



Material Safety Data Sheet

1. Chemical Product and Company Identification

| | |
|--------------------------|---------------------------------------|
| Product: | Lithium ion rechargeable battery |
| Nominal voltage: | 10.8 V |
| Nominal capacity: | 1.5 Ah |
| Manufacturer: | Conrad Electronic SE |
| Address: | Klaus-Conrad-Str. 1, D-92240 Hirschau |
| Telephone: | +49 (0) 9604 / 40 - 8988 |
| Date of issue: | 13.09.2019 |

2. Composition /Information on Ingredient

The following information is provided for the user's information only.

| Chemical Name | CAS No. | Chemical Formula Or Abbreviation | In % By Weight |
|-------------------------------------|-----------|--|----------------|
| Nickel and cobalt lithium manganate | --- | LiNi _{1/3} Co _{1/3} Mn _{1/3} O ₂ | ≤40 |
| Graphite | 7782-42-5 | C | ≤18 |
| Copper | 7440-50-8 | Cu | ≤10 |
| Aluminum | 7429-90-5 | Al | ≤5 |
| Super-P | --- | --- | ≤1 |
| Water adhesive LA133 | --- | --- | 0.5 |
| Nickel | 7440-02-0 | Ni | 0.5 |
| Lithium Content | 7439-93-2 | Li | 0.135g/pcs |



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3. Hazards Identification

For the battery cell, chemical materials are stored in a hermetically sealed metal case, designed to withstand temperature 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 extreme, hazardous materials may be released.

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

Hazards and effects

Human health effects:

Inhalation:

The steam of the electrolyte has an anesthesia action and stimulates a respiratory tract.

Skin contact:

The steam of the electrolyte stimulates skin. The electrolyte skin contact causes a sore and stimulation on the skin.

Eye contact:

The steam of the electrolyte stimulates eyes. The electrolyte eye contact causes a sore and stimulation on the eye. Especially, substance that causes a strong inflammation of the eyes is contained.

Environmental effects:

Since a battery cell remains in the environment, do not dispose into the environment. If the electrolyte contacts water, it will generate detrimental hydrogen fluoride.

4. First Aid Measures

Eye contact

If the contents from an opened battery comes into contact with the eyes, immediately flush eyes with water continuously for at least 15 minutes. Seek medical attention.

Skin contact

If the internal battery materials of an opened battery comes into contact with the skin, immediately flush with water for at least 15 minutes.

Inhalation

If potential for exposure to fumes or dusts occurs, remove immediately to fresh air and seek medical attention.

A battery cell and spilled internal materials

Ingestion

Do not induce vomiting. Seek medical attention immediately.



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5. Fire Fighting Measures

Suitable extinguishing Media:

Use CO2 or dry chemical extinguishers or use self-contained breathing apparatus, do not use water.

Special hazards:

Corrosive gas may be emitted during fire.

Special method of fire-fighting:

When the battery burns with other combustibles simultaneously, take fire-extinguishing method which correspond to the combustibles.

Special protective equipment for firefighters:

Respiratory protection:

Respiratory equipment of a protection-against-dust mask

Hand protection:

Protection gloves

Eye protection:

Protective glasses designed to protect against liquid splashes

Skin and body protection:

Protective wear

6. Accidental Release Measures

Spilled internal cell materials, such as electrolyte leaked from a battery cell, are carefully deal with according to the following:

Precautions for human body:

Remove spilled materials with protective equipment (protective glasses and protective gloves). Moreover, avoid skin contact as much as possible.

Environmental precautions:

Do not dispose of into the environment.

Method of cleaning up:

The spilled solids are placed into a container. Spilled liquids are absorbed 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

Accidental short circuit will bring high temperature elevation to the battery as well as shorten the battery life. Be sure to avoid prolonged short circuit since the heat can burn attendant skin and even rupture of the battery cell case. Batteries packaged in bulk containers should not be shaken. Metal covered tables or belts used for assembly work surface.

Storage

Take all precautions mentioned in this document and operate the battery within the temperature range of -20°C and 45°C. Store the battery at ambient temperature in clean environment without chemical vapor nor excessive humidity.

8. Exposure Controls/Personal Protection

Engineering measures:

No engineering measure is necessary during normal use. In the case of internal cell materials' leakage.

Personal protection equipment

Respiratory Protection:

Respiratory with air cylinder, dust mask.

Hand Protection:

Protective gloves.

Eye Protection:

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 |
| Cell Form: | Cylindrical |
| 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: Insoluble in water |



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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, crushes, 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:

Acrid 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:

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.

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.

Local effects: Coarse particulate stimulates a nose and a tracheal

When introduced to eyes, the symptom of the reddening and the pain is caused.

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



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12. Ecological Information

Persistence/Degradability:

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

13. Disposal Considerations

Recommended methods for safe and environmentally preferred disposal:

Product (Waste from residues)

Do not dispose a battery into the waste stream. Recycle through an authorized recycling company.

Contaminated packaging

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

14. Transport Information

During transportation, avoid exposure to high temperature (above 100°C) and prevent the formation of any condensation. Handle with care, do not drop or crush. Prevent collapse of by excessive cargo weight and wet by rain. The container must be handled carefully. Do not mechanically shock which results in damage. Please also refer to Section 7.

UN classification 3480: This product is classified as "Lithium-ion Batteries", it is NOT recognized as "DANGEROUS GOODS" when its transport conditions accords with "special provision A164 of IATA-DGR" or "special provision 188 of IMO-IMDG Code".

The battery has passed UN38.3 test and compliant with section II of both PI 965 and PI 966 of IATA DGR 54th Edition 2013. The battery's watt-hour rating is less than 100Wh. Gross per package is less than 10kg.

15. Regulatory Information

Regulations specifically applicable to the product

IATA-DGR (air transportation)

IMO-IMDG Code (sea transportation)

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.

Reference

Chemical substances information: International Chemical Safety Cards (ICSCs); International Occupational Safety and Health Information Centre (CIH)

Dangerous Goods Regulations-54th Edition Effective 2013: International Transport Association (IATA)

IMDG Code-2010 Edition: International Maritime Organization (IMO)

RTECS (CD-ROM)

MSDS of raw materials prepared by the manufacturers.