



MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT IDENTIFICATION

<b>Product Identification</b>	
Polymer Lithium-Ion Rechargeable Battery	
Nominal Voltage(V):	3.7
P/N:	SP281320AB
Nominal Capacity(mAh):	46
UL NO:	MH27663
Customer P/N:	N/A
<b>Manufacture Identification</b>	
Tianjin Lishen Battery Joint-Stock CO. LTD.	86 - 22 - 83710366
6 Lanyuan Road, Huayuan Hi-Tech	Phone Number (For Information)
Industry Park, Tianjin 300384, China	86 - 22 - 83710366
Http://www.lishen.com.cn	Emergency Phone Number Telex'
	86 - 22 - 83710366
	Note: Blank spaces are not permitted. If any item is not applicable or no information is available, the space must be marked to indicate that.

SECTION 2 HAZARDS IDENTIFICATION

<b>Primary Routes of Entry</b>	<input type="checkbox"/> Inhalation <input type="checkbox"/> Ingestion <input type="checkbox"/> Skin Absorption <input type="checkbox"/> Eye contact	<b>CARCINOGEN LISTED IN</b> <input type="checkbox"/> NTP <input type="checkbox"/> OSHA <input type="checkbox"/> LARC Monograph <input type="checkbox"/> NOT Listed
<b>Health Hazards</b>	<b>Acute and chronic</b> All chemicals are contained in a sealed can. Risk of exposure occurs only,if the battery is mechanically or electrically abused(mechanical, thermal, electrical), which leads to the rupture of the battery container. Electrolyte leakage, electrode materials reaction with moisture/water or battery vent/fire may follow, depending upon the circumstances.	
<b>Medical Conditions Generally Aggravated By Exposure</b>		
An acute exposure will not generally aggravate any medical condition.		
<b>Symptoms of Exposure</b>	Skin contact, no effect under routine handling and use.	
<b>Eye Contact</b>	No effect under routine handling and use	
<b>Skin Contact</b>	No effect under routine handling and use	
<b>Ingestion</b>	No effect under routine handling and use	
<b>Inhalation</b>	No	
<b>Reported as carcinogen</b>	Not applicable	

SECTION 3 COMPOSITION & INFORMATION ON INGREDIENTS

Equivalent lithium content per cell (g)		0.014	OSHA	ACGIH	CAS Number	OTHER LIMITS	
COMPONENTS-Chemical Name and Common Names		%	PEL	TLV		RECOMMENDED	
<b>Hazardous Ingredients:</b>	<b>Cathode active material</b>	<b>Lithium Cobalt Oxide</b>	38%		12190-79-3		
	<b>Anode active material</b>	<b>Graphite</b>	19%		7782-42-5		
	<b>Electrolyte</b>	<b>LiPF<sub>6</sub></b>	<b>12%</b>	2%		21324-40-3	
		<b>EC</b>	<b>30%</b>	5%		96-49-1	
		<b>EMC</b>	<b>50%</b>	8%		623-53-0	
		<b>PC</b>	<b>8%</b>	1%		108-32-7	
<b>Non-Hazardous Ingredients:</b>	<b>Anode tab</b>	<b>Nickel</b>	1%		7440-02-0		
	<b>Cathode tab</b>	<b>Aluminum</b>	0%		7429-90-5		
	<b>AL foil</b>	<b>Aluminum</b>	5%		7429-90-5		
	<b>Cu foil</b>	<b>Copper</b>	11%		7440-50-8		
	<b>Conductive additive</b>	<b>Carbon</b>	1%		7440-44-0		
	<b>Adhesive</b>	<b>Polyvinylidene fluoride</b>	2%		24937-79-9		
	<b>Tape</b>	<b>Polypropylene</b>	1%		9003-07-0		
	<b>Separator</b>	<b>Polypropylene</b>	3%			9003-07-0	
		<b>Polyethylene</b>				9002-88-4	
	<b>Package</b>	<b>Nylon</b>	3%			32131-17-2	
<b>Aluminum</b>					7429-90-5		
<b>Total</b>	<b>Polypropylene</b>				9003-07-0		
		100%					

SECTION 4 FIRST-AID MEASURES

<b>If exposure to internal materials in cell due to damaged outer casing, the following actions are recommended.</b>	
<b>Eye Contact</b>	In case of eye contact, flush with lot of water for 15 minutes, and get medical help.
<b>Skin Contact</b>	In case of skin contact with contents of battery, flush immediately with water.
<b>Inhalation</b>	In case of light inhalation ,move to an area with flash air immediately, if irritation persists, get medical help.
<b>Ingestion</b>	In case of ingestion, drink milk/water to induce vomiting and wash out, get medical help.



**SECTION 11 TOXICOLOGICAL INFORMATION**

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

**SECTION 12 ECOLOGICAL INFORMATION**

Cobalt and its compounds can pose a threat if released to environment. The detail information are showed in waste disposal method in Section 13 "Disposal Consideration".

**SECTION 13 DISPOSAL CONSIDERATIONS**

**There is no contamination during normal operation and use. Lithium batteries should have their terminals insulated prior to disposal, do not throw away a used battery and provide them for recycling company.**

**Open cells should be treated as hazardous waste. If the leakage or other material is Released, we should take actions as follows:**

- Leave the area, allow the batteries to cool down, let the vapors to dissipate .
- Avoid skin and eye contact or inhalation of vapors. Remove spiller liquid with absorbent and incinerate after.

**Waste Disposal method Opened cells should be treated as hazardous waste**

- Incineration: incineration should never be performed by battery users but eventually by trained professionals in authorized facilities with proper gas and fumes treatment.
- Landfilling: According to the proper laws and regulations in different countries or areas, the battery should be buried deeply in the specified place;
- Recycling: Send to authorized recycling facilities to get Co,Cu and Al,eventually through licensed waste carrier;

**SECTION 14 Transportation**

Lishen's SP281320AB Lithium Ion batteries are considered to be "rechargeable batteries" and meet the requirements of transportation by th U.S. Department of Transportation, Civil Aviation Organization (ICAO) Technical Instructions (2014-2015 Edition), the International Air Transport Association (IATA) Dangerous Goods Regulations (56th Edition, 2015). Packing instruction 965 Section IB or II for Lithium Ion battery, the International Maritime Dangerous Goods (IMDG) Code (2010 Edition) with special provision 188 & 230, US Harzardous Materials 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 4th revised edition(UN3480) as "non-dangerous goods" or "non-hazardous materials". The mentioned batteries are complied with the special provision, SectionII of PI965 to PI967. These lithium can be transported in nonrestrictive material and as Non-Dangerous Goods as they meet all the requirements in below:

1	Lithium content requirement
1.1	For the bar cells,the lithium content can not overpass 20Wt/h;
1.2	For the batteries, the lithium content can not overpass 100Wt/h;
2	Meet with UN Test Requirement
2.1	All the cell and battery must be verified to meet with all the requirements in Part 3 -38.3 item (UN38.3 tests) for "Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria" .
3	Package Requirement
3.1	The cell and battery must be packaged specially and singly, and put into hard outer package to prevent short-circuit if they do not be assembled in finished equipments (such as mobile phone,camera,NBPC.and so on)
3.2	The cell quantity is more than 24pcs or the battery quantity is more than 12pcs, they must be asked to meet with the requirements in blow besides they are assembled in finished equipment.
a	Every package must be marked in the content that the packages are loaded in lithium cells or batteries, also add new lithium iron operation label , also need point out the corrective actions when the packages are damaged.
b	Every batch shipment must be appendixes document which should contain the content that the packages are loaded in lithium cells or batteries, also need point out the corrective actions when the packages are damaged.
c	Every package must pass 1.2mm fall test in any direction. No damage for the cells and batteries, no move and touch together, no cells or batteries escape from the package.
d	Every package weight can not overpass 10kg if the batteries can not be assembled in finished equipment.

**SECTION 15 REGULATORY INFORMATION**

OSHA Hazard Communication Standard ( 29 CFR 1910.1200)

Hazardous  Non-hazardous

**SECTION 16 OTHER INFORMATION**

**There is no hazards in accordance with the UN recommendations test.(UN manual of tested and criteria 38.3)**

Battery Number	SP281320AB
Nominal Voltage	3.7
Nominal Capacity	46mAh
Battery Mass	2g
Equivalent Lithium Content	0.0138g

Test NO	Test Item	Criteria	Result
38.3.4.1	Altitude Test	No mass loss,leakage,venting,disassembly,rupture,and fire.OCV should not be less than 90% before testing	Passed
38.3.4.2	Thermal Test	No mass loss,leakage,venting,disassembly,rupture,and fire.OCV should not be less than 90% before testing	Passed
38.3.4.3	Vibration	No mass loss,leakage,venting,disassembly,rupture,and fire.OCV should not be less than 90% before testing	Passed
38.3.4.4	Shock	No mass loss,leakage,venting,disassembly,rupture,and fire.OCV should not be less than 90% before testing	Passed
38.3.4.5	External Short Circuit	External temperature should not exceed 170degC.No disassembly, and fire within six hours of this test.	Passed
38.3.4.6	Impact	External temperature should not exceed 170degC.No disassembly, and fire within six hours of this test.	-----
38.3.4.7	Overcharge	No disassembly, and fire within seven days of this test.	Passed
38.3.4.8	Forced Discharge	No disassembly, and fire within seven days of this test.	-----