

## Material Safety Data Sheet(MSDS)

### 1 Identification of the substance/preparation and of the company/undertak in

#### Product details

**.Chemical Name:** Lithium ion battery

**.End Uses:** Commercial or industrial products.

**.Applicant:** NINGBO EAST LITHIUM ION BATTERY CO, LTD.

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**.Further information obtainable from:** NINGBO EAST LITHIUM ION BATTERY CO, LTD.

#### .Information in case of emergency:

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### 2 Composition/information on ingredients

#### .Chemical characterization

**.Description:** Mixture of substances listed below with additions.

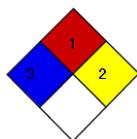
Components Number	CAS Number	Percent (%)
Aluminum Foil	7429-90-5	2-10
Metal Oxide (proprietary)	Confidential	20-50
Polyvinylidene Fluoride (PVDF)	24937-79-9	<5
Styrene Butadiene Rubber(SBR)	9003-55-8	<5
Copper Foil	7440-50-8	2-10
Carbon (proprietary)	7440-44-0	10-30
Electrolyte (proprietary)	Confidential	10-20
Aluminum and inert materials	N/A	Remainder

#### .Notes:

The lithium ion battery described in this Material Safety Date Sheet are sealed which are not hazardous when used according to the recommendations of the manufacturer. Under normal condition of use, electrode materials and liquid electrolyte they contain are non-reactive provided the battery integrity ia maintained and seals remain intact. Risk of exposure only in case of abuse, which leads to the activation of safety valves and the rupture of the battery container. Electrolyte leakage electrode material recation with moisture may follow dependind upon circumstances.

### 3 Hazards identification

.NFPA ratings (scale 0 - 4)



Health = 3; Fire = 1; Reactivity = 2

.HMIS-ratings (scale 0 - 4)

Health	3
Fire	1
Reactivity	2
Personal Protection	E

Health = 3; Flammability = 1; Reactivity = 2; Personal protection=E

.Potential Acute Health Effects:

Do not open battery. Avoid contact with internal components.

Electrolyte-electrolyte is corrosive and contact may cause skin irritation and chemical burns. Electrolyte causes severe irritation and burns of eyes, nose and throat. Ingestion can cause severe burns and vomiting.

### 4 First aid measures

Persons using these products should consult a physician or other medical professional if an accident involving these products in injury. Specific first-aid measures are as follows:

.Eye Contact: Flush with plenty of water for at least 15 minutes.

.Skin Contact: Remove all contaminated clothing and flush affected areas with plenty of water and soap for at least 15 minutes.

.Inhalation: Remove to fresh air and ventilate the contaminated area. Give oxygen or artificial respiration if needed.

.Ingestion: Dilute by giving plenty of water and get immediate medical attention. Assure that the victim does not aspirate vomited material by use of positional drainage. Assure that mucus does not obstruct the airway. Do not give anything by mouth to an unconscious person.

## 5 Fire-fighting measures

**.Flammability of the Product:** Non-flammable.

**.Auto-ignition Temperature:** Not applicable.

**.Flash Points:** Not applicable.

**.Flammable Limits:** Not applicable

**.Fire and Explosion Hazard:** The batteries can leak and combustible electrolyte fumes in case of exposure above 130 °C resulting from inappropriate use or from the environment. Possible foemation of hydrogen fluoride and phosphorous oxides fire . LiPF6 salt contained in the electrolyte releases hydrogen fluoride in contact with water.

**.Extinguishing media:** suitable:CO<sub>2</sub>, Dry chemical or foam extinguishers. Not to be used: type D extinguishers.

**.Special exposure hazards:** Following cell overheating due to external source or due to imprper use, electrolyte leakage or battery container rupture may occur and release inner component in the environment.

Eye contact: the electrolyte solution contained in the battery is irritant to ocular tissues.

Skin contact: the electrolyte solution contained in the battery causes skin irritation.

Ingestion :the ingestion of electrolyte solution causes tissue damage to throat and tract.

**.Special protective equipment:** Use self-contained breathing apparatus to avoid breathing irritat fumes. Wears protective clothing ans equipment to prevent body contact with electrolyte solution.

## 6 Accidental release measures

**.Procedures for cleanup:**

The materical contained within the batteries would only be expelled under abusive conditions . Using shovel or broom, cover battery or spilled substances with dry sand or vermiculite, place inapproved container and diapose in accordance with local regulations.

**.Personal precatuions:** Acid resistant aprons, boots and protective clothing. ANSI approved safety glasses with side face shield recommended. Ventilate enclosed areas.

## 7 Handling and storage

**.Percations::**

Do not crush ,pierce, short and btery terminals with conductive goods. Not directly heat or solder. Do not throw in fire. Do not mix batteries of different types. Do not mix new and used batteries. Keep bteries in non-conductivr trays.

**.Storage:**

Store batteries in cool(preferably below 30 °C) and ventilated are away from moisture sources of heat, open flames, food and drink. Keep adequate clearance between walls and batteries. Temperature above 90 °C may result in battery leakage anf rupture. Since short circuit can cause burn, leakage and rupture hazard, keep batteries in original packaging until use and do not jumble them.

**.Others:**Manufacturer recommendations regarding maximum recommended currents and operating temperature range.Applying pressure on defroming the battery may lead to disassembly followed by eye, skin and throat irritation.

**8 Exposure controls/personal protection****.Respiration protection:**

Not necessary under normal use. In case of battery rupture, use self-contained full-face respiratory equipment. Equip with type BBEK filter.

**.Hand Protective:** Not necessary under normal use. Use rubber gloves if handling a leaking or ruptured battery.

**.Eye protection:** Not necessary under normal use. Wear safety goggles or glasses with side shields if handling a leaking or ruptured battery.

**.Skin protection:** Not necessary under normal use. Use rubber apron and protective working in case of handling of a ruptured battery.

**9 Physical and chemical properties**

<b>Physical state and appearance:</b>	Cylindrical
<b>In storage:</b>	+30 °C max
<b>During discharge:</b>	-25 °C— +80 °C
<b>Specific energy:</b>	135wh/kg
<b>Specific pulse power:</b>	300wh/kg..
<b>Mechanical resistance:</b>	As defined in relevant IEC standard.
<b>Boiling Point:</b>	Not available.
<b>Melting Point:</b>	Not available.
<b>Vapor Pressure:</b>	Not applicable.
<b>Vapor Density:</b>	Not available.
<b>Volatility:</b>	Not available.
<b>Odor Threshold:</b>	Not available.
<b>Water/Oil Dist. Coeff:</b>	Not available.
<b>Ionicity (in Water):</b>	Not available.
<b>Dispersion Properties:</b>	Not available.
<b>Solubility:</b>	Not available.

**10 Stability and reactivity**

**.Stability:** The product is stable.

**.Conditions of instability:** heat above 90 °C or incinerate. Deform, mutilate, crush, pierce, disassemble. Short circuit. Prolonged exposure to humid conditions.

**.Incompatibility with Various Substances:**

Sparks, open flames, keep battery case away from strong oxidizers.

**.Hazardous decomposition products:**

Corrosive hydrogen fluoride is produced in case of reaction of lithium with water. Combustible vapors and formation of hydrogen fluoride and phosphorous oxides during fire.

### 11 Toxicological information

**.Chronic inhalation:**

Lithium-Ion rechargeable batteries do not contain toxic materials.

### 12 Ecological information

When properly used or disposed, Lithium-Ion rechargeable batteries do not present environmental hazard.

### 13 Disposal considerations

**.Recycle if possible. Dispose product according to national/regional regulations in force. Send to authorized disposal plants or to authorized controlled condition incinerators. Contaminated packaging may be recycled or disposed; in this case the receiver must be informed of potential hazards.**

**.Waste Disposal methods:**

Dispose in accordance with applicable regulations which vary from country to country. In more countries the thrashing of used batteries is forbidden and the end-users are invited to dispose them properly, eventually through not-for-profit organizations mandated by local governments or organized on a voluntary basis by professionals, Lithium ion battery should have their terminals insulated and be preferably wrapped in plastic bags prior to disposal.

**.Incineration :**

Incineration should never be performed by battery user but eventually by trained professionals in authorized facilities with proper gas and fumes treatment.

### 14 Transport information

**· Land transport ADR/RID (cross-border):**

- ADR/RID class: -
- Danger code (Kemler): -
- UN-Number: -
- Hazard label: -
- Description of goods: -

**· Maritime transport IMDG:**

- IMDG Class: -
- UN Number: -
- Label: -
- Packaging group: -
- EMS Number: -
- Marine pollutant: NO
- Proper shipping name:

**· Air transport ICAO-TI and IATA-DGR:**

- ICAO/IATA Class: -

· <b>UN/ID Number:</b>	-
· <b>Label</b>	-
· <b>Packaging group:</b>	-
· <b>Proper shipping name:</b>	-

**The consignment complies with current edition-52ND 2011 of the IATA regulation:**

Part II of packing instruction P1996 (lithium ion battery or accessories packed with equipment);

UN manual of tests and criteria. Part III sub-section 38.3 (withstanding a 1.2m drop test) and meets all requirements under UN Manual of tests and criteria part III. subsection 3480.

With content of lithium less than 20 Wh per cell or 100Wh per battery.

**15 Regulatory information**

**.Sara**

.Section 355 (extremely hazardous substances):

None of the ingredient is listed.

.Section 313 (specific toxic chemical listing):

None of the ingredient is listed.

.TSCA (toxic substance control act)

None of the ingredient is listed.

**.Proposition 65**

.Chemical known to cause cancer:

None of the ingredient is listed.

.Chemical known to cause reproductive toxicity for females:

None of the ingredient is listed.

.Chemical known to cause reproductive toxicity for males:

None of the ingredient is listed.

.Chemical known to cause developmental toxicity:

None of the ingredient is listed.

**.Carcinogenicity categories:**

.EPA (Environmental Protection Agency)

None of the ingredient is listed.

.IARC (International Agency for Research on Cancer)

None of the ingredient is listed.

.NTP (National Toxicology Program):

None of the ingredient is listed.

TLV (Threshold Limit Value established by ACGIH):

None of the ingredient is listed.

.NIOSH-Ca (National Institute for Occupational Safety and Health):

None of the ingredient is listed.

.OSHA-Ca(Occupational Safety & Health Administration):

None of the ingredient is listed.

.Product related hazard information:

The transport of rechargeable lithium ion battery is regulated by various bodies that follow the United Nations recommendations on the transport of dangerous goods, model regulation, 15<sup>th</sup> revised edition-ref.st/sg/ac.10/1 rev.15. Depending on their lithium ion equivalent weight content, design, and ability to pass safety tests defined by the UN in the recommendations on the transport of dangerous goods-manual of tests and criteria-4<sup>th</sup> revised edition- ref.st/sg/ac.10/11 rev4 amendment1, the lithium-ion cells and the battery packs are not be assigned to the UN NO3480 class-9,that is restricted for transport. Individual lithium-ion cells and battery packs with respectively less than 20 and 100 wh per gram that pass the UN-defined safety tests are not restricted for transport.

### **16 Other information**

The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty express or implied regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This MSDS was prepared and is to be used only for this product. If the product is used as a component in another product, this MSDS information may not be applicable.