NI-MH BATTERIES SPECIFICATIONS

(MODEL NO.): FP-MH-AA2500A 1.2V

(FILE NO.): LTT13-AS1-07-01-MH001

(CUSTOMER NO.):

(SPECIFICATIONS)

1. (Scope)

This specification is applied to the reference battery in this Specification and manufactured by Shenzhen LTT Co., Ltd.

2、 (MODEL)： FP-MH-AA2500A 1.2V

3、 (APPEARANCE)

The cell / battery shall be free from cracks, scars, breakage, rust, discoloration, leakage and deformation.

4、 (RATINGS)

Table below can be taken as the basic guideline of evaluation the battery quality.

4.1 (ambient temperature)20±5℃， (Relative Humidity)：65±20%

4.2 (Testing facility must conform to the condition)：

IEC 51/IEC 485 0.5 0.01Ω

Ampere meter: IEC 51/IEC 485 stipulated grade 0.5 or above, including the down-lead resistance totally less than 0.01Ω

1KHz 4

Resistance tester: AC 1 KHz sine wave 4 terminals testing equipment

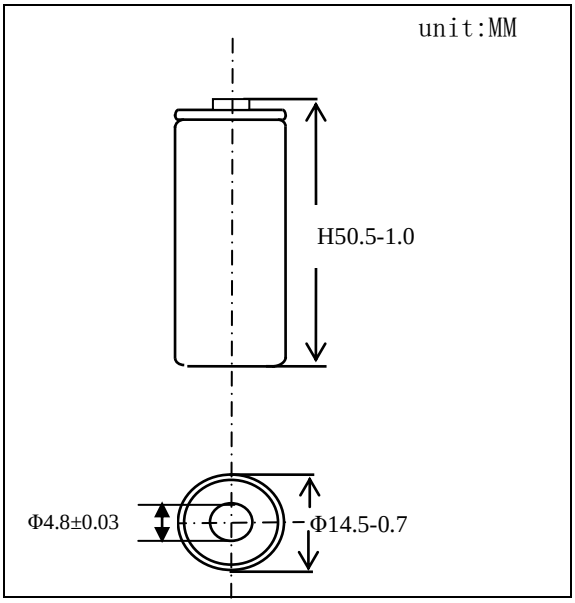
Item	Specification	Conditions
Standard charge	250 mA（0.1C）	ambient temperature of 20±5℃, Relative Humidity: 65±20%
	16 hrs	
Standard discharge	500 mA (0.2C)	standard charge, the final voltage is 1.0V
Rapid Charge	1250mA（0.5C）	ambient temperature of 20±5℃, Relative Humidity: 65±20%
Rapid discharge	1250mA（0.5C）	standard charge, the final voltage is 1.0V
Trickle Charge	50～125 mA (0.02C～0.05C)	Ta=-10～45 ℃
Storage Temperature	Within 1 year	-20～25℃
	Within 6 months	-20～35℃
	Within 1 months	-20～45℃
	Within 1 week	-20～55℃
Operation Temperature	Standard charge	15～25℃
	Fast Charge	0～45℃
	Discharge	-20～65℃
Nominal Voltage	1.2 V	
Open circuit voltage	≥1.25V	Within 1 hr after standard charge
Rated Capacity	2500 mAh	
Minimum Capacity	≥2500 mAh(0.2C)	Standard charge and Standard discharge
	≥2250 mAh(0.5C)	Standard charge and Rapid discharge
Internal Impedance	≤30mΩ	Within 1 hr after standard charge
Weight	30g	Approx:30 g

Charge-retention Rate	60%(1500mAh) Rate of Charge-retention≥60 % of Rated Capacity (1500mAh)	Storage a period of 28 days after standard charge, then Standard discharge (0.2C) to 1.0V
Cycles Test	≥ 500 Cycles	IEC61951-2:2003 （**see note 2**）
Constant humidity and hot performance	No damage	Full charge the battery at current 0.1C, 33±3℃， 80±5%R.H., storage 14 days.
Over-charge	No leakage nor explosion Capacity≥100%	0.2C discharge to 1.0V , 0.1C charge for 48 hrs, then test the Capacity with Standard discharge Conditions
Over-discharge	80%。No leakage nor explosion Capacity≥2000mAh	0.2C discharge to 1.0V,Cornbine the battery with a 2.4Ω electric resistance, after stored for a period of 24 hrs, then test the Capacity with Standard discharge Conditions
Vibration Test	Voltage variety: ≤0.03V/cell Internal impedance: ≤5mΩ/cell	Charge at current 0.1C for 15hrs; place for 24 hrs, check the battery before and after vibration. Vibration condition: Swing: 1.5mm, Frequency: 3000CPM, Vibrate for 1hr to any direction.
Drop Test	:≤0.03V/:≤5mΩ/	Charge at current 0.1C for 15hrs, place for 24 hrs, check the battery before and after fall down test; Impact condition: Fall down from height 1.5m to any direction on the hard-wood board(Thickness:10mm), test for 3 times
Safety	No disrupt or burst, explosion, but leakage of electrolyte and deformation are acceptable	. The battery shall undergo a forced discharge in an ambient temperature of 20±5℃,at a constant current of 0.2I_tA,to a final voltage of 0V.the current shall then bi increased to 1.0I_tA and the forced discharge continued in the same ambient temperature of 20±5℃,for 60 min.

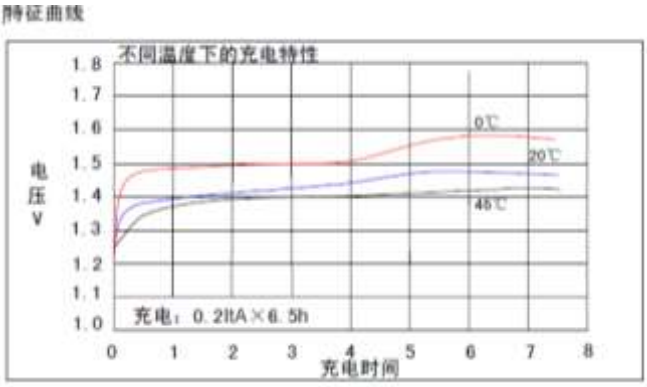
5、 Specifications of single cell

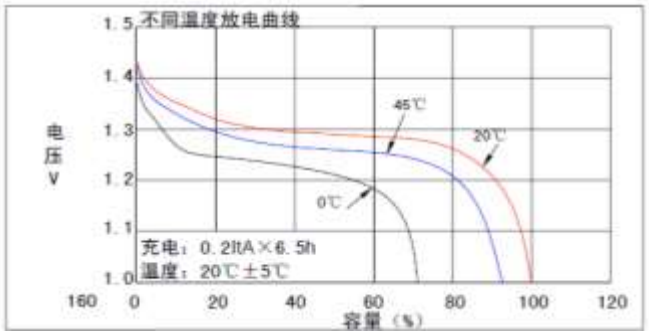
Specifications of single cell

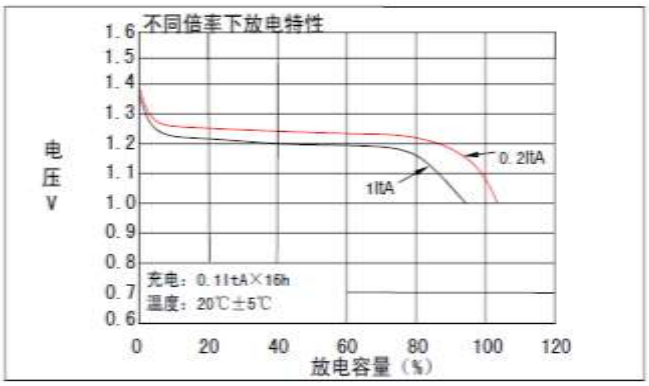
TYPE	Nickel-Metal Hydride cylindrical single cell	
MODEL	LTT- AA2500mAh 1.2V	
Dimensions	diameter	14.5-0.7mm
	Height	50.5-1.0mm



(characteristic of charge/discharge)：







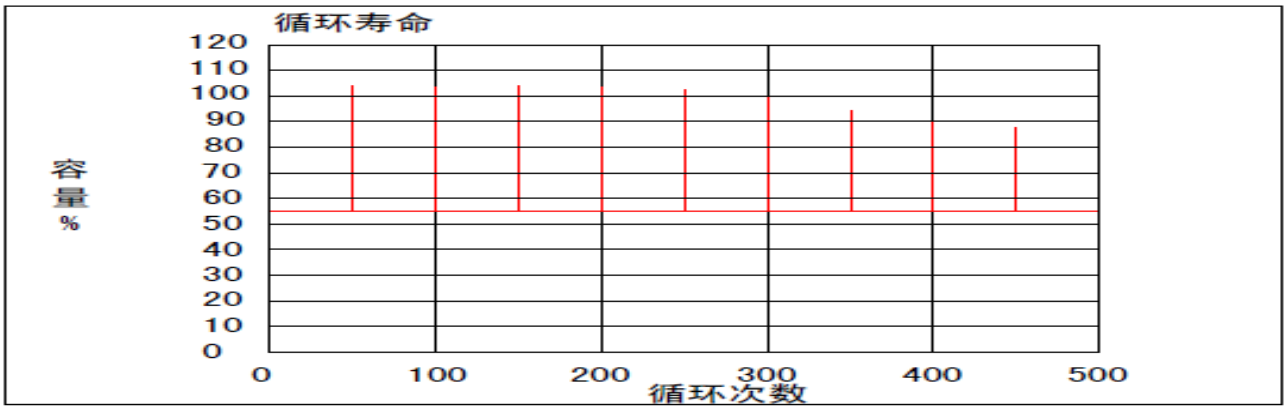
Note 1:. Standard charge and Standard discharge

Note 2:

(1). ambient temperature: 20±5℃, Relative Humidity: 65±20%

(2). IEC (Life test method of IEC61951-2:2003) :

Cycle Number	Charge	Stand in charged condition	Discharge
1	0.1C×16hrs	None	0.25C×2hrs 20min
2~48	0.25C×3hrs 10min	None	0.25C×2hrs 20min
49	0.25C×3hrs 10min	None	0.25C to 1.0V/ cell
50	0.1C×16hrs	1～4hr	0.20C to 1.0V/cell
Cycles 1 to 50 shall be repeated until the discharge duration on any 50th cycle become less than 3h.At this stage, a repeat capacity measurement as specified for 50 shall be carried out			



6、 (Quality guarantee period)

Guarantee time for one year due to the processing and raw material defectiveness.

Suggestion: The products before delivery would be charged 20-80% capacity according to the transportation distance and packing condition. While checking the capacity, please discharge the battery at 0.2C to 1.0V/cell; then charge and discharge the battery at by standard current. If the storage time over 3 months or above, please discharge the battery at the current 0.2C to 1.0V/cell, then charge the battery at 0.1C for 15 hours, after that place for 20mins, discharge the battery at 0.2C to 1.0V/cell. After this activation, check the capacity by the standard current charge and discharge the battery

The first time use suggested to take standard charge method to charge the battery to prevent from damage to battery.

7、 (Cautions):

1, Batteries should be charged prior to use.

2, When using a new battery for the first time or after long term storage, please fully charge the battery Before use.

1, For charging methods please reference to our specifications.

2, Use the correct charger for Ni-Cd or Ni-MH batteries.

3, Do not reverse charge batteries.

4, Do not short circuit batteries, permanent damage to batteries may result.

5, Do not incinerate or mutilate batteries, may burst or release toxic material.

6, Do not subject batteries to adverse condition such as extreme temperature, deep cycling and excessive Overcharge / overdischarge.

7, Store batteries in a cool dry place.

8, Do not mix VIGORPOWER batteries with other battery brands or batteries of a different chemistry such as Alkaline and zinc carbon.

9, Do not mix new batteries in use with semi-used batteries, overdischarge may occur.

10, Avoid batteries being used in an airtight compartment. Ventilation should be provided inside the battery compartment; otherwise batteries may generate hydrogen gas, which could cause an explosion if exposed to an ignition source.

11 When connecting a battery pack to a charger, ensure correct polarity.

12 If find any noise, excessive temperature or leakage from a battery, please stop its use.

13 When the battery is hot, please do not touch it and handle it, until it has cooled down.

14 Do not remove the outer sleeve from a battery pack nor cut into its housing.

15 When find battery power down during use, please switch off the device to avoid overdischarge.

16 When not using a battery, disconnect it from the device.

17 Unplug a battery by holding the connector itself and not by pulling at its cord.

18 After use, if the battery is hot, before recharging it, allow it to cool in a well-ventilated place out of direct sunlight.

19 Never put a battery into water or seawater.

20 During long term storage, battery should be charged and discharged once every 3 months.

21 Do not attempt to take batteries apart or subject them to pressure or impact. Heat may be generated or fire may result. The alkaline electrolyte is harmful to eyes and skin, and it may damage clothing upon contact.

22 Keep away from children. If swallowed, contact a physician at once.