

## Safety data sheet for chemical products (SDS)

### 1. PRODUCT AND COMPANY IDENTIFICATION

- MSDS No: **Hytera-BL1401**
- Product name: Lithium Ion Battery **BL1401**
- Spec: 7.4V/1400mAh/10.4Wh
- Company name: Hytera Communications Co., Ltd
- Address: Hytera Tower, Hi-Tech Industrial Park North, Nanshan District, Shenzhen China
- Telephone number: +86 755 26972999
- Fax number: +86 755 86137130
- Emergency telephone number: [Weekday] +86 755 26972999-1099  
[Night and holiday] +86 755 26972999-1099

### 2. COMPOSITION / INFORMATION ON INGREDIENTS

- Substance or preparation: Preparation
- Information about the chemical nature of product:

Common chemical name / General name	CAS number	Concentration / Concentration range	Classification and hazard labeling
Lithium Cobaltate (LiCoO <sub>2</sub> )	12190-79-3	20-60%	-
Aluminum	7429-90-5	1-10%	-
Graphite (Natural graphite) (Artificial graphite)	7782-42-5 7740-44-0	10-20%	-
Copper	7440-50-8	1-15%	Sensitization of the skin group No.2
Organic electrolyte	-	5-25%	Inflammable liquid

### 3. HAZARDS IDENTIFICATION

For the battery cell, chemical materials are stored in a hermetically sealed metal case, designed to withstand temperatures and pressures encountered during normal use. As a result, during normal use, there is no physical danger of ignition or explosion and chemical danger of hazardous materials' leakage.

However, if exposed to a fire, added mechanical shocks, decomposed, added electric stress by miss-use, the gas release vent will be operated. The battery cell case will be breached at the extremity, hazardous materials may be released.

Moreover, if heated strongly by a surrounding fire, acrid gas may be emitted.

- Most important hazard and effects

Human health effects:

Inhalation: The electrolyte may cause severe irritation of the mouth and upper respiratory tract with a burning sensation, pain, burns and inflammation in the nose and throat; there may also be coughing or difficulty breathing.

Skin contact: Electrolyte contact with the skin may cause burns to the skin or severe irritation.

**Eye contact:** The steam of the electrolyte stimulates eyes. Electrolyte contact with the eyes may cause irritation and inflammation. It may cause irreversible damage to the eyes. Contact may cause corneal burns.

**Environmental effects:** The battery should not be released to the environment; they should be recycled wherever possible or be disposed of as hazardous waste at an appropriate recycling facility.

- **Specific hazards:**

If the electrolyte contacts with water, it will generate detrimental hydrogen fluoride.

Since the leaked electrolyte is a flammable liquid, do not bring close to fire.

## 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.

### A battery cell and spilled internal cell materials

- **Ingestion:**

Rinse out mouth thoroughly with water and give plenty of water to drink. Do not induce vomiting. Obtain medical attention immediately.

## 5. FIRE-FIGHTING MEASURE

- **Suitable extinguishing media:** Plenty of water, carbon dioxide gas, nitrogen gas, chemical powder fire extinguishing medium and fire foam.

- **Specific hazards:** Corrosive gas may be emitted during fire.

- **Specific 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 firefighters:**

Respiratory protection: 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 cell, 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 contact 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 material is wiped off with dry cloth.
- Prevention of secondary hazards: Avoid re-scattering. Do not bring the collected materials close to fire.

## 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.

Spelling for local exhaust, and prevention of coarse particulate: Not spelling under normal use

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

Specific safe handling advice: Never throw out cells into 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 connect the positive terminal to the negative terminal with electrically conductive material. In the case of charging, use only dedicated charger or charge according to the conditions specified by our company.

### • Storage

Technical measures:

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

Incompatible products: Conductive materials, water, seawater, strong oxidizers and strong acids

Packing material (recommended): Insulation and tear proof materials are recommended.

State of Charge (SOC) of the battery should be 30% or less.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### • Engineering measures:

No engineering measures are necessary during normal use. In case of internal cell materials' leakage, operate the local exhaust or improve ventilation.

### • Control parameters

Common chemical name / General name	ACGIH (2002)	
	TLV-TWA	BEI
Lithium cobalt oxide (LiCoO <sub>2</sub> )	0.02mg/m <sup>3</sup> (as cobalt)	-
Aluminum	10mg/m <sup>3</sup> (metal coarse particulate) 5mg/m <sup>3</sup> (flammable powder) 5mg/m <sup>3</sup> (weld fume)	-
Carbon (Natural graphite) (Artificial graphite)	2mg/m <sup>3</sup> (inhalant coarse particulate)	-
Copper	0.2mg/m <sup>3</sup> (fume)	-

	1.0mg/m <sup>3</sup> (a coarse particulate, Mist)	
Organic electrolyte	-	-

ACGIH: American Conference of Governmental Industrial Hygienists, Inc.

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

BEI: Biological Exposure Indices

• Personal protective equipment:

Not necessary under normal use. If dealing with spilled internal cell materials such as electrolyte leaked from a battery cell, use the following 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: Working clothes with long sleeve and long trousers

## 9. PHYSICAL AND CHEMICAL PROPERTIES

• Appearance

Physical state: Solid

Form: Prismatic

Color: Metallic color (without tube)

• Odor: No odor

• pH: NA

• Specific temperatures/temperature ranges at which changes in physical state occur:

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

• Flash point: NA

• Explosion properties: NA

• Density: NA

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

## 10. STABILITY AND REACTIVITY

• Stability: Stable under normal use

• Hazardous reactions occurring under specific conditions

- Conditions to avoid: When a battery cell is exposed to an external short-circuit, crushing, deformation, high temperature above 100 degree 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: Acid or harmful gas is emitted during fire.

## 11. TOXICOLOGICAL INFORMATION

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

### Lithium cobalt oxide 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 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 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 caused.

- Chronic toxicity/Long term toxicity:

Since 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.

### Copper

- Acute toxicity:

60-100mg sized coarse particulate causes a gastrointestinal disturbance with nausea and inflammation.

TDLo, hypodermic - Rabbit 375mg/kg

- Local effects:

Coarse particulate stimulates a nose and a tracheal.

When it goes into one's eyes, the symptom of the reddening and the pain is caused. It may stimulate skin sensitively

- Sensitization: Sensitization of the skin may be caused by long-term or repetitive contact.

- Reproductive effects: TDLo, oral - Rat 152mg/kg

### Organic Electrolyte

- Acute toxicity:

LD50, oral - Rat 2,000mg/kg or more

- Local effects: Unknown.

- Skin irritation study: Rabbit - Mild

- Eye irritation study: Rabbit - Very severe

## 12. ECOLOGICAL INFORMATION

- Persistence/degradability:

Since a battery cell 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 cell. Recycle it through the recycling company.

#### **Contaminated packaging**

Neither a container nor packing is contaminated during normal use. When internal materials leaked from a battery cell contaminates, dispose as industrial wastes subject to special control.

### 14. TRANSPORT INFORMATION

In the case of transportation, avoid exposure to high temperature and prevent the formation of any condensation. Transport without falling, dropping and breakage. Prevention of cargo pile collapse due to wetting by rain. The container must be handled carefully. Do not cause shocks which result in marking on the external of the cell. Please refer to Section 7-HANDLING AND STORAGE also.

- UN classification: The cell passed the UN38.3 test. However this product's shipping name is "Lithium ion batteries" (or "Lithium ion Batteries packed with equipment" or "Lithium ion Batteries contained in equipment"), it is not recognized as "DANGEROUS GOODS" when its transport condition accords with "packing instruction 965 section II of IATA-DGR" (or "packing instruction 966 section II" or "packing instruction 967 section II") or "special provision 188 of IMO-IMDG Code".

The outer packaging has been tested to protect the lithium batteries from damage caused by falling from a height of up to 1.2m.

The Batteries are protected so as to prevent short circuits including protection against contact with conductive materials within the same packaging that could lead to a short circuit.

The Batteries have been packed according to PI965, Section IB of the current 58th edition of the IATA Dangerous Goods Regulations 2017, therefore they can be carried as non-Dangerous Goods.

### 15. REGULATORY INFORMATION

- UN(United Nations):Recommendations on the Transport of Dangerous Goods Model Regulations 19th revised edition
- ICAO(International Civil Aviation Organization):Technical Instruction for the safety transport of dangerous goods by air 2017/2018 Edition
- IATA(International Air Transport Organization):Dangerous Goods Regulations 58th Edition Effective 1 January 2017
- IMO(International Maritime Organization):International Maritime Dangerous Goods (IMDG) code 2016 Edition (Amendment 37-14)

### 16. OTHER INFORMATION

- UN(United Nations):Recommendations on the Transport of Dangerous Goods Model Regulations 19th revised edition
- IATA(International Air Transport Organization):Dangerous Goods Regulations 58th Edition Effective 1 January 2017

- IMO(International Maritime Organization):International Maritime Dangerous Goods (IMDG) code
- 2016 TLVs and BEIs

Edition: Jan.01, 2017

Prepared and approved by

Hytera communications Co., Ltd