



# **MATERIAL SAFETY DATA SHEET**

## **Lithium Cylindrical Rechargeable Battery**

### **Model: Lithium-ion Cylindrical Battery**

|                    |                    |
|--------------------|--------------------|
| <b>Prepared by</b> | <b>Approved by</b> |
| Zenghui            | Yinshishu          |
| Date: Apr 5, 2016  | Date: Apr 5, 2016  |

## Material Safety Data Sheet

Reference to ST/SG/AC.10/30/Rev.6(GHS)

### Section 1-Chemical Product and Company Identification

**Sample Description:** Li-ion Battery

**Sample Model:** 18500

**Recommended Uses:** Various

**Restrictions ON use:** N/A

**Supplier name:** SHENZHEN BEST ELECTRONICS CO., LTD

**Address:** Ganbei Industrial Park, Longgang, Shenzhen, China contact person : zenghui

**Phone number:** +86-755-89312863

**FAX:** +86-755-89989591

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**Emergency phone number:** +86-755-89312863

### Section 2-Hazards Identification

**Emergency overview:** This Product is an article which contains a chemical substance. Safety information is given for exposure to the article as sold. Intended use of the product should not result in exposure to the chemical substance. This is a battery.

In case of rupture: the below hazards exist.

**CAS#** 7429-90-5

**Classification according to GHS**

Specific target organ toxicity, repeated exposure (1) (Lung)

Hazardous to the aquatic environment, long-term hazard (4)

**Label elements**

**Hazard pictogram(s):**



**Signal word:**

Danger

**Hazard statement(s):**

H372 Causes damage to organs through prolonged or repeated exposure (Lung)

H413 May cause long lasting harmful effects to aquatic life

**Precautionary statement(s):**

**Prevention:**

P260 Do not breathe dust.

P264 Wash skin and clothing thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P273 Avoid release to the environment.

**Response:**

P314 Get medical advice if you feel unwell.

**Storage**

None.

**Disposal:**

P501 Contents handling to approved waste treatment plants.

CAS# 7440-50-8

**Classification according to GHS**

Specific target organ toxicity, single exposure; Respiratory tract irritation (3)

Specific target organ toxicity, repeated exposure (1) (liver)

Hazardous to the aquatic environment, long-term hazard (3)

**Label elements**

**Hazard pictogram(s):**



**Signal word:**

Danger

**Hazard statement(s):**

H335 May cause respiratory irritation

H372 Causes damage to organs through prolonged or repeated exposure (Lung)

H412 Harmful to aquatic life with long lasting effects

**Precautionary statement(s):**

**Prevention:**

P271 Use only outdoors or in a well-ventilated area.

P260 Do not breathe dust.

P264 Wash skin and clothing thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P273 Avoid release to the environment.

**Response:**

P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P312 Call a POISON CENTER or doctor, if you feel unwell.

**Storage**

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

**Disposal:**

P501 Contents or container handling to approved waste treatment plants.



Other hazards

Physical and chemical hazards: See Section 10

Human health hazards: See Section 11

Environmental hazards: See Section 12

### Section 3-Composition/Information on Ingredients

#### Chemical characterization: Mixture

| Chemical Composition                | CAS No.    | EC#       | Weight% |
|-------------------------------------|------------|-----------|---------|
| Cobaltate, lithium                  | 12190-79-3 | 235-362-0 | 39.6    |
| Aluminum                            | 7429-90-5  | 231-072-3 | 5.56    |
| Polyvinylidene fluoride resin       | 24937-79-9 | 607-458-6 | 1.15    |
| Graphite                            | 7782-42-5  | 231-955-3 | 23.2    |
| Copper                              | 7440-50-8  | 231-159-6 | 9.8     |
| Rubber, styrene-butadiene, fume     | 61789-96-6 | 612-382-1 | 1.78    |
| Polyethylene                        | 9002-88-4  | ---       | 0.06    |
| Polypropylene                       | 9003-07-0  | 618-352-4 | 0.78    |
| Phosphate(1-), hexafluoro-, lithium | 21324-40-3 | 244-334-7 | 15.35   |
| Ethylene carbonate                  | 96-49-1    | 202-510-0 | 2.72    |

### Section 4-First-aid Measures

#### Description of first aid measures

**General information** No special measures required.

#### After eye contact

Flush eyes with plenty of water for several minutes while holding eyelids open. Get medical attention if irritation persists.

#### After skin contact

Remove contaminated clothing and shoes. Immediately wash with water and soap and rinse thoroughly. Wash clothing and shoes before reuse. If irritation occurs, get medical attention.

#### After inhalation

Remove victim to fresh area. Administer artificial respiration if breathing is difficult. Seek medical attention.

#### After swallowing

Do not induce vomiting. Get medical attention.

**Personal protective equipment for first-aid responders:** No data available.



**Most important symptoms/effects, acute and delayed:** No data available.<sup>5</sup>

**Indication of immediate medical attention and special treatment needed:** No data available.

## Section 5-Fire Fighting Measures

**Suitable extinguishing media:**

Use extinguishing agent suitable for local conditions and the surrounding environment. Such as dry powder, CO<sub>2</sub>.

**Unsuitable extinguishing media:**

No data available.

**Specific Hazards arising from the chemical:**

Special hazards arising from the substance or mixture

Battery may burst and release hazardous decomposition products when exposed to a fire situation. Lithium ion batteries contain flammable electrolyte that may vent, ignite and produce sparks when subjected to high temperature(>150°C(302°F)), when damaged or abused (e.g. mechanical damage or electrical overcharging); may burn rapidly with flare-burning effect; may ignite other batteries in clothes proximity.

**Specific protective actions for fire-fighters:**

Protective equipment: Wear self-contained respirator. Wear fully protective impervious suit.

## Section 6-Accidental Release Measures

**Personal precautions:**

Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation

**Protective equipment:**

No data available.

**Emergency procedures:**

Remove ignition sources evacuate area. Sweep up using a method that does not generate dust. Collect as much of the spilled material as possible, placed the spilled material into a suitable disposal container. Keep spilled material out of sewers, ditches and bodies of water.

**Environmental precautions:**

Do not allow material to be released to the environment without proper governmental permits.

**Methods and materials for containment and cleaning up:**

All waste must refer to the United Nations the national and local regulations for disposal.

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

## Section 7-Handling and Storage

**Precautions for safe handling:**



Consumption of food and beverage should be avoided in work areas.<sup>6</sup>

Wash hands with soap and water before eating, drinking.

Ground containers when transferring liquid to prevent static accumulation and discharge.

**Information about fire and explosion protection**

Batteries may explode or cause burns, if disassembled, crushed or exposed to fire or high temperatures. Do not short or install with incorrect polarity.

Conditions for safe storage, including any incompatibilities:

Requirements to be met by storerooms and receptacles

Store in a cool, dry, well-ventilated place.

Information about storage in one common storage facility

Keep away from heat avoiding the long time of sunlight.

Further information about storage conditions

Keep container tightly sealed.

Specific and use

No data available.

**Section 8-Exposure Controls/Personal Protection**

**Control parameters:**

| CAS No.    | ACGIH                                                      | NIOSH                                                                                   | OSHA                                                       |
|------------|------------------------------------------------------------|-----------------------------------------------------------------------------------------|------------------------------------------------------------|
| 12190-79-3 | N/A                                                        | N/A                                                                                     | N/A                                                        |
| 7429-90-5  | TLV-TWA 10mg/m <sup>3</sup><br>TLV-TWA 5mg/m <sup>3</sup>  | REL-TWA 2mg/m <sup>3</sup><br>REL-TWA 5mg/m <sup>3</sup><br>REL-TWA 10mg/m <sup>3</sup> | PEL-TWA 5mg/m <sup>3</sup><br>PEL-TWA 15mg/m <sup>3</sup>  |
| 24937-79-9 | N/A                                                        | N/A                                                                                     | N/A                                                        |
| 7782-42-5  | TLV-TWA 2mg/m <sup>3</sup>                                 | REL-TWA 2.5mg/m <sup>3</sup>                                                            | PEL-TWA 15mppcf<br>PEL-TWA 20mppcf                         |
| 7440-50-8  | TLV-TWA 0.2mg/m <sup>3</sup><br>TLV-TWA 1mg/m <sup>3</sup> | REL-TWA 1mg/m <sup>3</sup><br>REL-TWA 0.1mg/m <sup>3</sup>                              | PEL-TWA 0.1mg/m <sup>3</sup><br>PEL-TWA 1mg/m <sup>3</sup> |
| 61789-96-6 | N/A                                                        | N/A                                                                                     | N/A                                                        |
| 9002-88-4  | N/A                                                        | N/A                                                                                     | N/A                                                        |
| 9003-07-0  | N/A                                                        | N/A                                                                                     | N/A                                                        |
| 21324-40-3 | N/A                                                        | N/A                                                                                     | N/A                                                        |
| 96-49-1    | N/A                                                        | N/A                                                                                     | N/A                                                        |

**Appropriate engineering controls:**

The usual precautionary measures for handling chemicals should be followed.

Keep away from foodstuffs, beverages and feed.



Remove all soiled and contaminated clothing immediately. <sup>7</sup>

Wash hands before breaks and at the end of work.

#### Personal Protective Equipment

**Respiratory protection:** Wear suitable protective mask in order to reduce the respiratory system. A large number of leakage, wear chemical protective clothing, including self-contained breathing apparatus.

**Hand Protection:** Wear appropriate protective gloves to reduce skin contact.

**Eyes Protection:** Wear safety goggles or eye protection combined with respiratory protection.

**Skin and Body Protection:** Working environment required, wear suitable protective clothing to minimize contact with skin. The type of protective equipment must be according to the concentration and the content of certain hazardous substances in the workplace.

## Section 9-Physical and Chemical Properties

### Information on basic physical and chemical properties

|                                                 |                |
|-------------------------------------------------|----------------|
| <b>Colour:</b>                                  | Blue.          |
| <b>Physical State:</b>                          | Cylindrical.   |
| <b>Odour:</b>                                   | Not available. |
| <b>Odour threshold:</b>                         | Not available. |
| <b>pH:</b>                                      | Not available. |
| <b>Melting point/freezing point:</b>            | Not available. |
| <b>Initial boiling point and boiling range:</b> | Not available. |
| <b>Flash Point:</b>                             | Not available. |
| <b>Evaporation rate:</b>                        | Not available. |
| <b>Flammability (solid,gas):</b>                | Not available. |
| <b>Explosion Limits (vol% in air):</b>          | Not available. |
| <b>Vapour pressure, kPa at 20°C:</b>            | Not available. |
| <b>Vapor density:</b>                           | Not available. |
| <b>Density/Relative density (water =1):</b>     | Not available. |
| <b>Solubility(ies):</b>                         | Not available. |
| <b>Partition coefficient: n-octanol/water:</b>  | Not available. |
| <b>Auto-ignition temperature:</b>               | Not available. |
| <b>Decomposition temperature:</b>               | Not available. |
| <b>Viscosity:</b>                               | Not available. |
| <b>Other information:</b>                       |                |
| <b>Voltage</b>                                  | 3.7V           |
| <b>Electric capacity</b>                        | 1400mAh        |
| <b>Electric Energy</b>                          | 5.18Wh         |

## Section 10- Stability and Reactivity

**Reactivity:** No data available.



**Chemical stability:** Stable.

**Possibility of hazardous reactions:** No data available.

**Conditions to Avoid:** Flames sparks and other sources of ignition, incompatible materials.

**Incompatibilities materials:** Oxidizing agents, acid, base.

**Hazardous decomposition products:** Carbon monoxide, carbon dioxide, lithium oxide fumes.

## Section 11-Toxicological Information

### Acute Toxicity:

| CAS No.    | LC50/LD50               |
|------------|-------------------------|
| 12190-79-3 | No data available.      |
| 7429-90-5  | No data available.      |
| 24937-79-9 | No data available.      |
| 7782-42-5  | No data available.      |
| 7440-50-8  | No data available.      |
| 61789-96-6 | No data available.      |
| 9002-88-4  | No data available.      |
| 9003-07-0  | No data available.      |
| 21324-40-3 | No data available.      |
| 96-49-1    | LD50 Rat (oral): 10g/kg |

**Skin corrosion/irritation:** No data available.

**Serious eye damage/irritation:** No data available.

**Respiratory or Skin sensitization:** No data available.

**Germ Cell mutagenicity:** No data available.

**Carcinogenicity:** No data available.

**Reproductive toxicity:** No data available.

**Specific target organ toxicity-Single exposure:** No data available.

**Specific target organ toxicity-Repeated exposure:** No data available.

**Aspiration hazard:** No data available.

**Information on the likely routes of exposure:** No data available.

**Eye:** No data available.

**Skin:** No data available.

**Ingestion:** No data available.

**Inhalation:** No data available.





**Section 12-Ecological Information**

**Ecological Toxicity:** No data available.  
**Persistence and degradability:** No data available.  
**Bioaccumulative Potential:** No data available  
**Mobility in Soil:** No data available.  
**Other adverse effects:** No data available.

**Section 13-Disposal Considerations**

**Disposal methods:**  
**Recommendation:**  
 Consult state, local or national regulations to ensure proper disposal.

**Uncleaned packaging**  
**Recommendation:** Disposal must be made according to official regulations.

**Section 14-Transport Information**

|                                   |                       |
|-----------------------------------|-----------------------|
| <b>UN Number</b>                  |                       |
| <b>IATA</b>                       | UN3480                |
| <b>IMDG</b>                       | UN3480                |
| <b>Model Regulation</b>           | UN3480                |
| <b>UN Proper shipping name</b>    |                       |
| <b>IATA</b>                       | Lithium ion batteries |
| <b>IMDG</b>                       | LITHIUM ION BATTERIES |
| <b>Model Regulation</b>           | LITHIUM ION BATTERIES |
| <b>Transport hazard class(es)</b> |                       |
| <b>IATA</b>                       | 9                     |
| <b>IMDG</b>                       | 9                     |
| <b>Model Regulation</b>           | 9                     |
| <b>Packing group</b>              |                       |
| <b>IATA</b>                       | N/A                   |
| <b>IMDG</b>                       | N/A                   |
| <b>Model Regulation</b>           | N/A                   |
| <b>Packaging Sign</b>             |                       |
| <b>IATA</b>                       | N/A                   |
| <b>IMDG</b>                       | N/A                   |
| <b>Model Regulation</b>           | N/A                   |



|                                     |                 |
|-------------------------------------|-----------------|
| <b>Environmental hazards</b>        |                 |
| <b>Marine pollutant:</b>            | No              |
| <b>Special precautions for user</b> | Not applicable. |

**Transport information:** The Li-ion Battery 18500 has passed the test UN38.3, according to the report ID: I06083061021D~1.

According to the Packing Instruction 965 section II of IATA DGR 57<sup>th</sup> Edition for transportation. Cargo aircraft only.

According to the special provision 188 of IMDG(37-14) or the <<Recommendations On The Transport Of Dangerous Goods-Model Regulations>>(19<sup>th</sup>). The products are not subject to dangerous goods.

Separate batteries to prevent short-circuiting, and they should be packed in strong package during transport. Lithium cell or battery should incorporate a safety venting device or be designed to prevent a violent rupture under normal transport conditions. Keep away from high temperature and open flames. Lithium ion cells and batteries must be offered for transport at a state of charge (SoC) not exceeding 30% of their rated design capacity from 1 April 2016.

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

## Section 15-Regulatory Information

### Safety, health and environmental regulations/legislation specific for the substance or mixture

| CAS No.    | TSCA   | IECSC  | DSL/NDSL   | EINECS/ ELINCS/ NLP |
|------------|--------|--------|------------|---------------------|
| 12190-79-3 | Listed | Listed | Listed DSL | Listed              |
| 7429-90-5  | Listed | Listed | Listed DSL | Listed              |
| 24937-79-9 | Listed | Listed | Listed DSL | Listed              |
| 7782-42-5  | Listed | Listed | Listed DSL | Listed              |
| 7440-50-8  | Listed | Listed | Listed DSL | Listed              |
| 61789-96-6 | Listed | Listed | Listed DSL | Listed              |
| 9002-88-4  | Listed | Listed | Listed DSL | Listed              |
| 9003-07-0  | Listed | Listed | Listed DSL | Listed              |
| 21324-40-3 | Listed | Listed | Listed DSL | Listed              |
| 96-49-1    | Listed | Listed | Listed DSL | Listed              |



## Section 16-Other Information

Issue Time: 2016-04-05

Issue Department: Technical department

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Other Information:

CAS: (Chemical Abstracts Service);

EC: (European Commission);

ACGIH: (American Conference of Governmental Industrial Hygienists);

NIOSH: (US National Institute for Occupational Safety and Health);

OSHA: (US Occupational Safety and Health);

TLV: (Threshold Limit Value)

TWA: (Time Weighted Average);

STEL: (Short Term Exposure Limit);

PEL: (Permissible Exposure Level);

REL: (Recommended Exposure Limit);

PC-STEL: (Permissible concentration-time weighted average);

PC-TWA: (Permissible concentration-short time exposure limit);

LC50: (Lethal concentration, 50 percent kill);

LD50: (Lethal dose, 50 percent kill);

IARC: (International Agency for Research on Cancer);

EC50: (Median effective concentration);

BCF: (Bioconcentration Factor);

BOD: (Biochemical oxygen demand);

NOEC: (No observed effect concentration);

NTP: (US National Toxicology Program);

RTECS: (Registry of Toxic Effects of Chemical Substances);

IATA: (International Air Transport Association);

IMDG: (International Maritime Dangerous Goods);

TDG: (Recommendations on the TRANSPORT OF DANGEROUS GOODS Model Regulations);

TOC: (Total Organic Carbon);

TSCA: (Toxic Substances Control Act of USA);

DSL:(the Domestic Substances List of Canada);

NDSL: (the Non-domestic Substances List of Canada)

\*\*\*End of report\*\*\*

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