

Safety Data Sheet

According to HCS-2012 APPENDIX D TO §1910.1200

Version: 1.0/EN

Product name: Li-ion Cylindrical Battery

Revision date:25/2/2016

Printing date:25/2/2016

1. Identification

(a) Product identifier

Product name: Li-ion Cylindrical Battery

(b) Other means of identification

Product description: Model:18650
Nominal Voltage:7.4V
Ampere-hour:2.1Ah
Typical Capacity:2100mAh(15.54Wh)

(c) Recommended use of the chemical and restrictions on use

Recommended use: Battery.
Restriction on use: No information available.

(d) Details of the supplier of the product

Company name(China) Huizhou Highpower TechnologyCo.,Ltd
Address: Xihu Industrial Zone, Ma'an Town, Huicheng District, Huizhou, Guangdong, China
E-mail: xhzhang@highpowertech.com
Telephone: +86-752-5807919

(e) Emergency phone number

+86-752-5807919

2. Hazard(s) identification

(a) Classification of the chemical

The batteries are defined as "articles", they are exempted from the requirements of the Hazard Communication Standard. A sealed Li-ion Cylindrical Battery is not hazardous in normal use.

(b) Label elements

Pictogram(s): No pictogram.
Signal word: No signal word.
Hazard statements: No hazard statement.
Precautionary statements: No precautionary statement.

(c) Description of any hazards not otherwise classified

In case of mistreatment (abusive over charge, reverse charge, external short circuit...) and in case of fault some electrolyte can leak from the cell through the safety device. In these cases refer to the risk of the electrolyte. Contact with internal components may cause irritation or severe burns. Irritating to eyes, respiratory system, and skin. The electrode materials are only hazardous, if the materials are released by mechanical damaging of the cell or if exposed to fire.

Skin touch: Contact with battery electrolyte may cause burns and skin irritation.

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Eyes touch: Contact with battery electrolyte may cause burns. Eye damage is possible.

Inhalation: Inhalation of a large number of vapors or fumes released due to heat may cause respiratory.

Ingestion: Ingestion of battery contents may cause mouth, throat and intestinal burns and damage.

(d) Ingredient with unknown acute toxicity

No information available.

3. Composition/information on ingredients

(a) Mixtures information

| Chemical name | CAS No. | Concentration |
|-------------------------|------------|---------------|
| Lithium nickel oxide | 12031-65-1 | 9.25 |
| Lithium Cobalt oxide | 12190-79-3 | 9.25 |
| Lithium Manganese oxide | 12057-17-9 | 18.5 |
| Graphite powder | 7782-42-5 | 23 |
| Electrolyte | 21324-40-3 | 13 |
| polyethylene | 9002-88-4 | 0.8 |
| Cu | 7440-50-8 | 7 |
| Nickel | 7440-02-0 | 2.5 |
| Polyvinylidene fluoride | 24937-79-9 | 0.9 |
| Polypropylene | 9003-07-0 | 4 |
| Aluminum foil | 7429-90-5 | 8 |
| Silicon | 7440-21-3 | 1.4 |
| Epoxy Resin | 38891-59-7 | 1.6 |
| PET | 25038-59-9 | 0.4 |
| Gold | 7440-57-5 | 0.3 |
| Sn | 7440-31-5 | 0.1 |

4. First-aid measures

(a) Description of first aid measures

Inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical advice / attention if you feel unwell.

Skin contact: Remove contaminated clothes and rinse the skin with plenty of water. Get medical advice / attention if you feel unwell.

Eye contact: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.
Continue rinsing. Get medical advice / attention if you feel unwell.

Ingestion: Have victim drink 60 to 240 mL (2-8 oz.) of water. and DO NOT induce vomiting. Get medical aid.

(b) Most important symptoms/effects, acute and delayed

Contact with internal components may cause allergic skin sensitization (rash) and irritate eyes, skin, nose, throat, respiratory system. Cobalt and Cobalt compounds are considered to be possible human carcinogen(s).

(c) Immediate medical attention and special treatment

No information available.

5. Fire-fighting measures

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(a) Extinguishing media

Suitable extinguishing media: Use foam, dry powder or dry sand, CO₂ as appropriate.

Unsuitable extinguishing media: No information available.

(b) Special hazards arising from the chemical

Under fire conditions, batteries may burst and release hazardous decomposition products when exposed to a fire situation. This could result in the release of flammable or corrosive materials. Hazardous combustion products: CO, CO₂, Metal oxides, Irritating fumes

(c) Special protective equipment and precautions for fire-fighters

Firefighters must wear fire resistant protective equipment and appropriate breathing apparatus. The staff must equip with filtermask (full mask) or isolated breathing apparatus. The staff must wear the clothes which can defense the fire and the toxic gas. Put out the fire in the upwind direction. Remove the container to the open space as soon as possible. Spray water on the containers in the fireplace to keep them cool until finish extinguishment.

6. Accidental release measures

(a) Personal precautions, protective equipment and emergency procedures

If the battery material is released, remove personnel from area until fumes dissipate. Provide maximum ventilation to clear out hazardous gases. The preferred response is to leave the area, dispose the case after the batteries cool and vapors dissipate. Provide maximum ventilation. Avoid skin and eye contact or inhalation of vapors.

(b) Methods and materials for containment and cleaning up

If battery casing is dismantled, small amounts of electrolyte may leak. Collect all released material in a plastic lined container. Dispose off according to the local law and rules. Avoid leached substances to get into the earth, canalization or waters.

7. Handling and storage

(a) Precautions for safe handling

Always follow the warning information on the batteries and in the manuals of devices. Only use the recommended battery types. Keep batteries away from children. For devices to be used by children, the battery casing should be protected against unauthorized access. Unpacked batteries shall not lie about in bulk. In case of battery change always replace all batteries by new ones of identical type and brand. Do not swallow batteries. Do not throw batteries into water. Do not throw batteries into fire. Avoid deep discharge. Do not short-circuit batteries Use recommended charging time and current.

(b) Conditions for safe storage, including any incompatibilities

If the Li-ion Polymer Battery is subject to storage for such a long term as more than 3 months, it is recommended to recharge the Li-ion Polymer Battery periodically. Operating temperature: Charge:0 °C ~45 °C . Discharge: -20 °C ~60 °C And recommended at -20 °C ~45 °C for 1 month storage, at -20 °C ~35 °C for 3 months storage. The capacity recovery rate in the delivery state (50% capacity of fully charged) after storage is assumed to be 80% or more. The voltage for a long time storage shall be 7.4V~8.4V range. Do not storage Li-ion Cylindrical 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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8. Exposure controls/personal protection

(a) Control parameters

Not established.

(b) Appropriate engineering controls

Under normal conditions (during charge and discharge) release of ingredients does not occur.

(c) Personal protective equipment

| | |
|-------------------------|--|
| Respiratory protection: | No personal respiratory protective equipment normally required. In case of inadequate ventilation wear respiratory protection. |
| Hand protection: | Wear protective gloves. |
| Eye/face protection: | No personal protective equipment normally required. |
| Skin/body protection: | Wear protective clothing to prevent contact. |

9. Physical and chemical properties

| | |
|---|---------------------|
| (a) Appearance | solid |
| (b) Odor | Monotony |
| (c) Odor threshold | Not available. |
| (d) pH | Not available. |
| (e) Melting point/freezing point | Not available. |
| (f) Initial boiling point and boiling range | Not available. |
| (g) Flash point | Not applicable. |
| (h) Evaporation rate | Not applicable. |
| (i) Flammability | Non flammable. |
| (j) Upper/lower flammability or explosive limits | Not available. |
| (k) Vapor pressure | Not applicable. |
| (l) Vapor density | Not available. |
| (m) Relative density | Not available. |
| (n) Solubility(ies) | Insoluble in water. |
| (o) Partition coefficient: n-octanol/water | Not available. |
| (p) Auto-ignition temperature | 130°C |
| (q) Decomposition temperature | Not available. |
| (r) Viscosity | Not available. |

10. Stability and reactivity

(a) Reactivity

Stable under recommended storage and handling conditions.

(b) Chemical stability

Stable under normal conditions.

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(c) Possibility of hazardous reactions

When heated above 150°C the risk of rupture occurs. Due to special safety construction, rupture implies controlled release of pressure without ignition.

(d) Conditions to avoid

Do not subject Li-ion Cylindrical Battery to mechanical shock. Keep away from open flames, high temperature.

(e) Incompatible materials

Strong oxidizer, strong acid.

(f) Hazardous decomposition products

Under fire conditions, the electrode materials can form carcinogenic nickel and cobalt oxides.

11. Toxicological information

(a) Information on the likely routes of exposure

| | |
|---------------|---|
| Inhalation: | Inhalation of a large number of vapors or fumes released due to heat may cause respiratory. |
| Ingestion: | Ingestion of battery contents may cause mouth, throat and intestinal burns and damage. |
| Skin contact: | Contact with battery electrolyte may cause burns and skin irritation. |
| Eye contact: | Contact with battery electrolyte may cause burns. Eye damage is possible. |

Under normal conditions (during charge and discharge) release of ingredients does not occur. If accidental release occurs see information in section 2, 3, and 4. Swallowing of a battery can be harmful. Call the local Poison Control Centre for advice and follow-up.

(b) Information on toxicological characteristics

| | |
|---------------------------------------|--|
| Acute toxicity: | No data available. |
| Skin corrosion/irritation: | The liquid in the battery irritates. |
| Serious eye damage/irritation: | The liquid in the battery irritates. |
| Respiratory sensitization: | The liquid in the battery may cause sensitization to some person. |
| skin sensitization: | The liquid in the battery may cause sensitization to some person. |
| Carcinogenicity: | Cobalt and Cobalt compounds are considered to be possible human carcinogen(s). |
| Germ Cell Mutagenicity: | No data available. |
| Reproductive Toxicity: | No data available. |
| STOT-Single Exposure: | No data available. |
| STOT-Repeated Exposure: | No data available. |
| Aspiration Hazard: | No data available. |

12. Ecological information

(a) Ecotoxicity

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Water hazard class 1(Self-assessment): slightly hazardous for water.

(b) Persistence and Degradability

No information available.

(c) Bioaccumulative potential

No information available.

(d) Mobility in soil

No information available.

(e) Other adverse effects

No information available.

13. Disposal considerations

(a) Safe handling and methods of disposal

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Local regulations may be more stringent than regional or national requirements.

14. Transport information

According to PACKING INSTRUCTION 965 ~ 970 of IATA DGR 57th Edition for transportation, the special provision 188 of IMDG (inc Amdt 35-10). The batteries should be securely packed and protected against short-circuits. Examine whether the package of the containers are integrate and tighten closed before transport. Take in a cargo of them without falling, dropping, and breakage. Prevent collapse of cargo piles. Don't put the goods together with oxidizer and chief food chemicals. The transport vehicle and ship must be cleaned and sterilized otherwise it is not allowed to assemble articles. During transport, the vehicle should prevent exposure, rain and high temperature. For stopovers, the vehicle should be away from fire and heat sources. When transported by sea, the assemble place should keep away from bedroom and kitchen, and isolated from the engine room, power and fire source. Under the condition of Road Transportation, the driver should drive in accordance with regulated route, don't stop over in the residential area and congested area. Forbid to use wooden, cement for bulk transport.

(a) UN number 3480&3481

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

(c) Transport hazard class(es) 9

(d) Packing group (if applicable) II

(e) Marine pollutant (Yes/No) No

(f) Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code) No information available.

(g) Special precautions No information available.

(h) Organizations governing the transport of lithium batteries

| Area | Method | Organization | Special Provision |
|------|--------|--------------|-------------------|
|------|--------|--------------|-------------------|

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| | | | |
|-------|-------------------------|-----|------------------------|
| U.S.A | Air, Rail, Road, Marine | DOT | 49 CFR Section 173.185 |
|-------|-------------------------|-----|------------------------|

15. Regulatory information

(a) Safety, health and environmental regulations specific for the product in question

| CAS No. | USA TSCA | EU EINECS | Japan ENCS | Korea ECL | China IECSC | Canada DSL |
|------------|-------------|--------------|---------------|--------------|----------------|---------------|
| 7782-42-5 | Listed | Listed | Not listed | Listed | Listed | Listed |
| 21324-40-3 | Not listed | Listed | Listed | Listed | Listed | Not listed |
| 9002-88-4 | Listed | Listed | Listed | Listed | Listed | Listed |
| 7440-50-8 | Not listed | Listed | Listed | Listed | Listed | Not listed |
| 7440-02-0 | Not listed | Listed | Listed | Listed | Listed | Not listed |
| 24937-79-9 | Listed | Not listed | Listed | Listed | Listed | Listed |
| 9003-07-0 | Listed | Listed | Listed | Listed | Listed | Listed |
| 7429-90-5 | Listed | Listed | Listed | Listed | Listed | Listed |
| 7440-21-3 | Listed | Listed | Listed | Listed | Listed | Not listed |
| 38891-59-7 | Not listed | Not listed | Listed | Listed | Not listed | Not listed |
| 25038-59-9 | Listed | Not listed | Listed | Listed | Listed | Not listed |
| 7440-57-5 | Listed | Listed | Listed | Listed | Listed | Not listed |
| 7440-31-5 | Listed | Not listed | Listed | Listed | Listed | Not listed |

16. Other information, including date of preparation or last revision

(a) Preparation and revision information

Date of previous revision: Not applicable.

Date of this revision:25/2/2016

Revision summary: The first New SDS

(b) Abbreviations and acronyms

| | |
|---------|--|
| TSCA: | Toxic Substances Control Act, The American chemical inventory. |
| DSL | Domestic Substances List |
| EINECS: | European Inventory of Existing Commercial chemical Substances |
| ENCS | Japanese Existing and New Chemical Substances |
| ECL: | Existing Chemicals List, the Korean chemical inventory. |
| IECSC: | Inventory of existing chemical substances in China. |

(c) Disclaimer

Because all of our batteries are defined as "articles", they are exempted from the requirements of the Hazard Communication Standard. The information in this SDS is provided all the relevant data fully and truly. However, the information is provided without any warranty on their absolute extensiveness and accuracy. This SDS was prepared to provide safety preventive measures for the users who have got professional training. The personal user who obtained this SDS should make independent judgment for the applicability of this SDS under special conditions. In these special cases, we do not assume responsibility for the damage.

----- End of the SDS -----