Specification For

Sodium-ion Rechargeable cell

MODEL:71173204

(220Ah)

Prepared By/Date	Checked By/Date	Approved By/Date

Customer Approval	**Signature/Date（**	
	Company Name	
	Company Stamp	

Contents

1 Preface

This standard describes the external dimensions, characteristics, technical requiremen -ts, and precautions of cylindrical sodium ion cell. This standard is applicable to the cylindrical 7117320E-220 sodium ion cell produced by Hunan Dpt Battery Co., Ltd.

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2 Definition

2.1 Rated capacity:

Rated capacity: Cap=220Ah. Under 25.0±3.0°C, It means the capacity value of being discharged by 2 hours rate to end voltage 1.50V, which is signed Cap, the unit is Ah.

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2.2 Standard charge method:

Standard charge Under 25.0±3.0°C, it can be charged to 3.95V with constan current of 0.50C, and then charged continuously with constant voltage of 3.95V until the charged current is 0.05C.

2.3 Standard discharge method:

Under 25.0±3.0°C, it can be discharged to 1.50V with constant current of 0.50C.

3 Cell modek bar code and dimension

3.1 Description and model

Description: Cylindrical sodium ion secondary cell

Model: 71173204E-220

3.2 Cell dimension

Cell physical dimension listed in Figure l(unit: mm).

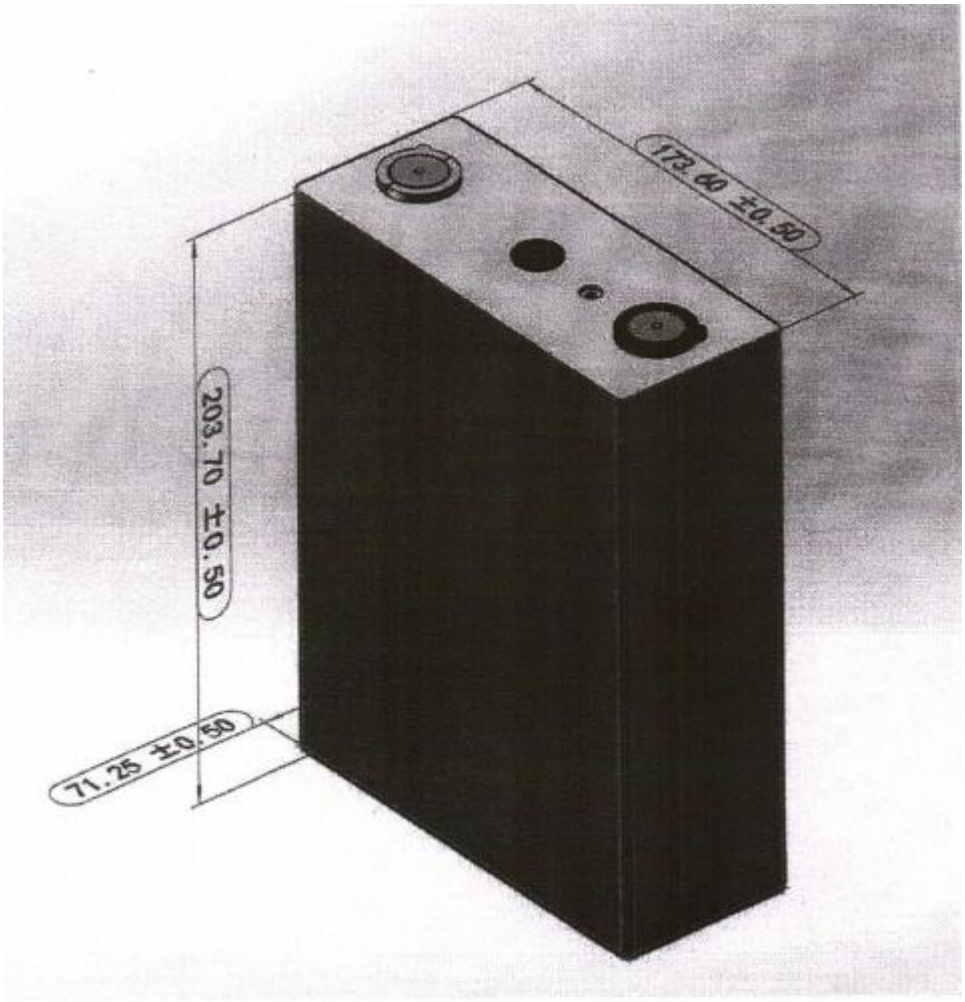

Figure 1/图 1

4 Cell specification

ITEM	SPECIFICATION
Nominal Capacity	220Ah@0.50C
Typical Capacity	225Ah@0.50C
Nominal Voltage	3.10V
Charge Voltage	3.95 ±0.05 V
Discharge cut-off Voltage	1.50 ±0.05 V
Internal Resistance	≤0.50mΩ
Cell Dimension	Length： 173.60±0.50mm Width: 71.25±0.50mm Height： 203.70±0.50mm
Energy Density	155.00Wh/Kg
Weight	4.40±0.20Kg
Storage Temperature (State of Charge at Shipment)	-20~40°C
Maximum Continuous Charging Rate	≤-10°C : can not charging temperature -10~0°C : ≤0.20C 0~45°C : ≤0.50C ≥45°C： can not charging temperature
Maximum Continuous Discharge Rate	≤−30°C : can not discharging temperature −30~0°C： ≤0.20C O-45°C ： ≤1.00C 45∽60°C： ≤0.50C ≥60°C : can not discharging temperature
Maximum Constant Charge Current	Constant Current 0.50C Constant Voltage 3.95V 0.05C cut-off
Maximum Constant Discharge Current	Constant Current 1.00C Constant Voltage 1.50V

5 Charging and discharging curves of sodium ion cell

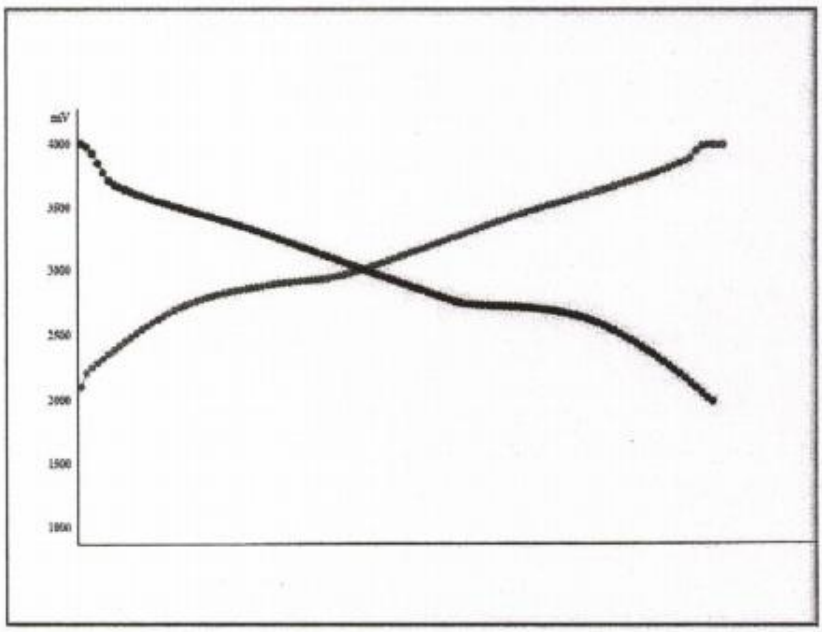

Figure 2/图 2

6 Technical characteristics

6.1 Cell usage conditions

Temperature of charge： −10∽45°C

Temperature of discharge： −30∽60°C

6.2 Cell testing conditions

Unless otherwise specified, all tests stated according to following

Temperature： 25.0±3.0°C

Humidity： 65±20%RH

6.3 Requirement of the testing equipment

Voltage meter: The voltage tester internal resistance is ≥10 KΩ/V

Temperature meter: The precision is ≤0.5°C

6.4 Electronic performance

NO.	ITEM	CRITERION	TESTING METHOD
1	Discharge rate capability	Test condition Temperature:25.0±3.0℃ Charge: CC/CV 0.50C 3.95V cut off current: 0.05C Discharge: CC variable values; End-of-discharge Voltage: 1.50V discharge capacity at 1.00C / discharge capacity at 0.50C ≥97.00% discharge capacity at 2.00C / discharge capacity at 0.50C ≥96. 00% discharge capacity at 3.00C / discharge capacity at 0.50C ≥95.00%	
2	Cycle life	Test condition: Temperature:25.0±3.0℃ Charge: CC/CV 0.50C 3.95V cut off current: 0.05C Discharge: CC 0.50C;End-of-discharge Voltage: 1.50V discharge capacity of 4000th cycle / nominal capacity ≥80.00%	
3	High-Low temperature discharge performance	Test condition: Temperature:25.0±3.0℃ Charge: CC/CV 0.50C 3.95V cut off current: 0.05C Discharge: CC 0.50C;End-of-discharge Voltage: 1.50V discharge capacity at-30℃ / discharge capacity at 25℃ ≥85.00% discharge capacity at 60℃ / discharge capacity at 25℃ ≥98.00%	
4	Storage performance	Test condition: Charge: CC/CV 0.50C 3.95V cut off current: 0.05C; stored at 25℃ for 1 month Discharge: CC 0.50C; End-of-discharge Voltage:1.50V recover capacity / original discharge capacity ≥95.00%	

6.5 Safety characteristics

NO.	ITEM	CRITERION	TESTING METHOD
1	Vibration Test	No explosion,No fire There shall be no electrolyte leakage	After standard charging, fixed the cell to vibration table and subjected to vibration cycling that the frequency is to be varied at the rate of 1Hz per minute between 10Hz an 55Hz, the excursion of the vibration is 1.6mm. The cell shall be vibrated for 30 minutes per axis of XYZ axes.
2	Thermal abuse	No explosion,No fire	Each fully charged cell, stabilized at room temperature is placed in a gravity or circulating air-convection oven. The oven temperature is raised at a rate of 5 °C/min ± 2 °C/min to a temperature of 130°C ± 2°C. The cell remains at this temperature for 10 min before the test is discontinued.
3	Short Circuit	No explosion,No fire The Temperature of the surface of the Cells are lower than 150°C	Each test sample cell, in turn, is to be short- circuited by connecting the (+) and (-) terminals of the cell with a Cu wire having a maximum resistance load of O.lQ.Tests are to be conducted at room temperature(20±2°C).
4	Abnormal Charging Test 过充电测试	No explosion,No fire	After standard charge,charge at a current of 1.0 C for lh.
5	Forced Discharge	No explosion,No fire	Discharge at a current of 1.0 C for 1.5h.

6	Impact	No explosion,No fire	A 15.8mm diameter bar is inlayed into the bottom of a 9.1kg weight. And the weight is to be dropped from a height of 610mm onto a sample cell and then the bar will be across the center of the sample.

7 Warning and cautions in handling the lithium-ion cell

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

1. Don't immerse the cell in water.

2. Don·t use and leave the cell near a heat source such as fire orheater.

3. When charging, use a cell charger specifically for that purpose.

4. Don't reverse the positive and negative terminals.

5. Don't connect the cell to an electrical outlet directly.

6. Don't discard the cell in fire or heater.

7. Don't connect the positive and negative terminal directly with metal objects.

8. Don't transport and store the cell together with metal objects such as necklaces, hairpins.

9. Don,t strike, throw or trample the cell.

10. Don't directly solder the cell.

11. Don't pierce the cell with a nail or other sharp object.

12. When disposing of secondary cells, keep cells of different electrochemical systems separate from each other.

Caution

1. Don't use or leave the cell at very high temperature conditions (for example, strong direct sunlight or a environment in extremely hot conditions).

2. 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 can result.

3. 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.

4. In case the cell terminals get dirty, clean the terminals with a dry cloth before use.

8 The restriction of the use of hazardous substances

This model of sodium ion secondary cell is in accordance with our company's request of "environmental substances control standard".

9 Packaging and shipment

9.1 Packaging

Each small box uses a card slot to place 100 cell, and each large box is sealed with 4 small boxes and labeled with paper. Each tray is placed in 5 layers, and each layer is placed in 10 large boxes. In total, the maximum number of cell carried by each tray is controlled within 20000, Figure 3.