



SHEN ZHEN BOYING ENERGY CO.,LTD

BY Ni-MH BATTERY DELIVERY SPECIFICATIONS

PRESENTED TO : _____

MODEL NO. : D10000 10000mAh 1.2V

DATE : December 11, 2023

Customer Part No. : _____

Specification Approved	Prepared By	Wen lu
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Customer Approved	Checked By	
	Approved By	
	Please sign and return one copy to us.	Seal the

**1. Scope**

This specification governs the performance of the following BY Nickel-Metal Hydride cylindrical battery .

2. BY model: D10000**3. External Appearance**

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

4. Ratings

The data involving the nominal voltage and the approximate weight of the battery pack.

Description	Unit	Specification	Conditions
Nominal Voltage	V	1.2	Unit: cell
Nominal Capacity	mAh	10000	Standard charging / discharging
Rated Capacity	mAh	9500	Standard charging / discharging
Standard Charge	mA	1000 (0.1C)	Ta=0~45°C (see note)
	hour	16	
Quick Charge	mA	5000(0.5C) With charge termination control	-ΔV=5~8mv/ cell Timer cutoff=120% input capacity Temp. cutoff= 45~50°C, Ta= 0~40°C dT / dt=0.5~1.0°C/ min
	minute	140approx.(0.5C)	
Trickle Charge	mA	500 (0.05C)	Ta=0~45°C (see note)
Discharge Cut-Off Voltage	V	1.00	Less than 1.0C discharge
		0.90	1C-2C discharge
Maximum Dischargeing	mA	20000 (2.0C)	Ta= 0~50°C
Storage Temperature (Percent40-60charged state)	°C	-20~+40	Less than 30 days
		-20~+30	Less than 90 days
		-20~+25	Less than 180 days
	%	65±20RH	Relative humidity
Typical Weight	g	180	Approx.



5. Performance

Unless otherwise stated, tests should be done within one month of delivery under the following conditions:

Relative humidity: $65 \pm 20\%$ RH.

Ambient Temperature: $20 \pm 5^\circ\text{C}$.

Notes: Standard charge / discharge condition

Charge: **1000 mA** (0.1C) x16 hrs

Discharge: **2000 mA**(0.2C) to 1.0V/cell.

The batteries must be standard discharged before charging

Battery test vide infra:

Test	Unit	Specification	Conditions	Remarks
Capacity	mAh	≥ 9500	Standard Charge / Discharge	Up to 3 cycles Allowed
Open Circuit Voltage (OCV)	V	≥ 1.35	Within 1 hr after standard charge	Unit: cell
Internal Impedance (Ri)	m Ω	≤ 13	Upon fully charge at 1Khz	Unit: cell
Rapid discharge (0.5C)	min	≥ 114	Standard charge, 30min rest before discharge at 0.5C to 1.0V/cell	Up to 3 cycles Allowed
Over charge test	N/A	No explosion Leakage may occur	Cell is discharged with 0.2C to 1.0V, then 0.1C for 48 hours	
Over discharge test	N/A	No explosion	Cell is discharged with 0.2C to 0.00V, then with 1C forced discharged for 1hours	
Charge Retention (20°C)	mAh	$\geq 6000(60\%)$	Standard charge, storage for 28 days at 20°C, standard discharge	
	mAh	$\geq 6000(60\%)$	Standard charge, storage for 7 days at 40°C, standard discharge	
IEC Cycle life test	cycle	≥ 500	IEC 61951-2 7.4.1.1	



Short circuit test	N/A	No fire No explosion	After 0.2C to 1.00V, cell is fully charged with 0.1C for 16hours(or with 0.5C for 2.2hours), then shorted for 1hour or longer with a 50~100mΩ load or less
Vibration test	N/A	No physical change No leakage Cell electrical performances unchanged	Cell is vibrated continuously lengthwise for 60minutes Amplitude: 4mm Frequency: 1000times/minutes
Drop test	N/A	No abruption No leakage No explosion	After 0.2C to 1.00V, cell is fully charged with 0.1C for 16hours ,then cell is dropped 3 times from a 1.0m height onto solid wood (20mm thick) with random orientation
Safetydevice Operation test	N/A	No explosion	Forced discharge at 0.2C to a final voltage of 0V, then the current be increased to 1C and forced discharge continue for 60 min

Attention: The object of abuse test is unit cell.

Append: IEC61951-2 Endurance in cycles

Normal Cycling Test:

Cycle No.	Charge	Rest	Discharge
1	0.1C × 16hrs	None	0.25C × 2hrs 20mins
2~48	0.25C × 3hrs 10mins	None	0.25C × 2hrs 20mins
49	0.25C × 3hrs 10mins	None	0.25C to 1.00V/cell
50	0.1C × 16hrs	1~4hrs	0.2C to 1.00V/cell
Cycle 1 to 50 shall be repeated until the discharge duration on any 50th cycle becomes less than 3hrs			

The endurance test is considered complete when two such successive cycles give a discharge duration less than 3h. The number of cycles obtained when the test is completed shall be not less than 500.



6. Configurations, Dimensions And Markings

Please refer to the related drawing.

7. Warranty

The quality guarantee period for our products is one year.

8. Cautions

1. Reverse charging is not acceptable.
2. Charge before use, use the correct charger for Ni-MH batteries.
3. Do not charge / discharge with more than the specified current.
4. Do not short circuit the cell / battery.
5. Do not incinerate or mutilate the cell/battery.
6. Do not solder directly to the cell / battery.
7. The life expectancy may be reduced if the cell / battery is subjected to adverse conditions, like extreme temperature, deep cycling, excessive overcharge /over-discharge.
8. Store the cell / battery in a cool dry place.
9. For charging methods please reference to BY technical handbook.
10. When find battery power down during use,please switch off the device to avoid over discharge.
11. When not using a battery, disconnect it from the device.
12. well-ventilated place out of direct sunlight.
13. During long term storage, please activate the battery once every 3 months according to the following method:
Charge at 0.1C for16 hrs , rest 10 min, then discharge with 0.2C to 1.0V/cell,rest 10 min, then charge at 0.2C to 150min.
14. When the battery is hot, please do not touch it and handle it, until it has cooled down.
15. Do not mix BY batteries with other battery brands or batteries of a different chemistry such as alkaline and zinc carbon batteries.
16. Do not mix new batteries in use with semi-used batteries, battery may be over-discharged.



17. 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.

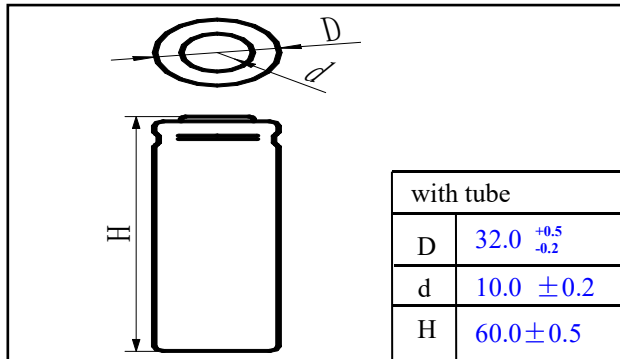
18. Keep away from children. If swallowed, contact a physician at once.

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Specifications of single cell

Dimensions (mm)



Nominal Voltage: 1.2V

Nominal Capacity: 10000 mAh

Rated Capacity : 9500 mAh

Standard Charge: 1000mA, 16 hours

Quick Charge: 5000mA, 140min

Continuous Discharge: less than 2000mA

Discharge Cut-Off Voltage: 0.9V

Weight: 180g(Approx)

Service Life: ≥ 500cycles

(according to IEC discharge characteristics standard)

Internal Impedance : ≤ 13m Ω (1KHz)

Ambient Temperature:

Standard charge: 0 ~45°C

Quick charge: 0 ~40°C

Standard discharge: -20 ~ 50°C

Storage : 65±20% RH

Less than 30 days : -20 ~ +40°C

Less than 90 days : -20 ~ +30°C

Less than 180 days : -20 ~ +25°C

Note :

1. After charge at 0.1C for 16 hrs and discharge at 0.2C to 1.0V at 25°C.

3. Control required:

4. 1) - ΔV: 5~8 mV 2) dT/ dt: 0.5-1.0°C/ min 3) Tco: 40~ 50°C

Typical electrical performance

