



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 1500mAh '2/3C'

1. SCOPE

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

Model: NC23C1500

Cell Size: 2/3C (Φ :25.2 \pm 0.3 mm H: 29.0 \pm 0.5 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 \times 3 = 3.6V

3. RATINGS

Description		Unit	Specification	Conditions
Nominal Voltage		V/Cell	1.2	Single cell or battery pack
Nominal Capacity		mAh	1500	Standard Charge/Discharge
Standard Charge Rate		mA	150 (0.1C)	
		Hour	14~16	
Rapid Charge Rate		mA	1500 (1C)	Voltage Cut Off- $\Delta V=10-15mV$ Temp. Cut Off= $50^{\circ}C$
		Hour	1.2 approx (See Note 1)	
Trickle Current		mA	(0.05C)~(0.1C)	
Standard discharge		mA	300(0.2C)	
Discharge Cut-off Voltage		V/Cell	1.0	Battery pack: ($n \times 1.0$)V ($n=1 \sim 6$) [($n-1$) \times 1.2]V ($n=7 \sim 10$) (n: cell number)
Operating Temperature Range	Standard Charge	$^{\circ}C$	0~+45	Humidity: +65% \pm 20%
	Rapid Charge	$^{\circ}C$	10~+40	
	Discharge	$^{\circ}C$	-20~+60	
Storage Temperature Range	Within 2 years	$^{\circ}C$	-20~+35 (See Note 2)	Humidity: +65% \pm 20%
	Within 6 months	$^{\circ}C$	-20~+40	
	Within 1 month	$^{\circ}C$	-20~+50	
	Within 1 week	$^{\circ}C$	-20~+55	
Dimension	Diameter	mm	25.2 \pm 0.3	
	Height	mm	29.0 \pm 0.5	



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Typical Weight	Gram	38approx	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: $150\text{mA}(0.1\text{C}) \times 15$ hours

Discharge: $300\text{mA}(0.2\text{C})$ to $1.0\text{V}/\text{Cell}$

Test Item	Unit	Specification	Test Conditions	Remarks
1. Capacity	mAh	≥ 1500	Standard Charge/Discharge	Up to 3 cycles are allowed
2. Open Circuit Voltage (O.C.V)	V/Cell	≥ 1.30	Within 1 hour after standard Charge	
3. Closed Circuit Voltage (C.C.V)	V/Cell	≥ 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.	
4. Internal Impedance	m Ω /Cell	≤ 20	Within 1 hour after standard Charge (1000Hz)	.
5. High Rate Discharge (1C)	minute	≥ 54	Following Standard Charge, Stored for a period of 1hour, The Discharge duration by $1500\text{mA}(1\text{C})$ to $1.0\text{V}/\text{cell}$	Up to 3 cycles are allowed
6. Low Temperature Discharge	hour	≥ 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	$\geq 1125(75\%)$	Following Standard Charge, Stored on open circuit for a period of 28days, The Discharge duration by $300\text{mA}(0.2\text{C})$ to $1.0\text{V}/\text{cell}$	
8. Storage	hour	≥ 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 $150\text{mA}(0.1\text{C})$. The discharge duration by $300\text{mA}(0.2\text{C})$ to $1.0\text{V}/\text{cell}$	
9. Overcharge	hour	≥ 5 (No leakage and	Charge: $150\text{mA}(0.1\text{C})$ charge 48h Storage: 1 hour	



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		no explosion)	Discharge: 300mA(0.2C) to 1.0V/cell	
10. Life Time (Based on IEC)	Cycle	≥ 500	IEC61951-1(2003)7.4.1.1	(See Note 3)
11. Over-discharge		No distortion	Within 1hour after standard Charge, Discharge 24h with 1 Ω /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 1500mA(1C) after pre-discharge at a constant current of 300mA(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) IEC61951-1(2003)7.4.1.1 Cycle Life:

Cycle No.	Charge	Storage	Discharge
1	0.1C \times 16h	None	0.25C \times 2h20min



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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 3h.			

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



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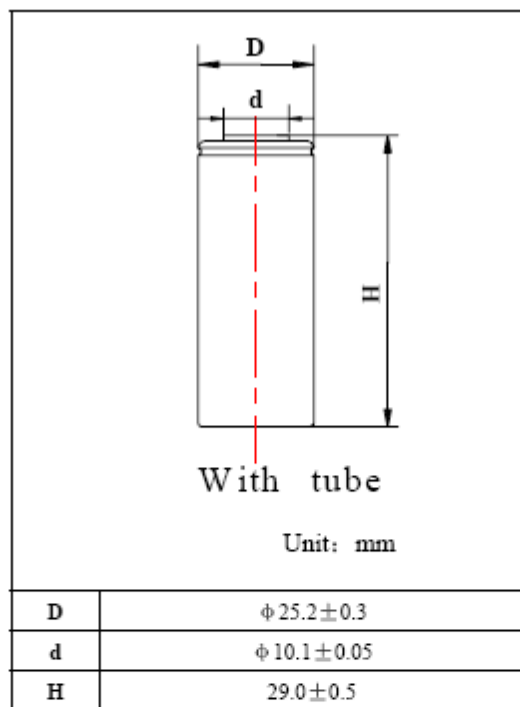
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Ni-Cd 2/3C1500mAh



Nominal voltage		1.2V		
Nominal Capacity (mAh)		C/10	C/5	1C
		1510	1500	1350
Weight		38g		
Internal Impedance at 1000Hz (After Charge)		$\leq 20m\Omega$		
Charge current	Standard	150mA		
	Rapid	1500mA		
Charge time	Standard	14~16Hrs		
	Rapid	1.2Hrs		
Ambient Temperature	Charge	Standard	0~+45°C	
		Rapid	10~+40°C	
	Discharge		-20~+60°C	
	Storage		-20~+35°C	

