

## Ni-MH Battery Technology Specification

**Customer** \_\_\_\_\_

**Part name** Ni-MH Battery

**Model No** Ni-MH AAA1000mAh 1.2V

**Serial No** \_\_\_\_\_

**Produce No** \_\_\_\_\_

|                    |  |                   |              |
|--------------------|--|-------------------|--------------|
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## 1. SCOPE

This specification governs the performance of the following pkcell Nickel-Metal Hydride Cylindrical Cell and its stack-up batteries.

pkcell Model: Ni-MH AAA1000mAh 1.2V

The data involving nominal voltage and the approximate weight of stake-up batteries shall be equal to the value of the unit cell multiplied by the number of unit cells in the battery.

Nominal voltage of unit cell = 1.2V

## 2. RATINGS

| Description                 | Unit | Specification         | Conditions   |
|-----------------------------|------|-----------------------|--|
| Nominal Voltage             | V    | 1.2                   |  |
| Nominal Capacity            | mAh  | 1000                  | Standard Charge/discharge  |
| Minimum Capacity            | mAh  | 950                   | Standard Charge/discharge  |
| Standard Charge             | mA   | 100(0.1C)             | Ta=0~45℃   |
|                             | hour | 14-16                 |  |
| Fast Charge                 | mA   | 500(0.5C)             | $-\Delta V=5\sim 10\text{mV/PCS}$<br>Timercutoff=110%input <sup>-2-</sup> capacity<br>Temp.cutoff=55℃<br>Ta=10~45℃ |
|                             | hour | 2.2approx             |  |
| Trickle Charge              | mA   | 50(0.05C) ~ 100(0.1C) | Ta=0~45℃   |
| Discharge Cut-off Voltage   | V    | 1.0                   | Ta=-20~55℃   |
| Maximum Discharging Current | mA   | 2000 (2C)             | Ta=10~45℃  |
| Storage Temperature         | ℃    | -20~35℃               | Discharge state  |

## 3. PERFORMANCE

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

Ambient Temperature: Ta=20±5℃    Relative Humidity: 65±20%

Standard Charge/ Discharge Condition:

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Charge: 100mA(0.1C)×16hrs

Discharge: 200mA(0.2C) to 1.0V/ cell

Table 1

| Test                       | Unit  | Specification            | Conditions   | Remarks                    |
|----------------------------|-------|--------------------------|--|----------------------------|
| Capacity(0.2C)             | min   | $\geq 290$               | Standard Charge/Discharge  | Up to 3 cycles are allowed |
| Open Circuit Voltage (OCV) | V     | $\geq 1.25$              | Within 1hr after standard charge                                 |                            |
| Internal Impedance (Ri)    | mΩ    | $\leq 40$                | Upon fully charge(1kHz) (1kHz)                                   |                            |
| High Rate Discharge (0.5C) | min   | $\geq 108$               | Standard Charge, 1hr rest before discharge                       |                            |
| High Rate Discharge (1C)   | min   | $\geq 54$                | Standard Charge, 1hr rest before discharge                       |                            |
| Overcharge                 | N/A   | No leakage nor explosion | 100mA(0.1C) charge 48 hours                                      |                            |
| Charge Retention           | mAh   | $\geq 700(70\%)$         | Standard Charge, Storage: 7 days at 45℃, 0.2C Standard Discharge | - 3 -                      |
| IEC Cycles Test            | Cycle | $\geq 500$               | IEC61951-2 (2003)  |                            |

Table 2

| Test                 | Unit | Specification  | Conditions  |
|----------------------|------|--|---|
| Leakage              | N/A  | No leakage nor deformation.  | Full charged at (0.1C) stand for 14 days  |
| Short Circuit        | N/A  | Leakage & deformation may occur, but no explosion is allowed.  | After standard charge, short circuit for 1 hour (leading wire=0.75mm <sup>2</sup> ×20mm)  |
| Vibration Resistance | N/A  | Change of voltage $\Delta V < 0.02V$ ,<br>Change of internal Impedance $\Delta Ri < 5 \text{ m}\Omega$ . | Charge the battery 0.1C 16hrs, then leave for 24hrs. check battery before / after vibration.<br>Amplitude: 1.5mm<br>Vibration: 3000CPM<br>Any direction for 60mins. |

|                   |     |   |   |
|-------------------|-----|---|---|
| Impact Resistance | N/A | Change of voltage<br>$\Delta V < 0.02V$ ,<br>Change of internal Impedance $\Delta Ri < 5 \text{ m}\Omega$ . | Charge the battery 0.1C 16hrs, then leave for 24hrs.<br>(check battery before / after )<br>dropped,<br>Height: 50cm, Wooden board (thickness 30mm) Direction not specified 3 times. |
|-------------------|-----|---|---|

#### 4. CONFIGURATION, DIMENSIONS AND MARKINGS

Please refer to the attached drawing.

#### 5. EXTERNAL APPEARANCE

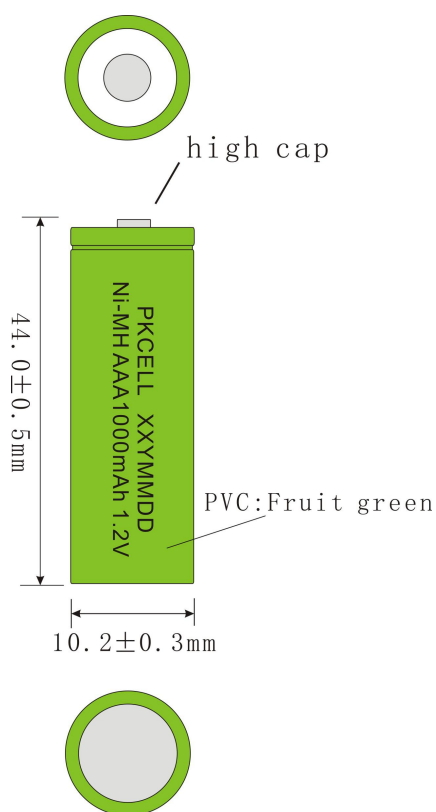
The cell/ battery shall be free from cracks, scars, breakage, rust, Discoloration, leakage nor deformation.

#### 6. CAUTION

- ◆. Reverse charging is not acceptable
- ◆. Do not burthen current when charging.
- ◆. Do not charge/discharge with more than the specified current.
- ◆. Do not short circuit the cell/ battery. Permanent damage to the cell/ battery may result.
- ◆. Do not incinerate or mutilate the cell/ battery.
- ◆. Do not subject batteries to adverse conditions like: extreme temperature, deep cycling and excessive Overcharge/overdischarge. The life expectancy may be reduced.
- ◆. Store the cell/ battery in a cool dry place. Always discharge the cell/battery before bulk storage or shipment.
- ◆. Cycle (charge and discharge) the battery every 6-9 months to maintain cell/battery performance when being stored for an extended period of time.
- ◆. Keep away from children. If swallowed, contact a physician at once.
- ◆. Avoid airtight battery compartments. Ventilation should be provided in the plastic case of batteries, otherwise oxygen and hydrogen gas generated inside can cause explosion when exposed to fire sources such as motors or switches.

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## 7. Dimensions of the battery:



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