



SHENZHEN JUHEYUAN SCIENCE&TECHNOLOGY CO., LTD.

Tianlong Lane, Qingshui Rd, Longxi Community, Longcheng Street, Longgang District, Shenzhen City, P.R. China. Tel: +86-0755-84516700 Fax: +86-0755-84516750
Email: info@jhypower.com Website: www.jhyenergy.com

MATERIAL SAFETY DATA SHEET

Reference No. 170101B

LITHIUM ION BATTERY

1. PRODUCT IDENTIFICATION AND COMPANY IDENTIFICATION

Product Name:	Lithium Ion Battery
Model	JHY 113441
Nominal Voltage:	3.7V
Typical Capacity:	1600mAh 5.92Wh

Manufacture: SHENZHEN JUHEYUAN SCIENCE&TECHNOLOGY CO., LTD.

Address: Tianlong Lane, Qingshui Rd, Longxi Community, Longcheng Street, Longgang District, Shenzhen City, P.R. China.

Tel: +86-0755-84516700

Fax: +86-0755-84516750

Emergency Tel: +86-0755-84516700

2. Composition & Information on Ingredients

Chemical Name	Concentration or concentration ranges (%)	CAS Number
Lithium Cobalt Oxide (CoLiO ₂)	15-40	12190-79-3
Graphite	10-30	7782-42-5
Phosphate(1-), hexafluoro-, lithium	10-30	21324-40-3
Copper	7-13	7440-50-8
Aluminum foil	5-10	7429-90-5
Nickel	1-5	7440-02-0

Labeling according to EC directives.

No symbol and risk phrase are required.

Note: CAS number is Chemical Abstract Service Registry Number.

N/A=Not apply.

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3. HAZARD DATA

Hazard Categories	Not dangerous with normal use. Do not dismantle, open or shred Rechargeable Lithium ion battery the ingredients contained within or their ingredients products could be harmful.
Appearance, Color, Odor	Solid object with no odor, no color.
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.
Potential Health Effects	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. 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. 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. 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. 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. CHRONIC (long term): see Section 11 for additional toxicological data.
Reported as Carcinogen	Not applicable

4. First Aid Measures

In case of battery rupture or explosion, evacuate personnel from contaminated area and provide maximum ventilation to clear out corrosive fumes/gases and pungent odor.

In all case, seek immediate medical attention.

Inhalation	If contents of an opened battery are inhaled, remove source of contamination or move victim to fresh air. Obtain medical advice.
Skin contact	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 contact	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

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	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 240mL (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.

5. Fire-Fighting Measures

Fire and explosion hazard:	The battery can leak and/or spout vaporized or decomposed and combustible electrolyte fumes in case of exposure to excessive heat; this could result in the release of flammable or corrosive materials.
Extinguishing media:	Use extinguishing media suitable for the materials that are burning. <i>Suitable</i> : CO ₂ , Dry chemical or Foam extinguishers <i>Not to be used</i> : Type D extinguishers
Special exposure hazards:	Following cell overheating due to external source or due to improper use, electrolyte leakage or battery container rupture may occur and release inner component/material in the environment. Eye contact: The electrolyte solution contained in the battery is irritant to ocular tissues. Skin contact: The electrolyte solution contained in the battery causes skin irritation. Ingestion: The ingestion of electrolyte solution causes tissue damage to throat and gastro/respiratory tract. Inhalation: Contents of a leaking or ruptured battery can cause respiratory tract, mucus, membrane irritation and edema.
Explosion data	Sensitivity to Mechanical Impact: This may result in rupture in extreme cases Sensitivity to Static Discharge: Not Applicable
Protective equipment and precautions of 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

6. Accidental Release Measures

The material contained within the batteries would only be expelled under abusive conditions. Using shovel or broom, cover battery or spilled substances with dry sand or vermiculite, place in approved container (after cooling if necessary) and dispose in accordance with local regulations.

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Personal Precautions, 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.

7. Handling and Storage

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 let water penetrate into packaging boxes during their storage and transportation.
- The batteries will be stored at room temperature, charged to about 30-50% of capacity.
- Do not store the battery in places of the high temperature exceeding 35deg.C or under direct sunlight or in front of a stove. Please also avoid the places of high humidity. Be sure not to expose the battery to condensation, water drop or not to store it under frozen condition.
- Batteries are sure to be packed in such a way as to prevent short circuits under conditions normally encountered in transport.
- Please avoid storing the battery in the places where it is exposed to the static electricity so that no damage will not be caused to the protection circuit of the battery pack.

The batteries should not be opened, destroyed nor incinerated since they may leak or rupture and release in the environment the ingredients they contain.

Handling	Don't handling Rechargeable 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	Store in a cool (preferably below 30°C) and ventilated area away from moisture, sources of heat, open flames, food and drink. Keep adequate clearance between walls and batteries. Temperature above 70°C may



	<p>result in battery leakage and rupture. Since short circuit can cause burn, leakage and rupture hazard, keep batteries in original packaging until use and do not jumble them.</p> <p>If the Rechargeable Li-ion Battery is subject to storage for such a long term as more than 3 months, it is recommended to recharge the Rechargeable Li-ion Battery periodically.</p> <p>Keep out of reach of children.</p> <p>Do not expose Rechargeable Li-ion Battery to heat or fire. Avoid storage in direct sunlight. Do not store together with oxidizing and acidic materials</p>
Other	Follow Manufacturers recommendations regarding maximum recommended currents and operating temperature range.

Applying pressure on deforming the battery may lead to disassembly followed by eye, skin and throat irritation.

8. Exposure Controls/Personal Protection

Engineering Controls	<p>Use local exhaust ventilation or other engineering controls to control sources of dust, mist, fumes and vapor.</p> <p>Keep away from heat and open flame. Store in a cool, dry place.</p>
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 nitride 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	Do not eat, drink, or smoke in work area. Maintain good housekeeping.

9. Physical And Chemical Properties

9.1 Appearance (Physical State)

Form: Solid

Color: Silvery

Odour: Monotony

9.2 Temperature range:

	Continuous	Occasional
In storage	+30°C max	-30/+70°C
During discharge	-30/+70°C	-35/+70°C
During charge	0/+45°C	0/+45°C

9.3. Specific energy: about 130Wh/kg

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(Note : Wh = Nominal voltage x Rated Ah as defined in IEC Standard N° 285. Kg = Average battery weight)

9.4 Specific pulse power: about 300Wh/kg

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 Rechargeable 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. Do not heat above 70°C or incinerate.
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

11. Toxicological Information

Shenzhen JUHEYUAN Science & Technology Co., Ltd. Lithium Ion Batteries do not contain toxic materials.

12. Ecological Information

When properly used or disposed, the Lithium Ion Batteries do not present environmental hazard.

13. DISPOSAL CONSIDERATIONS

Dispose in accordance with applicable regulations which vary from country to country.

(In most countries, the trashing of used batteries is forbidden and the end-users are invited to dispose them properly, eventually through not-for-profit profit organizations, mandated by local governments or organized on a voluntary basis by professionals).

Lithium Ion batteries should have their terminals insulated and be preferably wrapped in plastic bags prior to disposal.

13.1 Incineration : Incineration should never be performed by battery users but eventually by trained professionals in authorized facilities with proper gas and fumes treatment.

13.2 Land filling: According to the proper laws and regulations in different countries or areas, the battery should be buried deeply in the specified place.

13.3 Recycling: Send to authorized recycling facilities, eventually through licensed waste carrier.

14. TRANSPORTATION INFORMATION

Based on IATA dangerous goods regulation 58th Effective 1st January 2017, packing

instruction 965 Section IB, the consignment is fully described by proper shipping name and

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packed, marked and in proper condition for carriage by air. According to the current edition of the IATA 58th Effective 1st January 2017, Dangerous goods regulations and all applicable carrier and government regulations and the battery can be shipped by air.

We also acknowledge that we may be liable for damage resulting from any blunder or omission and we further agree that any air carrier involved in the carriage of this consignment may reply upon this certification.

UN number: 3480 & 3481

UN Proper shipping name: a) LITHIUM ION BATTERIES (including lithium ion polymer batteries) or;
b) LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT or LITHIUM ION BATTERIES PACKED WITH EQUIPMENT (including lithium ion polymer batteries)

Transport hazard class(es): 9

Packing group (if applicable): IB

Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside their premises.

Transport information:

The transportation of primary lithium cells and batteries is regulated by the International Air Transport Association (According to **Section II / Section IB** of PACKING INSTRUCTION 965 ~ 967 of IATA DGR 58th Edition for transportation), International Civil Aviation Organization, International Maritime Dangerous Goods Code and the US Department of Transportation.

The batteries must meet the following criteria for shipment:

1. Air shipments must meet the requirements of Transportation listed in Special Provision A45 of the International Air.
2. Meet the requirements for the US Department of Transportation listed in 49 CFR 173.185.
3. Lithium batteries shipped as "Lithium batteries", "Lithium batteries packed with equipment", or "Lithium batteries contained in equipment" may not be classified as "Dangerous Goods" when shipped in accordance with "special provision A45 of IATA-DGR" or "special provision 188 of IMO-IMDG Code".
4. Separate batteries when shipping to prevent short-circuiting. They should be packed in strong packaging for support during transport. Each package are capable of withstanding a 1.2 m drop test in any orientation without:
 - damage to cells or batteries contained therein;
 - shifting of the contents so as to allow battery to battery (or cell to cell) contact;
 - release of contents.
5. Per IATA **Lithium Batteries as Cargo in 2017 Update III** Lithium ion cells and batteries must be offered for transport at a state of charge (SoC) not exceeding 30% of their rated design capacity.

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6. The transport of primary lithium batteries is prohibited aboard passenger aircraft. All packages must bear the Cargo Aircraft Only label in addition to the other marks and labels required by the Regulations.
7. Gross weight per package shall not exceed 10kgs.
8. Each consignment are accompanied with a document such as an air waybill with an indication that:
 - the package contains lithium ion cells or batteries;
 - the package are handled with care and that a flammability hazard exists if the package is damaged;
 - special procedures are followed in the event the package is damaged, to include inspection and repacking if necessary; and -a telephone number for additional information.
9. Each package are labeled with a lithium battery handling label.
10. More information concerning shipping, testing, marking and packaging can be obtained from <http://www.iata.org/publications/Pages/lithium-battery-guidelines.aspx>
<http://www.labelmaster.com/>
<http://www.iata.org/whatwedo/cargo/dgr/Pages/download.aspx>.

Even classified as lithium ion batteries (UN3480), 2017 IATA Dangerous Goods Regulations 58th edition Packing Instruction 965 Section IB is applied. The product is handled as Dangerous Goods by meeting the following requirements.

Lithium ion cells and batteries offered for transport are not subject to other additional requirements of the UN Regulations if they meet the following

- (1) For cells, the Watt-hour rating is not more than 20Wh;
- (2) For batteries, the Watt-hour rating is not more than 100Wh.
- (3) 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.

Regulatory Information

IATA Dangerous Goods Regulations 58th Edition Effective 1st January 2017.

ICAO Technical Instructions for the safe transport of dangerous goods by air.

Transport Fashion: By air, by sea, by railway, by road.

15. Regulatory Information

OSHA hazard communication standard (29 CFR 1910.1200)

Hazardous

√ Non-hazardous

16. Additional Information

This information has been compiled from sources considered to be dependable and is, to the best of our knowledge and belief, accurate and reliable. However, SHENZHEN JUHEYUAN SCIENCE & TECHNOLOGY CO., LTD. makes no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. Although reasonable precautions have been taken in the preparation of the data contained herein, it is offered solely for The information and recommendations set forth are made in good faith and believed to be accurate as of the date of presentation. SHENZHEN JUHEYUAN SCIENCE & TECHNOLOGY CO., LTD. makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities from reliance on it.



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January 1st,2017

Authorized Person: Long Jiangwei

Signature: