

## Material Safety Data Sheet

### Section 1 - Chemical Product and Company Identification

**Product Name:** Lithium Nickel Manganese Cobalt Oxide (LiNiMnCoO<sub>2</sub>)

**Address:** 825 S 19<sup>th</sup> Street, Richmond, CA 94804, **Tel:** 510-525-2328 **Fax:** 510-439-2808

**Emergency Tel (Within USA and Canada):** CHEMTREC 1-800-424-9300

**Emergency Tel (Outside USA and Canada) for Shipment to USA:** CHEMTREC +1 703-527-3887

**Email:** [sales@batteryspace.com](mailto:sales@batteryspace.com)

### Section 2 - Composition/Information on Ingredient

Ingredient	Content (percent of total weight)	CAS Index No.
Manganese compound (proprietary)	6-15	N/A
Carbon (proprietary)	10-30	7440-44-0
Electrolyte (proprietary)	10-20	N/A
Polyvinylidene Fluoride (PVDF)	<5	24937-79-9
Styrene-Butadiene-Rubber	<1	96-49-1
Cobalt compound (proprietary)	4-10	N/A
Nickel compound (proprietary)	10-25	N/A
Copper Foil	2-10	7440-50-8
Aluminum Foil	2-10	7429-90-5
Stainless steel and Nickel and inert materials	Remainder	N/A

### Section 3 - Hazards Identification

Intact batteries present no specific hazards. If batteries show signs of leaking, AVOID skin or eye contact with the material leaking from the battery. If battery is burning, put out the fire by using right extinguisher for materials burning in fire.

#### Potential Health Hazards:

**Eye:** No particular hazards for proper use. It will cause severe irritation or chemical burn when batteries are broken.

**Skin:** No particular hazards for proper use. It will cause skin severe irritation by inhalation of EC and Routes of Entry: DMC or chemical burn when batteries are broken.

**Inhalation:** It will irritate breath system by being exposed to fumes when batteries are broken.

**Ingestion:** It is deleterious by swallowing battery. Broken batteries will cause severe chemical burn to mouth, esophagus and gastro enteric system

**Environment hazards:** It will cause different harms to man and environment.

**Burning and exploding hazards:** When the battery is short-circuited, over charged or over heated, it may cause electrolyte of the battery leaked out or the battery exploding.

### Section 4 - First Aid Measures

**Eye** - Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

**Skin** - Remove contaminated clothes and rinse skin with plenty of water or shower for 15 minutes. Get medical aid.

**Inhalation** - Remove from exposure and move to fresh air immediately. Use oxygen if available.

**Ingestion** - Give at least 2 glasses of milk or water. Induce vomiting unless patient is unconscious. Call a physician

### Section 5 - Fire Fighting Measures

#### General Hazard

Cell is not flammable but internal organic material will burn if the cell is incinerated. Combustion products include, but are not limited to hydrogen fluoride, carbon monoxide and carbon dioxide.

#### Hazard properties:

The battery may be over-heated by outside and interior short-circuit, and burning batteries may emit toxic fumes.

#### Hazardous Combustion products:

Metallic oxide, Carbon oxide (CO), Carbon dioxide (CO<sub>2</sub>), etc.

#### Extinguishing Media:

Species D fire extinguishers of chemical dry powder, yellow sands. Do not use water.

#### Firemen safeguard:

Firemen should wear fire-fighting suits with a self-contained breathing apparatus

### Section 6 - Accidental Release Measures

#### Steps to be taken in case Material is Released or Spilled

If the battery is accidentally broken and organic electrolyte leaks out, wipe it up with a cloth, and dispose of it in a plastic bag and put into a steel can. The preferred response is to leave the area and allow the batteries to cool and vapors to dissipate. Provide maximum ventilation. Avoid skin and eye contact or inhalation of vapors. Remove spilled liquid with absorbent and incinerate.

#### Waste Disposal Method

It is recommended to discharge the battery to the end, to use up the metal lithium inside the battery, and to bury the discharged battery in soil.

### Section 7 - Handling and Storage

#### Handling:

- Do not vibrate the battery excessively.
- Avoid short-circuiting the battery. Though short-circuit for little time will not influence badly the battery, short-circuit for long time will lose the battery's energy and bring plenty of heat which will burn skin and cause fire or explosion indeed.
- The equipments of metal which are used for battery pack such as coin, metal accouterments, metal worktable, metal strip, etc. are source of short-circuit.
- It should be provide with effective measures to prevent short-circuit during transportation and storage.

- Do not disassemble and damage the battery.
- The battery should be transported with 10-50% charged states.
- Do not contact the battery with water.
- Do not store the battery in the place with point-blank sunshine.
- The battery should be 40-60% charged for long time storage.
- The battery should be stored in the place where is cool, dry and lee.

#### Storage:

- High temperature may cause the battery capability loss, leakage and rustiness.
- Do not expose the battery to fire.
- Store the battery away from moisture.

## Section 8 - Exposure Controls, Personal Protection

### Respiratory Protection

In case of battery venting, provide as much ventilation as possible. Avoid confined areas with venting batteries. Respiratory Protection is not necessary under conditions of normal use.

### Ventilation

Not necessary under conditions of normal use.

### Protective Gloves

Not necessary under conditions of normal use.

### Other Protective Clothing or Equipment

Not necessary under conditions of normal use.

### Personal Protection is recommended for venting batteries

Respiratory Protection, Protective Gloves, Protective Clothing and safety glass with side shields.

## Section 9 - Physical and Chemical Properties

Please refer most updated information by searching the product part# at [www.batteryspace.com](http://www.batteryspace.com)

## Section 10 - Stability and Reactivity

**Stability:** Stable

**Conditions to Avoid:** Short-circuit, collision, refit, high temperature ( over 100°C), point-blank sunshine and high humidity environment.

**Hazardous Decomposition Products:** Toxic gas brought when burning.

**Hazardous Polymerization:** N/A.

**Incompatibility (Materials to avoid):** Electric materials, water, seawater, oxidant, acid.

## Section 11 - Toxicological Information

Inhalation, skin contact and eye contact are possible when the battery is opened. Exposure to internal contents, the corrosive fumes will be very irritating to skin, eyes and mucous membranes. Overexposure can cause symptoms of non-fibrotic lung injury and membrane irritation.

## Section 12 - Ecological Information

### Ecological toxicity:

The chemicals of the battery will cause harm to the environments if it is discarded to the surroundings.

**Biodegradability:** No information available.

**Non- biodegradability:** No information available.

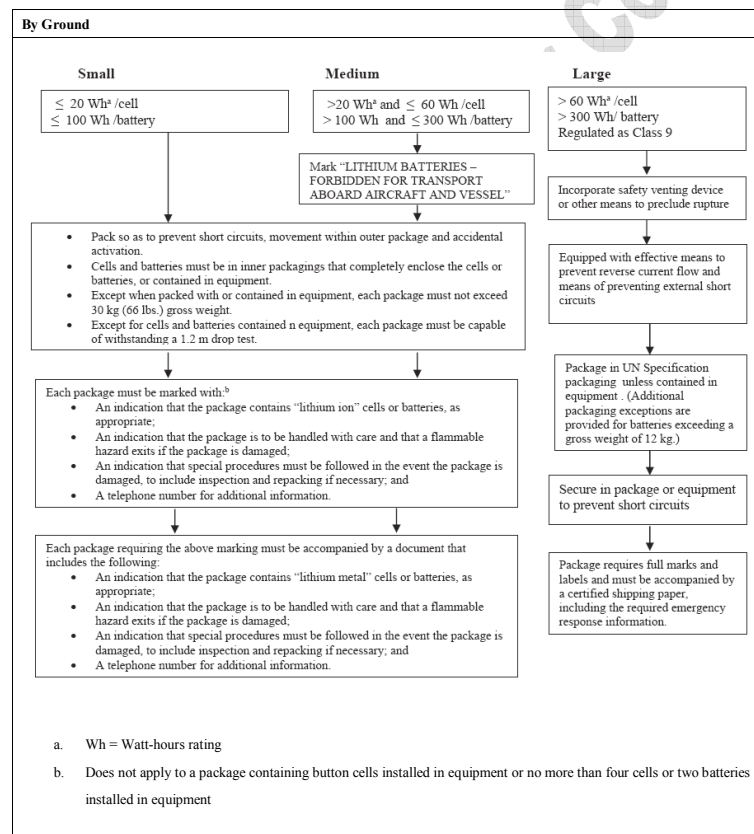
## Section 13 - Disposal Considerations

### APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

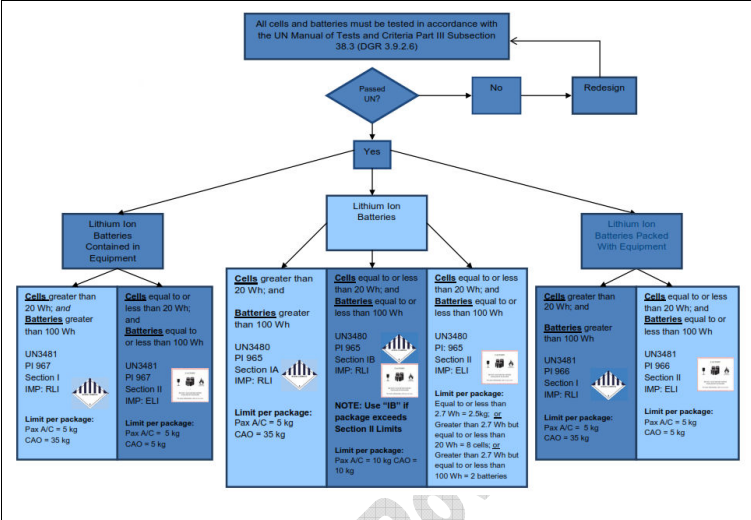
If batteries are still fully charged or only partially discharged, they can be considered a reactive hazardous waste because of significant amount of unreacted, or unconsumed lithium remaining in the spent battery. The batteries must be neutralized through an approved secondary treatment facility prior to disposal as a hazardous waste. Recycling of battery can be done in authorized facility, through licensed waste carrier.

## Section 14 - Transport Information

All cells and batteries (regardless small/medium/large batteries) must be proven to meet the requirement of each test in the UN Manual of Tests and Criteria.

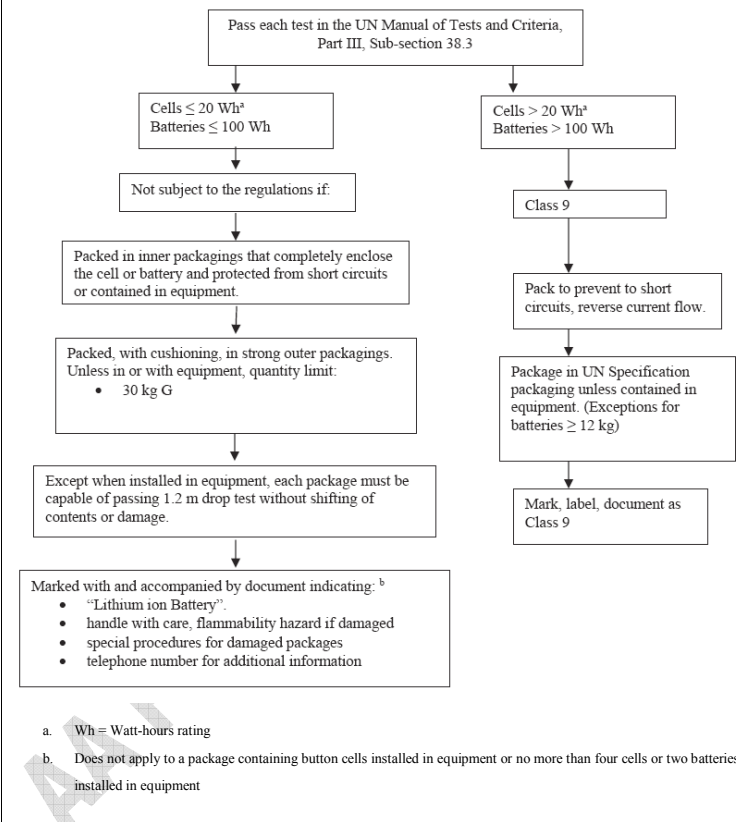


## By Air



## By Ocean

### Lithium-Ion (Rechargeable) Batteries by Ocean



Separate Li-ion batteries when shipping to prevent short-circuiting. They should be packed in strong packaging for support during transport. In the case of transportation, confirm no leakage and no overspill from a container. 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.



## Section 15 - Regulatory Information

### Law Information

《Dangerous Goods Regulation》

《Recommendations on the Transport of Dangerous Goods Model Regulations》

《International Maritime Dangerous Goods》

《Classification and code of dangerous goods》

IATA 2015 DGR 56<sup>th</sup> edition

OSHA Hazard Communication Standard Status

Toxic Substances Control Act (TSCA) Status

SARA Title III

RCRA

In accordance with all Federal, State and Local laws.

## Section 16 - Additional Information

The above information is based on the data of which we are aware and is believed to be correct as of the data hereof. Since this information may be applied under conditions beyond our control and with which may be unfamiliar and since data made available subsequent to the data hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

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