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VER:B

Date:2018.11.21

LiFePO4
18500 Cylindrical Battery
Specification

Model: UL18500SL-2P & LIFEPO4-18500 CELL

History of revisions				
Edition	Description	Prepared by	Approved by	Date
B	2nd Edition	S. Provost		11/21/18
A	1st Edition	S. Provost		4/21/11

1. Foreword

This specification is applied to LIFEO4-18500 Manufactured for Dantona Industries, Inc.

2. Retail Packaged Model

UL18500SL-2P 1000mAh

3. Reference

IEC 61960-1: 2000 Secondary lithium cells and batteries for portable applications-Part1: Secondary lithium cells

4. Products specification

	Item	Spec	
1	Standard Voltage	3.2V	
2	Typical Capacity	1000mAh @ 0.2C Discharging with 0.2C	
3	Min Capacity	950mAh @ 0.2C Discharging with 0.2C	
4	Cut off Voltage of Discharging	2.0V	
5	Cut off Voltage of charging	3.65V	
6	The highest Voltage of Charging	3.80V	
7	AC (1KHz) Impedance New Cell Max.(mΩ)	≤75mΩ（ 20C±5C Testing after the standard charging)	
8	Standard charge	0.2C 3.65V, 3.65V 0.01C。Constant Current 0.2C_5A Constant Voltage 3.65V ,0.01 C_5A cut-off	
9	Standard discharge	Constant current 0.2 C_5A to end voltage at 2.0V	
10	Self-Discharge	23±2 ℃ 30, ≤10% ,Store the for 30 days In the condition 23±2 ℃,after standard charging the cells Self-Discharge Rate≤10%	
11	Maximum Continuous Charge Current	850mA	
12	Maximum Continuous Discharge Current	2550mA	
13	Operation Temperature Range	Charge: 0~45℃ Discharge: -10~60℃	humidity : 60±25%R.H
14	Storage Temperature Range	1: -20~25℃ Less than 1 year: -20~25℃ -20~40°C Less than 3 months: -20~40℃	humidity : 60±25%R.H
15	Weight	28g (approx)	Bare Cell
16	Cell Dimension	Diameter: Max. 18.5mm High: Max. 50.5mm	

5. Performance And Test Conditions

5.1 Measuring Instrument or Apparatus

5.1.1 Dimension Measuring Instrument

The dimension measurement shall be implemented by instruments with equal or more precision scale of 0.01mm.

5.1.2 Voltmeter

Standard class specified in the national standard or more sensitive class having inner impedance more than 10kΩ/V

5.1.3 Ammeter

Standard class specified in the national standard or more sensitive class. Total external resistance including ammeter and wire is less than 0.01Ω

5.1.4 Impedance Meter

1000

Impedance shall be measured by a sinusoidal alternating current method(1kHz LCR meter)

5.2 Standard Test Conditions

5.2.1 Temperature& humidity

5, 25±5℃ 45~85%。Test should be conducted with new batteries within one week after shipment from our factory and the cells shall not be cycled more than five times before the test. Unless otherwise defined, test and measurement shall be done under temperature of 25±5℃ and relative humidity of 45~85%.

5.2.2 Standard Charge\Discharge

a. 0.2C_5A =170mA

0.2C_5A 3.65V， 3.65V 0.01C_5A。8

Standard Charge ： Test procedure and its criteria are referred as follows:0.2C_5A =170mA

Charging shall consist of charging at a 0.2C_5A constant current rate until the cell reaches 3.65V. The cell shall then be charged at constant voltage of 3.65 volts while tapering the charge current. Charging shall be terminated when the charging current has tapered to 0.01C_5A . Charge time : Approx 8.0h.

b. 0.2 C_5A 2.0 V， 25 ± 5ºC ,0.2C_5A =170mA

Standard Discharge

0.2C_5A =170mA

Cells shall be discharged at a constant current of 0.2 C_5A to 2.0 volts @ 25 ± 5 ºC

5.3 Initial Performance Test

No	Item	Test	Standard
1	Open-Circuit Voltage	The open-circuit voltage shall be measured within 24 hours after standard charge.	≥3.2 V
2	AC Impedance Resistance	(1kHz) The Impedance shall be measured in an alternating current method (1kHz LCR meter) after standard charge at 20±5℃.	≤75mΩ
3	Nominal Capacity	160mA 2.0V. The capacity on 0.2C_5A discharge at end voltage 2.0V shall be measured after standar charge.	850mAh
4	Cycle Life (0.2 C_5A)	Carry out 1500 cycle charging/Discharging in the below condition. ▪ 0.2C C_5A, 5.2.2 a Charge: Standard Charge 0.2C_5A=120mAh ▪ 0.2C C_5A，5.2.2 b Discharge:0.2 C_5A to 2.0V ▪ Rest Time between charge/discharge:30min. ▪ 20±5℃ Temperature:20±5℃	1500 70%。 Higher than 70% of the Initial Capacities of the Cells after 1500 cycle test.
5	Self-Discharge	5.2.1 30 ， 0.2C 2.0V. Store the cells for 30 days according to the per5.2.1 condition and with 0.2 C_5A discharge at the end voltage 2.0V	Higher than 90% discharge capacity of the Initial Capacities of the Cells

5.4 Safety Tests

1	Short Circuit	<50 (20±2℃)，Each test sample battery, in turn, is to be short-circuited by connecting the (+) and (-) terminals of the battery with a Cu(<50mΩ) wire for 1 day Tests are to be conducted at room temperature(20±2℃).	≤150℃ No Fire,No Blast The Temperature of the surface ≤150℃
2	Over-Discharge	1C_5A 2.5h Discharge at a current of 1CmA for 2.5h	No Fire,No Blast
3	Over-Charge	3C 10V 10V 1h。continue charge with 3 C_5A until to 10V and Keep 10V charging for 1 hour after standard charge	≤150℃ No Fire,No Blast Surface Tem≤150℃

5.5 Ruinous machine test

No.	Item	Test	Standard
1	Vibration	HZ：10~55hz; Swing: 2mm; 3 90. Keep the vibration with 10~55hz, seeing 2mm for 90 minutes	≤0.02V No leak, No Blast, No Fire Open-Circuit Voltage change≤0.02V
2	Impact	56mm 10kg 1。A 56mm diameter bar is inlayed into the bottom of a 10kg weight. And the weight is to be dropped from a height of 1m onto a sample battery and then the bar will be across the center of the sample.	No Blast, No Fire.
3	Crush	13kN(1.72Mpa) 30min. Crush between two flat plates. Applied force is about 13kN(1.72Mpa) for 30min.	. No Blast, No Fire.

5.6 Environment test

No.	Item	Test condition	Standard
1	High temperature	Store cells for 7 days with 60℃ after full voltage and then discharge 0.2C to end voltage 2.0V in 20+/0.5℃	No Leak ≥90% Resume capacity more than 90%
2	Drop Test	Drop from 1m high to floor 6 times and every 2nd time inspect for full voltage.	No Leak, No Blast, No Fire.

5.7 Check appearance

There shall be no such defect such as flaw, crack, rust, leakage, which may adversely affect commercial value of battery.

6. CAUTIONS IN USE

To ensure proper use of the battery please read the cautions below carefully before use.

Handling

- Do not expose to, dispose of the battery in fire.
- Do not put the battery in a charger or equipment with wrong terminals connected.
- Avoid shorting the battery
- Avoid excessive physical shock or vibration
- Do not disassemble or deform the battery.
- Do not immerse in water.
- Do not use the battery mixed with other different make, type, or model batteries.
- Keep out of the reach of children

Storage

- Store the battery in a cool, dry and well-ventilated area.

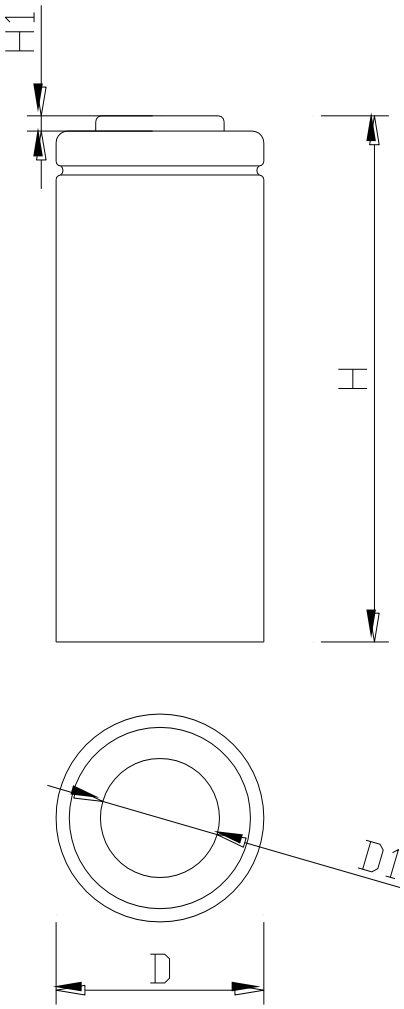
Disposal

- Regulations vary for different countries.
- Dispose of in accordance with local regulations.

7. Remark：

Any other items which are not covered in this specification shall be agreed by both parties.

8. Initial Dimension:



D	Max:18.5mm	H	Max:50.5	Units	mm
D1	9±0.1mm	H1	＞1.2mm		

Drawer		Checked		Approved		Date	Date:2018.11.21

	Drawing ID	LIFE04-18500 DRAWING