Material Safety Data Sheet

1. Basic item
Product name Lithium ion battery (“Lithium ion battery” includes lithium polymer battery in this document)

2. Product information
Basic composition of the product
This product is a battery which consists of such main component as core battery pack assembled with some Lithium ion cells. And it consists of any combination of plastic casing, tube casing, protection circuit boards, safety devices and interface terminals.

3. Safety information
- Certifies the battery has passed and satisfied the UN Manual of Tests and Criteria Part III, sub-section 38.3 testing in Shipping.
- Manufactured the battery under the quality management program required in UN model

4. Battery pack
1. The Watt-hour rating of the battery is under than 100Wh.
2. Package of the battery satisfy the following conditions.
(1) The product name “Lithium ion batteries” and how to deal with the damage of the package are written on the label.
(2) The package has passed the drop test from the height of 1.2m.

5 The battery is not subject to the fully regulated requirements for Dangerous Goods in ocean and ground transportation.

Lenovo MSDS Finder

Last updated May 19, 2017

For more information, including how to locate your Lenovo FRU Part Number and what to do if your battery part number is not listed below, please visit:

Table : SDS_LGC

Battery Part Numbers			Battery Information						
Lenovo ASM Lenovo PN Part Number	Lenovo FRU Part Number	Lenovo model name	MSDS Type #	UN DOT 38.3 Test Certificate	Cell Voltage (V)	Battery Voltage (V)	Watt hour Rating (Wh)	Weight (grams)	Equivalent Lithium Content (grams)
121-000824		L09C6Y11	SDS_LGC	121-000824_UN38.3	3.6	10.8	47	319	7.92
121-001129		L10C3Z11	SDS_LGC	121-001129_UN38.3	3.6	10.8	24	185	1.98
121-001128		L10C3Z11	SDS_LGC	121-001128_UN38.3	3.6	10.8	24	185	1.98
121-001127		L10C6Y12	SDS_LGC	121-001127_UN38.3	3.6	10.8	48	325	7.92
121-001035		L10C6Y11	SDS_LGC	121-001035_UN38.3	3.7	11.1	48	335	7.92
121-500169		L12C3A01	SDS_LGC	121-500169_UN38.3	3.6	10.8	24	170	1.98
121-500187		L12C3A01	SDS_LGC	121-500187_UN38.3	3.6	10.8	24	170	1.98
121-001127		L10C6Y12	SDS_LGC	121-001127 _UN38.3	3.7	11.1	48	325	7.92
121-001129		L10C3Z11	SDS_LGC	121-001129_UN38.3	3.7	11.1	24	185	1.98
121-001128		L10C3Z11	SDS_LGC	121-001128_UN38.3	3.7	11.1	24	185	1.98
5B10K10220		L14C3A01	SDS_LGC	5B10K10220_UN38.3	3.6	10.8	23.7	144.5	1.98
5B10L04166		L15C3A03	SDS_LGC	5B10L04166_UN38.3	3.6	10.8	23.7	174.3	1.98
5B10L04163		L15C4A02	SDS_LGC	5B10L04163_UN38.3	3.6	14.4	31.6	215.3	2.64
5B10L04160		L15C4E01	SDS_LGC	5B10L04160_UN38.3	3.65	14.6	41	231	3.42
5B10K90783		L15C3PB0	SDS_LGC	5B10K90783_UN38.3	3.8	11.4	45	215.3	3.61
5B10L04161		L15C3A01	SDS_LGC	5B10L04161_UN38.3	3.6	10.8	23.7	178.5	1.98

Material Safety Data Sheet [29 CFR 1910.1200]

Material Safety Data Sheet
May be used to comply with OSHA's Hazard communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

US Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form) Form Approved
OMB No.1218-0072

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER： Celxpert Energy Co., Ltd
ADDRESS： No.128, Gong Wu Rd., Lung Tan, Taoyuan, Taiwan, 325, R.O.C.
TELEPHONE： +886-3-4899054
FAX ： +886-3-4897320
Product Name : Lithium Ion Rechargeable Battery Pack
Product Detail information: Refer Table "SDS_LGC"

SECTION 2: INGREDIENT

Battery Cell

HAZARDOUS INGREDIENTS	%	CAS NUMBER
Cobalt compound	4-50	1307-96-6
Styrene-Butadiene-Rubber	<1	27288-99-9
Aluminum Foil	2-10	7429-90-5
Polyvinylidene Fluoride (PVDF)	<5	24937-79-9
Copper Foil	2-10	7440-50-8
Carbon	10-30	7440-44-0
Electrolyte (Ethylene carbonate)	10-20	96-49-1
Lithium hexafluorophosphate	<5	21324-40-3
Stainless steel, Nickel and inert materials	Remainder	N/A

Circuit Module

HAZARDOUS INGREDIENTS	%	CAS NUMBER
Lead	0.001	7439-92-1
Mercury	0	7439-97-6
Chromium	0	7440-47-3
Cadmium	0	7440-43-9

Plastic case and Si2O	0	N/A

Plastic Parts and Paints

HAZARDOUS INGREDIENTS	%	CAS NUMBER
Lead	<0.1	7439-92-1
Nickle	<0.01	7440-02-0
CFCs	0	75-69-4
Polyclorinated Biphenyls	0	1336-36-3

SECTION 3: HAZARDS IDENTIFICATION

PROTENTIAL HEALTH EFFECTS

PRIMARY ROUTES OF ENTRY

Skin contact, Skin absorption, Eye contact, Inhalation, and Ingestion : NO

SYMPTOMS OF EXPOSURE

Skin contact

No effect under routine handling and use.

Skin absorption

No effect under routine handling and use.

Eye contact

No effect under routine handling and use.

Inhalation

No effect under routine handling and use.

SECTION 4: FIRST AID MEASURES

INHALATION, EYE CONTACT, and SKIN CONTACT : Not a health hazard.

INGESTION

If swallowed, obtain medical attention immediately.

If exposure to internal materials within cell(pack) due to damaged outer casing, the Following actions are recommended.

INHALATION

Leave area immediately and seek medical attention.

EYE CONTACT

Rinse eyes with water for 15 minutes and seek medical attention.

SKIN CONTACT

Wash area thoroughly with soap and water and seek medical attention.

INGESTION

Drink milk/water and induce vomiting; seek medical attention.

SECTION 5: FIRE FIGHTING MEASURES

5.1 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.

5.2 EXTINGUSHING MEDIA

Use extinguishing media suitable for the materials that are burning.

5.3 SPECIAL FIREFIGHTING INSTRUCTIONS

If possible, remove cell(s) from fire fighting area. If heated above 125°C, cell(s) can explode/vent.

5.4 FIREFIGHTING EQUIPMENT

Use NIOSH/MSHA approved full-face self-contained breathing apparatus (SCBA) with full protective gear.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 ON LAND

Place material into suitable containers and call local fire/police department.

6.2 IN WATER

If possible, remove from water and call local fire/police department.

SECTION 7: HANDLING AND STORAGE

7.1 HANDLING

No special protective clothing required for handling individual cells.

7.2 STORAGE

Store in a cool, dry place.

SECTION 8: EXPOSURE CONTROLS//PERSONAL PROTENTION

8.1 ENGINEERING CONTROLS

Keep away from heat and open flame. Store in a cool dry place.

8.2 PERSONAL PROTECTION

Respirator: Not required during normal operations. SCBA required in the event of a fire.

Eye/face protection: Not required beyond safety practices of employer.

Gloves: Not required for handling of cells.

Foot protection: Steel toed shoes recommended for large container handling.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

State	Solid
Odor	N/A
PH	N/A
Vapor pressure	N/A
Vapor density	N/A
Boiling point	N/A
Solubility in water	Insoluble
Specific gravity	N/A
Density	N/A

SECTION 10: STABILITY AND REACTIVITY

10.1 REACTIVITY

None

10.2 INCOMPATIBILITIES

None during normal operation. Avoid exposure to heat, open flame, and corrosives.

10.3 HAZARDOUS DECOMPOSITION PRODUCTS

None during normal operating conditions. If cells are opened, hydrogen fluoride and carbon monoxide may be released.

10.4 CONDITIONS TO AVOID

Avoid exposure to heat and open flame. Do not puncture, crush or incinerate.

SECTION 11: TOXICOLOGICAL INFORMATION

This product does not elicit toxicological properties during routine handling and use.

Sensitization: NO Teratogenicity: NO Reproductive toxicity:NO Acute toxicity: NO

This product does not contain any kinds of the following substances and halogen-type flame retardants including Chlorine and Bromide type harmful flame retardants which are listed in Appendix of TCO documents and relevant international ECO requirements:

Polybromated Biphenyls (PBB)
Polybromated Diphenylethers (PBDE)
Polychlorinated Biphenyls (PCBs)
Polychlorinated Terphenyls(PCTs)
Polychlorinated Paphthalene(PCN)
Chlorinated Paraffins(C10-C13)
Chlorofluorocarbons(CFCs)
Polyvinyl Chloride(PVC)
Carbon Tetrachloride

None of the following substances will be exposed, leaked, or emitted during transportation, storage or any operation and any temperature condition:

Chlorinated Fluorohydrocarbon (FCKW)
Acrylonitride
Styrol
Phenol
Benzol
Mercury of greater than 0.0001 wt% for alkaline battery
Mercury of greater than 0.0005 wt% for other battery
Lithium content of greater than 0.5g/battery cell
Cadmium, lead, and other harmful heavy metal

And will comply with the regulation of 49 CFR (DOT regulation), International Air Transport Association (IATA), and Deuche Forschungsgemeinschaft (DFG) regarding concentrations of emitted substances.

This product does not contain mercury and cadmium.

Mercury content: N/A

Cadmium content: N/A
If the cells are opened through misuse or damage, discard immediately. Internal components of cell are irritants and sensitizers.

SECTION 12: ECOLOGICAL INFORMATION

Some materials within the cell are bio-accumulative. Under normal conditions, these materials are contained and pose no risk to persons or the surrounding environment.

SECTION 13: DISPOSAL CONSIDERATIONS

CALIFORNIA REGULATED DEBRIS

RCRA Waste Code: Non regulated

Dispose of according to all federal, state, and local regulations.

SECTION 14: TRANSPORT INFORMATION

- The International Civil Aviation Organization (ICAO) Technical Instructions (2018-2019 Edition).
- The International Air Transport Association (IATA) Dangerous Goods Regulations (59th Edition, 2018). Packing instruction 965 Section IB or II for Lithium Ion battery.
- The International Maritime Dangerous Goods (IMDG) Code (38-16 Edition) with special provision 188 & 230.
- US Hazardous Materials Regulations 49 CFR(Code of Federal Regulations)Sections 173-185 Lithium batteries and cells.
- The UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria 38.3 Lithium batteries, 6th revised edition(UN3480) .

SECTION 15: OTHER INFORMATION

Package if damaged: do not load or transport.

Celxpert contact window: J.D. Chen

For more information,call 1-800-424-9300

SECTION 16: UN MANUAL OF TEST CRITERIA

All battery pack model pass UN383 test and drop test.

Item	Test Item	Test specification
T1	Altitude Simulation (UN38.3-1)	1-1. 4 batteries are standard charged. 4 batteries are 1C cycled 50 times, ending in fully charged state. All batteries weight is measured. The charged batteries voltage are measured and recorded. 1-2. Batteries shall be stored at a pressure of 11.6Kpa or less for at least six hours at ambient temperature 20+/-5 ℃. 1-3. Vacuum is released. All cells weight is measured. The charged cell voltage are measured and recorded.

Item	Test Item	Test specification
T2	Thermal test (UN38.3-2)	2-1. Packs are stored for 6 hours at 75℃±2℃, followed by storage for 6 hours at -40℃±2℃. The maximum time interval between test temperature extremes is 30 minutes. 2-2. Repeat 2-1 for 10 times. Then store the packs at ambient for 24 hours. All packs weight are measured. The charged battery voltage are measured and recorded.
T3	Vibration test (UN38.3-3)	3-1. Packs are firmly secured to the platform of the vibration machine without distorting the packs in such a manner as to faithfully transmit the vibration. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 and 200 Hz and back to 7 Hz traversed in 15 minutes. This cycle shall be repeated 12 times for a total of 3 hours for each of 3 mutually perpendicular to the terminal face. 3-2. The logarithmic frequency sweep is as follows: 7-18 Hz ➔ 1gn 18-50 Hz ➔ 0.8mm amplitude 50-200 Hz ➔ 8gn 3-3. All packs weight are measured. The charged packs voltage are measured and recorded.
T4	Shock test (UN38.3-4)	4-1. Packs shall be secured to the testing machine by means of a rigid mount, which will support all mounting surfaces. 4-2. Packs shall be subjected to a half-sine shock of peak acceleration 150gn and pulse duration of 6 milliseconds. Each pack shall be subjected to 3 shocks in the positive direction followed by three shocks in the negative direction of three mutually perpendicularly mounting positions of the pack for a total of 18 shocks. 4-3. All batteries weight are measured. The charged cell voltage are measured and recorded.
T5	Short Circuit Test (UN38.3-5)	5-1. Packs are placed in to a 57℃±4℃ oven, and exterior packs temperature are monitored 5-2. When packs exterior reach 57℃±4℃, they are shorted by connecting terminals with a copper wire of resistance less than 100 mOhm. 5-3. The short was continued for more than 1hour or the cell temperature return to 57℃. The packs are observed for a further 6 hours.
T6	Impact test (UN38.3-6)	6-1. Cell's diameter ≧ 18mm, Execution impact test. (A 9.1 Kg mass is to be dropped from a height of 61±2.5cm onto the sample.) 6-2. Cell's diameter ＜ 18mm, Execution crush test (The cells are crushed with a 13 KN with the crush tester. Once the force is obtained it is to be released.)
T7	Overcharge test (UN38.3-7)	7-1. The charge current shall be twice the SPEC's recommended maximum continuous charge current. 7-2. The minimum voltage of the test shall be as follows: (a) When the SPEC's recommended charge voltage is not more than 18V, the minimum voltage of the test shall be the lesser of two times the maximum charge voltage of the battery or 22V. (b) When the SPEC's recommended charge voltage is more than 18V, the minimum voltage of the test shall be 1.2 times the maximum charge voltage. 7-3. Tests are to be conducted at ambient temperature. The duration of the test shall be 24 hours.

Item	Test Item	Test specification
T8	Forced discharge test-cell only (UN38.3-8)	8-1. Cell shall be forced discharged at ambient temperature by connecting it in series with a 12 V D.C. power supply at an initial current equal to the maximum discharge current Specified by the manufacturer.

Package Drop Test
Test specification: Height :120cm.

SECTION 17: REGULATORY INFORMATION

OSHA hazard communication standard (29 CFR 1910.1200)

_____Hazardous __V__ Non-hazardous