

MATERIAL SAFETY DATA SHEET

Product	Rechargeable Li-ion Battery Pack
Model/Type	ACFR1B
Issue Date	2024-12-09
Validity	2025-01-01 ~ 2025-12-31
Compiler	Fan lijun
Approver	Xiao ke

Material Safety Data Sheet

Section 1-Chemical Product and Company Identification

Product	Rechargeable Li-ion Battery Pack
Type/Model	ACFR1B
Parameter	3.89V, 1255mAh, 4.89Wh
Equivalent lithium content	20.5g
Approximate Weight	0.55g
Usage	Used in portable Equipment
Company	Guangdong Highpower New Energy Technology Co., Ltd.
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Section 2-Hazards Identification

Preparation hazards and classification	Not dangerous with normal use. Do not dismantle, open or shred Li-ion Battery. Exposure to the ingredients contained within or their ingredients products could be harmful.
Appearance, Color, and Odor	Solid object with no odor, black.
Primary Route(s) of Exposure	These chemicals are contained in a sealed stainless steel enclosure. Risk of exposure occurs only if the cell is mechanically, thermally or electrically abused to the point of compromising the enclosure. If this occurs, exposure to the electrolyte solution contained within can occur by Inhalation, Ingestion, Eye contact and Skin contact.

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Potential Health Effects:	<p>ACUTE (short term): see Section 8 for exposure controls In the event that this battery has been ruptured, the electrolyte solution contained within the battery would be corrosive and can cause burns.</p> <p>Inhalation: Inhalation of materials from a sealed battery is not an expected route of exposure. Vapors or mists from a ruptured battery may cause respiratory irritation.</p> <p>Ingestion: Swallowing of materials from a sealed battery is not an expected route of exposure. Swallowing the contents of an open battery can cause serious chemical burns of mouth, esophagus, and gastrointestinal tract.</p> <p>Skin: Contact between the battery and skin will not cause any harm. Skin contact with contents of an open battery can cause severe irritation or burns to the skin.</p> <p>Eye: Contact between the battery and the eye will not cause any harm. Eye contact with contents of an open battery can cause severe irritation or burns to the eye.</p> <p>CHRONIC (long term): see Section 11 for additional toxicological data</p>
Medical Conditions Aggravated by Exposure	Not applicable
Reported as carcinogen	Not applicable

Section 3-Composition/Information on Ingredients

Ingredient	Molecular formula	CAS No.	Weigh
Lithium Cobalt Oxide	LiCoO ₂	12190-79-3	35%~38%
Graphite powder	C ₂₄ X ₁₂	7782-42-5	23%~25%
Lithium hexafluorophosphate	LiPF ₆	21324-40-3	12%~15%
Laminated aluminum film	Al	7429-90-5	0.5%~1%
Aluminum foil	Al	7429-90-5	2%~6%
Copper foil	Cu	7440-50-8	5%~10%
Aluminum	Al	7429-90-5	2%~3%
Polypropylene	(C ₃ H ₆) _n	9003-07-0	1%~2%
Nickel	Ni	7440-02-0	2%~3%
Poly(oxy-1,2-ethanediylloxycarbonyl-1,4-phenylenecarbonyl)	(C ₁₀ H ₈ O ₄) _n	25038-59-9	0.01%~1.05%
Acrylic	C ₅ H ₈ O ₂	9011-14-7	0.01%~1.05%
Polyvinylidene fluoride(PVDF)	(C ₂ H ₂ F ₂) _n	24937-79-9	0.5%~2%
Polyethylene	(C ₂ H ₄) _n	9002-88-4	2%~5%

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Section 4-First-aid Measures

Inhalation	If contents of an opened battery are inhaled, remove source of contamination or move victim to fresh air. Obtain medical advice.
Skin Exposure	If skin contact with contents of an open battery occurs, as quickly as possible remove contaminated clothing, shoes and leather goods. Immediately flush with lukewarm, gently flowing water for at least 30 minutes. If irritation or pain persists, seek medical attention. Completely decontaminate clothing, shoes and leather goods before reuse or discard.
Eye Exposure	If eye contact with contents of an open battery occurs, immediately flush the contaminated eye(s) with lukewarm, gently flowing water for at least 30 minutes while holding the eyelids open. Neutral saline solution may be used as soon as it is available. If necessary, continue flushing during transport to emergency care facility. Take care not to rinse contaminated water into the unaffected eye or onto face. Quickly transport victim to an emergency care facility.
Ingestion	If ingestion of contents of an open battery occurs, never give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. Have victim drink 60 to 240 mL (2-8 oz.) of water. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Have victim rinse mouth with water again. Quickly transport victim to an emergency care facility.

Section 5-Fire Fighting Measures

Flammable Properties	In the event that this battery has been ruptured, the electrolyte solution contain within the battery would be flammable. Like any sealed container, battery cells may rupture when exposed to excessive heat; this could result in the release of flammable or corrosive materials.
Suitable extinguishing Media	Plenty of water, dry chemical powder or carbon dioxide.
Unsuitable extinguishing Media	Not available
Explosion Data	Sensitivity to Mechanical Impact: This may result in rupture in extreme cases Sensitivity to Static Discharge: Not Applicable
Specific Hazards arising from the chemical	Fires involving Li-ion Battery can be controlled with water. When water is used, however, hydrogen gas may evolve. In a confined space, hydrogen gas can form an explosive mixture. In this situation, smothering agents are recommended to extinguish the fire

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Protective Equipment and precautions for firefighters	As for any fire, evacuate the area and fight the fire from a safe distance. Wear a pressure-demand, self-contained breathing apparatus and full protective gear. Fight fire from a protected location or a safe distance. Use NIOSH/MSHA approved full-face self-contained breathing apparatus(SCBA) with full protective gear.
NFPA	Health: 0 Flammability: 0 Instability: 0

Section 6-Accidental Release Measures

Personal Protective equipment, and emergency procedures	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.
Environmental Precautions	Prevent material from contaminating soil and from entering sewers or waterways.
Methods and materials for Containment	Stop the leak if safe to do so. Contain the spilled liquid with dry sand or earth. Clean up spills immediately.
Methods and materials for cleaning up	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.

Section 7-Handling and Storage

Handling	Don't handling Li-ion Battery with metalwork. Do not open, disassemble, crush or burn battery. Ensure good ventilation/ exhaustion at the workplace. Prevent formation of dust. Information about protection against explosions and fires: Keep ignition sources away- Do not smoke.
Storage	If the Li-ion Battery are subject to storage for such a long term as more than 3 months, it is recommended to recharge the Li-ion Battery periodically. 3 months: -10 °C ~+40 °C , 45 to 85%RH And recommended at 0 °C ~+35 °C for long period storage. The capacity recovery rate in the delivery state (50% capacity of fully charged) after storage is assumed to be 80% or more.
	Do not storage Li-ion Battery haphazardly in a box or drawer where they may short-circuit each other or be short-circuited by other metal objects. Keep out of reach of children.

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	<p>Do not expose Li-ion Battery to heat or fire.</p> <p>Avoid storage in direct sunlight.</p> <p>Do not store together with oxidizing and acidic materials.</p>
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Section 8-Exposure Controls/Personal Protection

Engineering Controls	Use local exhaust ventilation or other engineering controls to control sources of dust, mist, fumes and vapor. Keep away from heat and open flame. Store in a cool, dry place.
Personal Protective Equipment	<p>Respiratory Protection: Not necessary under normal conditions.</p> <p>Skin and body Protection: Not necessary under normal conditions, Wear neoprene or nitrile rubber gloves if handling an open or leaking battery.</p> <p>Hand protection: Wear neoprene or natural rubber material gloves if handling an open or leaking battery.</p> <p>Eye Protection: Not necessary under normal conditions, Wear safety glasses if handling an open or leaking battery.</p>
Other Protective Equipment	Have a safety shower and eye wash fountain readily available in the immediate work area.
Hygiene Measures	<p>Do not eat, drink, or smoke in work area.</p> <p>Maintain good housekeeping.</p>

Section 9-Physical and Chemical Properties

Physical State	Form: Solid	
	Color: Black	
	Odour: Monotony	
Change in condition:		
pH, with indication of the concentration		Not applicable
Melting point/freezing point		Not available.
Boiling Point, initial boiling point and Boiling range:		Not available.
Flash Point		Not available.
Upper/lower flammability or explosive limits		Not available.
Vapor Pressure:		Not applicable

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Vapor Density: (Air = 1)	Not applicable
Density/relative density	Not available.
Solubility in Water:	Insoluble
n-octanol/water partition coefficient	Not available.
Auto-ignition temperature	130°C
Decomposition temperature	Not available.
Odour threshold	Not available.
Evaporation rate	Not available.
Flammability (soil, gas)	Not available.
Viscosity	Not available.

Section 10- Stability and Reactivity

Stability	The product is stable under normal conditions.
Conditions to Avoid (e.g. static discharge, shock or vibration)	Do not subject Li-ion Battery to mechanical shock. Vibration encountered during transportation does not cause leakage, fire or explosion. Do not disassemble, crush, short or install with incorrect polarity. Avoid mechanical or electrical abuse.
Incompatible Materials	Not Available
Hazardous Decomposition Products	This material may release toxic fumes if burned or exposed to fire
Possibility of Hazardous Reaction	Not Available

Section 11-Toxicological Information

Irritation	Risk of irritation occurs only if the cell is mechanically, thermally or electrically abused to the point of compromising the enclosure. If this occurs, irritation to the skin, eyes and respiratory tract may occur.
Sensitization	Not Available

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Neurological Effects	Not Available
Teratogenicity	Not Available
Reproductive Toxicity	Not Available
Mutagenicity (Genetic Effects)	Not Available
Toxicologically Synergistic Materials	Not Available

Section 12-Ecological Information

General note:	Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
Anticipated behavior of a chemical product in environment/possible environmental impact/ecotoxicity	Not Available
Mobility in soil	Not Available
Persistence and Degradability	Not Available
Bioaccumulation potential	Not Available
Other Adverse Effects	Not Available

Section 13-Disposal Considerations

Product disposal recommendation: Observe local, state and federal laws and regulations. Packaging disposal recommendation: Be aware discarded batteries may cause fire, tape the battery terminals to insulate them. Don't disassemble the battery. Completely discharge containers (no tear drops, no powder rest, scraped carefully). Containers may be recycled or re-used. Observe local, state and federal laws and regulations.

The potential effects on the environment and human health of the substances used in batteries and accumulations; the desirability of not disposing of waste batteries and accumulators as unsorted municipal waste and of participating in their separate collection so as to facilitate treatment and recycling.

Section 14-Transport Information

General packaging requirement

1. The cells or batteries must be protected so as to prevent short circuits.
2. The cells or batteries or equipment must be packed in suitable strong outer packaging.

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3.If batteries contained in equipment, equipment must be secured against movement within the outer packaging and be packed so as to prevent accidental activation.					
No.	UN numbers & P.S.N., if applicable		No.	UN numbers & P.S.N., if applicable	
(01)	UN 3480, LITHIUM ION BATTERIES		(04)	UN 3090, LITHIUM METAL BATTERIES	
(02)	UN 3481, LITHIUM ION BATTERIES PACKED WITH EQUIPMENT		(05)	UN 3091, LITHIUM METAL BATTERIES PACKED WITH EQUIPMENT	
(03)	UN 3481, LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT		(05)	UN 3091, LITHIUM METAL BATTERIES CONTAINED IN EQUIPMENT	
No.	Hazard Class	Packing Group	Packaging requirement		
☑	Air transportation, according to IATA-DGR 66th Edition (Effective 1 January-31 December 2025)				
(01)	Class 9	NIL	PACKING INSTRUCTION 965, section IB		
(02)	Not restricted	NIL	PACKING INSTRUCTION 966, section II		
(03)	Not restricted	NIL	PACKING INSTRUCTION 967, section II		
☑	Maritime transportation, according to IMO IMDG Code (Amend 42-24)				
(01)	Not restricted	NIL	Special provision 188		
(02)	Not restricted	NIL	Special provision 188		
(03)	Not restricted	NIL	Special provision 188		
Remark	In "Hazard Class", "Class 9" means "Class 9 dangerous goods", and "Not restricted" means that they are not restricted				
	In "Packing Group", "II" means " Packing Group II" and "NIL" means "No requirement"				

Section 15-Regulatory Information

Dangerous Goods Regulation (DGR)
 Recommendations on the Transport of Dangerous Goods Model Regulations
 International Maritime Dangerous Goods (IMDG)
 Occupational Safety and Health Act (OSHA)
 Toxic Substances Control Act (TSCA)
 Code of Federal Regulations (CFR)
 Technical Instructions for the Safe Transport of Dangerous Goods
 California Proposition 65
 Superfund Amendments and Reauthorization Act Title III (302/311/312/313) (SARA)
 Globally Harmonized System of Classification and Labeling of Chemicals(GHS)
 In accordance with all Federal, State and local laws.

Section 16-Other Information

According standard

GB/T 16483-2008 Safety data sheet for chemical products Content and order of sections



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ISO 11014:2009(E) Safety data sheet for chemical products – Content and order of sections

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Other Information

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The data/information contained herein has been reviewed and approved for general release on the basis that this document contains no export controlled information.