

河北银隆新能源有限公司

文件名称: YLE-LTO-20130205 方形电池规格书

SPECIFICATIONS of YLE-LTO-20130205 BATTERY

电池型号: YLE-LTO-20130205-33Ah

Document No. 文件编号	Version 版次	Department 拟案单位	Valid Date 生效日期
YTE-SPEC-LTO20130205-01	A0	工程部	2016-08-01
Design 编制	Check 审核		Approval 批准

Customer Approval 客户	Signature/Date 签字/日期	
	Company Name 公司名称	
	Company Stamp 公司印章	

Revision History 文件修订履历

Version 版次	Revision Status 修订内容	Editor 编制人	Pages 修订页次	Date 修订日期
A0	Original 初版发行	张要枫	全部页次	2016.08.01

Check/Approval 审核批准

Department 审核部门	Suggestion 审核意见	Signature 审核人签名	Date 审核日期

Approval
批准:

Date
批准日期:

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1.0 Purpose 目的

The purpose of this specification is the standard of the production of YLE-LTO-20130205 battery in the Hebei Yinlong New Energy Co., Ltd, including the safety tests and technical information.

本规格书说明了河北银隆新能源有限公司 YLE-LTO-20130205 方形电池的技术信息以及安全性能等内容，是公司方形电池规格参数的依据标准。

2.0 Application Area 适用范围

The specification is applied to the referred batteries manufactured by Hebei Yinlong New Energy Co., Ltd.

本说明书适用于本书中所提及的河北银隆新能源有限公司制造的电池。

3.0 Description of Batteries 电芯说明

Product Model : YLE-LTO-20130205-33Ah Lithium Ion Power Battery

产品型号： YLE-LTO-20130205-33Ah 锂离子动力电池；

3.1 Cell Size 电芯尺寸

Depth: 20.0±0.2mm ; Height: 205.0±0.5mm; Width:130±0.5 mm

厚度： 20.0±0.2mm； 长度： 205.0±0.5mm； 宽度： 130±0.5 mm

For details of battery size, please refer to 1st page of attachment.

关于成品电池的详解尺寸信息，请参阅附图1。

3.2 Cell Structure 电芯结构

This cell is of square Li-ion battery which is composed of negative and positive

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electrode, separator, electrolyte and metal case etc.

本电芯为方形锂离子电池，由正极、负极、隔膜、电解液和金属外壳等组成。

4.0 Technical Specification 技术规格

4.1 Single Battery Specification 单电池规格基本参数

Single Battery Specification 单电池规格基本参数			
No. 序号	Item 项目	General Parameters 常规参数	Remark 备注
1	Weight 重量	1210.0±30.0g	
2	Dimension 尺寸	Depth: 20.0±0.2mm ; Height: 205.0±0.5mm; Width: 130.0±0.5mm 厚度: 20.0±0.2mm; 长度: 205.0±0.5mm 宽度: 130.0±0.5mm	
3	Internal Impedance 内阻	≤1.0mΩ	Internal resistance measured at AC 1KHz after 50% charge 半电态下用交流法测量内阻 The measurement must use the new batteries within one week after shipment and cycles less than 5 times. 使用出货后不到一个星期及循环次数少于 5 次的新电池测量
4	Nominal Capacity 额定容量	33.0Ah	Standard discharge at 1C after standard charge at 1C 1C 标准充电后 1C 标准放电
5	Nominal Voltage 额定电压	2.3V	Operating Voltage 工作电压
6	Standard Charging Voltage 标准充电电压	2.9V	
7	Standard Voltage at end of Discharge 标准放电终止电压	1.5V	Discharge Cut-off Voltage 放电截止电压
8	Maximum Continuous Charge Current 最大充电持续电流	10C(330A)	

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9	Maximum Continuous Discharge Current 最大放电持续电流	10C(330A)	
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4.2 Single Battery Electrochemical Performance Parameter 单电池电化学性能参数

Single Battery Electrochemical Performance Parameter 单电池电化学性能参数			
No. 序号	Item 项目	General Parameters 常规参数	Remark 备注
1	Cycle Life 循环寿命	Above 95% of the initial capacity of the cells 初始容量的 95%以上	<ul style="list-style-type: none"> ◆1000 cycles ◆Standard discharge at 2C after charge at 2C ◆Discharge at 2C to 1.5V ◆Rest time between charge/discharge:10min. ◆Temperature:25±2℃ ◆循环 1000 次 ◆2C 充电后 2C 放电 ◆2C 放电至 1.5V ◆搁置:10min. ◆温度:25±2℃
2	High Temperature Cycle Life 高温循环寿命	Above 90% of the initial capacity of the cells 初始容量的 90%以上	<ul style="list-style-type: none"> ◆1000 cycles ◆Discharge at 2C after charge at 2C ◆Discharge at 2C to 1.5V ◆Rest Time between charge/discharge:10min. ◆Temperature:55±2℃ ◆循环 1000 次 ◆2C 标准充电后 2C 标准放电 ◆2C 放电至 1.5V ◆搁置:10min. ◆温度:55±2℃
3	Standard Charge 标准充电	1C,CC(constant current)charge to 2.8V,then CV(constant voltage 2.8V)charge till charge current decline to ≤0.1C 1C, CC (恒流) 充电至 2.8V, 再 CV (恒压) 2.8V 充电直至充电电流≤0.1C	Charge Time : Approximate 1h 充电时间: 大约 1 个小时
4	Standard Discharge 标准放电	Constant current: 1C End voltage: 1.5V 恒流: 1C 截止电压: 1.5V	

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5	Operating Temperature Range 工作温度范围	Charge 充电: -40~55℃	50±25%RH Bare Cell 单体电池储存湿度范围
		Discharge 放电: -40~55℃	
6	Storage Temperature Range 储存温度范围	Less than 1 year: 0~25℃ 小于一年: 0~25℃	50±25%RH at the shipment state 出货状态时的湿度范围
		Less than 3 months: -10~40℃ 小于3个月: -10~40℃	
7	Discharge capacity at 55℃ 55℃放电容量	Higher than 95% of the nominal capacitie of the cell at 0.3C 0.3C 容量保持高于额定容量的 95%	
8	Low Temperature Performance(-20℃) 低温性能 (-20℃)	Higher than 70% of the nominal capacities of the cells at 0.3C 0.3C 容量保持高于额定容量的 70%	

5.0 Test Conditions 测试条件

5.1 Standard Test Conditions 标准测试条件

Test should be conducted with new batteries within one week after shipment from our factory and which not be cycled more than five times before the test. Unless otherwise specified, test and measurement shall be done under temperature of 25±2℃ and relative humidity of 45~75%RH. If it is judged that the test results are not affected by such conditions, the tests may be conducted at temperature 20~30℃ and humidity 25~85%RH.

测试必须使用出厂时间不超过一个星期的新电池，且未进行过五次以上的充放电循环。除非特别说明，否则测试会在温度25±2℃，相对湿度45~75%RH的条件下进行。如果经鉴定测试结果不受上述条件影响，测试也可以在温度20~30℃，相对湿度25~85%RH的条件下进行。

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5.2 Measuring Instruments and Apparatus 测量器具及设备

5.2.1 Dimension Measuring Instrument 尺寸测量器具

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

尺寸测量器具的精度等级应不小于0.01 mm 。

5.2.2 Voltmeter 伏特计

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

按照国家标准指定规格等级或采用灵敏度更高的，测量电压时内阻不应小于10kΩ/V。

5.2.3 Ammeter 安培计

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

按照国家标准指定规格等级或采用灵敏度更高的，包括电流表及电线在内的总外阻应小于0.01Ω。

5.2.4 Impedance Meter 电阻计

Impedance should be measured by employing a sinusoidal alternating current method(1KHz LCR meter).

内阻测试仪测量原理应为交流阻抗法（1KHz电感电容电阻测量计）。

5.3 Appearance 外观

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There should be no such defects as flaw, crack, rust, leakage, which may depreciate the commercial value of battery.

电池外观应没有划伤、破裂、污渍、生锈、漏液等影响市场价值的缺陷存在。

6.0 Safety Test 安全测试

Single Battery Safety Performance Parameters 单电池安全性能参数			
No. 序号	Items 项目	Criteria 标准	Test Method and Conditions 测试方法及条件
1	Vibration Test 振动测试	No leakage No fire 无泄漏, 不起火	Fixing the cell to vibration table after standard charging, and subjecting to vibration cycling that the frequency is to be varied at the rate of 1Hz per minute between 10Hz and 55Hz, the amplitude of the vibration is 1.6mm. The cell shall be vibrated for 30 minutes per axis of X, Y, Z axes. 将标准充电后的电芯固定在振动台上, 沿 X、Y、Z 三个方向各振动 30 分钟, 每分钟变化 1Hz 振动频率为 10Hz~55Hz, 振幅 1.6mm。
2	Dropping Test 跌落测试	No explosion, No fire 无爆炸、不起火	The cell is to be dropped from a height of 1 meter twice onto the concrete-based ground. 将标准充电后的电芯从 1 米高度自由跌落至混凝土地面 2 次。
3	Temperature shocking 温度冲击	No explosion, No fire 不爆炸、不起火	1) At 70±3℃ for 4h; 2) At 20±3℃ for 4h; 3) Then at -40±3℃ for 4h; Temperature variation time between each step does not exceed 30 minutes. Repeat these procedures for 9 times. 1) 电芯在 70±3℃ 环境中搁置 4h; 2) 然后在 20±3℃ 环境中搁置 4h; 3) 最后在 -40±2℃ 在环境中搁置 4h; 各步骤间温度变化时间不超过 30 分钟, 重复此步骤 9 次
4	1C/UV Over Charge 1C/UV 过充	No explosion, No fire 无爆炸、不起火	After discharge in a standard way, 1C (33.0A), CC (constant current) charge to UV. 标准放电方式放电后, 对电芯以 1C(33.0A) 恒流充电, 上限电压设置 UV, 达到 UV 后结束 (其中 U 为 1.5*充电截止电压)。
5	Over Discharge 过放	No explosion, No fire 无爆炸、不起火	After charge in a standard way, 0.3C (9.9A) CC (constant current) discharge to 0V. 标准充电方式充电后, 对电芯以 0.3C(9.9A) 电流放电到 0V。
6	Crush Test 挤压测试	No explosion, No fire 无爆炸、不起火	After charge in a standard way, press in the vertical direction (pressure head area ≥20cm ²) until the batteries shell burst or internal short circuit (batteries voltage at 0V). 标准充电方式充电后, 垂直于电芯极板方向施压 (压头面积

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			≥20cm ²), 直至电芯壳体破裂或内部短路(电芯电压变为 0V)。
7	Puncture Test 针刺	No explosion, No fire 无爆炸、不起火	After charge in a standard way, with a diameter of 3 mm nails at a rate of 10~40 mm/s through the batteries, then the nails stay within the batteries for 30 min. 标准充电方式充电后, 用 1 个直径 3mm 的钉子以 10~40mm/s 的速度穿过电芯, 并把钉子停留在电芯内 30min。

7.0 Safety Instructions 安全守则

7.1 Prohibition Short Circuit 禁止电池短路

Never make short circuit cell. It generates very high current which causes heating of the cells and may cause electrolyte leakage, toxic gas emission or explosion that are very dangerous. The poles may be easily short-circuited by putting them on conductive surface. Such outershort circuit may lead to heat generation and damage of the cell. An appropriate circuitry with PCM shall be employed to protect accidental short circuit of the battery pack.

避免电池短路。短路会产生很高的电流而使电池发热以及电解液泄漏, 产生有毒气体或爆炸是非常危险的。电极端连接在导电物体表面很容易短路, 外部短路会导致发热及损害电池。选用一个适当的保护电路可以在意外短路时保护电池。

7.2 Mechanical Shock 机械撞击

Falling, hitting, etc. may cause degradation of battery characteristics.

跌落、碰撞、等都可能会降低电池的性能。

7.3 Prevention of Short Circuit within A Battery 电池内部的短路预防

Enough insulation layers between wiring and the cells shall be used to maintain extra

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safety protection.

在电池和引线之间应该有足够的绝缘层用于安全保护。

The battery pack shall be structured with no short circuit within the battery pack, which may cause generation of smoke or firing.

电池的包装构成应没有导致起烟起火的短路情况。

8.0 Period of Warranty 保质期

The period of warranty is half a year from the date of shipment. We guarantees to give a replacement in case of cells with defects proven due to the manufacturing process instead of abuse and misuse by the customers.

电池的保质期从出货之日算起为半年。如果证明电池的缺陷是在制造过程中形成的而不是由于用户滥用及错误使用造成，本公司负责退换电池。

9.0 Storage 电池存放

The batteries should be stored at room temperature, charged to about 30% to 50% of capacity. We recommend that batteries should be charged about once per half a year to prevent over discharge.

电池应当在室温下存放，应充到30%至50%的电量。如长时间储存，建议每半年充一次电以防止电池过放电。

10.0 Other Chemical Reactions 其它化学反应

Because batteries utilize a chemical reaction, battery performance will deteriorate over time even if stored for a long period of time without being used. In addition, if the

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various usage conditions such as charge, discharge, ambient temperature, etc. are not maintained within the specified ranges the life expectancy of the battery may be shortened or the device in which the battery is used may be damaged by electrolyte leakage. If the batteries cannot maintain a charge for long periods of time, even when they are charged correctly, this may indicate it is time to change the battery.

由于电池是利用化学反应的原理，所以随时间的增加电池的性能会降低，即使是存放很长一段时间而不使用。如果使用条件如充电、放电及周围环境温度等情形不在指定的使用范围内，会使缩短电池的使用寿命，或者会产生漏液导致设备损坏。如果电池长周期不能充电，即使充电方法正确，这样需要更换电池了。

11.0 Technical Consultation 技术咨询

If any questions, please contact us as follows:

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12.0 Note 备注

Any other items which are not covered in this specification shall be agreed by both sides.本说明书未包括事项应由双方协议确定。

Appendix 1 附图 1

Scheme of the battery structure 成品电池结构图:

