

# Material Safety Data Sheet

Product Name: Lithium ion Battery

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Date/Revised: 03 January 2017 File No. MSDS-1 LIION-CN01

Revision: 8

## 1- PRODUCT AND COMPANY IDENTIFICATION

**Product name** Lithium Ion Battery (including Lithium Ion Polymer Battery)

**Company Name**

**Name:**

**Address:**

## 2- COMPOSITION/INFORMATION ON INGREDIENTS

**Substance or preparation: Preparation.**

**Information about the chemical nature of products**

Chemical name	CAS N°	Concentration/Concentration range	Classification and hazard labeling
LiCoO <sub>2</sub>	12190-79-3	25-40%	-
Iron	7439-89-6	15~25%	-
Aluminum	7429-90-5	2~6%	-
Graphite	7782-42-5	10~20%	-
Organic Eletrolyte	n.a.	10~20%	Inflammable liquid

## 3 – HAZARDS IDENTIFICATION

**Health Hazards (Acute and Chronic):**

These chemicals are contained in a sealed can. Risk of exposure occurs only if the battery is mechanically or electrically abused. The most likely risk is an acute exposure when the gas release vent works. organic solvent has slight toxicity and can irritate skin and eyes. Lithium salt is irritating to skin, eyes and mucous membranes and should be avoided.

**Carcinogenicity:** NTP: None

IARC Monograph: None

OSHA

Regulated: None

**Medical Conditions Generally Aggravated by Exposure:** An acute exposure will not generally aggravate any medical condition.

**Emergency and First Aid Procedures:** In case of skin contact with contents of battery, flush immediately with water. For eye contact, flush with copious amounts of water for 15 minutes. Do not inhale leaked material. if irritation persists, get medical help.

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## **4 – FIRST AID MEASURES**

### **Spilled internal cell materials**

**Inhalation:** Make the victim blow his/her nose, gargle. Seek medical attention if necessary.

**Skin contact:** Remove contaminated clothes and shoes immediately. Wash extraneous matter or contact region with soap and plenty of water immediately..

**Eye contact:** Do not rub one's eyes. Immediately flush eyes with water continuously for at least 15 minutes. Seek medical attention immediately

**Ingestion:** Make the victim vomit. When it is impossible or the feeling is not well after vomiting, seek medical attention..

## **5 – FIRE-FIGHTING MEASURES**

**Extinguishing media:** Plenty of water, CO<sub>2</sub> gas, nitrogen gas, chemical powder fire extinguishing medium and fire foam.

**Special hazards:** Corrosive gas may be emitted during fire.

**Special methods of fire-fighting:** When the battery burns with other combustibles simultaneously, take fire extinguishing method which correspond to the combustibles. Extinguish a fire from the windward as much as possible.

**Special protective equipment for firefighter:** Respiratory equipment of a gas cylinder style or protection-against-dust mask.

Hand protection: Protective gloves.

Eye protection: Goggle or protective glasses designed to protect against liquid splashes.

Skin and body protection: Protective cloth.

## **6 – ACCIDENTAL RELEASE MEASURES**

Spilled internal cell materials, such as electrolyte leaked from a battery, are carefully dealt with according to the followings.

### **Precautions for human body:**

Remove spilled materials with protective equipment (protective glasses and protective gloves). Do not inhale the gas as much as possible. Moreover, avoid touching with as much as possible.

Environmental precautions: do not throw out into the environment.

Method of cleaning up: The spilled solids are put into a container. The leaked place is wiped off with dry cloth.

Prevention of secondary hazards: Avoid re-scattering. Do not bring the collected materials close to fire.

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## 7 – HANDLING AND STORAGE

### **Handling:**

Technical measures

Prevention of user exposure: Not necessary under normal use.

Prevention of fire and explosion: Not necessary under normal use.

Precaution for safe handling: Do not damage or remove the external tube.

Specific safe handling advice: Never throw out cells in a fire or expose to high temperatures. Do not soak cells in water or seawater. Do not expose to strong oxidizers. Do not give a strong mechanical shock or fling. Never disassemble, modify or deform. Do not connector the positive terminal to negative terminal with electrically conductive material. In the case of charging, use only dedicated charger of charge according to the conditions specified by .

### **Storage:**

Technical measures

Storage conditions (suitable, to be avoid): Avoid direct sunlight, high temperature, high humidity. Store in cool place (temperature: -20~ 35°C, humidity: 45~85%) .

Incompatible products: conductive materials, water, seawater, strong oxidizers and strong acids.

Packing material (recommended, not suitable): Insulative and tearproof materials are recommended.

## 8 – EXPOSURE CONTROLS/PERSONAL PROTECTION

### **Engineering measures:**

**No engineering measure is necessary during normal use.** In case of internal cell material's leakage, operate the local exhaust or improve ventilation.

### **Control parameters**

Chemical name	ACGIH(2002)	
	TLV-TWA	BEI
LiCoO <sub>2</sub>	0.02mg/m <sup>3</sup> (as cobalt)	-
Aluminum	10 (metal coarse particulate) 5 (flammable powder) 5 (weld fume)	-
Graphite	2 (inhalant coarse particulate)	-
Organic Electrolyte	1.0 (a coarse particulate, Mist)	-

ACGIH: American Conference of Governmental Industrial Hygienists, Inc.

TVL-TWA: Threshold Limit Value-Time Weighted Average concentration

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BEI: Biological Exposure indices

Personal protective equipment:

Respiratory protection: Respirator with air cylinder, dust mask

Hand protection: Protective gloves

Eye protection: Goggle or protective glasses designed to protect against liquid splashes.

Skin and body protection: Protective cloth:

## **9 – PHYSICAL AND CHEMICAL PROPERTIES**

**8.1 Appearance:** (Physical shape and color as supplied)

Prismatic positive/negative stack, heat sealed with a laminated aluminum packing film.

**8.2 Temperature range:**

There is no useful information for the products as a mixture.

Flash Point: N.A.

Explosion properties: N.A.

Density: N.A.

Solubility, with indication of the solvent(s): Insoluble in water.

## **10 – STABILITY AND REACTIVITY**

**Stability:** Stable under normal use.

**Hazardous reactions under occurring under specific conditions:**

Conditions to avoid: When a battery is exposed to an external short-circuit, crushes, deformation, high temperature above 100 °C , it will be the cause of heat generation and ignition. Direct sunlight and high humidity.

Materials to avoid: Conductive materials, water, seawater, strong oxidizers and strong acids.

Hazardous decomposition products: Acrid or harmful gas is emitted during fire.

## **11 – TOXOLOGICAL INFORMATION**

There is no available data on the product itself. The information of the internal cell material is as follows.

**Lithium Cobaltate-LiCoO<sub>2</sub>**

**Acute toxicity:** No applicable data

**Reference cobalt;** LDLo, oral-Guinea pig 20mg/kg

**Local effects:** Unknown

**Sensitization:**

The nervous system of respiratory organs may be stimulated sensitively.

**Chronic toxicity/Long term toxicity:**

By the long-term inhalation of coarse particulate or vapor of cobalt, it is possible to

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cause the serious respiratory-organs disease. Skin reaction or a lung disease for allergic or hypersensitive person may be caused.

**Skin causticity:** Although it is very rare, the rash of the skin and allergic erythema may result.

## Aluminum

**Local effects:** Aluminum itself has no toxicity. When it goes into a wound, dermatitis may be caused.

### Chronic toxicity/Long term toxicity:

By the long-term inhalation of coarse particulate or vapor or fume, it is possible to cause a lung damage (aluminum lungs).

## Graphite

**Acute toxicity:** Unknown

**Local effects:** When it goes into one's eyes, it stimulates one's eyes; conjunctivitis, thickening of corneal epithelium or edematous inflammation palpebra may be cause.

### Chronic toxicity/Long term toxicity:

By the long-term inhalation of high levels of graphite coarse particulate may become a cause of a lung disease or a tracheal disease.

**Carcinogenicity:**

Graphite is not recognized as a cause of cancer by research organizations and natural toxic substance research organizations of cancer.

## 12 – ECOLOGICAL INFORMATION

**Persistence/degradability:**

Since a battery and the internal materials remain in the environment, do not bury or throw out into the environment.

## 13 – DISPOSAL CONSIDERATIONS

Recommended methods for safe and environmentally preferred disposal:

### Product (waste from residues)

Do not throw out a used battery. Recycle it through the recycling company.

### Contaminated packaging

Nether a container nor packing is contaminated during normal use. When internal materials leaked from a battery contaminates, dispose as industrial wasters subject to special control.

## 14 – REGULATORY INFORMATION.

Regulations sppecifically applicable to the product:

IATA-DGR (air transportation)

IMO-IMDG Code (sea transportation)

US Department of Transportation 49 Code of Federal Regulations [USD]

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## **15: TRANSPORTATION INFORMATION**

In the case of transportation, avoid exposure to high temperature and prevent the formation of any condensation. Take in a cargo of them without falling, dropping and breakage. Prevent collapse of cargo piles and wet by rain. The container must be handled carefully. Do not give shocks that result in a mark of hitting on a cell. Please refer to Section 7-HANDLING AND STORAGE also.

UN classification: However this product's shipping name is "Lithium batteries" (or Lithium Batteries packed with equipment" or "Lithium Batteries contained in equipment"), it is not recognized as "DANGEROUS GOODS" when its transport condition accords with "special provision Section II of PI 965 of IATA DGR" or "special provision 188 of IMP-IMDG Code, UN Number: UN3480 & UN3481.

It also complies with the provision IATA DGR 58<sup>th</sup> Edition, is not classified as dangerous under the current edition.

Transportation condition shipped from \_\_\_\_\_ meets these special provisions.

Each \_\_\_\_\_ battery has been tested under provisions of the UN Manual of Tests and Criteria, Part III, Sub-section 38.3.

## **16- OTHER INFORMATION/**

The information contained in this Safety Data Sheet is based on the present state of knowledge and current legislation.

This safety data sheet provides guidance on health, safety and environmental aspects of the product and should not be construed as any guarantee of technical performance or suitability for particular applications.