

MSDS

Report No.: PTC18012206603C-EN01

Date: Apr. 04, 2018

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Applicant : Power System Electronic Technology Co., Ltd.
Address : 2F building C, Bao Xing Long Industrial Park, Sanzhong Village, Qingxi Town, Dongguan
Sample Name : Li-ion Cylindrical Battery
Model No. : 18650
Manufacturer : SHENZHEN DHMPOWER TECHNOLOGY CO., LTD.
Address : 2F building C, Bao Xing Long Industrial Park, Sanzhong Village, Qingxi Town, Dongguan
Sample Received Date : Mar. 30, 2018
Completed Date : Apr. 04, 2018

Signed for and on Behalf of PTC



Raul Cheng / P & C Department General Manager
DongGuan Precise Testing and Certification Corp. Ltd.

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Material Safety Data Sheet

Section 1 - Chemical Product and Company Identification

Product Identification

Product Name:	Li-ion Cylindrical Battery
Model No.:	18650
Applicant:	Power System Electronic Technology Co., Ltd.
Address:	2F building C, Bao Xing Long Industrial Park, Sanzhong Village, Qingxi Town, Dongguan
Manufacturer:	SHENZHEN DHMPOWER TECHNOLOGY CO., LTD.
Address:	2F building C, Bao Xing Long Industrial Park, Sanzhong Village, Qingxi Town, Dongguan
Typical Capacity	4400mAh @ 0.2C Discharge
Minimum capacity	4350mAh @ 0.2C Discharge
Nominal voltage	3.7V
Max Charge voltage	4.2V \pm 0.05
Standard charge current	880mA
Max Charge current	2200mA
Min Discharge voltage	3.0V \pm 0.05V
Fast Discharge current	4400mA
Max continuous discharge current	6600mA
Initial Impedance	Max: 140m

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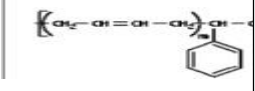
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Section 2 - Composition/Information on Ingredients

Chemical Composition	Chemical Formula	CAS NO.	Weight(%)
Lithium Cobalt Oxide	LiCoO ₂	12190-79-3	39.6
Polyvinylidene Fluoride	(C ₂ H ₂ F ₂) _n	24937-79-9	1.15
Aluminium	Al	7429-90-5	5.56
Graphite	C	7782-42-5	23.2
Styrene-Butadiene Rubber		61789-96-6	1.78
Copper	Cu	7440-50-8	9.8
Lithium Hexafluorophosphate	LiPF ₆	21324-40-3	15.35
Polyethylene	(C ₂ H ₄) _n	9002-88-4	0.06
Polypropylene	(C ₃ H ₆) _n	9003-07-0	0.78
Electrolyte Carbonate	C ₃ H ₄ O ₃	96-49-1	2.72
Others	N/A	---	0%
Lead	Pb	7439-92-1	0%
Cadmium	Cd	7440-43-9	0%
Mercury	Hg	7439-97-6	0%

Section 3 –Hazards Summarizing

Battery can explode or leak if heated, disassembled, shorted, recharged, exposed to fire or high temperature or inserted incorrectly. Keep in original package until ready to use. Do not carry batteries loose in your pocket or purse. Keep batteries away from children. If swallowed, consult a physician at once. For information on treatment, call the NATIONAL BUTTON BATTERY INGESTION HOTLINE, collect to the United States of America, day or night, at (202) 625-3333. Under certain misuse conditions and by abusively opening the battery, exposed lithium can react with water or moisture in the air causing potential thermal burns or fire. And also complies with the Special Provision 188 of IMDG CODE (Amdt.38-16) 2016 Edition.

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Section 4 - First-aid Measures

General Advice	The chemicals and metals in this product are contained in a sealed can. Exposure to the contents will not occur unless the battery leaks, is exposed to high temperatures or is mechanically, physically, or electrically abused.
Eyes	If battery is leaking and material contacts the eye, flush thoroughly with copious amounts of running water for 30 minutes. Seek immediate medical advice.
Skin	If battery is leaking and material contacts the skin, remove any contaminated clothing and flush exposed skin with copious amounts of running water for at least 15 minutes. If irritation, injury or pain persists, seek medical advice.
Inhaled	If battery is leaking, contents may be irritating to respiratory passages. Move to fresh air. If irritation persists, seek medical advice.
Swallowed	If battery is swallowed seek immediate medical advice. Batteries lodged in the esophagus should be removed immediately since leakage, caustic burns and perforation can occur as soon as two hours after ingestion. If mouth area irritation or burning has occurred, rinse the mouth and surrounding area with tepid water for at least 15 minutes. Do not give ipecac.

Section 5 - Fire Fighting Measures

Fire and Explosion Hazards	Batteries may burst and release hazardous decomposition products when exposed to a fire situation.
Extinguishing Media	Use any extinguishing media that is appropriate for the surrounding fire.
Special Fire Fighting Procedures	Firefighters should wear positive pressure self-contained breathing apparatus and full protective clothing. Fight fire from a distance or protected area. Cool fire exposed batteries to prevent rupture. Use caution when handling fire-exposed containers (batteries may explode in heat of fire).
Hazardous Combustion Products	Thermal degradation may produce hazardous fumes of lithium and manganese; hydrofluoric acid, oxides of carbon and sulfur and other toxic by-products.

Section 6 - Accidental Release Measures

Notify safety personnel of large spills. Irritating vapors and flammable may be released from leaking or ruptured batteries. Eliminate all ignition sources. Evacuate the area and allow the vapors to dissipate. Clean-up personnel should wear appropriate protective clothing to avoid eye and skin contact and inhalation

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of vapors or fumes. Increase ventilation. Carefully collect batteries and place in an appropriate container for disposal. Remove spilled liquid with absorbent and contain for disposal.

Section 7 –Handling And Storage

Handling	Avoid mechanical or electrical abuse. DO NOT short circuit or install incorrectly. Batteries may explode, pyrolize or vent if disassembled, crushed, recharged or exposed to high temperatures. Install batteries in accordance with equipment instructions. Replace all batteries in equipment at the same time. Do not carry batteries loose in a pocket or bag.
Storage	Store batteries in a dry place at normal room temperature.

Section 8 - Exposure Controls/Personal Protection

Respiratory Protection	In case of battery venting, provide as much ventilation as possible. Avoid confined areas with venting cell cores. Respiratory Protection is not necessary under conditions of normal use.
Ventilation	Not necessary under conditions of normal use.
Other Protective Clothing or Equipment	Not necessary under conditions of normal use.
Personal Protection is recommended for venting battery	Respiratory Protection, Protective Gloves, Protective Clothing and safety glass with side shields.

Section 9 - Physical and Chemical Properties

Appearance	solid state
Odour	odorlessness
Colour	Silvery
pH	Not applicable
Flash Point	Not applicable
Flammability	Not applicable
Relative density	Not applicable

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Solubility (water)	Not applicable
Solubility (other)	Not applicable

Section 10 - Stability and Reactivity

Stability	This product is stable.
Incompatibility/Conditions to Avoid	Contents are incompatible with strong oxidizing agents. Do not heat, crush, disassemble, short circuit or recharge.
Hazardous Decomposition Products	Thermal decomposition may produce hazardous fumes of lithium and manganese; hydrofluoric acid, oxides of carbon and sulfur and other toxic by-products.
Hazardous Polymerization	Will not occur

Section 11 - Toxicological Information

Potential Health Effects	The chemicals and metals in this product are contained in a sealed can. Exposure to the contents will not occur unless the battery leaks, is exposed to high temperatures or is mechanically, physically, or electrically abused.
Eye Contact	Contact with battery contents may cause irritation.
Skin Contact	Contact with battery contents may cause irritation.
Inhalation	Inhalation of vapors or fumes released due to heat or a large number of leaking batteries may cause respiratory and eye irritation.
Ingestion	Swallowing is not anticipated for larger batteries due to battery size. Smaller batteries may be swallowed. If battery is swallowed, seek immediate medical advice. Batteries lodged in the esophagus should be removed immediately since leakage, caustic burns and perforation can occur as soon as two hours after ingestion. Irritation to the internal/external mouth areas, may occur following exposure to a leaking battery.
Chronic Effects	The chemicals in this product are contained in a sealed can and exposure does not occur during normal handling and use. No chronic effects would be expected from handling a leaking battery.
Target Organs	Skin, eyes and respiratory system.
Carcinogenicity	None of the components of this product are listed as carcinogens by the EU Directive on the classification and labeling of substances.

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Section 12 - Ecological Information

No ecotoxicity data is available. This product is not expected to present an environmental hazard.

Section 13 - Disposal

Do not incinerate or subject cells to temperature in excess of 80 °C .Dispose of in accordance with local regulations.

Section 14 - Transport Information

All lithium, lithium ion and lithium polymer cells and batteries must be tested in accordance with the "UN Manual of Tests and Criteria, Part III, Subsection 38.3 2017.

The 59th edition of the IATA Dangerous Goods Regulations incorporates all amendments made by the ICAO Dangerous Goods Panel in developing the content of the 2018 edition of the ICAO Technical Instructions as well as changes adopted by the IATA Dangerous Goods Board. The following list is intended to assist the user to identify the main changes introduced in this edition and must not be considered an exhaustive listing. The changes have been prefaced by the section or subsection in which the change occurs.

UN3480, PACKING INSTRUCTION 965, Lithium Ion Batteries

UN3481, PACKING INSTRUCTION 966, Lithium Ion Batteries packed with equipment

UN3481, PACKING INSTRUCTION 967 Lithium Ion Batteries contained in equipment

Cells and batteries must be packed in inner packaging that completely encloses the cell or battery.

Cells and batteries must be protected so as to prevent short circuits. This includes protection against contact with conductive materials within the same packaging that could lead to a short circuit.

Each consignment must be accompanied with a document such as an air waybill with an indication that:

- the package contains lithium ion cells or batteries;
- the package must be handled with care, and that a flammability hazard exists if the package is damaged;
- special procedures should be followed in the event the package is damaged, to include inspection and repacking if necessary; and
- a telephone number for additional information.

Each package must be labelled with a lithium battery handling label;

Any person preparing or offering cells or batteries for transport must receive adequate instruction on these requirements commensurate with their responsibilities.

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Section 15 - Regulatory Information

Special requirement be according to the local regulations.

《Dangerous Goods Regulations》

《Recommendations on the Transport of Dangerous Goods Model Regulations》

《International Maritime Dangerous Goods》

《Technical Instructions for the Safe Transport of Dangerous Goods》

《Classification and code of dangerous goods 》

《Occupational Safety and Health Act 》 (OSHA)

《Toxic Substance Control Act》 (TSCA)

《Consumer Product Safety Act 》 (CPSA)

《Federal Environmental Pollution Control Act》 (FEPCA)

《The Oil Pollution Act》 (OPA)

《Superfund Amendments and Reauthorization Act TitleIII(302/311/312/313) 》 (SARA)

《Resource Conservation and Recovery Act》 (RCRA)

《Safety Drinking Water Act》 (CWA)

《California Proposition 65》

《Code of Federal Regulations》 (CFR)

Section 16 - Other Information

Note:	This Sheet is provided as technical information only. The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. Dongguan Precise Testing Service 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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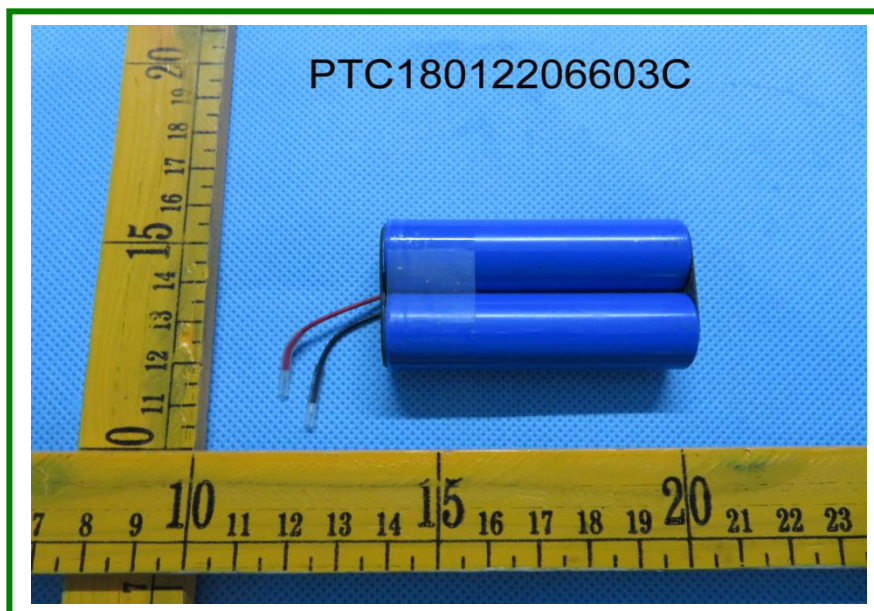
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