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MATERIAL SAFETY DATA SHEET

Lithium Cylindrical Rechargeable Battery

Model: 32650 12V 100Ah

Prepared by	Approved by
Candy	Jiayi Chang
Date： Jan. 10，2013	Date： Jan. 10，2013

Material Safety Data Sheet

Section 1-Chemical Product and Company Identification

Product Identification

SP Lithium-Ion Cylindrical battery

Nominal Voltage : 12V
Nominal Capacity : 100Ah
Energy : 1200wh
Testing Period : Jan. 10，2013 To Jan. 10，2013

Manufacturer

OPTIMUM BATTERY CO., LTD.
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Section 2-Composition/Information on Ingredients

Chemical Composition	Molecular Formula	Weight%	CAS No	OSHA(PEL)	ACGIH(TLV)
$LiFePO_4$	$LiFePO_4$	25～30%	15365-14-7	N/A	N/A
Polyvinylidene fluoride	（CH_2CF_2）n	0.5～2%	24937-79-9	N/A	N/A
Graphite powder	C	15～20%	7782-42-5	N/A	N/A
Electrolyte	LiPF6 $C_3H_4O_3$ $C_4H_6O_3$ $C_3H_{10}O_3$	10～15%	21324-40-3	N/A	N/A
Polyethylene	（C_2H_4）n	0.5～1%	9002-88-4	N/A	N/A
Copper foil	Cu	5～10%	7440-50-8	N/A	N/A
Nickel	Nickel	5～10%	7440-02-0	N/A	N/A
Iron	Fe	15～20%	7439-89-6	N/A	N/A
Aluninum foil	Al	5～10%	7429-90-5	N/A	N/A

Section 3-Hazards Identification

Preparation hazards and classification	Not dangerous with normal use. Do not dismantle, open or shred Li-ion Battery. Exposure to the ingredients contained within or their ingredients products could be harmful.
Appearance, Color, and Odor	Solid object with no odor, no color.
Primary Route(s) of Exposure	These chemicals are contained in a sealed stainless steel enclosure. Risk of exposure occurs only if the cell is mechanically, thermally or electrically abused to the point of compromising the enclosure. If this occurs, exposure to the electrolyte solution contained within can occur by Inhalation, Ingestion, Eye contact and Skin contact.
Potential Health Effects:	ACUTE (short term): see Section 8 for exposure controls In the event that this battery has been ruptured, the electrolyte solution contained within the battery would be corrosive and can cause burns. Inhalation: Inhalation of materials from a sealed battery is not an expected route of exposure. Vapors or mists from a ruptured battery may cause respiratory irritation. Ingestion: Swallowing of materials from a sealed battery is not an expected route of exposure. Swallowing the contents of an open battery can cause serious chemical burns of mouth, esophagus, and gastrointestinal tract. Skin: Contact between the battery and skin will not cause any harm. Skin contact with contents of an open battery can cause severe irritation or burns to the skin. Eye: Contact between the battery and the eye will not cause any harm. Eye contact with contents of an open battery can cause severe irritation or burns to the eye. CHRONIC (long term): see Section 11 for additional toxicological data
Medical Conditions Aggravated by Exposure	Not applicable
Reported as carcinogen	Not applicable

Section 4-First-aid Measures

Inhalation	If contents of an opened battery are inhaled, remove source of contamination or move victim to fresh air. Obtain medical advice.
Skin contact	If skin contact with contents of an open battery occurs, as quickly as possible remove contaminated clothing, shoes and leather goods. Immediately flush with lukewarm, gently flowing water for at least 30 minutes. If irritation or pain persists, seek medical attention. Completely decontaminate clothing, shoes and leather goods before reuse or discard.
Eye contact	If eye contact with contents of an open battery occurs, immediately flush the contaminated eye(s) with lukewarm, gently flowing water for at least 30 minutes while holding the eyelids open. Neutral saline solution may be used as soon as it is available. If necessary, continue flushing during transport to emergency care facility. Take care not to rinse contaminated water into the unaffected eye or onto face. Quickly transport victim to an emergency care facility.
Ingestion	If ingestion of contents of an open battery occurs, never give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. Have victim drink 60 to 240 mL (2-8 oz.) of water. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Have victim rinse mouth with water again. Quickly transport victim to an emergency care facility.

Section 5-Fire Fighting Measures

Flammable Properties	In the event that this battery has been ruptured, the electrolyte solution contain within the battery would be flammable. Like any sealed container, battery cells may rupture when exposed to excessive heat; this could result in the release of flammable or corrosive materials.
Suitable extinguishing Media	Use extinguishing media suitable for the materials that are burning.
Unsuitable extinguishing Media	Not available
Explosion Data	Sensitivity to Mechanical Impact: This may result in rupture in extreme cases Sensitivity to Static Discharge: Not Applicable

Specific Hazards arising from the chemical	Fires involving Li-ion Battery can be controlled with water. When water is used, however, hydrogen gas may evolve. In a confined space, hydrogen gas can form an explosive mixture. In this situation, smothering agents are recommended to extinguish the fire
Protective Equipment and precautions for firefighters	As for any fire, evacuate the area and fight the fire from a safe distance. Wear a pressure-demand, self-contained breathing apparatus and full protective gear. Fight fire from a protected location or a safe distance. Use NIOSH/MSHA approved full-face self-contained breathing apparatus(SCBA) with full protective gear.
NFPA	Health: 0 Flammability: 0 Instability: 0

Section 6-Accidental Release Measures

Personal Precautions, protective equipment, and emergency procedures	Restrict access to area until completion of clean-up. Do not touch t he spilled material. Wear adequate personal protective equipment as indicated in Section 8.
Environmental recautions	Prevent material from contaminating soil and from entering sewers or waterways.
Methods and materials for Containment	Stop the leak if safe to do so. Contain the spilled liquid with dry sand or earth. Clean up spills immediately.
Methods and materials for cleaning up	Absorb spilled material with an inert absorbent (dry sand or earth). Scoop contaminated absorbent into an acceptable waste container. Collect all contaminated absorbent and dispose of according to directions in Section 13. Scrub the area with detergent and water; collect all contaminated wash water for proper disposal.

Section 7-Handling and Storage

Handling	Don’t handling Li-ion Battery with metalwork. Do not open, dissemble, crush or burn battery. Ensure good ventilation/ exhaustion at the workplace. Prevent formation of dust. Information about protection against explosions and fires: Keep ignition sources away- Do not smoke.

Storage	If the Li-ion Battery are subject to storage for such a long term as more than 3 months, it is recommended to recharge the Li-ion Battery periodically. 3 months: -10℃~+40℃, 45 to 85%RH And recommended at 0℃~+35℃ for long period storage. The capacity recovery rate in the delivery state (50% capacity of fully charged) after storage is assumed to be 80% or more. The voltage for a long time storage shall be 3.7V~4.2V range.
	Do not storage Li-ion Battery haphazardly in a box or drawer where they may short-circuit each other or be short-circuited by other metal objects. Keep out of reach of children. Do not expose Li-ion Battery to heat or fire. Avoid storage in direct sunlight. Do not store together with oxidizing and acidic materials.

Section 8-Exposure Controls/Personal Protection

Engineering Controls	Use local exhaust ventilation or other engineering controls to control sources of dust, mist, fumes and vapor. Keep away from heat and open flame. Store in a cool, dry place.
Personal Protective Equipment	Respiratory Protection: Not necessary under normal conditions. Skin and body Protection: Not necessary under normal conditions, Wear neoprene or nitrile rubber gloves if handling an open or leaking battery. Hand protection: Wear neoprene or natural rubber material gloves if handling an open or leaking battery. Eye Protection: Not necessary under normal conditions, Wear safety glasses if handling an open or leaking battery.
Other Protective Equipment	Have a safety shower and eye wash fountain readily available in the immediate work area.
Hygiene Measures	Do not eat, drink, or smoke in work area. Maintain good housekeeping.

Section 9-Physical and Chemical Properties

Physical State	Form: Solid
	Color: Green
	Odour: Monotony

Change in condition:	
pH, with indication of the concentration	Not applicable
Melting point/freezing point	Not available.
Boiling Point, initial boiling point and Boiling range:	Not available.
Flash Point	Not available.
Upper/lower flammability or explosive limits	Not available.
Vapor Pressure:	Not applicable
Vapor Density: (Air = 1)	Not applicable
Density/relative desity	Not available.
Solubility in Water:	Insoluble
n-octanol/water partition coefficient	Not available.
Auto-ignition temperature	130℃
Decomposition temperature	Not available.
Odout threshold	Not available.
Evaporation rate	Not available.
Flammability (soil, gas)	Not available.
Viscosity	Not applicable

Section 10- Stability and Reactivity

Stability	The product is stable under normal conditions.
Conditions to Avoid (e.g. static discharge, shockor vibration)	Do not subject Li-ion Battery to mechanical shock. Vibration encoutered during transportation does not cause leakage, fire or explosion. Do not disassemble, crush, short or install with incorrect polarity. Avoid mechanical or electrical abuse.
Incompatible Materials	Not Available
Hazardous Decomposition Products	This material may release toxic fumes if burned or exposed to fire
Possibility of Hazardous Reaction	Not Available

Irritation	Risk of irritation occurs only if the cell is mechanically, thermally or electrically abused to the point of compromising the enclosure. If this occurs, irritation to the skin, eyes and respiratory tract may occur.
Sensitization	Not Available
Neurological Effects	Not Available
Teratoaenicitv	Not Available
Reproductive Toxicity	Not Available
Mutagenicity (Genetic Effects)	Not Available
Toxicologically Synergistic Materials	Not Available

Section 12-Ecological Information

General note:	Water hazard class 1(Self-assessment): slightly hazardous for water. Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
Anticipated behavior of a chemical product in environment/possible environmental impace/ecotoxicity	Not Available
Mobility in soil	Not Available
Persistence and Degradability	Not Available
Bioaccumulation potential	Not Available
Other Adverse Effects	Not Available

Section 13-Disposal Considerations

Product disposal recommendation: Observe local, state and federal laws and regulations. Packaging disposal recommendation: Be aware discarded batteries may cause fire, tape the battery terminals to insulate them. Don't disassembly the battery. Completely discharge containers(no tear drops, no powder rest, scraped carefully). Containers may be recycled or re-used. Observe local, state and federal laws and regulations.

Section 14-Transport Information

The battery models listed have aggregate equivalent lithium content is not more than 100Wh. And shipment is not restricted to IMO IMDG Code according to special provision 188,and contains no item listed under IATA DGR Special Provision A154.And meets all requirements under UN Manual of Tests and Criteria Part III, subsection 38.3.

No	ITEMS	RESULT	REMARKS

1	Altitude simulation	Pass	Test 1 to 5 must be conducted in sequence on the same cell or battery
2	Thermal test	Pass	
3	Vibration	Pass	
4	Shock	Pass	
5	External short circuit	Pass	
6	Impact	Pass	
7	Overcharge	Pass	Only battery do need this test item

The goods are packed according to the packaging requirement of ordinary goods and be applicable to transport by sea. The product is not classified as dangerous Goods according to the current edition of IATA Dangerous Goods Regulations.And not regulated by IATA DGR. This product fully conforms to IATA Shipping PI 965, section Ⅱ. Do not damage or mishandle this package. If package is damaged, batteries must be quarantined, inspected, and repacked. For emergency information, call: +86-755-84630787.

The Li-ion Battery according to NEW PACKING INSTRUCTION 965~967 of IATA DGR 54 th Edition for transportation.

Section 15-Regulatory Information

OSHA hazard communication standard (29 CFR 1910.1200)

_____Hazardous _____V_____Non-hazardous

Section 16-Other Information

This information is not effective to all the batteries manufactured by OPTIMUM BATTERY. This information comes from reliable sources, but no warranty is made to the completeness and accuracy of information contained. OPTIMUM BATTERY doesn't assume responsibility for any damage or loss because of misuse of batteries. Users should grasp the correct use method and be responsible for the use of batteries.