



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 700mAh 'AA'

#### 1. SCOPE

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

Model: NCAA700

Cell Size: AA (  $\phi$  :14.1<sup>±0.2</sup>mm, H: 48.0<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	700	Standard Charge/Discharge
Standard Charge Rate	mA		70(0.1C)	
	Hour		14~16	
Rapid Charge Rate	mA		700(1C)	Voltage Cut Off- $\Delta V=10-15mV$ Temp.Cut Off =50 <sup>0</sup> C
	Hour		1.25approx (see Note 1)	
Trickle Current		mA	(0.05C)~(0.1C)	
Standard discharge		mA	140(0.2C)	
Discharge Cut-off Voltage		V/Cell	1.0	Battery pack : (n × 1.0)V (n=1~6) [(n-1) × 1.2]V (n=7~10) (n: cell number)
Operating Temperature Range	Standard Charge	<sup>0</sup> C	0~+45	Humidity: +65% ± 20%
	Rapid Charge	<sup>0</sup> C	10~+40	
	Discharge	<sup>0</sup> C	-20~+60	
Storage Temperature Range	Within 2 years	<sup>0</sup> C	-20~+35 (see Note 2)	Humidity: +65% ± 20%
	Within 6 months	<sup>0</sup> C	-20~+40	
	Within 1 month	<sup>0</sup> C	-20~+50	
	Within 1 week	<sup>0</sup> C	-20~+55	
Dimension	Diameter	mm	14.1 <sup>±0.2</sup>	
	Height	mm	48.0 <sup>±0.5</sup>	
Typical Weight		Gram	17approx	Single 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,  $T_1$ :  $20 \pm 5^{\circ}\text{C}$

Relative Humidity:  $65 \pm 20\%$

Notes: Standard Charge/Discharge Conditions:

Charge:  $70\text{mA}(0.1\text{C}) \times 15$  hours

Discharge:  $140\text{mA}(0.2\text{C})$  to  $1.0\text{V}/\text{Cell}$

Test Item	Unit	Specification	Test Conditions	Remarks
1. Capacity	mAh	$\geq 700$	Standard Charge/Discharge	Up to 3 cycles are allowed
2. Open Circuit Voltage (O.C.V)	V/Cell	$\geq 1.30$	Within 1 hour after standard Charge	
3. Closed Circuit Voltage (C.C.V)	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 1 sec.	
4. Internal Impedance	$\text{m}\Omega / \text{Cell}$	$\leq 22$	Within 1 hour after standard Charge (1000Hz)	
5. High Rate Discharge (1C)	minute	$\geq 54$	Following Standard Charge, Stored for a period of 1hour, The Discharge duration by $700\text{mA}(1\text{C})$ to $1.0\text{V}/\text{cell}$	Up to 3 cycles are allowed
6. Low Temperature Discharge	hour	$\geq 3$	Standard Charge(0.1C): $14\sim 16\text{h}$ ( $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$ ) Storage: $16\sim 24\text{h}$ ( $-18^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ) Standard Discharge(0.2C): $1.0\text{V}/\text{cell}$ ( $-18^{\circ}\text{C} \pm 2^{\circ}\text{C}$ )	
7. Self Discharge	mAh	$\geq 525$ (75%)	Following Standard Charge, Stored on open circuit for a period of 28days, The Discharge duration by $140\text{mA}(0.2\text{C})$ to $1.0\text{V}/\text{cell}$	
8. Storage	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 $70\text{mA}(0.1\text{C})$ . The discharge duration by $140\text{mA}(0.2\text{C})$ to $1.0\text{V}/\text{cell}$	
9. Overcharge	hour	$\geq 5$ (No leakage and no	Charge: $70\text{mA}(0.1\text{C})$ charge 28 days Storage: 1 hour Discharge: $140\text{mA}(0.2\text{C})$ to $1.0\text{V}/\text{cell}$	



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		explosion)		
10. Life Time (Based on IEC)	Cycle	$\geq 500$	IEC285 (1993) 4.4.1	(see Note 3)
11. Over-discharge		No distortion	Within 1hour after standard Charge, Discharge 24h with 1 $\Omega$ /cell load.	
12. Humidity		No leakage	The charged battery is stored for 10 days at $33 \pm 3^{\circ}\text{C}$ and $80 \pm 5\%$ of relative humidity.	
13. Safety Valve Operation		No explode or disrupt	Forced discharge is conducted for 1hour at a constant current of 700mA(1C) after pre-discharge at a constant current of 140mA(0.2C) up to 0V.	(see note 4)
14. Drop Test		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	$0.1\text{C} \times 16\text{h}$	None	$0.25\text{C} \times 2\text{h}20\text{min}$



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2-48	0.25C × 3h10min	None	0.25C × 2h20min
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.