SPECIFICATIONS
Sealed Rechargeable Nickel Cadmium
Ni-CD 4000mAh D

1. SCOPE:

The specifications govern the performance of the following Nickel-Cadmium cylindrical cell and its stack-up battery.

Rated capacity: 4000mAh
Designation: NCD4000 (32/61)（D）
Cell Size: D cusp (32.1±0.2×61±0.5) mm, D crew cut (32.1±0.2×59.2±0.5) mm

2. DATA OF STACK-UP BATTERY:

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

3. PERFORMANCE

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

Ambient Temperature：T：20±5℃　　Relative Humidity：65±20%

Test Item	Test Conditions	Requirements
(1) Standard Charge	Charge is conducted continuously for 16 hours at the constant current of 400mA (0.1C) after pre-discharge at the constant current of 800mA（0.2C）up to a cut-off voltage of 1.0V/cell	
(2) Open-circuit Voltage	Voltage between terminals of the charged battery specified in item (1) is measured after rest for 1 hour	≥1.25V
(3) Capacity（0.2C）	Capacity of the charged battery specified in item (1) is measured at 800mA (0.2C) up to a cut-off voltage of 1.0V after rest for 15 minutes. If the discharge time doesn't reach the specified value, the test may be carried out further twice, up to three times in total.	≥4000mAh
(4) High-rate discharge (1500mA)	Discharge time of the charged battery specified in item (1) is measured at 1500mA up to a cut-off voltage of 1.0V after lest for 15 minutes. If the discharge time doesn't reach the specified value, the test may be carried out further twice, up to three times in total.	≥144minutes
(5) Fast charge （1200mA）	Charge: 1200mA ×4 hours (charging Cut off =-△V=5~10mV/cell or Temp.Cut off=50°C)	
(6) Trickle charge current	132mA (0.033C) ~ 200mA (0.05C)	

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<table>
<tr><td>(7) Charge retention</td><td colspan="4">Capacity of the charged battery specified in item (1) is measured at 800mA(0.2C) up to a cut-off voltage of 1.0V after rest for 28 days at 20°C.</td><td>≥70%</td></tr>
<tr><td rowspan="6">(8) IEC Cycle life
（IEC61951-1
（2003）7.4.1.1）</td><td>Cycle No</td><td>Charge</td><td>Rest</td><td>Discharge</td><td rowspan="6">≥500</td></tr>
<tr><td>1</td><td>0.1C×16h</td><td>None</td><td>0.25C×140min</td></tr>
<tr><td>2-48</td><td>0.25C×190min</td><td>None</td><td>0.25C×140min</td></tr>
<tr><td>49</td><td>0.25C×190min</td><td>None</td><td>0.25C to 1.0v</td></tr>
<tr><td>50</td><td>0.1C×16h</td><td>1-4h</td><td>0.2C to 1.0v</td></tr>
<tr><td colspan="4">Cycles 1 to so shall be repeated until the discharge duration on any 50th cycle becomes less than 3h</td></tr>
<tr><td>(9) Accelerated cycle life</td><td colspan="4">Charge: 1200mA ×4 hours (charging Cut off =-△V=5~10mV/cell or Temp.Cut off=50°C) ;Discharge: 1500mA to 1.0V/cell,end-of:70% nominal capacity .</td><td>≥400</td></tr>
<tr><td>(10)Safety valve operation</td><td colspan="4">Forced discharge is conducted for 60 minutes at a constant current of 4000mA (1C) after pre-discharge at a constant current of 800mA (0.2C) up to 0V</td><td>Leakage, No explode or disrupt</td></tr>
<tr><td>(11)Leakage</td><td colspan="4">Fully charged at 1200mA for 4.0 hour stand for 14 days</td><td>No leakage nor deformation</td></tr>
<tr><td>(12) Vibration Resistance</td><td colspan="4">Charge the battery 0.1C 16hrs, then leave for 24hrs, check Battery before/after vibration,
Amplitude 1.5mm
Vibration 4500 CPM
Any direction for 60mins.</td><td>Change of voltage should be under 0.02V/cell, change of impedance should be under 5 milli-ohm/cell</td></tr>
<tr><td>(13) Impact Resistance</td><td colspan="4">Charge the battery 0.1C 16hrs
Then leave for 24hrs, check bat-before/after dropped,
Height 50cm
Wooden board (thickness 30mm)
Direction not specified, 3 times.</td><td>Change of voltage should be under 0.02V/cell
Change of impedance should be under 5 milli-ohm/cell</td></tr>
</table>

4. EXTERNAL APPEARANCE

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

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5. 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.

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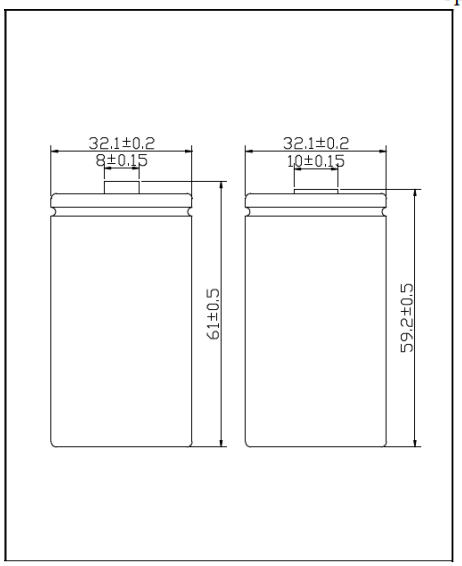
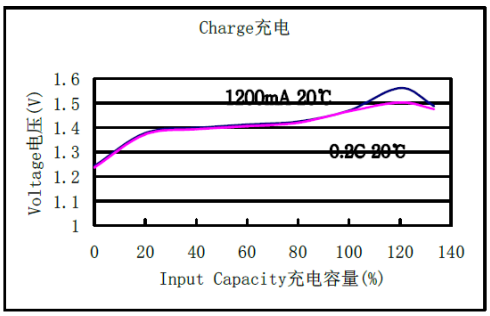
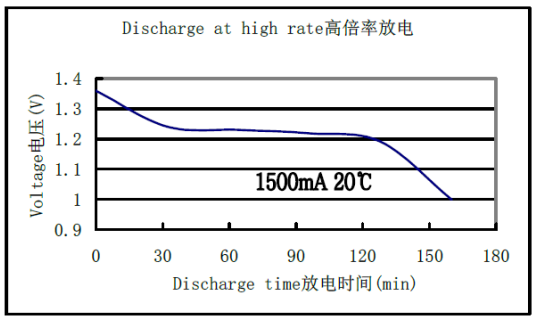
MODEL No: NCD4000 **Description:** 4000mAh D SIZE NI-Cd

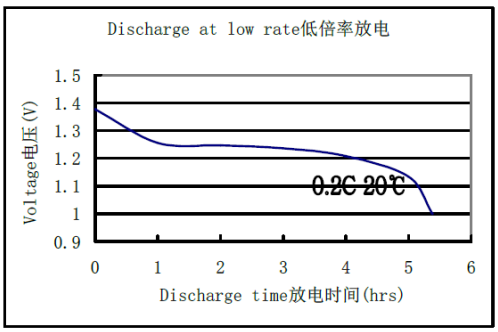


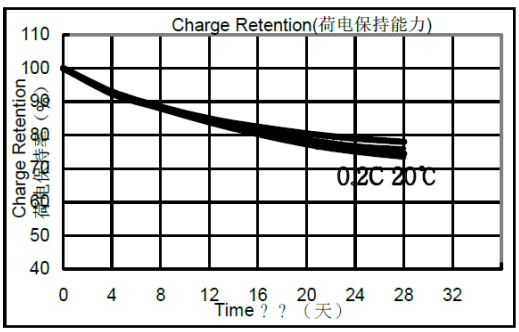
Specification

Nominal Capacity		4000 mAh
Nominal Voltage		1.2 V
Charge current	Standard	400mA
	Quick	800mA
	Fast	1200mA
Charge time	Standard	14~16 Hrs
	Quick	6.0 Hrs
	Fast	4Hrs
Ambient Temperature	Charge Standard	0℃~35℃
	Charge Quick	10℃~35℃
	Charge Fast	10℃~35℃
	Discharge	-30℃~60℃
	Storage	-30℃~35℃
Internal Impedance (mΩ) (Upon fully charge)		Max≤18.8
Weight		115g









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