

MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT	T IDENTIFICATION							
• Product Identification	Dalaman Lishiman Lan Dashaman La Dattama			7				
	Polymer Lithium-Ion Rechargeable Battery Nominal Voltage(V): 3.7							
	P/N:	SP281320	AB					
	Nominal Capacity(mAh):	46						
	UL NO:	MH2766	53					
	Customer P/N:	N/A						
• Manufacture Identification Tianjin Lishen Battery Joint-Stock CO. LTD.				_	86 - 22 - 83		potion)	_
	6 Lanyuan Road, Huayuan Hi-Tech			-	Phone Number (For Information) 86 - 22 - 83710366 Emergency Phone Number Telex'			_
	Industry Park, Tianjin 300384, China			_	86 - 22 - 83710366			
	Http://www.lishen.com.cn						permitted. If any item is not applicable or a marked to indicate that.	no information is
SECTION 2 HAZARD	S IDENTIFICATION							
	 Inhalation 	■ Ingestion			□ NTP		□ OSHA	
Primary Routes of Entry	Skin Absorption	■ Eye contact		CARCINOGEN LISTED IN	□ LARC Monograph □ NOT Listed			
	Acute and chronic							
		sealed can Risk of	exposure oc	curs only if the bat	terv is mech:	anically or elec	trically abused(mechanical, thermal, electri	ical) which leads
Health Hazards			•	•	•	•	•	
	to the rupture of the battery con	tainer. Electrolyte le	akage, elect	rode materials react	tion with mo	isture/water or	battery vent/fire may follow, depending up	on the circumstances.
Medical Conditions Gene	rally Aggravated By Exposure							
	not generally aggravate any medi							
Symptoms of Exposure	Skin contact, no effect under ro	utine handling and u	se.					
Eye Contact	No effect under routine handling	No effect under routine handling and use						
Skin Contact	No effect under routine handling and use							
Ingestion	No effect under routine handling and use							
Inhalation	No							
Reported as carcinogen	Not applicable							
SECTION 3 COMPOS	ITION & INFORMATION OF	NINGREDIENTS						
Equivalent lithium conte	nt per cell (g)			0.014	OSHA	ACGIH	GIGN. I	
COMPONENTS-Chemic	al Name and Common Names			%			CAS Number	OTHER LIMITS
(Hazardous Components	1% or greater, Carcinogens 0.	1			PEL	TLV		RECOMMENDED
	Cathode active material	Lithium Cobalt O	xide	38%			12190-79-3	
	Anode active material	Graphite	120/	19%			7782-42-5	
${\bf Hazardous\ Ingredients:}$		LiPF ₆ EC	12% 30%	2% 5%			21324-40-3 96-49-1	
	Electrolyte	EMC	50%	8%			623-53-0	
		PC	8%	1%			108-32-7	
	Anode tab	Nickel		1%			7440-02-0	
	Cathode tab	Aluminum		0%			7429-90-5	
	AL foil	Aluminum		5%			7429-90-5	
	Cu foil	Copper		11%			7440-50-8	
Non Honordone	Conductive additive Adhesive	Carbon Polyvinylidene fluo		1% 2%			7440-44-0 24937-79-9	
Non-Hazardous Ingredients:	Tape	Polypropylene	oriae	1%			9003-07-0	
ingredients.		Polypropylene					9003-07-0	
	Separator	Polyethylene		3%			9002-88-4	
		Nylon					32131-17-2	
	Package	Aluminum		3%			7429-90-5	
Total		Polypropylene		100%			9003-07-0	
SECTION 4 FIRST-AI	D MEASURES							
If exposure to internal ma	aterials in cell due to damaged	outer casing, the fo	ollowing act	ions are recomme	nded.			
Eye Contact	In case of eye contact, flush with lot of water for 15 minutes, and get medical help.							
Skin Contact	In case of skin contact with contents of battery, flush immediately with water.							
Inhalation	In case of light inhalation ,move to an area with flash air immediately, if irritation persists, get medical help.							
Ingestion	In case of ingestion, drink milk/water to induce vomiting and wash out, get medical help.							



2015-2-6



■ Will Not Occur

SECTION 5 FIREFIGHTING MEASURES						
Extinguisher Media:						
CO ₂ or dry chemical power						
Special Fire-Fighting Procedures:						
In case of fire in cell original containers, use CO2 or dry c	hemical extinguisher; For fire i	n an adjacent area, water can l	pe used.			
SECTION 6 ACCIDENTAL RELEASE MEASURES						
On Land:						
Place material into suitable containers, If the skin has com-	ie into contact with the electroly	te, it should be washed thorou	ighly with water, Sand or earth should be used to absorb any exuded			
material. Seal leaking battery and contaminated absorbent m	aterial should be treated by loca	al regulation, and call local fire	e/police department to ask for help.			
In Water:						
If possible, remove from water far from body in special fixture, and call local fire/police department to ask for help						
SECTION 7 HANDING AND STORAGE						
Handling:						
Take all precautions mentioned in this document and oper	ate the battery within the tempe	erature range of -20 °C and 45°	C.			
No special protective clothing required for handling indivi-	idual cells in corrective operation	onal method.				
Improper handling of lithium ion battery may result in inju	ury or damage from electrolyte	leakage, heating, ignition or e	xplosion. So do not crush, pierce, short cell/battery terminals with conductive			
material; Do not directly heat or solder; do not throw into fir	e; do not place cell/battery in no	on conductive trays.				
Storage:						
Store the battery in a cool, drying place, without chemical	vapor or excessive numberly.					
SECTION 8 EXPOSURE CONTROLS & PERSONAL	PROTECTION					
Engineering Controls:						
keep away from heat and open flame, prevent hard & shar	p thing penetration, store in a co	ool & dry place.				
Personal Protection:						
Respiratory Protection: Not necessary under normal opera		I in the event of a fire.				
Eye/Face Protection: Not necessary under normal operation Glove protection: Not necessary under normal operation of						
Foot Protection: Steel toed shoes recommended for Large						
1 oot 11 otee took blood 1 oo ballge	☐ Local Exhaust		□ Mechanical (General)			
			Not necessary under conditions of Normal use.			
Ventilation to Be Used	Not necessary under conditions	of Normal use.	□ Special			
ventilation to be esect			Not necessary under conditions of Normal use.			
	☐ Other (Specify)	er tre				
Other Protective Clothing and Equipment	Not necessary under normal op	eration conditions.				
Other Protective Clothing and Equipment						
Not necessary under normal operation conditions.						
Hygienic Work Practices						
Not necessary under normal operation conditions.						
SECTION 9 PHYSICAL /CHEMICAL PROPERTIES	1					
Specific Gravity (H2O=1):						
LiCoO ₂ :3.80		Graphite:2.0~2.2				
Melting Point:		G 11: 2500 2000%				
LiCoO2:1130°C Appearance and Odor:		Graphite:3500-3900°C				
LiCoO ₂ is a gray odorless power; Graphite is a black or of	dorless nower					
	-					
Organic solvent is a colorless liquid; Lithium salt is a whi	te, crystalline and odorless pow	er.				
SECTION 10 STABILITY & REACTIVITY DATA						
Stability	Conditions to Avoid:					
■ Stable	Do not heat or incinerate the ba	ttery. Never impact pierce o	or crush the battery			
			. Class die Salesy.			
	Do not disassemble or modify the battery,					
☐ Unstable	Do not charge the battery under high temperature conditions such as near a fire or in the direct sunlight.					
Do not shot-circuit the battery by connect the positive and negative terminals with a metal material.						
Do not allow the battery to get wet or be immersed in water.						
Incompatibility (Materials to Avoid)						
Water, salted water, other solvent with water						
Hazardous Decomposition Products						
N/A						
Hazardous Polymerization		Conditions to Avoid				
□ May Occur						
•		1				



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, Section of P1965 to P1967. 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				
	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)				
	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.				
	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.				
	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.				
CECTION 15 DECLIE A	TODY INFORMATION				

SECTION 15 REGULATORY INFORMATION

OSHA Hazard Communication Standard (29 CFR 1910.1200)

Hazardous	4	Non-hazardou

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.	