深圳市耐科森电源科技有限公司
Shenzhen Naccon Power Technology Co., Ltd.

承 认 书

SPECIFICATION FOR APPROVAL

Model

型 号: 852030 500mAh

Total Page

页 数: 10

Customer

客 户: _____

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AMENDMENT RECORDS

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Cell specification

1.Scope

The purpose of this product specification is to provide technical information for the rechargeable lithium-ion polymer cell, manufactured and supplied by Shenzhen Naccon Power Technology Co.,Ltd.

1.1. Description and Model

1.1.1	Description	Rechargeable Lithium-ion Polymer Battery
1.1.2	Model	852030

1.2.1. Specifications

1.2.1	Typical Capacity (C)	500mAh (standard discharge to 3.0V process after standard charge)	
1.2.2	Minimum Capacity	480mAh (standard discharge to 3.0V process after standard charge)	
1.2.3	Charging Voltage	4.2V	
1.2.4	Normal Voltage	3.7V	
1.2.5	Fast Charge(25±2℃)	1CmA **CC** charge to 4.2V 4.2V CV charge to 0.02CmA cut-off	
1.2.6	Standard Charge(25±2℃)	0.2CmA **CC** charge to 4.2V 4.2V CV charge to 0.02CmA cut-off	
1.2.7	Charge time	Approx.3.0hours (Fast charge)	
1.2.8	Fast Discharge(25±2℃)	1CmA CC discharge to 3.0V Cut-off	
1.2.9	Discharge time(25±2℃)	1CmA CC discharge to 3.6V Cut-off，discharge time >40min	
1.2.10	Standard Discharge(25±2℃)	0.2CmA CC discharge to 3.0V Cut-off	
1.2.11	Max. Charge Current	1CmA	
1.2.12	Max. Discharge Current	1CmA	
1.2.13	Weight of Battery	Approx.7.0g	
1.2.14	Temperature range of operation		
	Charge	10℃～45℃	
	Discharge	-20℃~60℃	
1.2.15	Storage (At 50% SOC and specified temp, recoverable capacities in % vs time.)	-20℃~25℃	(12 months, ≥85%)
		-20℃ ~35℃	(3 months, ≥85%)
		-20℃ ~45℃	(1 month, ≥90%)
		-20℃~60℃	(1 month, ≥80%)
		20±5℃ is the recommended storage temperature	

Remark: **CC**----Constant Current **CV**----Constant Voltage **SOC**---- State of Charge

1.3. Shape/Dimension and Appearance

1.3.1 Shape/Dimension

Refer to **Fig. 1 Monomer Dimension Drawing(Page 10)**

1.3.2 Appearance

Free from any abnormal strain, deformation, nor damage or any noticeable scratch, flaw, rust, discoloration or electrolyte leakage.

1.4. Standard Test Condition

1.4.1 Environmental Conditions

Unless otherwise specified, all tests shall be conducted within one month of delivery at the temperature 23±3℃ and the relative humidity 65±20 %.

1.4.2 Test Equipments

1.4.2.1 Ammeter and voltmeter

The ammeter and voltmeter shall have an accuracy of ± 0.1mA and ± 0.1mV, respectively.

1.4.2.2 Slide caliper

The slide caliper shall meet with JIS B7507 standard（slide caliper）and have a scale of 0.01mm.

1.4.2.3 Impedance meter

The impedance meter shall be operated at 1 kHz.

1.5. Test Procedure and its Standard

	Item	Measuring Procedure	Standard
1.5.1	Appearance	Visual	No Defects and Leakage
1.5.2	Dimension	Caliper for dimension	As item 1.3
1.5.3	Weight	Balance	As item 1.2.12
1.5.4	Open Circuit Voltage	Voltmeter	≥3. 90V
1.5.5	Initial Internal Impedance	Measure the AC impedance at 1kHz	≤80mΩ (50% SOC)
1.5.6	Discharge Capacity	Within 1h after standard charge, fast discharge until final discharge voltage of 3.0V	≥500mAh (min.)
1.5.7	Cycle Life (Rest for 10 min. between each cycle.)	Charge: 0.5CmA CC to 4.2V, 4.2V CV charge to 0.02CmA cut-off Discharge: 0.5CmA CC discharge to 3.0 V	Discharge capacity should be ≥80% of 1st cycle capacity @ 500th cycle.
1.5.8	Leakage Proof	The cell which is fully charged shall be stored at 60±3℃ and 95±5% RH for 7 days.	No leakage.
1.5.9	H/L Temp. Characteristic (Hold for 2h after each charging)	Charge: 0.2CmA CC to 4.2V, 4.2V CV charge to 0.02CmA cut-off at 23±3℃ Discharge:0.2CmA CC discharge to 3.0V at -10±3℃and 60±3℃.	Discharge capacity rate: ≥60% for -10±3℃ ≥95% for 60±3℃.

1.6. Safety Criteria for Acceptance

Item	State	Test method	Specification
External Short-circuit Test	Fully Charged	Cell terminals are short-circuited to discharged state less than 0.1V or longer time with a resistance of 50mΩ or less. Tests are to be conducted at room temperature.	NO EXPLOSION AND NO FIRE.
Over-Discharge Test	Fully Charged	Cell is discharged at a current of 1C rate for 2.5 hours. (If current stops by safety or passive circuit on the battery, test is finished.)	NO EXPLOSION AND NO FIRE.
Heating Test	Fully Charged	The temperature of the oven is to be raised at a rate of 5±2℃/min. to a temperature of 130±2℃, and remains for 30 minutes at this temperature.	NO EXPLOSION AND NO FIRE.
Crush Test	Fully Charged	Crush between two flat plates. Applied force is about 13kN.	NO EXPLOSION AND NO FIRE.
Impact Test	Fully Charged	Impact between bar (15.8mm diameter) and 9 Kg falling material (at a height of 60 cm). Bar is laid across the center of the test sample.	NO EXPLOSION AND NO FIRE.
Drop Test	Fully Charged	Drop a fully charged cell onto a concrete floor from the height of 1.0 meters for 2 times.	NO EXPLOSION AND NO FIRE.
Vibration Test	Fully Charged	Vibrate the cell in tri-axial directions each for 90~100 min. in conditions of 10~55 Hz with amplitude 0.8 mm.	NO EXPLOSION DEFORMATION AND NO FIRE
Abnormal Charge Test	Fully Discharged	Charge the cell with 3 times of max charge current by connecting it to a 4.4V dc-power supply for 7 hours.	NO EXPLOSION AND NO FIRE.

1.7. Self Discharge

The residual capacity should be ≥90% of the initial capacity .The capacity after 30days storage, measured under the same conditions as 23±3℃and relative humidity 65±20 % environmental test conditions.

Data is collected by fully charging the battery, measuring the initial capacity (discharging), recharging the battery, storing the battery, and then measuring the residual capacity after storing.

1.8. Charge State of Battery Before Shipment

The battery is charged to approximately 60 % of minimum capacity. Voltage is ≥3. 90V. This measuring test should be performed within one month after shipment from our factory.

1.9. RoHs compliance is for all parts.

1.10. Handling Precautions

Naccon battery pack shall have enough protection for **Naccon** cell from the specification of electrical, mechanical and environmental characteristics. For use of this battery, must follow as specified below.

Other than IEC62133 safety requirement conditions listed may cause major burst, fire, some smokes and it would cause severe performance failure and unsafe for use.

Please be sure to follow instructions carefully.

2.DANGERS:

2.1 Don't disassemble or modify the battery.

The battery has safety function and protection circuit to avoid the danger. **Naccon** cell is packaged by Aluminum laminated plastic film which is easy to be damaged by sharp edge such as pin, needle, edge of devices like nickel tabs, etc. If they have serious damage, electrolyte leakage, short-circuit between positive and negative tabs, etc. It would cause the generation, smoke, rupture, or flaming with mishandling.

2.2 Don't incinerate or heat the battery

Don't use or leave battery nearby fire, stove or heated place (more than 130℃). These occur the melting of insulator, damage of safety function, or ignition on electrolyte. In case that separator made of polymer is melted by high temperature, the internal short-circuit occurs in individual cells and then it would cause the generating, smoke, rupture or flaming.

2.3 Don't use any damage battery

Don't use the battery that are dented or bent on their edge part. **Naccon** batteries are possible to be damaged by strong mechanical shock and it would cause wire break, short-circuit inside the cell, leakage of electrolyte, etc.

2.4 Don't drive a nail into a battery, strike it by hammer, or tread it.

As the battery might be broken or deformed and then it will be short-circuited, it would cause the generating, smoke, rupture or flaming.

2.5 Don't give battery impact or fling it

If the protection circuit assembled in the battery is broken, the battery will be charged at abnormal voltage or current and abnormal chemical reaction will occur. It may cause the generating, smoke, rupture or flaming.

2.6 Don't make the direct ultrasonic wave power to the battery or soldering near the battery

It may cause serious damage to the batteries. Soldering near the battery may cause damage of the components, such as separator and insulator, are melted by heat, it would cause the gas generating, smoke, rupture or flaming.

2.7 Don't use battery nearby the high temperature place or under the blazing sun.

Naccon batteries have possibility to be degraded its performance such as capacity, thickness increase, impendence, etc. The battery will be charged at the abnormal chemical reaction occurs in the high temperature place. The thickness change may lead to stressing on battery case/ device, wiring or cell which may have possibility to lead to damage performance.

2.8 Don't use the unspecified charger.

If the battery is charged with unspecified condition (under high temperature over the regulated value, excessive high voltage or current over regulated value, or remodeled charger with PCM failed or disassemble), there are causes that it will be overcharged or the abnormal chemical reaction will occur in cells. It causes the gas generating, smoke, rupture or flaming.

2.9 Don't reverse polarity (and terminals)

If the protection circuit assembled in the battery is broken. On charging, the battery is reversed-charged and abnormal chemical reaction occurs. There may be case that unexpected large current flows on discharging. There causes the generating, smoke, rupture or flaming.

2.10 Don't reverse-charge or reverse-connect

The battery has polarity. In case the battery is not connected with charger or equipment smoothly do not force them to connect and do check polarity of battery. If the battery is connected to opposite polarity with charger. It will be reverse-charged and abnormal chemical reaction will occur. If the protection circuit assembled in the battery is broken, it would cause the generating, swelling, smoke, rupture or flaming.

2.11 Don't use battery for another equipment

If the battery is used for unspecified equipment, it will deteriorate its performance and cycle-life.

2.12 Don't touch a leaked battery directly

In case the leaked electrolyte gets into eyes, wash them with fresh water as soon as possible without rubbing eyes. And then, see a doctor immediately. If leave damaged eyes undone, it will cause eye-trouble.

3.WARNINGS:

3.1 Keep the battery away from babies

Keep the little battery out of the reach of babies in order to avoid troubles by swallowing. In case of swallowing the battery, see a doctor immediately.

3.2 Don't get into a microwave or a high pressure container

Because of sudden heat or damage of sealing condition of battery, it may cause the generating, smoke, rupture or flaming.

3.3 Don't use a leaked battery nearby fire

If the liquid leaks from the battery (or the battery gives out bad smell), let the battery leave from flammable objects immediately. Unless do that, the electrolyte leaked from battery may catch fire and it would cause the smoke, flaming or rupture of it.

3.4 Don't use an abnormal battery, such as leakage, swelling, deformation, etc.

In case the battery has bad smell, it generates, its color change or it is warped in using (includes charging and storage), let it take out from equipment or charger and do not use it. If an abnormal battery is used, it may generate bad performance or damage the device or pack.

4.CAUTIONS:

4.1 Don't use or leave the battery under the blazing sun (or in heated car by sunshine)

The battery may smoke, heat or flame. And also, it might cause the deterioration of Battery's characteristics or cycle life.

4.2 Static Electricity

The battery has the protection circuit to avoid the danger. Do not use nearby the place where generates static electricity (more than 100V) which gives damage to the protection circuit. If the protection circuit were broken under abnormal handling, the battery would generate, smoke, rupture or flame.

4.3 Manual

Please read the manual before using the battery and let it keep after reading. And also, please read it necessary.

4.4 Charging Method

Please read the manual of specific charger about charging method.

4.5 First time use

When the battery has rust, bad smell or something abnormal at first-time-using, do not use the equipment and go to the shop which it was bought.

5.DISPOSAL METHOD:

The used battery is immersed in NaCl 2~3 % water solution for 1 week. Then, it is disassembled and this battery should be handled according to all national laws and regulations.

6. Monomer Dimension Drawing

(not in scale)

Items	Description	Dimension and Spec
T	**Thickness**	8.5mm max(shipment) 9.0mm max(after 300 cycle)
W	**Width**	20.0mm max
L	**Length**	30.0mm max
A	**Sealant Length**	0.2～2.0mm
B	**Tab width**	2.0±0.1mm
C	**Tab length**	5.0~6.0mm
W1	**Distance between 2 tabs**	7.0±2.0mm

