



Specification Approval Sheet

Name: **Tenergy NiCD AA Size (Button Top)**

Model: **20104**

SPECS: **1.2 V 1000mAh**

Approved By	Checkup	Make

Customer Confirmation	Signature	Date
	Company Name :	
	Stamp :	

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1、 APPLICATION

This specification governs the performance of the following Nickel-Cadmium Cylindrical stack-up battery.

Model: 20104

Cell Size : High AA ($\Phi 14.5^{+0}_{-0.7} \times 50.5^{+0}_{-1.3}$)

2、 DATA OF STACK UP BATTERIES

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

Example:

Stack-up battery consisting three unit cells

Nominal voltage of unit cell=1.2V

Nominal voltage of stack-up batteries=1.2V×3=3.6V

3、 RATINGS

Description	Unit	Specification	Conditions
Nominal Voltage	V/ Cell	1.2	Unit cell
Capacity	mAh	1000	Nominal Capacity
		850	Minimum Capacity
Standard Charge	mA	80	Ambient Temperature: $T_a = 20 \pm 5^\circ\text{C}$ (see Note 1)
	Hour	16	
Quick Charge	mA	320	Ambient Temperature: $T_a = 10 \sim 40^\circ\text{C}$ $-\Delta V = 10\text{mV}$
	hour	3.5	
Fast Charge	mA	800	
	hour	1.2 (see Note 2)	
Trickle Charge	mA	(0.03C)~(0.05C)	$T_a = 0 \sim 45^\circ\text{C}$
Standard discharge	mA	160	Ambient Temperature: $T_a = 20 \pm 5^\circ\text{C}$ Humidity: $50 \pm 15\%$
Discharge Cut-off Voltage	V/ Cell	1.0	
Storage Temperature	$^\circ\text{C}$	-20~25 $^\circ\text{C}$ /Within 1year	Discharged state、 Humidity、 Max.60% (see Note 3)
		-20~35 $^\circ\text{C}$ /Within 6 months	Discharged state、 Humidity、 Max.85% (see Note 3)
		-20~45 $^\circ\text{C}$ /Within 3 months	



Typical Weight	Gram	Approx.19	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 T_a : $20 \pm 5^\circ\text{C}$

Relative Humidity: $50 \pm 15\%$

Test	Unit	Specification	Other Condition	Remarks
Capacity	mAh	≥ 850	Standard Charge Discharge	up to 3 cycles are allowed
Open Circuit Voltage(OCV)	V/Cell	≥ 1.25	Within 2 weeks after standard Charge	
Internal Impedance	m Ω / Cell	≤ 35	Upon fully charge(1KHz)	up to 3 cycles are allowed
High Rate Discharge(1C)	minute	≥ 54	Quick Charge, 0.5hour rest Before Discharge by 1C to 1.0 V	up to 3 cycles are allowed
Overcharge		No leakage nor deformation	0.1C Charge 28 days	
Charge Retention	mAh	≥ 520 (65%)	Standard Charge, Storage: 28 days, Standard Discharge	
IEC Cycle Life	Cycle	≥ 500	IEC61951-1(2003)7.4.1.1	(see Note 4)
Leakage Test		No leakage nor deformation	Fully charged at 1C for 1.2 hour 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 Vibration 3000 CPM Any direction for 60mins.	Ambient Temperature $T_a = 20 \pm 5^\circ\text{C}$
Impact Resistance		Change of voltage should be under 0.02V/ Cell Change of impedance should be under 5 mΩ	Charge the cell 0.1C 14hrs Then leave for 1~4hrs, check bat-before/after dropped, Height 50cm Wooden board (thickness 30 mm) Direction not specified, 3 times.	Ambient Temperature: $T_a = 20 \pm 5^\circ\text{C}$
Security Test		No break nor blast , but allow Leakage or deformation	Discharge the cell 0.2C to 0V, then advance current to 1C 。 Discharge the cell 1C 30 minutes	Ambient Temperature: $T_a = 20 \pm 5^\circ\text{C}$

4、 CONFIGURATION, DIMENSIONS AND PACKINGS

Please refer to the attached drawing.

5、 EXTERNAL APPEARANCE

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

6、 CAUTION

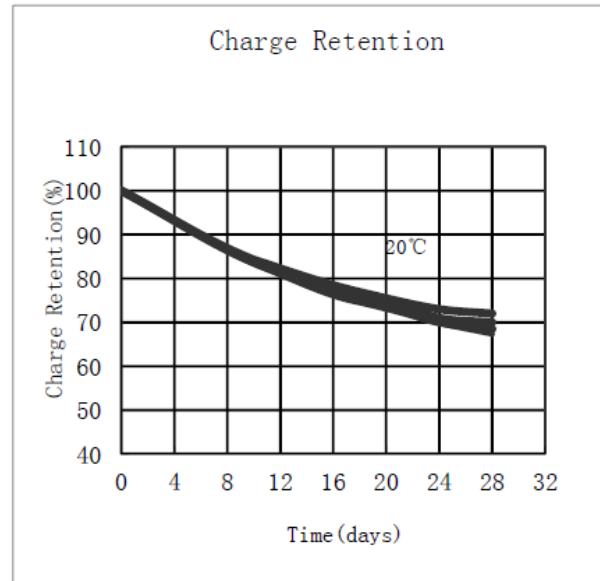
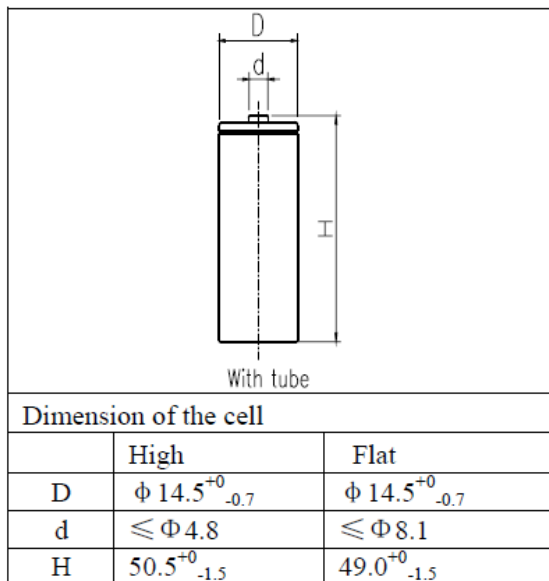
- (1) Reverse charging is not acceptable.
- (2) Charge before use. The cells/batteries are delivered in an uncharged state.
- (3) Do not charge/discharge with more than our specified current.
- (4) Do not short circuit the cell/battery Permanent damage to the cell/battery may result.
- (5) Do not incinerate 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.

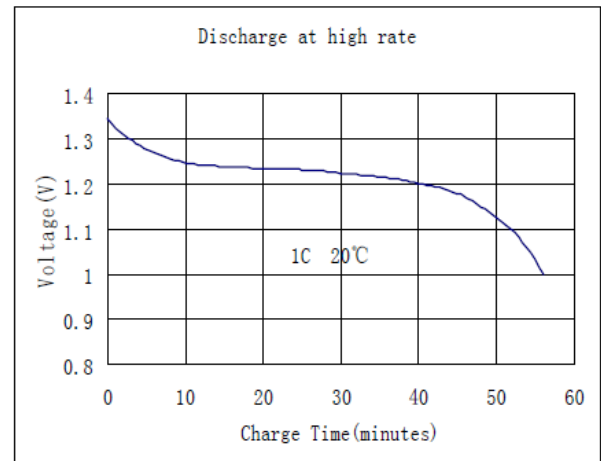
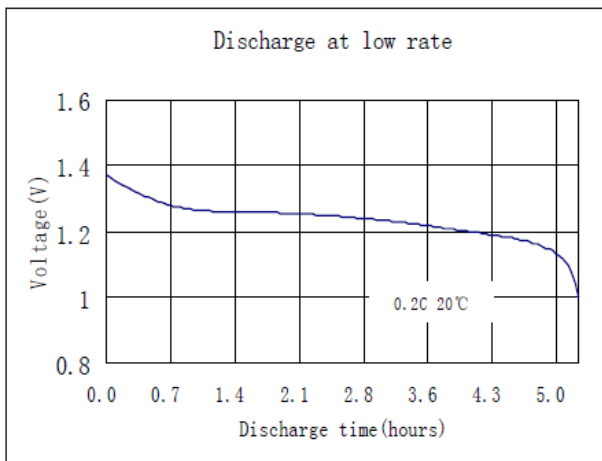
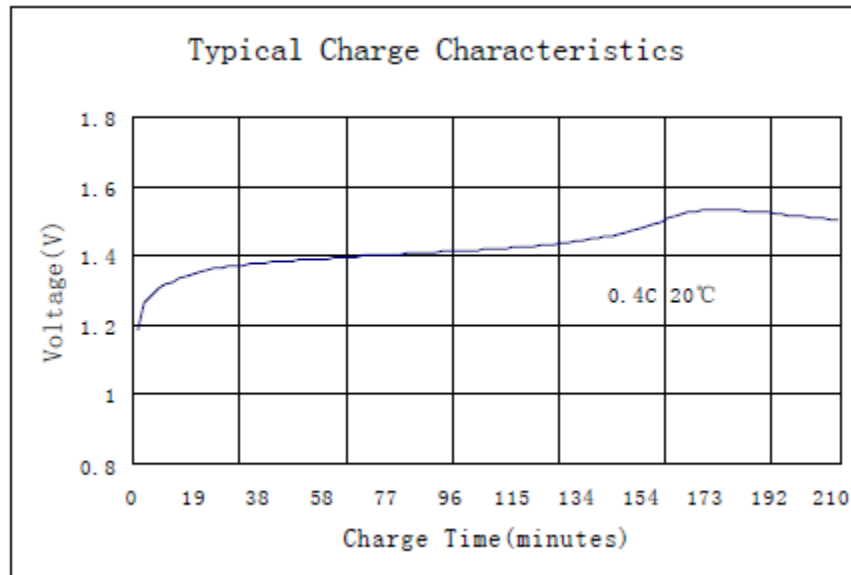
7、Notes:

- (1) T_a : Ambient Temperature.
- (2) Approximate charge time from discharged state is for reference only.
- (3) We recommend cells or batteries are charged and discharged at least once every 6 months.

(4) IEC61951-1(2003)7.4.1.1 Cycle Life:

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





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