



**SPECIFICATIONS**  
**Sealed Rechargeable Nickel Cadmium**  
**NI-CD 2/3AA 400mAh**

**1. SCOPE**

The specifications governs the performance of the following Nickel-Cadmium Cylindrical cell and its battery pack..

Model: NC23AA400

Cell Size: 2/3AA (j: 14.1<sup>±0.2</sup>mm H: 28.0<sup>±0.5</sup> mm)

**2. DATA OF BATTERY PACK**

The data of battery pack, including voltage and weight, is almost equivalent to the multiple numbers of the relevant single cells.

Example: Battery pack consisting three single cells

Nominal voltage of single cell = 1.2V

Nominal voltage of battery pack = 1.2V × 3 = 3.6V

**3. RATINGS**

| Description                 |                 | Unit   | Specification              | Conditions   |
|-----------------------------|-----------------|--------|----------------------------|--|
| Nominal Voltage             |                 | V/Cell | 1.2                        | Single cell or battery pack  |
| Nominal Capacity            |                 | mAh    | 400                        | Standard Charge/Discharge  |
| Standard Charge Rate        |                 | mA     | 40 (0.1C)                  |  |
|                             |                 | Hour   | 14~16                      |  |
| Rapid Charge Rate           |                 | mA     | 400 (1C)                   | Voltage Cut Off-DV=10-15mV<br>Temp. Cut Off =50°C                                |
|                             |                 | Hour   | 1.25approx<br>(see Note 1) |  |
| Trickle Current             |                 | mA     | (0.05C)~(0.1C)             |  |
| Standard discharge          |                 | mA     | 80 (0.2C)                  |  |
| Discharge Cut-off Voltage   |                 | V/Cell | 1.0                        | Battery pack:<br>(n ~1.0)V (n=1~6)<br>[(n-1) ~1.2]V (n=7~10)<br>(n: cell number) |
| Operating Temperature Range | Standard Charge | °C     | 0~+45                      | Humidity: +65%±20%   |
|                             | Rapid Charge    | °C     | 10~+40                     |  |
|                             | Discharge       | °C     | -20~+60                    |  |
| Storage Temperature Range   | Within 2 years  | °C     | -20~+35<br>(see Note 2)    | Humidity: +65%±20%   |
|                             | Within 6 months | °C     | -20~+40                    |  |
|                             | Within 1 month  | °C     | -20~+50                    |  |
|                             | Within 1 week   | °C     | -20~+55                    |  |
| Dimension                   | Diameter        | mm     | 14.1 <sup>±0.2</sup>       |  |
|                             | Height          | mm     | 28.0 <sup>±0.5</sup>       |  |



**SPECIFICATIONS**  
**Sealed Rechargeable Nickel Cadmium**  
**NI-CD 2/3AA 400mAh**

|                       |      |          |             |
|-----------------------|------|----------|-------------|
| <b>Typical Weight</b> | Gram | 7 approx | Single cell |
|-----------------------|------|----------|-------------|

**4. PERFORMANCE**

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

Ambient Temperature,  $T_1$ :  $20 \pm 5^\circ\text{C}$

Relative Humidity:  $65 \pm 20\%$

Notes: Standard Charge/Discharge Conditions:

Charge: 40mA (0.1C) ~15 hours

Discharge: 80mA (0.2C) to 1.0V/Cell

| Test Item                                | Unit    | Specification                  | Test Conditions  | Remarks                    |
|--|---------|--------------------------------|--|----------------------------|
| <b>1. Capacity</b>                       | mAh     | $\geq 400$                     | Standard Charge/Discharge  | Up to 3 cycles are allowed |
| <b>2. Open Circuit Voltage (O.C.V)</b>   | V/Cell  | $\geq 1.30$                    | Within 1 hour after standard Charge  |                            |
| <b>3. Closed Circuit Voltage (C.C.V)</b> | V/Cell  | $\geq 1.25$                    | Within 1 hour after standard Charge, discharge the cell with 1C, The C.C.V. shall exceed 1.25V per cell within 1sec.   |                            |
| <b>4. Internal Impedance</b>             | mW/Cell | $\leq 40$                      | Within 1 hour after standard Charge (1000Hz)   | .                          |
| <b>5. High Rate Discharge (1C)</b>       | minute  | $\geq 54$                      | Following Standard Charge, Stored for a period of 1hour, The Discharge duration by 400mA(1C) to 1.0V/cell  | Up to 3 cycles are allowed |
| <b>6. Low Temperature Discharge</b>      | hour    | $\geq 3$                       | Standard Charge(0.1C): 14~16h ( $20^\circ\text{C} \pm 5^\circ\text{C}$ )<br>Storage: 16~24h ( $-18^\circ\text{C} \pm 2^\circ\text{C}$ )<br>Standard Discharge(0.2C): 1.0V/cell ( $-18^\circ\text{C} \pm 2^\circ\text{C}$ )               |                            |
| <b>7. Self Discharge</b>                 | mAh     | $\geq 300$ (75%)               | Following Standard Charge, Stored on open circuit for a period of 28days, The Discharge duration by 80mA(0.2C) to 1.0V/cell  |                            |
| <b>8. Storage</b>                        | hour    | $\geq 5$                       | The cell shall be stored on open circuit for a period of 12months at discharged state, Following completion of the storage period, the cell shall be charge for 16hours at 40mA(0.1C). The discharge duration by 80mA(0.2C) to 1.0V/cell |                            |
| <b>9. Overcharge</b>                     | hour    | $\geq 5$<br>(No leakage and no | Charge: 40mA(0.1C) charge 28 days<br>Storage: 1 hour<br>Discharge: 80mA(0.2C) to 1.0V/cell   |                            |



**SPECIFICATIONS**  
**Sealed Rechargeable Nickel Cadmium**  
**NI-CD 2/3AA 400mAh**

|   |       |                                      |  |              |
|---|-------|--------------------------------------|--|--------------|
|   |       | explosion)                           |  |              |
| <b>10. Life Time<br/>(Based on IEC)</b> | Cycle | ≈500                                 | IEC285 (1993) 4.4.1  | (see Note 3) |
| <b>11. Over-discharge</b>               |       | No distortion                        | Within 1hour after standard Charge, Discharge 24h with 1W/cell load.   |              |
| <b>12. Humidity</b>                     |       | No leakage                           | The charged battery is stored for 10 days at 33±3°C and 80±5% of relative humidity.  |              |
| <b>13. Safety Valve Operation</b>       |       | No explode or disrupt                | Forced discharge is conducted for 1hour at a constant current of 400mA(1C) after pre-discharge at a constant current of 80mA(0.2C) up to 0V.               | (see note 4) |
| <b>14. Drop Test</b>                    |       | Mechanically and electrically normal | The battery is subjected to a drop, which has a height of 45cm(17.7 inches)to an oak board of 10mm or more thick in a voluntary axis respectively 3 times. |              |

**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. 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.

**8. Notes:**

- (1) Approximate charge time from discharged state, for reference only.
- (2) We recommend cells or batteries are charged at least once every 6 months.
- (3) IEC285(1993)4.4.1 Cycle Life:

| Cycle No. | Charge         | Storage | Discharge      |
|-----------|----------------|---------|----------------|
| 1         | 0.1C ~16h      | None    | 0.25C ~2h20min |
| 2-48      | 0.25C ~3h10min | None    | 0.25C ~2h20min |



EVERGREEN (C.P.) USA INC.

TEL: (650) 952-8091 FAX: (650) 952-3629 E-MAIL: sales@evergreencpusa.com

**SPECIFICATIONS**  
**Sealed Rechargeable Nickel Cadmium**  
**NI-CD 2/3AA 400mAh**

|   |                |      |                    |
|---|----------------|------|--------------------|
| 49  | 0.25C ~3h10min | None | 0.25C to 1.0V/cell |
| 50  | 0.1C ~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 3h. |                |      |                    |

(4) Electrolyte leakage and deformation of battery are acceptable.