

**1 、 SCOPE**

This specification governs the performance of the following ORN Nickel-Cadmium cylindrical cell and its stack-up battery.

ORN Model : AA1000

Cell Size: AAcrew cut(13.9±0.1×48.0±0.5)mm

AAcusp(13.9±0.1×49.5±0.5)mm

**2 、 DATA OF STACK UP BATTERIES**

All data involve voltage and weight of stack-up batteries are equal to the value of unit cell multiplied by the number of unit cell which consisted in the stack-up batteries.

Example : Stack-up batteries 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	Condition
Nominal Voltage	V/cell	1.2	Unit cell or stack-up batteries
Nominal Capacity	mAh	1000	Standard Charge/Discharge
Standard Charge	mA	100 (0.1C)	T <sub>1</sub> =20±5°C (See Note 1)
	hour	14~16	
Fast Charge	mA	1000 (1C)	- ΔV=0~15mV/cell , Timer Cutoff=120%nominal capacity , Temp.Cutoff=55°C , dT/dt=0.8°C/min, T <sub>1</sub> =20±5°C
	hour	1.2 approx (See Note 2)	
Trickle Charge	mA	(0.03C)~(0.05C)	T <sub>1</sub> =20±5°C
Standard discharge	mA	200 (0.2C)	T <sub>1</sub> = 20±5°C Humidity: Max85%
Discharge Cut-off Voltage	V/cell	1.0	
Storage Temperature	°C	-20~30(Within 1 year)*	Discharged state Humidity: Max85%
		-20~40(Within 6 months)	
		-20~50(Within 1 month)	
		-20~60(Within 1 week)	
Typical Weight	Gram	21	unit cell

\*To keep the best performance for those not used for a long time,we recommend to charge and discharge the cells/batteries at least once in every 6 months.

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**4、 PERFORMANCE**

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

Ambient Temperature : 20±5℃

Relative Humidity : 65±20%

Notes: Standard Charge/Discharge conditions:

Charge: 100 mA(0.1C)× 14 hours

Discharge: 200 mA(0.2C) to 1.0V/cell

Test	Unit	Specification	Condition	Remarks
Capacity	mAh	≥ 1000	Standard Charge / discharge	up to 3 cycles are allowed
Open Circuit Voltage(OCV)	V	≥ 1.25	Within 1 hour after standard charge	
Internal Impedance	mΩ	≤ 25	Upon fully charged(1KHz)	
High Rate Discharge(1C)	min	≥ 51	Standard Charge, 1 hour rest before discharge by 1C to 1.0V/cell	up to 3 cycles are allowed
Charge Retention	mAh	≥ 650 (65%)	Standard Charge,Storage: 28 days,Standard Discharge	T <sub>1</sub> =20±5℃
IEC Cycle Life	Cycle	≥500	IEC61951-1(2003)7.4.1.1	see Note 3
Leakage		No leakage nor deformation	Fully charged at 100 mA for 28 days	
Vibration Resistance		Change of voltage should be less than 0.02V/cell,change of impedance should be less than 5milliohm/cell	Charge the battery at 0.1C for 14hrs,then leave for 24hrs,check battery before/after vibration,amplitude 1.5mm,vibration 3000 CPM,any direction for 60mins.	
Impact Resistance		Change of voltage should be less than 0.02V/cell,change of impedance should be less than 5milliohm/cell	Charge the battery at 0.1C for 14hrs,then leave for 24hrs,check battery before/after dropped,height 50 cm wooden board(thickness 30mm)direction not specified,3 times.	

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**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 or deformation.

**7、 WARRANTY**

One year limited warranty against workmanship and material defects.

**8、 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 cells/batteries may result.

[5]Do not incinerate or mutilate the cells/batteries.

[6]Do not solder directly to the cells/batteries.

[7]The expected life may be reduced if the cells/batteries are subjected to adverse conditions as:  
extreme temperature, deep cycling, excessive overcharge/ over-discharge.

[8]Store the cells/batteries in a cool dry place. Always discharge batteries before packing.

**Notes:**

(1)  $T_1$ : Ambient Temperature.

(2) Approximate charge time from discharged state, for reference only.

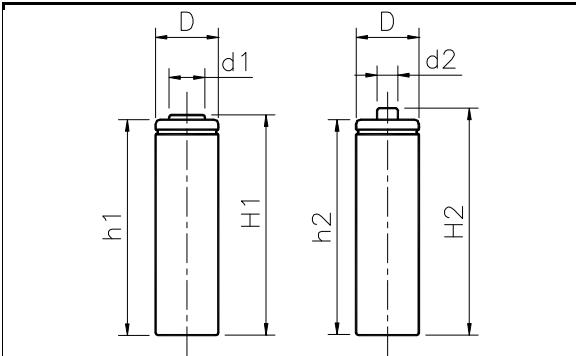
Cycle No.	Charge	Rest	Discharge
1	0.1C×16h	None	0.25C×2h20min
2-48	0.25C×3h10min	None	0.25C×2h20min
49	0.25C×3h10min	None	0.25C to 1.0V/cell
50	0.1C×16h	1-4h	0.2C to 1.0V/cell

Cycle 1 to 50 shall be repeated until the discharge duration on any 50th cycle becomes less than 3 h.

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**MODEL No:** ORN-AA1000

**Description:** 1000 mAh SIZE NI-Cd AA

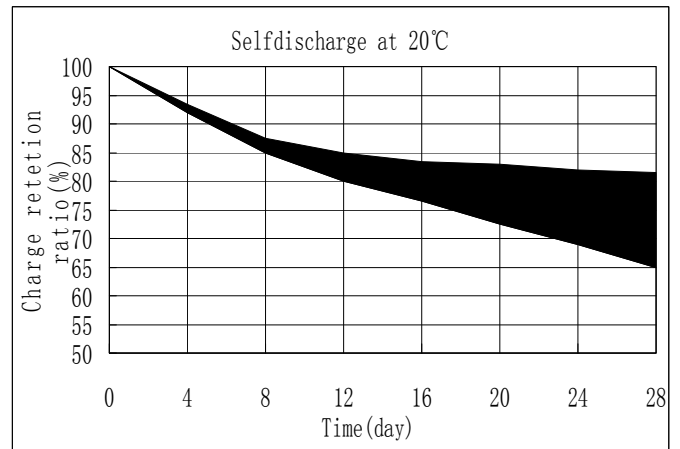
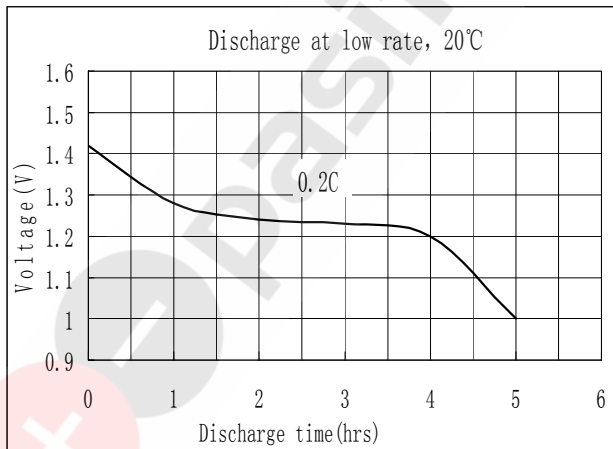
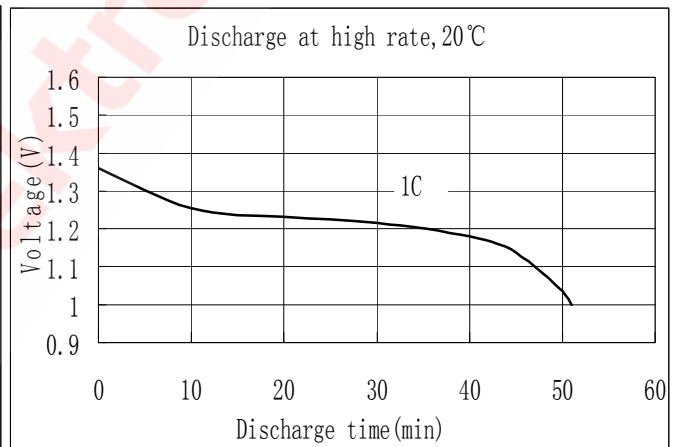
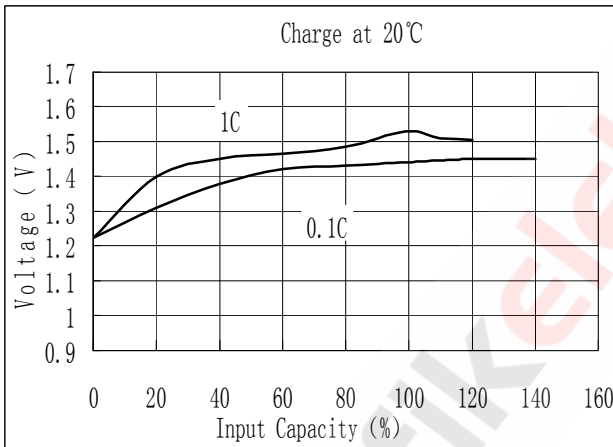


Dimensions(without Tube) (mm)

D	13.90±0.10		
d <sub>1</sub>	8.10±0.08	d <sub>2</sub>	4.75±0.08
H <sub>1</sub>	48.00±0.50	H <sub>2</sub>	49.50±0.50
h <sub>1</sub>	47.50±0.50	h <sub>2</sub>	47.50±0.50

**Specification**

Nominal Capacity		1000 mAh
Nominal Voltage		1.2 V
Charge current	Standard	100 mA
	Fast	1000 mA
Charge time	Standard	14~16 Hrs
	Fast	1.2 Hrs
Ambient Temperature	Charge	Standard 0°C~45°C
		Fast 10°C~45°C
	Discharge	-30°C~60°C
	Storage	-20°C~60°C
Internal Impedance(mΩ) (After Charge)		≤ 25
Weight		21 g



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