



## Specification Approval Sheet

Name: Nickel Metal Hydride Battery

Model: 10511

SPEC: MH-4/5SC 1.2V 2000mAh

Approved By	Checkup	Make

Customer Confirmation	Signature	Date
	Company Name :	
	Stamp :	

436 Kato Terrace, Fremont, CA 94539 U.S.A.

Tel: 510.687.0388 Fax: 510.687.0328

[www.TenergyBattery.com](http://www.TenergyBattery.com)



## 1 Application

This specification applies to the Nickel- Metal Hydrides Cylindrical Cell.

Model: MH-4/5SC 1.2V 2000mAh

Cell type: 4/5SC

## 2 Ratings

### Form1:Battery rated performance

No	Description	Specification	Conditions
1	Nominal voltage	1.2 V	
2	Nominal capacity	2000mAh	Standard Charge/Discharge
3	Minimum capacity	1900mAh	Standard Charge/Discharge
4	Standard charge	0.1C × 16 hrs	Ta=0~45°C
5	Rapid charge	0.5C×2.4hrs approx.	-dV=5mV/cell
6	Standard discharge	0.2C	Ta= -20°C~50°C
7	Discharge cut-off voltage	1.0V	
8	Maximum discharging current	1.0C	
9	Storage temperature	-20°C~35°C	Discharged state
10	Typical weight(approximate)	43g	

## 3 Performance

### 3.1 Test conditions

Unless otherwise stated, tests should be done within one month after receipt under the following conditions

Ambient temperature ,Ta: 20±5°C and

Relative humidity: 65±20%

Notes: Standard charge/discharge conditions:

Charge: 0.1C × 16 hrs

Discharge: 0.2C to 1.0V/cell

### 3.2 Test method & performance

#### Form2:Test method & performance

No	Test	Conditions	Specification
1	Capacity	Standard charge/discharge	≥Minimum capacity
2	Open circuit voltage(OCV)	Within 1hr after standard charge	≥1.25V
3	Internal impedance (Ri)	Upon fully charge(1000Hz)	≤16mΩ
4	Charge retention	Standard Charge, Storage: 28 days, Standard Discharge	≥60%
5	IEC cycle test	IEC 61951-2: 2003(see below note)	≥500 Cycle

### Note:

Specifications and data are subject to change without notice. Contact Tenergy for latest information.

©2010 Tenergy Corporation. All rights reserved.



**Form3:IEC 61951-2: 2003 Cycle life test**

Cycle number	Charge	Rest	Discharge
1	0.1C×16hrs	None	0.25C× 2hrs20mins
2-48	0.25C× 3hrs10mins	None	0.25C×2hrs20mins
49	0.25C× 3hrs10mins	None	0.25C× 1.0V/cell
50	0.1C×16hrs	1-4hr(s)	0.2C×1.0V/cell

Cycles 1 to 50 shall be repeated until the discharge duration on any 50th cycle becomes less than 3hrs

**Form4: Safty test**

Test	Condition	Specification
Vibration	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.	Voltage variety: ≤ 0.02V/cell Internal impedance: ≤ 5 mΩ/cell
Fall down test	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 board( Thickness:10mm), test for 3 times	Voltage variety: ≤ 0.02V/cell Internal impedance: ≤ 5 mΩ/cell
Over charge	Charge 48h at 0.1C	No explode.
Over discharge	Discharge the battery at current 0.2C to 0V, then over discharge the battery at current 1C for 60mins	No explode.

**4 Assembly & dimension**

As per attached drawing.

**5 External appearance**

The cell / battery shall be free from cracks, scars, breakage, rust, discoloration, leakage nor deformation.

**6 Warranty**

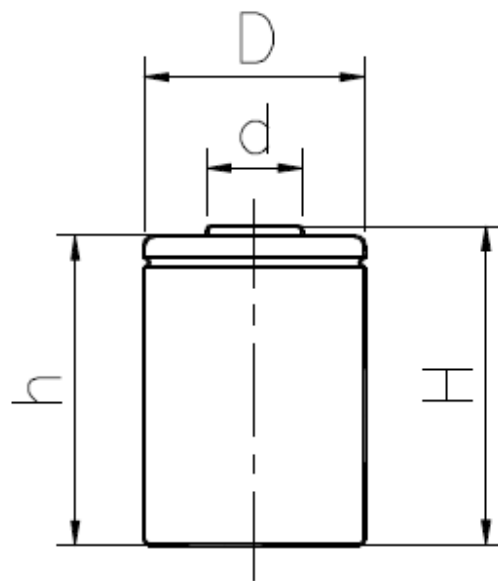
One year limited warranty against workmanship and material defects.

**7 Caution**

- 7.1 Reverse charging is not acceptable.
- 7.2 Charge before use. The cells / batteries are delivered in an uncharged state.
- 7.3 Do not charge / discharge with more than the specified current.

- 7.4 Do not short circuit the cell / battery. Permanent damage to the cell / battery may result.
- 7.5 Do not incinerate or mutilate the cell /battery.
- 7.6 Do not solder directly to the cell /battery.
- 7.7 The life expectancy may be reduced if the cell / battery is subjected to adverse conditions like:  
Extreme temperature, deep cycling , excessive overcharge / over discharge.
- 7.8 Store the cell / battery uncharged in a cool dry place. Always discharge batteries before bulk storage or shipment.
- 7.9 For storage of cells/ batteries over one year, in order to prevent the degrading of the function of cells, cells /batteries  
Should be at least charged and discharged once trimester.
- 7.10 Keep away from children. If swallowed, contact a physician at once.
- 7.11 Air ventilation should be provided in the plastic case of batteries, otherwise it may have a risk of accumulating gas  
(Oxygen gas, hydrogen gas) generated inside the cell resulting in explosion triggered by fire sources (motors or switches).  
Airtight battery compartments are strongly discouraged.

**8 Battery drawing**



D	$22.0 \pm 0.1$
d	$10.0 \pm 0.08$
H	$32.5 \pm 0.5$
H	$32.0 \pm 0.5$