

# AA Portable Power Corp.

Document Number:

Revision: 3

Document Title: Product Specification of Ni-MH - D10000 Cells

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## 1、SCOPE

This specification governs the performance of the following Nickel-Metal hydride Cylindrical cell and its stack-up battery.

Model: MH- D10000

Cell Size: D( $\phi 32.1^{+0.2} \times 61.0^{+0.5}$ )

## 2 、DATA OF STACK UP BATTERIES

All data involves voltage and weight to stack-up battery are equal to the value of unit cell time the number of unit cell which consisted in the stack-up batteries

Example : Stack-up batteries consisting three unit cells

Nominal voltage of unit cell=1.2V

Nominal voltage of stack-up batteries =1.2V $\times$ 3=3.6V

## 3、 RATINGS

| Description               | Unit   | Specification             | Conditions  |
|---------------------------|--------|---------------------------|---|
| Nominal Voltage           | V/Cell | 1.2                       | Unit cell   |
| Nominal Capacity          | mAh    | 10000                     | Standard Charge/Discharge   |
| Standard Charge           | mA     | 1000(0.1C)                | T <sub>1</sub> =0~45°C(see Note1)   |
|                           | Hour   | 14~16                     |   |
| Quick Charge              | mA     | 3000 (0.3C)               | - $\Delta V=0\sim 5\text{mV/cell}$ or Timer Cutoff=120%<br>nominal capacity or Temp.Cutoff=55°C,<br>T <sub>1</sub> =10~45°C |
|                           | Hour   | 4.0approx<br>(see Note 2) |   |
| Trickle Charge            | mA     | (0.05C)~(0.1C)            | T <sub>1</sub> =0~45°C  |
| Standard discharge        | mA     | 1800 (0.2C)               | T <sub>1</sub> = -30~60°C Humidity: Max.85%   |
| Discharge Cut-off Voltage | V/cell | 1.0                       |   |
| Storage Temperature       | °C     | -30~65                    | Discharged state、 Humidity、 Max.85%   |
| Typical Weight            | Gram   | 165                       | Unit cell   |

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## 4、 PERFORMANCE

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

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

Relative Humidity :  $65 \pm 20\%$

Notes: Standard Charge/Discharge Conditions:

Charge: 1000 mA(0.1C)×14 hours

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

| Test                      | Unit     | Specification   | Conditions   | Remarks   |
|---------------------------|----------|---|--|---|
| Capacity                  | mAh      | $\geq 10000$  | Standard Charge Discharge  | up to 3 cycles are allowed  |
| Open Circuit Voltage(OCV) | V/cell   | $\geq 1.25$   | Within 1 hour after standard Charge  |   |
| Internal Impedance        | mΩ /cell | $\leq 7.0$  | Upon fully charge(1KHz)  |   |
| High Rate Discharge(1C)   | minute   | $\geq 54$   | Standard Charge, 1 hour rest Before discharge by 10000mA (1C)to 1.0V/cell  | up to 3 cycles are allowed  |
| Overcharge                | /        | No leakage nor explosion  | 1000mA(0.1C)Charge 28 days   |   |
| Charge Retention          | mAh      | $\geq 7000(70\%)$   | Standard Charge, Storage: 28 days, Standard Discharge  |   |
| IEC Cycle Life            | Cycle    | $\geq 500$  | IEC285(1993)4.4.1  | (see Note 3)  |
| Accelerated Cycle Life    | Cycle    | $\geq 400$  | Charge:3000mA(0.3C)<br>Discharge: 5000mA(0.5C)<br>To 1.0V/cell,<br>End-of:80% nominal Capacity   | Cycling charging cut-off condition:<br>- $\Delta V=0\sim 5\text{mV/cell}$<br>and Timer cut-off=110%<br>Nominal capacity Input and Temp.cutoff= $55^{\circ}\text{C}$ |
| Leakage                   |          | No leakage nor deformation  | Fully charged at 0.3C for 4.0 hrs Stand for 14 days  |   |
| Vibration Resistance      |          | Change of voltage should be under 0.02V/cell,Change of impedance should be under 5 milli-ohm/cell     | Charge the battery 0.1C 14hrs,then leave for 24hrs,check battery before/after vibration, amplitude 1.5mm<br>Vibration 3000 CPM<br>Any direction for 60mins.              |   |
| Impact Resistance         |          | Change of voltage sho-uld be under 0.02V/cell<br>Change of impedance should be under 5 milli-ohm/cell | Charge the battery 0.1C 14hrs<br>Then leave for 24hrs,check bat-before/after dropped,<br>Height 50cm<br>Wooden board(thickness 30mm)<br>Direction not specified,3 times. |   |

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## 5、 CONFIGURATION, DIMENSIONS AND MARKINGS

Please refer to the attached drawing.

## 6、 EXTERNAL APPEARANCE

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

## 7、 WARRANTY

One year limited warranty against workmanship and material defects.

## 8、 CAUTION

- (1) Reverse charging is not acceptable.
  - (2) Charge before use. The cells/batteries are delivered in an uncharged state.
  - (3) Do not charge/discharge with more than our specified current.
  - (4) Do not short circuit the cell/battery Permanent damage to the cell/battery may result.
  - (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 adverse conditions like: extreme temperature, deep cycling, excessive overcharge/ over-discharge.
  - (8) store the cell/battery uncharged in a cool dry place. Always discharge batteries before bulk storage or shipment.
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### Notes:

- (1)  $T_1$ : Ambient Temperature.
- (2) Approximate charge time from discharged state, for reference only.
- (3) IEC285(1993)4.4.1 Cycle Life:

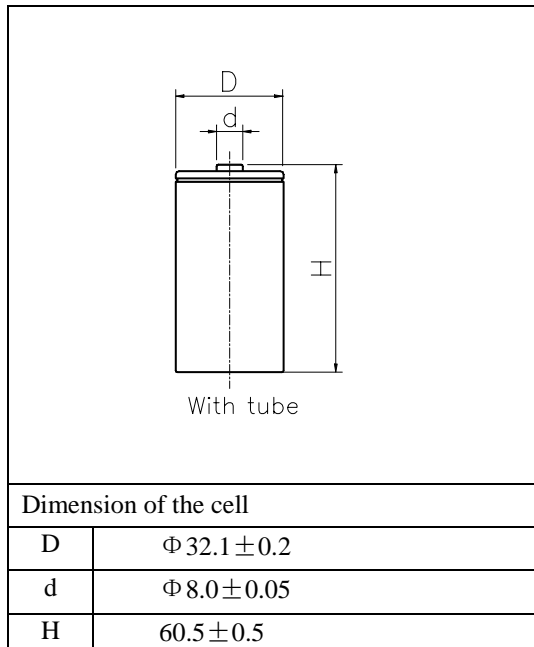
| Cycle No.  | Charge                 | Rest | Discharge              |
|--|------------------------|------|------------------------|
| 1  | $0.1C \times 16h$      | None | $0.25C \times 2h20min$ |
| 2-48   | $0.25C \times 3h10min$ | None | $0.25C \times 2h20min$ |
| 49   | $0.25C \times 3h10min$ | None | $0.25C$ to $1.0V/cell$ |
| 50   | $0.1C \times 16h$      | 1-4h | $0.2C$ to $1.0V/cell$  |
| Cycles 1 to so shall be repeated until the discharge duration on any 50th Cycle becomes less than 3 h. |                        |      |                        |

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**MODEL No:** MH-D10000  
NI-MH

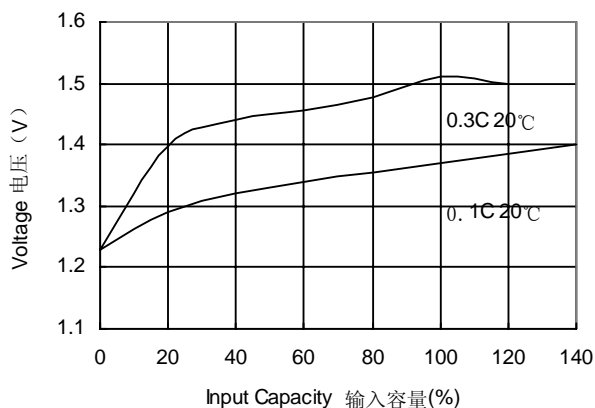
**Description:**10000mAh D SIZE



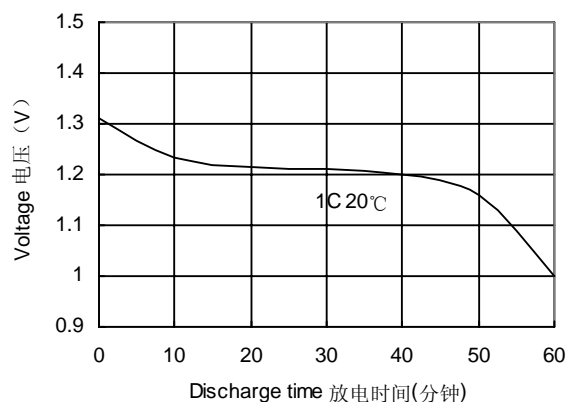
## Specification

|   |              |             |            |
|---|--------------|-------------|------------|
| Nominal Capacity 额定容量                       | 10000 mAh    |             |            |
| Nominal Voltage 额定电压                        | 1.2 V        |             |            |
| Charge current 充电电流                         | Standard 标准  | 1900mA      |            |
|   | Quick 快充     | 3000 mA     |            |
| Charge time 充电时间                            | Standard 标准  | 14~16 Hrs   |            |
|   | Quick 快充     | 4.0 Hrs     |            |
| Ambient Temperature 使用温度                    | Charge 充电    | Standard 标准 | 0°C~45°C   |
|   |              | Quick 快充    | 10°C~45°C  |
|   | Discharge 放电 |             | -30°C~60°C |
|   | Storage 储存   |             | -30°C~65°C |
| Internal Impedance(mΩ) (After Charge) 充电后内阻 |              | Max ≤7.0    |            |
| Weight 重量                                   |              | 165g        |            |

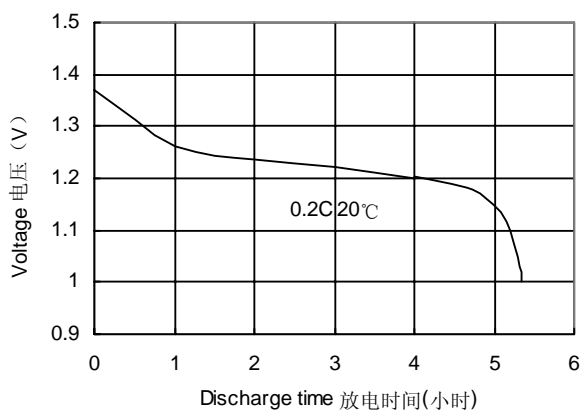
Charge(充电)



Discharge at high rate(高倍率放电)



Discharge at low rate(低倍率放电)



Charge Retention(荷电保持能力)

