

Material Safety Data Sheet

For

LN Energy Technology Co., Ltd.

Room 501 NO. 8 Stage 2 Tianfulai Industrial Park Ronggui, Shunde, Foshan, Guangdong, CHINA

And for their product

LITHIUM-ION BATTERY PACK

Model/type reference: LN-36V10.4AH

Nominal Voltage: 36V

Typical Capacity: 10400mAh (374.4Wh)

Version number: V1.0

Revision date: N/A

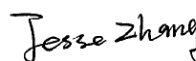
Laboratory: **Shenzhen NTEK Testing Technology Co., Ltd.**

Address: 1/F, Building C, Fenda Science Park, Sanwei Community, Xixiang
Street, Bao'an District, Shenzhen 518126 P. R. China

Compiled by (name+ signature) ..: Jingjing Liu



Approved by (+ signature): Jesse Zhang



Shenzhen NTEK Testing Technology Co., Ltd.

Address: 1/F, Building C, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen 518126 P.R. China
Tel: +86-755-6115 6588 Fax: +86-755-6115 6599 [Http://www.ntek.org.cn](http://www.ntek.org.cn)

Section 1- Chemical Product and Company Identification

Product Identification: LITHIUM-ION BATTERY PACK

Model No.: LN-36V10.4AH

Manufacturer's/ Supplier Name: LN Energy Technology Co., Ltd.

Address: Room 501 NO. 8 Stage 2 Tianfulai Industrial Park Ronggui, Shunde, Foshan, Guangdong, CHINA

Telephone number of the supplier: +86-757-28870701

Emergency Telephone No. (24h): +86-757-28870701

Fax: +86-757-28870701

E-mail address: 41043991@qq.com

Preparation Date: 2019-01-22

This MSDS was prepared by Shenzhen NTEK Testing Technology Co., Ltd.

Item Number: S18122502519001

Referenced documents: ISO 11014:2009 Safety data sheet for chemical products

Section 2 – Hazards Identification

Preparation hazards and classification	Not dangerous with normal use. Do not dismantle, open or shred the LITHIUM-ION BATTERY PACK 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 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:	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>CHRONIC (long term): see Section 11 for additional toxicological data</p>

Medical Conditions Aggravated by Exposure	Not applicable
Reported as carcinogen	Not applicable

Section 3 – Composition/Information on Ingredients

LITHIUM-ION BATTERY PACK is a mixture.

Hazardous Ingredients (Chemical Name)	Concentration or concentration ranges (%)	CAS Number
Nickelous oxide	0-25	1313-99-1
Manganese dioxide	0-15	1313-13-9
Cobalt oxide	4-50	1307-96-6
2,5-Furandione, polymer with 1,3-butadiene and ethenylbenzene	<1	27288-99-9
Polyvinylidene fluoride(PVDF)	<5	24937-79-9
Aluminum foil	2-10	7429-90-5
Copper foil	2-10	7440-50-8
Carbon	10-30	7440-44-0
Ethylene carbonate	10-20	96-49-1
Lithium hexafluorophosphate	<5	21324-40-3
Stainless steel,Nickel and inert materials	Remainder	N/A

Labeling according to EC directives.

No symbol and risk phrase are required.

Note: CAS number is Chemical Abstract Service Registry Number.

N/A=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.
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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 LITHIUM-ION BATTERY PACK are 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
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Section 6 – Accidental Release Measures

Personal Precautions, protective equipment, and emergency procedures	Restrict access to area until completion of clean-up. Do not touch the spilled material. Wear adequate personal protective equipment as indicated in Section 8.
Environmental Precautions	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	<p>Don't handle LITHIUM-ION BATTERY PACK with metalwork. Do not open, disassemble, crush or burn battery. Ensure good ventilation/ exhaust at the workplace.</p> <p>Prevent formation of dust.</p> <p>Information about protection against explosions and fires: Keep ignition sources away- Do not smoke.</p>
Storage	<p>If the LITHIUM-ION BATTERY PACK is subject to storage for such a long term as more than 3 months, it is recommended to recharge the LITHIUM-ION BATTERY PACK periodically.</p> <p>3 months: -10°C~+40°C, 45 to 85%RH</p> <p>And recommended at 0°C~+35°C for long period storage.</p> <p>The capacity recovery rate in the delivery state (50% capacity of fully charged) after storage is assumed to be 80% or more.</p> <p>Do not store LITHIUM-ION BATTERY PACK</p>

	<p>haphazardly in a box or drawer where they may short-circuit each other or be short-circuited by other metal objects.</p> <p>Keep out of reach of children.</p> <p>Do not expose LITHIUM-ION BATTERY PACK to heat or fire. Avoid storage in direct sunlight.</p> <p>Do not store together with oxidizing and acidic materials.</p>
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Section 8 – Exposure Controls and Personal Protection

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

Section 9 - Physical and Chemical Properties

Physical State	Form: Solid
	Color: Black
	Odor: Odorless
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 density	Not available.
Solubility in Water:	Insoluble
n-octanol/water partition coefficient	Not available.
Auto-ignition temperature	130°C
Decomposition temperature	Not available.
Odour 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, shock or vibration)	Do not subject LITHIUM-ION BATTERY PACK to mechanical shock. Vibration encountered 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

Section 11 - Toxicological Information

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
Teratogenicity	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 impact/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

With regard to transport, the following regulations are cited and considered:

- The International Civil Aviation Organization (ICAO) Technical Instructions, Packing instruction 965, section I A(2019-2020 Edition).
- The International Air transport Association (IATA) Dangerous Goods Regulations, Packing instruction 965, section I A(60th Edition, 2019).
- The International Maritime Dangerous Goods (IMDG) Code (Amendment 38-16 Edition).
- The US Hazardous Materials Regulation 49 CFR (Code of Federal Regulations).
- The UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria 38.3 Lithium batteries, Rev.6/Amend.1.
- Proper shipping name and UN ID number: LITHIUM ION BATTERIES, UN No.: UN3480.

Our products are properly classified, described, packaged, marked, and labeled, and are in proper condition for transportation according to all the applicable international and national governmental regulations, and should be transported as Class 9 hazardous material. We further certify that the enclosed products have been tested and fulfilled the requirements and conditions in accordance with UN Recommendations (T1 – T8) on the Transport of Dangerous Goods Model Regulations and the Manual of Tests and Criteria.

Test results of the UN Recommendation on the Transport of Dangerous Goods

Manual of Test and Criteria (38.3 Lithium battery)			
No.	Test items	Test results	Remark
T1	Altitude simulation	Pass	-
T2	Thermal test	Pass	-
T3	Vibration	Pass	-
T4	Shock	Pass	-
T5	External short circuit	Pass	-
T6	Crush	Pass	-
T7	Overcharge	Pass	-
T8	Forced discharge	Pass	-

The following information is provided for domestic and international transportation:

DOT regulations:		
UN Classification (Transport Hazard class):	9	
UN number:	3480	
Packing group:	II	
UN Proper shipping name(technical name):	LITHIUM ION BATTERIES	
Marine pollutant(Y/N)	N	
Label:	Class 9	
Land transportation ADR/RID (cross-broder):		
ADR/RID class:	9 Miscellaneous dangerous substances and articles	
Danger code(Kemler):	9	
UN-Number:	3480	
Packaging group:	II	
Marine pollutant(Y/N):	N	
Label:	Class 9	
Description of goods:	LITHIUM ION BATTERIES	
Sea transport IMDG:		
Class or division:	Class 9	
UN Number:	3480	
Label:	Class 9	
Packaging group:	II	
EMS Number:	F-A, S-I	
Marine pollutant(Y/N):	N	
Propper shipping name:	LITHIUM ION BATTERIES	
Air transport ICAO-TI and IATA-DGR:		
Class or division:	Class 9	
UN Number:	3480	
Label:	Class 9	
Packaging group:	II	
Marine pollutant(Y/N):	N	
Propper shipping name:	LITHIUM ION BATTERIES	

Section 15 - Regulatory Information

OSHA hazard communication standard (29 CFR 1910.1200)

_____ Hazardous

_____ Non-hazardous

Section 16 - Other Information

The information above is believed to be accurate and represents the best information currently available to us. However, NTEK makes no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. Although reasonable precautions have been taken in the preparation of the data contained herein, it is offered solely for your information, consideration and investigation. This material safety data sheet provides guidelines for the safe handling and use of this product; it does not and cannot advise on all possible situations, therefore, your specific use of this product should be evaluated to determine if additional precautions are required.

The data/information contained herein has been reviewed and approved for general release on the basis that this document contains no export controlled information.

***** End of MSDS *****