

# 鋰電池運輸 證明文件





Reliability Laboratory

## TEST REPORT



Report No. : HE40021/2016

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Date : May 27, 2016

MOBILE ENERGY TECHNOLOGY CO., LTD  
NO.13, KONG 9<sup>TH</sup> ROAD, 2<sup>ND</sup> INDUSTRIAL PARK,  
LINKOU DISTRICT, NEW TAIPEI CITY, TAIWAN, R.O.C.

The following merchandise was submitted and identified by the vendor as:

Item	Information	Comments
Product Description	7S4P Li-ion Battery Pack	
Battery Manufacturer	Mobile Energy Technology Co., Ltd.	
Model No.	LES-2401PF	
Watt-Hour Rating	274.4 Wh	
Pack Voltage	25.2 V	
Charging Mode	CC-CV	
Charge Current	3 A	
Charge Voltage	29.4 V	
End of Charge Current	300mA	
Discharging Mode	CC	
Discharge Current	15 A	
End of Discharge Voltage	21 V	

We have tested the submitted sample(s) as requested and the following results were obtained:

Test Required : ☒ Section 38.3 Lithium metal and lithium ion batteries in UN ST/SG/AC.10/11/Rev.5/

Amend.1 Recommendations on the TRANSPORT OF DANGEROUS GOODS

Manual of Tests and Criteria.

Clause 6.4 Transport tests and Clause 6.5 Misuse tests in IEC 62281 Edition 2.0:2012

Safety of primary and secondary lithium cells and batteries during transport.

### Conclusion

Submittals samples comply with the requirement of Section 38.3 Lithium metal and lithium ion batteries in UN ST/SG/AC.10/11/Rev.5/Amend.1 Recommendations on the TRANSPORT OF DANGEROUS GOODS Manual of Tests and Criteria Fifth revised edition.

Clause 6.4 Transport tests and Clause 6.5 Misuse tests in IEC62281 Edition 2.0:2012 Safety of primary and secondary lithium cells and batteries during transport.

Signed for and on behalf of  
SGS TAIWAN Ltd.

*Norman Wu*

Norman Wu  
Asst. Manager

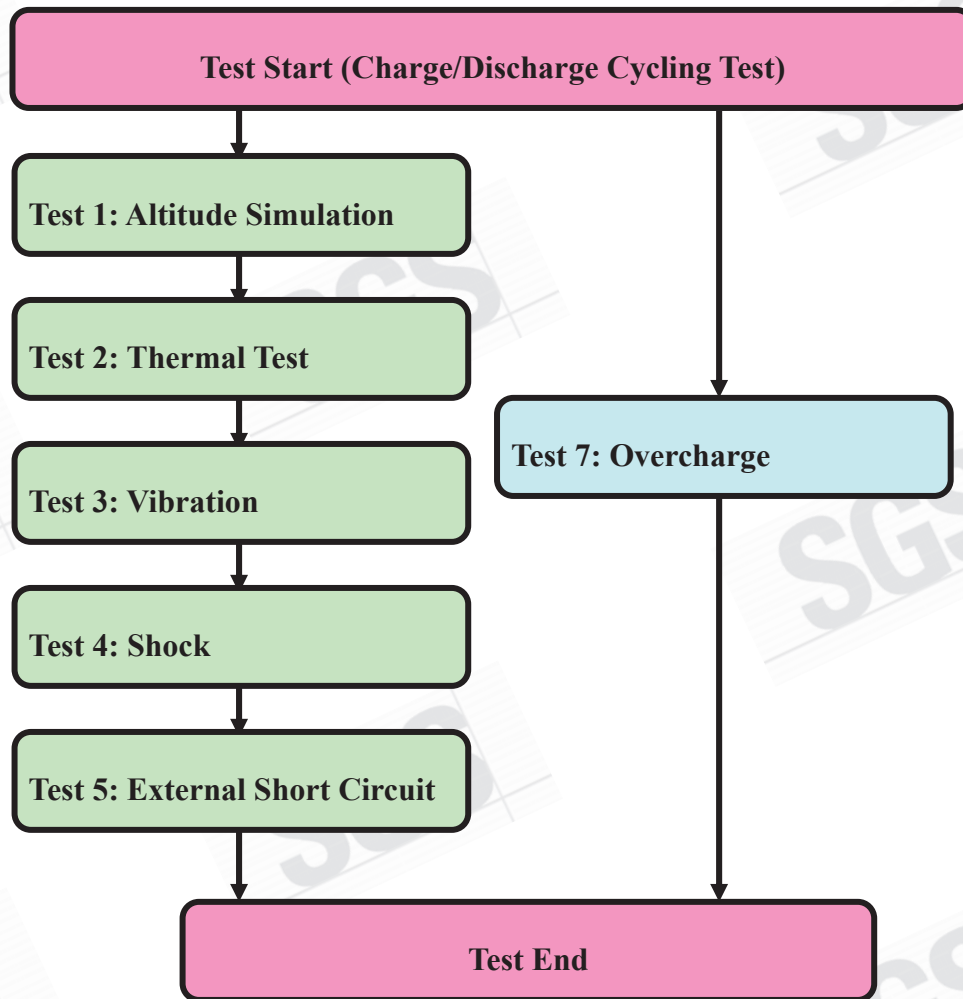
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### Test Flowchart:



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Date of Tests:

Test Started	Test Completed
Apr. 20 ,2016	Mar. 25 ,2016

Lab Environmental Conditions:

Ambient temperature: (20 ± 5) °C

Ambient humidity: (50 ± 20) % RH

Sample Condition:

Sample Status	Sample Size	Sample No.
1. First cycle in fully charged status	8 packs	No.1~No.4, No.9~No.12
2. After fifty cycles ending in fully charged status	8 packs	No.5~No.8, No.13~No.16

Test Equipment:

Name	Brand	Model	Serial No.
Vacuum-Temperature Cabinet	YEONG SHIN	DOBL-45	YSCB940280E
Thermal Shock Tester	KSON	TSK-C4T-150+RAMP	4295T
Vibration Test System	UNHOLTZ-DICKIE	SAI60-H560BAC/2/ST	474
Controller	Dactron	LASER	7110357
Control Accelerometer	PCB	353B34	143550
Shock Test System	LANSMONT	65-81 TTSII	M-13418
Data Acquisition & Analysis System	LANSMONT	103570-2-B	0503-73
ICP Accelerometer	PCB	353B14	79347
Data Acquisition/ Switch Unit	Agilent	34970A	MY44061199
Programmable Temperature & Humidity Chamber	Giant Force	GTH-960-40-CP-AR	MAA1410-009
True RMS Multimeter	Fluke	289	19360015
Electronic Precision Balance	Mettler Toledo	MS6002S/01	B116131743
Charge/Discharge Battery Test System	ChenTech	MCF60L4060A	D11139-1
Charge/Discharge Battery Test System	ChenTech	MCF60L4060A	D11139-2
Charge/Discharge Battery Test System	ChenTech	MCF60L4060A	D11139-3
Charge/Discharge Battery Test System	ChenTech	MCF60L4060A	D09174

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### Images:



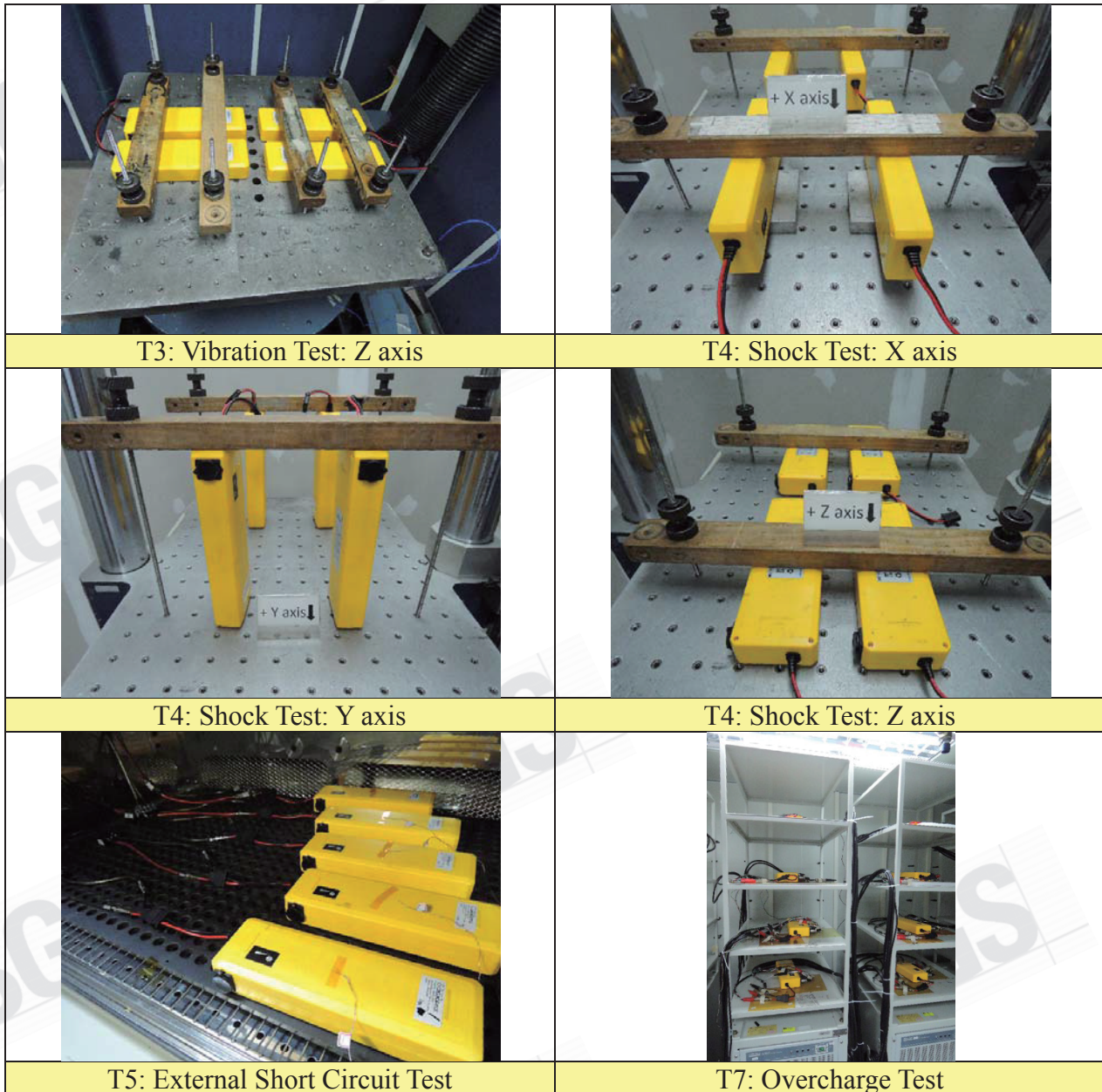
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### Images--Continued:



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## Test Method/ Specification:

Test T.1: Altitude simulation	
Purpose:	This test simulates air transport under low-pressure conditions.
Test Procedure:	Test cells and batteries shall be stored at a pressure of 11.6 kPa or less for at least six hours at ambient temperature ( $20 \pm 5$ ) °C.
Requirement:	Cells and batteries meet this requirement if there is no mass loss, no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

Test T.2: Thermal test	
Purpose:	This test assesses cell and battery seal integrity and internal electrical connections. The test is conducted using rapid and extreme temperature changes.
Test Procedure:	Test cells and batteries are to be stored for at least six hours at a test temperature equal to ( $72 \pm 2$ ) °C, followed by storage for at least six hours at a test temperature equal to ( $-40 \pm 2$ ) °C. The maximum time interval between test temperature extremes is 30 minutes. This procedure is to be repeated 10 times, after which all test cells and batteries are to be stored for 24 hours at ambient temperature ( $20 \pm 5$ ) °C. For large cells and batteries the duration of exposure to the test temperature extremes should be at least 12 hours.
Requirement:	Cells and batteries meet this requirement if there is no mass loss, no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90 % of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

Test T.3: Vibration	
Purpose:	This test simulates vibration during transport.
Test Procedure:	Cells and batteries are firmly secured to the platform of the vibration machine without distorting the cells in such a manner as to faithfully transmit the vibration. The vibration shall be a sinusoidal waveform with a logarithmic sweep between 7 Hz 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 three mutually perpendicular mounting positions of the cell. One of the directions of vibration must be perpendicular to the terminal face. The logarithmic frequency sweep is as follows: from 7 Hz a peak acceleration of 1 gn is maintained until 18 Hz is reached. The amplitude is then maintained at 0.8 mm (1.6 mm total excursion) and the frequency increased until a peak acceleration of 8 gn occurs (approximately 50 Hz). A peak acceleration of 8 gn is then maintained until the frequency is increased to 200 Hz.
Requirement:	Cells and batteries meet this requirement if there is no mass loss, no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90 % of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

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**Test Method/ Specification--Continued:**

<b>Test T.4: Shock</b>	
Purpose:	This test simulates possible impacts during transport.
Test Procedure:	Test cells and batteries shall be secured to the testing machine by means of a rigid mount which will support all mounting surfaces of each test battery. Each cell or battery shall be subjected to a halfsine shock of peak acceleration of 150 gn and pulse duration of 6 milliseconds. Each cell or battery shall be subjected to three shocks in the positive direction followed by three shocks in the negative direction of three mutually perpendicular mounting positions of the cell or battery for a total of 18 shocks. However, large cells and large batteries shall be subjected to a half-sine shock of peak acceleration of 50 gn and pulse duration of 11 milliseconds. Each cell or battery is subjected to three shocks in the positive direction followed by three shocks in the negative direction of each of three mutually perpendicular mounting positions of the cell for a total of 18 shocks.
Requirement:	Cells and batteries meet this requirement if there is no mass loss, no leakage, no venting, no disassembly, no rupture and no fire and if the open circuit voltage of each test cell or battery after testing is not less than 90% of its voltage immediately prior to this procedure. The requirement relating to voltage is not applicable to test cells and batteries at fully discharged states.

<b>Test T.5: External short circuit</b>	
Purpose:	This test simulates an external short circuit.
Test Procedure:	The cell or battery to be tested shall be temperature stabilized so that its external case temperature reaches $(55 \pm 2) ^\circ\text{C}$ and then the cell or battery shall be subjected to a short circuit condition with a total external resistance of less than 0.1 ohm at $(55 \pm 2) ^\circ\text{C}$ . This short circuit condition is continued for at least one hour after the cell or battery external case temperature has returned to $(55 \pm 2) ^\circ\text{C}$ . The cell or battery must be observed for a further six hours for the test to be concluded.
Requirement:	Cells and batteries meet this requirement if their external temperature does not exceed $170 ^\circ\text{C}$ and there is no disassembly, no rupture and no fire within six hours of this test.

<b>Test T.7: Overcharge</b>	
Purpose:	This test evaluates the ability of a rechargeable battery to withstand an overcharge condition.
Test Procedure:	The charge current shall be twice the manufacturer's recommended maximum continuous charge current. The minimum voltage of the test shall be as follows: (a) when the manufacturer's recommended charge voltage is not more than 18 V, the minimum voltage of the test shall be the lesser of two times the maximum charge voltage of the battery or 22 V. (b) when the manufacturer's recommended charge voltage is more than 18 V, the minimum voltage of the test shall be 1.2 times the maximum charge voltage. Tests are to be conducted at ambient temperature. The duration of the test shall be 24 hours.
Requirement:	Rechargeable batteries meet this requirement if there is no disassembly and no fire within seven days of the test.

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**Test Result:**

## 1. Altitude Simulation:

Model No.: LES-2401PF

Test Item Sample No.	Weight Measurement				Voltage Measurement				Appearance Check
	Unit: gram				Unit: Volt				No leakage, No venting, No disassembly, No rupture and No fire
	Initial (W <sub>0</sub> )	Final (W <sub>1</sub> )	Mass loss (W <sub>0</sub> -W <sub>1</sub> )/ W <sub>0</sub>	Mass loss < 0.1%?	Initial (V <sub>0</sub> )	Final (V <sub>1</sub> )	(V <sub>1</sub> /V <sub>0</sub> )	(V <sub>1</sub> /V <sub>0</sub> ) >90%?	
No.1	1848.74	1848.70	0.00%	Pass	29.321	29.212	99.63%	Pass	Pass
No.2	1849.26	1849.22	0.00%	Pass	29.331	29.231	99.66%	Pass	Pass
No.3	1849.79	1849.72	0.00%	Pass	29.442	29.334	99.63%	Pass	Pass
No.4	1849.49	1849.43	0.00%	Pass	29.433	29.321	99.62%	Pass	Pass
No.5	1848.66	1848.60	0.00%	Pass	29.215	29.191	99.92%	Pass	Pass
No.6	1849.62	1849.55	0.00%	Pass	29.196	29.184	99.96%	Pass	Pass
No.7	1845.21	1845.15	0.00%	Pass	29.215	29.203	99.96%	Pass	Pass
No.8	1848.20	1848.17	0.00%	Pass	29.187	29.161	99.91%	Pass	Pass
Conclusion	Meet the requirement of Test T.1: Altitude Simulation.								
Note									

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Test Result--Continued:

## 2. Thermal test:

Model No.: LES-2401PF									
Test Item  Sample No.	Weight Measurement				Voltage Measurement				Appearance Check
	Unit:gram				Unit:Volt				No leakage, No venting, No disassembly, No rupture and No fire
	Initial (W <sub>1</sub> )	Final (W <sub>2</sub> )	Mass loss (W <sub>1</sub> -W <sub>2</sub> )/W <sub>1</sub>	Mass loss < 0.1%?	Initial (V <sub>1</sub> )	Final (V <sub>2</sub> )	(V <sub>2</sub> /V <sub>1</sub> )	(V <sub>2</sub> /V <sub>1</sub> ) >90%?	
No.1	1848.70	1847.66	0.06%	Pass	29.212	28.747	98.41%	Pass	Pass
No.2	1849.22	1848.26	0.05%	Pass	29.231	28.747	98.34%	Pass	Pass
No.3	1849.72	1848.70	0.06%	Pass	29.334	28.785	98.13%	Pass	Pass
No.4	1849.43	1848.33	0.06%	Pass	29.321	27.901	95.16%	Pass	Pass
No.5	1848.60	1847.74	0.05%	Pass	29.191	28.738	98.45%	Pass	Pass
No.6	1849.55	1848.59	0.05%	Pass	29.184	28.732	98.45%	Pass	Pass
No.7	1845.15	1844.39	0.04%	Pass	29.203	28.745	98.43%	Pass	Pass
No.8	1848.17	1847.27	0.05%	Pass	29.161	28.694	98.40%	Pass	Pass
Conclusion	Meet the requirement of Test T.2: Thermal test.								
Note									

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## Test Result--Continued:

### 3. Vibration:

Model No.: LES-2401PF									
Test Item  Sample No.	Weight Measurement				Voltage Measurement				Appearance Check  No leakage, No venting, No disassembly, No rupture and No fire
	Unit:gram				Unit:Volt				
	Initial (W <sub>2</sub> )	Final (W <sub>3</sub> )	Mass loss (W <sub>2</sub> -W <sub>3</sub> )/W <sub>2</sub>	Mass loss < 0.1%?	Initial (V <sub>2</sub> )	Final (V <sub>3</sub> )	(V <sub>3</sub> /V <sub>2</sub> )	(V <sub>3</sub> /V <sub>2</sub> ) >90%?	
No.1	1847.66	1847.20	0.02%	Pass	28.747	28.715	99.89%	Pass	Pass
No.2	1848.26	1848.21	0.00%	Pass	28.747	28.706	99.86%	Pass	Pass
No.3	1848.70	1848.22	0.03%	Pass	28.785	28.749	99.87%	Pass	Pass
No.4	1848.33	1848.30	0.00%	Pass	27.901	27.900	100.00%	Pass	Pass
No.5	1847.74	1847.28	0.02%	Pass	28.738	28.698	99.86%	Pass	Pass
No.6	1848.59	1848.11	0.03%	Pass	28.732	28.690	99.85%	Pass	Pass
No.7	1844.39	1844.29	0.01%	Pass	28.745	28.706	99.86%	Pass	Pass
No.8	1847.27	1847.21	0.00%	Pass	28.694	28.620	99.74%	Pass	Pass
Conclusion	Meet the requirement of Test T.3: Vibration Test.								
Note									

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Test Result--Continued:

## 4. Shock:

Model No.: LES-2401PF									
Test Item  Sample No.	Weight Measurement				Voltage Measurement				Appearance Check
	Unit:gram				Unit:Volt				No leakage, No venting, No disassembly, No rupture and No fire
	Initial (W <sub>3</sub> )	Final (W <sub>4</sub> )	Mass loss (W <sub>3</sub> -W <sub>4</sub> )/W <sub>3</sub>	Mass loss < 0.1%?	Initial (V <sub>3</sub> )	Final (V <sub>4</sub> )	(V <sub>4</sub> /V <sub>3</sub> )	(V <sub>4</sub> /V <sub>3</sub> ) >90%?	
No.1	1847.20	1847.17	0.00%	Pass	28.715	28.691	99.92%	Pass	Pass
No.2	1848.21	1848.18	0.00%	Pass	28.706	28.674	99.89%	Pass	Pass
No.3	1848.22	1848.11	0.01%	Pass	28.749	28.722	99.91%	Pass	Pass
No.4	1848.30	1848.24	0.00%	Pass	27.900	27.900	100.00%	Pass	Pass
No.5	1847.28	1847.24	0.00%	Pass	28.698	28.666	99.89%	Pass	Pass
No.6	1848.11	1848.10	0.00%	Pass	28.690	28.658	99.89%	Pass	Pass
No.7	1844.29	1844.05	0.01%	Pass	28.706	28.674	99.89%	Pass	Pass
No.8	1847.21	1847.13	0.00%	Pass	28.620	28.552	99.76%	Pass	Pass
Conclusion	Meet the requirement of Test T.4: Shock Test.								
Note									

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Test Result--Continued:

## 5. External Short Circuit:

Model No.: LES-2401PF			
Test Item Sample No.	External Temperature Unit: °C		Appearance Check
	Temperature (T <sub>1</sub> )	T <sub>1</sub> < 170°C ?	No disassembly, No rupture and No fire with in six hours
No.1	55.6	Pass	Pass
No.2	55.2	Pass	Pass
No.3	55.2	Pass	Pass
No.4	56.5	Pass	Pass
No.5	55.2	Pass	Pass
No.6	55.4	Pass	Pass
No.7	55.5	Pass	Pass
No.8	55.0	Pass	Pass
Conclusion	Meet the requirement of Test T.5: External short circuit.		
Note			

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**Test Result--Continued:**

## 6. Overcharge:

Model No.: LES-2401PF			
Test Item	Charge Voltage	Charge Current	Appearance Check
Sample No.	Unit: Volt	Unit: Amp	No disassembly and No fire within seven days of the test
No.9	35.28	7	Pass
No.10	35.28	7	Pass
No.11	35.28	7	Pass
No.12	35.28	7	Pass
No.13	35.28	7	Pass
No.14	35.28	7	Pass
No.15	35.28	7	Pass
No.16	35.28	7	Pass
Conclusion	There is no overcharge protection function of battery pack.		

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Test Summary:

Test Item	Test Result	Note
Test T.1: Altitude simulation	Pass	
Test T.2: Thermal test	Pass	
Test T.3: Vibration	Pass	
Test T.4: Shock	Pass	
Test T.5: External short circuit	Pass	
Test T.7: Overcharge	Pass	

— — — The End of Test Report — — —

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# 維洋科技股份有限公司

## Mobile Energy Technology Co., Ltd

No.13, Kong 9<sup>th</sup> Road, 2<sup>nd</sup> Industrial Park, Linkou District, New Taipei City, Taiwan, R.O.C.  
TEL: 886-2-2601-0385 FAX: 886-2-2601-0460 <http://www.metco.com.tw>

### MATERIAL AND SAFETY DATA SHEET

#### MANUFACTURER INFORMATION

Mobile Energy Technology Co., Ltd.

No.13, Kong 9<sup>th</sup> Road, 2<sup>nd</sup> Industrial Park, Linkou District, New Taipei City, Taiwan, R.O.C.

TEL: 886-2-2601-0385 FAX: 886-2-2601-0460 <http://www.metco.com.tw>

Date: April 24, 2019 Version: A.0

#### 1. PRODUCT INFORMATION

Product Name: Lithium Ion Rechargeable Battery Pack

Model No.: **LES-2401PF(W)**

Cell: NCR18650PF

Rating: 25.2V/10.8Ah/274.4Wh

SOC State of Charge: ☒  $\leq 30\%$  ☐  $\sim 50\%$  ☐  $\sim 80\%$

**IATA Battery type code:**

**UN 3480 - Lithium Ion Batteries**

**UN 3481 - Lithium Ion Batteries and Lithium Ion batteries contained in equipment or packed with equipment.**

#### 2. COMPOSITION / INFORMATION ON INGREDIENTS

- Substance or preparation: Preparation
- Information about the chemical nature of product:\*1

Portion	Chemical Name	CAS NO.	Typical Concentration
Positive electrode	Lithium transition metal oxide ( $\text{Li}[\text{M}]_m[\text{O}]_n$ *2) Lithium nickel oxide( $\text{LiNiO}_2$ )	12031-65-1	37%
Negative electrode	Graphite	7782-42-5	24%
Positive electrode's base	Aluminum	7429-90-5	5%
Negative electrode's base	Copper	7440-50-8	9%
Outer case	Iron	7439089-6	14%
Electrolyte	Dimethyl carbonate	616-38-6	8%
	Ethylene carbonate; EC	96-49-1	1%
	Lithium Hexafluorophosphate	21324-40-3	2%

\*1 Not every product includes all of these materials.

\*2 The letter M means transition metal and candidates of M are Co, Mn, Ni and Al. One compound includes one or more of these metals and one product includes one or more of the compounds.  
The letter m and n means the number of atoms.

#### 3. HAZARDS IDENTIFICATION

For the battery cell, chemical materials are stored in a hermetically sealed metal or metal laminated plastic case, designed to withstand temperatures and pressures encountered during normal use. As a result, during normal use, there are no physical hazards such as ignition, explosion and chemical hazards due to leakage of battery contents.

However, if exposed to a fire, added mechanical shocks, decomposed, added electric stress by miss-use, the gas release vent will be operated. The battery cell case will be breached at the extreme, hazardous materials may be released.

Also, if it is heated strongly by surrounding fires or the like, there is a possibility that irritating or harmful





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gas may be generated.

- GHS classification: Not available

(This product is outside the scope of GHS system since it's considered as an "article".)

- **Most important hazard and effects**

### **Human health effects:**

Inhalation: The steam of the electrolyte has an anesthesia action and stimulates a respiratory tract.

Skin contact: The steam of the electrolyte stimulates a skin. The electrolyte skin contact causes a sore and stimulation on the skin.

Eye contact: The steam of the electrolyte stimulates eyes. The electrolyte eye contact causes a sore and stimulation on the eye. Especially, substance that causes a strong inflammation of the eyes is contained.

Environmental effects: Since a battery cell remains in the environment, do not throw out it into the environment.

- **Specific hazards:**

If the electrolyte contacts with water, it will generate detrimental hydrogen fluoride.

Since the leaked electrolyte is inflammable liquid, do not bring close to fire.

## **4. FIRST-AID MEASURES**

### **Spilled internal cell materials**

- Inhalation:

Make the victim blow his/her nose, gargle. Seek medical attention if necessary.

- Skin contact:

Remove contaminated clothes and shoes immediately. Wash extraneous matter or contact region with soap and plenty of water immediately.

- Eye contact:

Do not rub one's eyes. Immediately flush eyes with water continuously for at least 15 minutes. Seek medical attention immediately.

### **A battery cell and spilled internal cell materials**

- Ingestion:

Wash out mouth thoroughly. Do not make the victim vomit, unless instructed by medical personnel. Seek medical attention immediately.

## **5. FIRE-FIGHTING MEASURE**

- Suitable extinguishing media: Plenty of water, carbon dioxide gas, nitrogen gas, chemical powder fire extinguishing medium and fire foam.
- Specific hazards: Corrosive gas may be emitted during fire.
- Specific methods of fire-fighting: When the battery burns with other combustibles simultaneously, take fire-extinguishing method which correspond to the combustibles. Extinguish a fire from the windward as much as possible.
- Special protective equipment for firefighters: Refer to Section 8-EXPOSURE CONTROLS/PERSONAL PROTECTION (WHEN THE ELECTROLYTE LEAKS)

## **6. ACCIDENTAL RELEASE MEASURES**

Spilled internal cell materials, such as electrolyte leaked from a battery cell, are carefully dealt with according to the followings.



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- Precautions for human body:  
Remove spilled materials with protective equipment (refer to Section 8-EXPOSURE CONTROLS/ PERSONAL PROTECTION (WHEN THE ELECTROLYTE LEAKS)). Do not inhale the gas as much as possible. Moreover, avoid touching with as much as possible.
- Environmental precautions: Do not throw out into the environment.
- Method of cleaning up: The spilled solids are put into a container. The leaked place is wiped off with dry cloth.
- Prevention of secondary hazards: Avoid re-scattering. Do not bring the collected materials close to fire.

## 7. HANDLING AND STORAGE

- Handling suggestions
  - Do not connect the positive terminal to the negative terminal with electrical wire or chain.
  - Avoid polarity reverse connection when installing the battery to an instrument.
  - Do not wet the battery with water, seawater, drink or acid; or expose to strong oxidizer.
  - Do not damage or remove the external tube.
  - Keep the battery away from heat and fire.
  - Do not disassemble or reconstruct the battery; or solder the battery directly.
  - Do not give a mechanical shock or deform.
  - Do not use unauthorized charger or other charging method. Terminate charging when the charging process doesn't end within specified time.
- Storage
  - Do not store the battery with metalware, water, seawater, strong acid or strong oxidizer.
  - Make the charge amount less than or equal to 50% then store at -20~40 degree C in a dry (humidity: 45~85%) place.  
Since deterioration will be faster in the high temperature range than in the low temperature range, so do not keep it in the high temperature range beyond the period that is specified by the seller or owner.
  - Use insulative and adequately strong packaging material to prevent short circuit between positive and negative terminal when the packaging breaks during normal handling. Do not use conductive or easy to break packaging material..

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION (WHEN THE ELECTROLYTE LEAKS)

- Control parameters  
ACGIH has not been mentioned control parameter of electrolyte.
- Personal protective equipment  
Respiratory protection: Respirator with air cylinder, dust mask  
Hand protection: Protective gloves  
Eye protection: Goggle or protective glasses designed to protect against liquid splashes  
Skin and body protection: Working clothes with long sleeve and long trousers

## 9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance  
Physical state: Solid  
Form: Cylindrical  
Color: Metallic color (without tube if it has tube)  
Odor: No odor



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### 10. STABILITY AND REACTIVITY

- Stability: Normally stable unless a strong shock is applied or heated strongly
- Possibility of hazardous reactions: Damage to the container may cause leakage of contents. Contents may leak or ignite due to temperature rise.
- Conditions to avoid: Crushing or deformation, use and storage at 80 degree C or higher or at high humidity. Usage at a voltage or a current outside the rating and external short circuit.
- Incompatible materials: Conductive material such as water or metal pieces. Oxidizing agent such as bleach.
- Hazardous decomposition products: Acrid or harmful gas is emitted during leakage or fire.

### 11. TOXICOLOGICAL INFORMATION

#### Organic Electrolyte

- Acute toxicity:  
LD<sub>50</sub>, oral - Rat 2,000mg/kg or more
- Irritating nature: Irritative to skin and eye

### 12. ECOLOGICAL INFORMATION

- Persistence/degradability:  
Since a battery cell and the internal materials remain in the environment, do not bury or throw out into the environment.

### 13. DISPOSAL CONSIDERATIONS

- Recommended methods for safe and environmentally preferred disposal:

#### Product (waste from residues)

Specified collection or disposal of lithium ion battery is required by the law like as "battery control law" in several nations. Collection or recycle of the battery is mainly imposed on battery's manufacturer or importer in the nations recycle is required.

#### Contaminated packaging

Neither a container nor packing is contaminated during normal use. When internal materials leaked from a battery cell contaminates, dispose as industrial wastes subject to special control.

### 14. TRANSPORT INFORMATION

In the case of transportation, avoid exposure to high temperature and prevent the formation of any condensation. Take in a cargo of them without falling, dropping and breakage. Prevent collapse of cargo piles and wet by rain. The container must be handled carefully. Do not give shocks that result in a mark of hitting on a cell. Please refer to Section 7-HANDLING AND STORAGE also.

#### UN regulation

- UN number: 3480 (3481 when the battery is contained in equipment or packed with equipment)
- Proper shipping name:  
Lithium ion batteries ("lithium ion batteries packed with equipment" or "lithium ion batteries contained in equipment")
- Class: 9\*

*\* Although this product meets the criteria of "dangerous goods" and are classified as "lithium ion batteries", depending on the battery's total capacity in the packaging, etc., they may not be subject to the*

*fully regulated provisions.*

#### **Regulation depends on region and transportation mode**

- Worldwide - Air transportation:  
ICAO/IATA-DGR [packing instruction 965 section IA or IB]  
(When shipping batteries “packed with” or “contained in” equipment, use packing instruction 966 or 967 as appropriate.)
- Worldwide - Ocean transportation:  
IMO-IMDG Code [special provision 188]
- Europe - Ground transportation:  
ADR [special provision 188]  
*\* Instructions or provisions in the box brackets are conditions to make the battery cell exempted from full regulation.*

#### **15. REGULATORY INFORMATION**

- Regulations specifically applicable to the product:  
Wastes Disposal and Public Cleaning Law [Japan]  
Law for Promotion of Effective Utilization of resources [Japan]  
US Department of Transportation 49 Code of Federal Regulations [USA]  
*\* About overlapping regulations, please refer to Section 15-TRANSPORT INFORMATION.*

#### **16. OTHER INFORMATION**

- This safety data sheet is offered an agency who handles this product to handle it safely.
- The agency should utilize this safety data sheet effectively (put it up, educate person in charge) and take proper measures.
- ***The information contained in this Safety data sheet is based on the present state of knowledge and current legislation.***
- This safety data sheet provides guidance on health, safety and environmental aspects of the product and should not be construed as any guarantee of technical performance or suitability for particular applications.

#### **Reference**

Dangerous Goods Regulations – 60th Edition Effective 1 January 2019: International Air Transport Association (IATA)

IMDG Code – 2018 Edition: International Maritime Organization (IMO)

The European Agreement concerning the International Carriage of Dangerous Goods by Road – 2019:

The United Nations Economic Commission for Europe (UNECE)

Safety Data Sheet for product - Lithium ion rechargeable battery cell Reference number: SDS-IBT-00026

Establishment / Revision: Nov. 29, 2018

Rechargeable Lithium Ion Battery Pack assembled by: Mobile Energy Technology Co., Ltd.

No.13, Kong 9th Road, 2nd Industrial Park, Linkou District, New Taipei City, Taiwan, R.O.C.

TEL: 886-2-2601-0385 FAX: 886-2-2601-0460 <http://www.metco.com.tw>

Note: The reference data provide from supplier -

Battery Pack Engineering Department

Energy Solutions Business Division Sanyo Electric Co., Ltd.

Panasonic group

Prepared and approved by Mobile Energy Technology Co., Ltd.