - a. Example for 3c packs: $(1000 \text{ mAh} \div 1000) \times 3c = 3.0 \text{ Amps}$
 - b. Example for 5c packs: $(3000 \text{ mah} \div 1000) \times 5c = 15.0 \text{ Amps}$

SECTION 19: Battery Disposal Instructions

1. Discharge battery pack to 2.5 Volts per cell or less.
2. Fill a bucket with enough water to submerge the battery pack completely.
3. Add salt to the water until no more salt will dissolve; the water is now saturated with salt.
4. Place the battery pack in the bucket and leave submerged in the salt water solution for 24 hours.
5. Remove the battery pack from the salt water and test the voltage.
6. If the voltage does not read 0.0 Volts, re-submerge and re-test until the voltage reads 0.0 Volts.
7. Once the battery pack has been discharged to 0.0 Volts, it is safe to dispose.
8. Dispose in according to local, state and country regulations.
9. These batteries do not contain any materials listed by the U.S. EPA that require special disposal requirements.

SECTION 20: Additional Information

The information contained herein is based on the data available to us and believed to be correct. However, Honcell Energy makes no warranty, expressed or implied. Users should consider the data only as a supplement to other information gathered through personal research and must make independent determinations of the suitability and completeness of information from all sources to ensure the proper use and disposal of these materials and the safety and health of employees and customers.