



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 1800mAh Sub C

1. SCOPE

The specifications govern the performance of the following Nickel-Cadmium Cylindrical cell and its battery pack.. (Refer to the attached figure 1)

Rated capacity: **1800mAh**

Designation: **NCTSC1800F (23/43) (SC)** ($D: 23.0^{+0}_{-1.0}$ mm $H: 43.0^{+0}_{-1.5}$ mm)

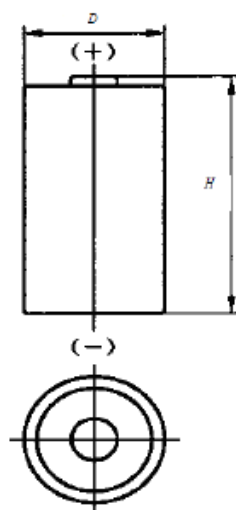


Figure 1- Jacketed cylindrical cells

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

Table 1 - Ratings of the cells

Description	Unit	Specification	Conditions
Nominal Voltage	V/Cell	1.2	Single cell
Rated Capacity	mAh	1800	Standard Charge/Discharge

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: $65 \pm 20\%$

Standard Charge/Discharge Conditions:

Preparative: Prior to charging, the cell shall be discharged by **360mA**($0.2I_c$) to 1.0V



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 1800mAh Sub C

Charge: 180mA(0.1I_A)×16hours

Stand in charged condition:1~4h

Discharge: 360mA(0.2I_A) to 1.0V/Cell I

Table 2 – Performance and test methods

Test Item		Unit	Specification	Test Conditions	Remarks
Discharge performance	20℃ ^a	h	≥5	Standard Charge/Discharge	/
		min	≥48	After Standard Charge, stored for 1~4h, then discharged by 1800mA (1.0I _A) to 0.9V.	/
	-18℃	h	≥2	After Standard Charge, stored for 16~24h in -18±2℃, then discharged by 360mA (0.2I _A) to 1.0V in -18±2℃.	/
Charge (capacity) retention		h/min	≥3h15min	After Standard Charge, stored on open circuit for a period of 28days, then discharged by 360mA (0.2I _A) to 1.0V.	/
Endurance in cycles		cycle	≥50	Appendix-table 3	/
Permanent charge endurance		A:≥3h45min B:≥42min 2 nd		Appendix-table 4	/
		A:≥3h45min B:≥42min 3 rd			
		A:≥2h30min B:≥24min 8 th			
		A:≥2h30min B:≥24min 9 th			
Over charge	Discharge A	h/min	≥4h15min	Appendix-table 5	/
	Discharge B	min	≥36		
Safety device operation		Not disrupt or burst		Undergo a forced discharge at constant current 360mA(0.2I _A) to 0V. Then discharged by 1800mA (1.0I _A) for 60min.	/
Storage ^b		hour	≥5	Stored on open circuit for 12 months. Then standard charge/discharge.	/
Charge acceptance		/	/	IEC 61951-1 2003 7.9	Reference
Internal resistance		mΩ	≤15	Within 1~4h after standard Charge (1000Hz)	Battery pack
Weight		g	46.0(approx)	/	Reference
Vibration		No leakage, no fire, no explosion		IEC 62133 2002 4.2.2	/
Free fall		No fire, no explosion		IEC 62133 2002 4.3.3	/

a) Five cycles is permitted b) Unless otherwise stated, the cell shall be discharged by 360mA(0.2I_A) to 1.0V before test.

Notice: Test conditions is drawn according to IEC 61951-1 2003; Please refer to the related description of the standard.

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.



SPECIFICATIONS
Sealed Rechargeable Nickel Cadmium
Ni-CD 1800mAh Sub C

-
- (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) Prevent short circuit, do not incinerate or disassemble the cell/battery.
 - (5) Do not solder directly to the cell/battery for a long time .
 - (6) The life expectancy may be reduced if the cell/battery is subjected adverse conditions like: extreme temperature, deep cycling, excessive overcharge/ over-discharge.
 - (7) Store the cell/battery in a cool and dry place. Always discharge batteries before assemble or solder.
 - (8) Always discharge batteries before bulk storage or shipment.
 - (9) Do not mix batteries of different types and capacities.

Appendix

A) Endurance in cycles

Prior to the endurance on cycle test ,the cell shall be discharged at 360mA(0.2I_tA) to 1.0V. The following test shall be carried out in accordance with the conditions specified in Table 3.

Table 3 Endurance in cycles

Cycle number	Charge	Stand in charged condition	Discharge
1	0.1I _t A for 16h	none	0.25I _t A for 2h20min
2~48	0.25I _t A for 3h10min	none	0.25I _t A for 2h20min
49	0.25I _t A for 3h10min	none	0.25I _t A to 1.0V
50	0.1I _t A for 16h	1h~4h	0.20I _t A to 1.0V ^a
a) Cycles 1 to 50 shall be repeated until the discharge duration on any 50th Cycle becomes less than 3h or the cell voltage drops below 1.0V during 1~48 th cycle.			

B) Permanent charge endurance

The permanent charge endurance test shall be performed in three steps according to the conditions specified in table 4.

It consists of:

- A charge acceptance test at +40°C;
- An ageing period of six months at +70°C;
- A final charge acceptance test to check the cell's performance after aging.

Note: The six months' aging period and the temperature of +70°C have been selected to simulate four years of permanent charge operation at +40°C.



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 1800mAh Sub C

Table 4 Permanent charge endurance

Cycle number	Ambient temperature	Charge	Discharge A or B ^a	Minimum discharge duration
1	40°C±2°C	0.05I _t A for 48h	A: 0.2I _t A to 1.0V or B: 1.0I _t A to 1.0V	No requirement
2		0.05I _t A for 24h	A: 0.2I _t A to 1.0V or B: 1.0I _t A to 1.0V	3h45min 42min
3		0.05I _t Afor 24h	A: 0.2I _t A to 1.0V or B: 1.0I _t A to 1.0V	3h45min 42min
4	70°C±2°C	0.05I _t A for 60d	A: 0.2I _t A to 1.0V or B: 1.0I _t A to 1.0V	No requirement
5		0.05I _t A for 60d	A: 0.2I _t A to 1.0V or B: 1.0I _t A to 1.0V	
6		0.05I _t A for 60d	A: 0.2I _t A to 1.0V or B: 1.0I _t A to 1.0V	
7	40°C±2°C	0.05I _t A for 48h	A: 0.2I _t A to 1.0V or B: 1.0I _t A to 1.0V	No requirement
8		0.05I _t A for 24h	A: 0.2I _t A to 1.0V or B: 1.0I _t A to 1.0V	2h30min 24min
9		0.05I _t A for 24h	A: 0.2I _t A to 1.0V or B: 1.0I _t A to 1.0V	2h30min 24min
a) A: for LT、MT、HT cells; B: for MT、HT cells only.				

C) Over charge

The ability of the cell to withstand an overcharge shall be determined by the following test at 0°C±2°C in circulating air.

The test shall be carried out according to the specified in table 5.

Table 5 Overcharge at 0°C

Charge	Discharge A ^a	Discharge B ^a
	LT, MT, HT cells	MT, HT cells
0.05 I _t A for 28d	0.2I _t A to 1.0V	1.0I _t A to 1.0V
a) The discharge is carried out immediately on the charging		



EVERGREEN (C.P.) USA INC.

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

SPECIFICATIONS

Sealed Rechargeable Nickel Cadmium

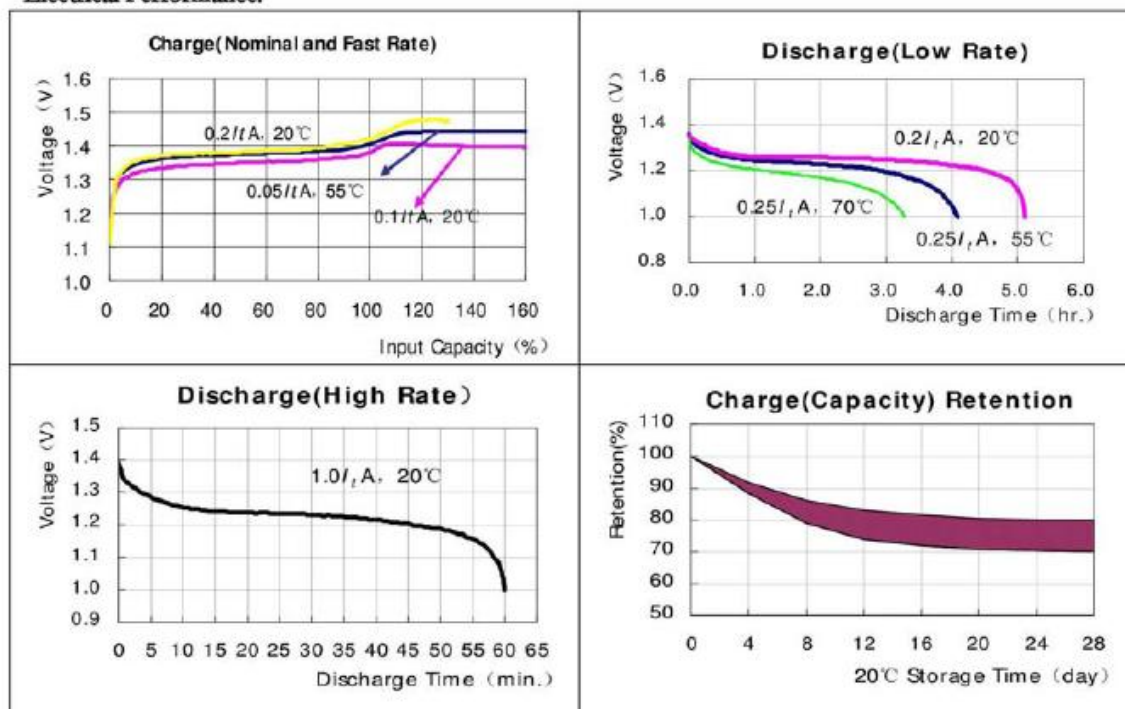
Ni-CD 1800mAh Sub C

Base Data:

D	23.0 ⁰ _{-0.16} mm
H	43.0 ⁰ _{-0.3} mm
I	/
I	/

Nominal voltage		1.2V
Capacity comparison(mAh)	0.2I _A	1800
	1.0I _A	1440
Weight(g)		46
Internal Impedance at 1000Hz (After Charge;mΩ)		≤ 15
Charge current	Trickle	90mA
	Standard	180mA
	Rapid	360mA
Charge time	Trickle	48h
	Standard	16h
	Rapid	6.5h
Temperature Ambient	charge	0~+70℃
	Discharge	-20~+70℃
	Storage	-30~+70℃
Max. Test Temperature		70℃

Electrical Performance:



NOTICE: Manufacturer reserves the right to alter or amend the design, model and specification without prior to notice.

The information (subject to change without prior to notice) contained in this document is for reference only and should not be used as a criterion for product guarantee or warranty.