锂离子电池规格书

Specification of Lithium-ion Battery

类别 Classification	锂离子电池 Li-ion battery
型号 Model	**IFR26650E3.2Ah**
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WILTSON

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目录 Content

1. 前言 Preface

此规格书仅适用于东莞市威特盛新能源科技有限公司生产的圆柱型 IFR26650E3.2Ah 型号锂离子电芯。

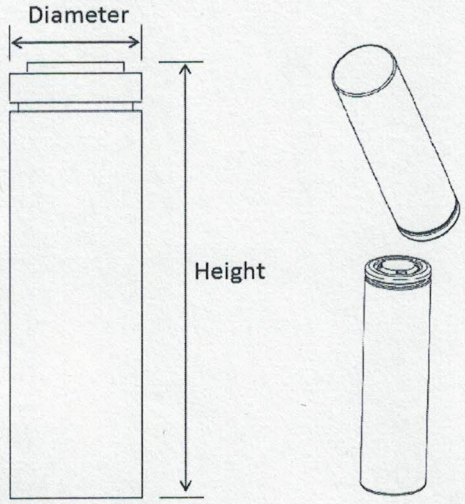
This Specification only applies to IFR26650E3.2Ah cell supplied by Dongguan Wiltson New Energy Technology Co., Ltd.

2. 说明及型号 Description and model

2.1 产品名称 description: 圆柱锂离子二次电芯 Cylindrical Li-ion battery 。

2.2 电芯型号 model: IFR26650E3.2Ah

2.3 电芯外观尺寸 Dimension:



序号 No.	项目 Item	特性 Specification
1	高度 Height	65.7 ± 0.2mm
2	直径 Diameter	26.3 ± 0.2mm

3. 定义 Definition

3.1 标称容量 Rated capacity

标称容量 Cap=3200mAh，指在 25±2℃环境下，以 5 小时率放电至终止电压 2.00V 时的容量，以 Cap 表示，单位为毫安培时（mAh）。

Rated capacity:Cap=3200mAh.under 25±2℃,It means the capacitay value of being discharged by 5-hours rate to end voltage 2.00V,which is signed Cap ,the unit is mAh.

3.2 标准充电方式 Standard charge method

在 25±2℃环境下，以 0.5C 的电流恒流充电至单体电芯电压 3.65V 后，转为恒压 3.65V 充电，至充电电流小于 0.05C 时，停止充电。

Under 25±2℃,it can be charged to 3.65V with constant current of 0.5C,and then,charged continuously with constant voltage of 3.65V until the charged current is 0.05C.

3.3 标准放电方式 Standard discharge method

在 25±2℃环境下，以 1C 的电流恒流放电至单体电芯电压 2.00V

Under 25±2℃,it can be discharged to 2.00V with constant current of 1C.

4. 常规特性 Nominal Specification

项目 Item		特性 Specification	
标称容量 Nominal capacity		3200mAh@0.2C	
最小容量 Minimum capacity		3200mAh@0.2C	
标称电压 Nominal voltage		3.2V	
能量密度 Energy density		122Wh/kg	
最小放电电压 Min. discharging voltage		2.00V	
最大充电电压 Max. charging voltage		3.65±0.03V	
标准充电电流 Std. charging current		0.5C_5A	
标准放电电流 Std. discharging current		1.0C_5A	
最大充电电流 Max. charging current		2.0C_5A	
最大放电电流 Max. discharging current		3.0C_5A	
工作温度范围 Operating temperature range		充电 Charge: 0～45℃ 放电 Discharge: -20～60℃	
内阻 Internal Impedance		≤20mΩ（交流频率 AC Impedance,1kHZ）	
重量 Weight		≈84g	
电芯尺寸 Cell dimension		高度 height: 65.7 ± 0.2mm 直径 diameter: 26.3 ± 0.2mm	
电芯存储和运输环境和温度范围 Cell storage and transportation environment and temperature ranges	<1 个月 <1 month	-20～+45℃； <75%RH*	电芯 50%SOC，运输过程容量损失小于 10%，容量恢复率大于 90%。 Cell 50% SOC, the capacity lost during shipment < 10%. Capacity recover rate >90%
	<3 个月 <3 months	-20～+35℃； <75%RH*	
	<12 个月 <12 months	-20～+25℃； <75%RH*	

5. 电性能 Electrical Characteristics

倍率放电性能 Discharge rate capability	温度 Temperature: 25±2℃ 充电 Charger: CC/CV 0.5C 3.65V; 截止电流 End current: 0.05c 放电 Discharger: CC 测试电流 Tect current; 截止电压 End voltage: 2.00V $\frac{0.5C\text{ 放电容量}}{0.2C\text{ 放电容量}} \geq 98\%$ $\frac{\text{discharge capability at 0.5C}}{\text{discharge capability at 0.2C}} \geq 98\%$ $\frac{1C\text{ 放电容量}}{0.2C\text{ 放电容量}} \geq 97\%$ $\frac{\text{discharge capability at 1C}}{\text{discharge capability at 0.2C}} \geq 97\%$ $\frac{3C\text{ 放电容量}}{0.2C\text{ 放电容量}} \geq 96\%$ $\frac{\text{discharge capability at 3C}}{\text{discharge capability at 0.2C}} \geq 96\%$
循环寿命 Cycle life	温度 Temperature:25±2℃ 充电 Charger: CC/CV 0.5C 3.65V; 截止电流 End current: 0.05c; 搁置 Rest time: 0.5 h 放电 Discharger: CC 0.5C; 截止电压 End voltage: 2.00V; 搁置 Rest time: 0.5 h $\frac{\text{第 2001 次循环放电容量}}{\text{首次放电容量}} \geq 80\%$ $\frac{\text{discharge capability of 2001th cycle}}{\text{Original discharge capacity}} \geq 80\%$
不同温度放电性能 Different temperature discharge performance	充电 Charger: CC/CV 0.5C 3.65V; 截止电流 End current 0.05c 放电 Discharger: CC 0.2C; 截止电压 End voltage: 2.00V $\frac{-10℃\text{ 放电容量}}{25℃\text{ 放电容量}} \geq 70\%$ $\frac{\text{discharge capability at } -10℃}{\text{discharge capability at 25℃}} \geq 70\%$ $\frac{0℃\text{ 放电容量}}{25℃\text{ 放电容量}} \geq 80\%$ $\frac{\text{discharge capability at 0℃}}{\text{discharge capability at 25℃}} \geq 80\%$ $\frac{60℃\text{ 放电容量}}{25℃\text{ 放电容量}} \geq 98\%$ $\frac{\text{discharge capability at 60℃}}{\text{discharge capability at 25℃}} \geq 98\%$
荷电保持 Storage performance	电芯按 3.2 规定充电结束后，在环境温度为 25℃±2℃条件下，搁置 28 天，以 0.5C 的电流放电至终止电压，测量电芯的剩余容量；电芯再按 3.2 规定充电结束后，以 0.5C 的电流放电至终止电压，测量电芯的恢复容量。 After the battery is charged according to 3.2, it is set aside for 28 days at an ambient temperature of 25℃±2℃ and discharged to 2.0V with a current of 0.5C to measure the remaining capacity of the battery; after the battery is charged according to 3.2, it is discharged to 2.0V with a current of 0.5C to measure the recovered capacity of the battery. $\frac{\text{剩余容量}}{\text{首次放电容量}} \geq 90\%$ $\frac{\text{Remaining capacity}}{\text{Original discharge capacity}} \geq 90\%$ $\frac{\text{恢复容量}}{\text{首次放电容量}} \geq 95\%$ $\frac{\text{Recovery capacity}}{\text{Original discharge capacity}} \geq 95\%$

6. 环境适应性 Environmental characteristics

项目 Item	测试方法 Test Method	性能标准 Criterion
振动性能 Vibration	电芯按 3.2 的规定充电结束后，将电芯用夹具安装在振动台的台面上，按下面的振动频率和对应的振幅调整好实验设备。X、Y、Z 三个方向每个方向上从 10～55Hz 循环扫频振动 30min，扫频速率为 1oct/min： 振动频率：10Hz～30Hz 位移幅值(单振幅)：0.38mm； 振动频率：30Hz～55Hz 位移幅值(单振幅)：0.19mm A cell is charge in accordance with 3.2, then installed onto the vibration desk with clamps, Equipment parameters of frequency and amplitude are as follow(the frequency is to be varied at the rate of 1 oct/min between 10 and 55 herts, and repet vibration for 30 min. The cell is to be tested in three mutually perpendicular directions); Frequency: 10Hz~30Hz amplitude:0.38mm Frequency: 30Hz~55Hz amplitude:0.19mm	1) 电芯外观应无明显损伤、不漏液、不着火、不爆炸、不裂开； 2) 单体电芯电压不低于 3.0V. 1) NO scratch, no leckage, no fire, no explosion, no vent; 2) The voltage is not less than 3.0V.
温度冲击性能 Temperature Test	电芯按 3.2 的规定充电结束后，将电芯放入温控箱内，在 30 分钟内，环境温度升至 65±3℃，并在此温度下保持 4h，在 30 分钟内，环境温度降至 20±3℃，并在此温度下保持 4h，在 30 分钟内，环境温度降至-20±3℃，并在此温度下保持 4h，重复以上步骤 9 次，将电池保持在室温环境下 24h，目测电芯外观。 A cell is charge in accordance with 3.2, then heated the cell to be in a oven. Then the temperature of the oven is to be raised to the temperature of 65 ± 3 ℃ and remain for 4 h at that temperature,then the temperature of the oven is to be dropped to the temperature of 20±3℃ and remain for 4 h at that temperature, then the temperature of the oven is to be dropped to the temperature of - 20±3℃and remain for 4 h at that temperature, repeat this for another 9 cycles,after that put the cell in room temperature for at least 24 hrs, then chack cell's appearance.	电芯应不漏液、不着火、不爆炸、不裂开 No leakage, no fire, no explosion, no vent

7. 安全性能 Safety Characteristics

项目 Item	测试方法 Test Method	性能标准 Criterion
短路测试 Short Circuit	电芯用铜线短路其正负极（线路总电阻不大于 50 毫欧）。实验过程中监视电芯温度变化，当电芯温度下降到比峰值低约 10℃时，结束实验。 A cell is to be short-circuited by connecting the positive and negative terminals of the battery with an external load of less than 50 mΩ until the surface temperature decrease 10 degree from the highest point.	电芯不起火、不爆炸 No fire, no explosion
过充测试 Over charge	先将电池以 0.2C 放电至终止电压，然后将电芯正负极连接于恒压电源，调节电流至 10A，电压为 10V，然后对电芯以 10A 充电，直到输出电压达到 10V，持续充电 7h。 A cell is discharged to cut-off voltage at CC of 0.2C.then it is to be subjected to CC/CV power by connecting its positive & negative terminal, then set the current as 10A,the voltage as 10V,after that, Charge the cell up to 10V at CC of 10A ,until that last 7h at the voltage of 10V.	电芯不起火、不爆炸 No fire, no explosion
过放测试 Forced-Discharge	以 1C 电流放电，直至电池电压为 0V。 A cell is discharged to voltage 0V at a constant current of 1C.	电芯不起火、不爆炸 No fire, no explosion
热箱测试 Heating	将电芯放在电热鼓风干燥箱中，温度以 5℃±2℃/min 的速率由室温升至 130℃±2℃并保持 30min。 A cell is to be heated in a circulating air oven. The temperature of the oven is to be raised at a rate of 5℃±2℃ per minute to a temperature of 130℃±2℃ and remain for 30min at that temperature before the test is discontinued.	电芯不起火、不爆炸 No fire, no explosion
跌落测试 Drop	电池按照标准充电方式充满电后，搁置 1～4 h，将电池由高度为 1 m 的位置自由跌落到 18～20mm 厚的水平硬木板上，每只电芯做 2 个循环跌落，每个循环包括底部向下、顶部向下、侧边向下三次跌落。 A cell is charged in accordance to standard charge method and stored for 1~4h, then dropped from a height of 1000mm to a wooden board(18-20mm thick) which is placed on the concrete ground. Cells shall be dropped from top, bottom and diameter side. Each side drop 3 and repeat two times.	电池不漏液、不冒烟、不起火、不爆炸 No leakage, no smoking, no fire, no explosion
备注 Remarks	除特殊说明，以上所有安全测试均应在 25℃±5℃通风橱中，且附带有保护装置的条件下进行。 All above safety tests will be conducted at 25℃±5℃ except where specified differently. Use proper ventilation with protective equipment.	

8. 电芯使用时警告事项及注意事项 Warning and cautions in handling the lithium-ion cell

为防止电芯可能发生泄露，发热，爆炸，请注意以下预防措施：

To prevent the possibility of the cell from leaking, heating, explosion, please observe the following precautions:

警告！ Warning!

- 严禁将电芯浸入水中。
- Don't immerse the cell in water.
- 禁止将电芯在热高温源旁，如火、加热器等旁边使用和留置。
- Don't use and leave the cell near a heat source such as fire or heater.
- 充电时请选用锂离子电芯专用充电器。
- When charging, use a cell charge specifically for that purpose.
- 严禁颠倒正负极后使用电芯。
- Don't reverse the positive and negative terminals.
- 严禁将电芯直接插入电源插座。
- Don't connect the cell to an electrical outlet directly.
- 禁止将电芯丢入火或加热器中。
- Don't discard the cell in fire or heater.
- 禁止用金属直接连接电芯正负极，造成短路。
- Don't connect the positive and negative terminal directly with metal objects.
- 禁止将电芯与金属，如发卡、项链等一起运输或存储。
- Don't transport and store the cell together with metal objects such as necklaces, hairpins.
- 禁止敲击，抛掷或踩踏电芯等。
- Don't strike,throw or trample the cell.
- 禁止用钉子或其它利器刺穿电芯。
- Don't pierce the cell with a nail or other sharp object.

小心！ Caution!

- 禁止在高温下（直热的阳光下或很热的汽车中）使用或放置电芯，否则可能会引起电芯过热，起火或功能失效，寿命减短。
- Don't use or leave the cell at very high temperature conditions (for exampie, strong direct or a vehicle in extremely ho t conditions).
- 如果电芯发生泄露，电解液进入眼睛，请不要搓揉，应用清水冲洗眼睛，必要时请立即前往医院接受治疗，否则会伤害眼睛。
- If the cell leaks and the electrolyte get into your eyes, don't wipe eyes, instead, thoroughly rinse the eyes with clean running water for at least 15 minutes, and immediately seek medical attention.Otherwise, eyes injury an result.
- 如果电芯发出异味，发热，变色，变形或使用、存储、充电过程中出现任何异常现象，立即将电芯从装置或充电器中移开并停用。
- If the cell gives off an odor,generates heat, becomes discolored or deformed, or in any way appear abnormal during usage, recharging or storage, immediately remove it from the device or cell charger and stop using it.

- 如果电芯弄脏，使用前应用干布抹净。
- In case the terminals get dirty, clean the terminals with a dry cloth before use.
- 如果电池使用寿命达到极限，请将电池放电至 2.0V 以下，将电池头部用绝缘胶纸粘住，送至专业的废品回收站回收。
- If the cell beyond the useful-life, please fully discharge, sticks the cell with insulating tape, then put the cell to the specialized recycle bin.

9. 产品责任书 Warranty

东莞市威特盛新能源科技有限公司只对在 1 年内由于产品本身缺陷给予退换，您必须严格遵守东莞市威特盛新能源科技有限公司规格书中上述说明使用电芯。对于没有按照规格书进行操作所造成的任何意外事故，东莞市威特盛新能源科技有限公司不负担任何责任。

Dongguan Wiltson New Energy technology Co., Ltd. will be responsible for replacing the cell against defects or poor workmanship for 1year from the date of shipping. Any other problems caused by malfunction of the equipment or unsuitable use of the cell are not under this warranty. The warranty set forth in proper use, handing conditions described above, and excludes in the case of a defect witch is not related to manufacturing of the cell.

10. 联系方式 Contact information

如有疑问，请按以下地址联系：

If you have any questions regarding the cell, please contact the following address:

厂址：东莞市石排镇能达路 3 号

Headquarter: No.3 Nengda Road, Shipai District, Dongguan.

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