SAFETY DATA SHEET

Issue date:2015-9-21 Rev:2015-001

MSDS REF. NO.: SDS-C-09009-07

Section 1: Product and Company Identification

Product: Batteries

Trade name: LITHIUM-ION BATTERY

Electrochemical system:

Electrodes: Negative Electrode: C

Positive Electrode: LiCoO2

Electrolyte: LiPF6

Nominal Voltage: 11.1V

Model NO.: 18650

WAH VALUE: 7800mAh

WH VALUE: 86.58Wh

Company Name: Collection Power Sources Co., Ltd.

Address: 5F, Bldg C, KeLunTe Industrial Pack, Chuangyi Rd, Xiazao, Dalang, Longhua, Shenzhen 518109 China

Emergency Tel.: +86 0755 36690656 Fax: +86 0755 36690655

Section 2: Hazard Identification

2.1 Physical:

The LITHIUM-ION battery described in this Safety Data Sheet is not hazardous when used according to the recommendations of the manufacturer.

Under normal conditions of use, electrode materials and liquid electrolyte they contain are non-reactive provided the battery integrity is maintained and seals remain intact, Risk of exposure only in case of abuse,

e.g. mechanical, thermal, electrical, which leads to the activation of safety valves and/or the rupture of the battery containers. Electrolyte leakage, electrode materials reaction with moisture/water of battery vent/explosion/fire may follow depending upon circumstances.

2.2 Chemical:

Classification of dangerous Substances Contained into the Product as per Directive

Substance	Chemical Symbol	Content (%)	Melting Point ℃	Indication of Danger	Special Risk	Safety Advice
Lithium cobaltite	LiCoO2	23~33	> 1000		R22 R43	S2 S22 S24 S26 S36 S37 S45
Carbon	C	12~17	> 1000			
Organic solvents	EC DMC DEC	3	EC : 38°C DMC : 4°C DEC : -43°C		R21 R22 R41 R42/43	S2 S24 S26 S36 S37 S45
	LiPF6		N/A	Irritant Corrosive	R14	S2 S8 S22 S24 S26 S36

1). Name of Special Risks:

R14/15 Reacts with water and yields flammable gases

R21 Harmful in contact with skin

R22 Harmful us swallowed

R35 Causes severe burns

R41 Risk of serious damage to the eye
R42/43 May cause sensitization by inhalation and skin contact
R43 May cause sensitization by skin contact

2). Safety Advices:

S2 Keep out of reach from children
S8 Keep away from moisture
S22 Do not breathe dust
S24 Avoid contact with skin
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical attention
S36 Wear suitable protective clothing
S37 Wear suitable gloves
S45 In case of incident, seek medical attention

Section 3: Composition/Information on Ingredients

Lithium is mainly contained，while other substance please refer to“2.2 chemical”

Section 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 odors.

In all case, seek immediate medical attention,

Eye contact: Flush with plenty of water (eyelids-held open) for at least 15 minutes

Skin contact: Remove all contaminated clothing and flush affected areas with plenty of water and sop for at least 15minutes.

Ingestion: Dilute by giving plenty of water and get immediate medical attention.
Assure that the victim does not aspirate vomited material by use of positional drainage.
Assure that mucus does not obstruct the airway.
Do not give anything by mouth to an unconscious person

Inhalation: Remove to fresh air and ventilate the contaminated area.
Give oxygen or artificial respiration if needed.

Section 5: Fire-Fighting Measures

Fire and explosion hazard:	The batteries can leak and/or spout vaporized or decomposed and combustible electrolyte fumes in case of exposure above 90°C resulting from inappropriate use or from the environment. Possible formation of hydrogen fluoride (HF) and phosphorous oxides during fire. LiPF6 salt contained in the electrolyte releases hydrogen fluoride (HF) in contact with water.
Extinguishing media:	Suitable : CO2, Dry chemical or Foam extinguishers Not to be used : 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.
Special protective equipment:	Use self-contained breathing apparatus to avoid breathing irritant fumes. Wear protective clothing and equipment to prevent body contact with electrolyte solution

Section 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.

Section 7: Handling and Storage

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	Do not crush, pierce, short (+) and (-) battery terminals with conductive (i.e.metal) goods. Do not directly heat or solder. Do not throw into fire. Do not mix batteries of different types. Do not mix new and used batteries. Keep batteries in non-conductive (i.e. plastic) trays.
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 90°C may 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.
Other	Manufacturer 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.

Section 8: Exposure Controls/Personal Protection

Respiratory protection:	Not necessary under normal use. In case of battery rupture, use self-contained full-face respiratory equipment with type ABEK filter.
Hand protection:	Not necessary under normal use. Use rubber gloves if handling a leaking or ruptured battery.
Eye protection:	Not necessary under normal use. Wear safety goggles or glasses with side shields if handling a leaking or ruptured battery.
Skin protection:	Not necessary under normal use. Use rubber apron and protective working in case of handling of a ruptured battery.

Section 9: Physical and Chemical Properties

9.1 Appearance (Physical shape and color as supplied.)

9.2 Temperature range

	Temperature range
In storage	-20～+25℃ (less than 1 year)
During discharge	-20～+60℃

9.3 Specific energy: 135Wh/Kg

9.4 Specific pulse power: ≈ 300 Wh/kg

9.5 Mechanical resistance: As defined in relevant IEC standard

Section 10: Stability and Reactivity

Conditions to avoid	Heat above 90°C or incinerate. Deform, mutilate, crush, pierce, disassemble. Short circuit. Prolonged exposure to humid conditions.
Materials to avoid	N/A
Hazardous decomposition products	Corrosive/Irritant Hydrogen fluoride (HF) is produced in case of reaction of lithium (LiPF6) with water. Combustible vapors and formation of Hydrogen fluoride (HF) and phosphorous oxides during fire.

Section 11: Toxicological Information

The LITHIUM-ION batteries do not contain toxic materials.

Section 12: Ecological Information

When properly used or disposed, the LITHIUM-ION batteries do not resent environmental hazard.

Section 13: Disposal Considerations

Dispose in accordance with applicable regulations which vary from country to country. (In more countries, the thrashing of used batteries is forbidden and the end-users are invited to dispose them properly, eventually through not-for-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: Leach ability regulations (mg/l)

Component	Leach ability EC limit	EPA	Other*
Iron	100		5
Nickel	500	2	0.5

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

Section 14: Transport Information

The battery model listed has aggregate equivalent lithium content below the 100WH. The Lithium-ion Battery according to NEW PACKING INCTRUCTION 965 of IATA DGR56th, 2015 Edition for transportation and meets all requirements under UN Manual of Tests and Criteria Part III, subsection 38.3.

No.	ITEMS	RESULT	REMARKS
1	Altitude simulation	Pass	Test 1 to 5 must be conducted in sequence on the same cell or battery
2	Thermal test	Pass	
3	Vibration	Pass	
4	Shock	Pass	
5	External short circuit	Pass	
6	Impact	Pass	
7	Overcharge	Pass	Only battery do need this test item
8	Forced Discharge	Pass	

The product is not classified as dangerous under the current edition of the ICAO & IATA dangerous goods regulations and according Section II of PI965 all applicable Carriers. The product is safe for air transportation and regulated by ICAO & IATA DGR.

Section 15: Regulatory Information

The transport of rechargeable Lithium-ion batteries is regulated by various bodies (IATA, IMO, ADR, US-DOT) that follow the United Nations "Recommendations on the Transport of Dangerous Goods, Model Regulations, 15th Revised edition - Ref.ST/SG/AC.10/1 Rev. 15".

Depending on their lithium metal equivalent weight content, design, and ability to pass safety tests defined by the UN in the "Recommendations on the Transport of Dangerous Good - Manual of Tests and Criteria– 4th Revised edition - Ref. ST/SG/AC.10/11 Rev.4 Amendment 1 «Lithium Batteries»&", the Lithium-ion cells and the battery packs are not be assigned to the UN N°3480 Class-9, that is restricted for transport.

Individual Lithium-ion cells and battery packs with respectively less than 20 and 100 Wh per gram that pass the UN-defined safety tests, are not restricted for transport .

Section 16: Other 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 as of the date compiled. However, no representation, warranty (either expressed or implied) or guarantee is made to the accuracy, reliability or completeness of the information contained herein.

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