

SAFETY DATA SHEET FOR PRODUCT

1. PRODUCT INFORMATION

Product Name: Rechargeable Lithium Ion Battery Pack

IATA Battery type code:

UN 3480 – Lithium Ion Batteries

UN 3481 – Lithium Ion Batteries and Lithium Ion batteries contained in equipment or packed with equipment

Product	CE	configuration	energy	celltype	Cell manufacturer
H2B661.4	Yes	2S2P	70Wh	INR21700M50LT	LG

Product and company identification

Product name: Lithium ion rechargeable battery cell

Product code: None

Company name: HY-LINE AG

Address: Hochstrasse. 355, 8200 Schaffhausen, Switzerland

Telephone number: +41 52 647 42 00

Fax number: +41 52 647 42 01

Emergency telephone number: [Weekday] +41 52 647 42 00

2. Hazards identification

For the battery cell, chemical materials are stored in a hermetically sealed metal or metal laminated plastic 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 extreme, hazardous materials may be released.

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

GHS classification: Not available (This product is outside the scope of GHS system since it's considered as an "article".)

Most important hazard 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 a 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 throw out it into the environment.

Specific hazards:

If the electrolyte contacts with water, it will generate detrimental hydrogen fluoride. Since the leaked electrolyte is inflammable liquid, do not bring close to fire.

3. Composition / information on ingredients

Substance or preparation: Preparation

Information about the chemical nature of product: *1

Portion	Material name	Concentration range (wt %)
Positive electrode	Lithium transition metal oxidate (Li[M] _m [O] _n *2)	20~60
Positive electrode's base	Aluminum	1~10
Negative electrode	Carbon	10~30
Negative electrode's base	Copper	1~15
Electrolyte	Organic electrolyte principally involves ester carbonate	5~25
Outer case	Aluminum, iron, aluminum laminated plastic	1~30

*1 Not every product includes all of these materials.

*2 The letter M means transition metal and candidates of M are Co, Mn, Ni and Al. One compound

Includes one or more of these metals and one product includes one or more of the compounds. The letter m and n means the number of atoms.

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

5. Fire-fighting measures

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.

<u>Precautions for human body:</u>	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.
<u>Environmental precautions:</u>	Do not throw out into the environment.
<u>Method of cleaning up:</u>	The spilled solids are put into a container. The leaked place is wiped off with dry cloth.
<u>Prevention of secondary hazards:</u>	Avoid re-scattering. Do not bring the collected materials close to fire.

7. Handling and storage

Handling suggestions:

- Do not connect the positive terminal to the negative terminal with electrical wire or chain.
- Avoid polarity reverse connection when installing the battery to an instrument.
- Do not wet the battery with water, seawater, drink or acid; or expose to strong oxidizer.
- Do not damage or remove the external tube.
- Keep the battery away from heat and fire.
- Do not disassemble or reconstruct the battery; or solder the battery directly.
- Do not give a mechanical shock or deform.
- Do not use unauthorized charger or other charging method. Terminate charging when the charging process doesn't end within specified time.

Storage:

- Do not store the battery with metal ware, water, seawater, strong acid or strong oxidizer.
- Make the charge amount 30~50% then store at room temperature or less (temperature= -20~35 degree C) in a dry (humidity: 45~85%) place. Avoid direct sunlight, high temperature, and high humidity.
- Use insulating and adequately strong packaging material to prevent short circuit between positive and negative terminal when the packaging breaks during normal handling. Do not use conductive or easy to break packaging material.

8. Exposure controls / personal protection (when the electrolyte leaks)

Control parameters

ACGIH has not been mentioned control parameter of electrolyte.

Personal protective equipment

Respiratory protection: Respirator with air cylinder, dust mask

Hand protection: Protective gloves

Eye protection: Goggles 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: Cylindrical or Prismatic or Pouch (laminated)

Color: Metallic color or black (without tube if it has tube)

Odor: No odor

10. Stability and reactivity

<u>Stability:</u>	Stable under normal use Hazardous reactions occurring under specific conditions.
<u>Conditions to avoid:</u>	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.
<u>Materials to avoid:</u>	Conductive materials, water, seawater, strong oxidizers and strong acids.
<u>Hazardous decomposition products:</u>	Acrid or harmful gas is emitted during fire.

11. TOXICOLOGICAL INFORMATION

Organic Electrolyte

<u>Acute toxicity:</u>	LD50, oral - Rat 2,000mg/kg or more
<u>Irritating nature:</u>	Irritation to skin and eye

12. Ecological information

<u>Persistence/degradability:</u>	Since a battery cell and the internal materials remain in the environment, do not bury or throw out into the environment.
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13. Disposal considerations

Recommended methods for safe and environmentally preferred disposal:

Product (waste from residues)

Specified collection or disposal of lithium-ion battery is required by the law like as "battery control law" in several nations. Collection or recycle of the battery is mainly imposed on battery's manufacturer or importer in the nations recycle is required.

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. 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 regulation

<u>UN number:</u>	3480 (3481 when the battery is contained in equipment or packed with equipment)
<u>Proper shipping name:</u>	Lithium ion batteries ("lithium ion batteries contained in equipment" or "lithium ion batteries packed with equipment")
<u>Class:</u>	9 *
	<i>* Although this product meets the criteria of "dangerous goods" and are classified as "lithium ion batteries", depending on the battery's total capacity in the packaging, etc., they may not be subject to the fully regulated provisions.</i>

Regulation depends on region and transportation mode

<u>Worldwide - Air transportation:</u>	ICAO/IATA-DGR [packing instruction 965 section IB or II] (When shipping batteries "packed with" or "contained in" equipment, use packing instruction 966 or 967 as appropriate.)
<u>Worldwide - Ocean transportation:</u>	IMO-IMDG Code [special provision 188]
<u>Europe - Ground transportation:</u>	ADR [special provision 188]
	<i>* Instructions or provisions in the box brackets are conditions to make the battery cell exempted from full regulation.</i>

15. Regulatory information

Regulations specifically applicable to the product:

Wastes Disposal and Public Cleaning Law [Japan]

Law for Promotion of Effective Utilization of resources [Japan]

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

** About overlapping regulations, please refer to Section 14-TRANSPORT INFORMATION*

16. Other information

This safety data sheet is offered an agency who handles this product to handle it safely.

The agency should utilize this safety data sheet effectively (put it up, educate person in charge) and take proper measures.

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

Latest Dangerous Goods Regulations by International Air Transport Association (IATA)

IMDG Code – latest Edition: International Maritime Organization (IMO)

Agreement concerning the International Carriage of Dangerous Goods by Road (ADR)–
latest version: The United Nations Economic Commission for Europe (UNECE)