



XELLEX BATTERY (HK) LIMITED

XELLEX BATTERY & POWER SUPPLY TECH. CO., LTD.

MH AA2000 mAh *1 (L)

TECHNICAL SPECIFICATIONS

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The Technical Specifications hereinafter is only applicable to the Ni-Mh MH AA2000L *1 type battery, which was provided by Xellex Battery Co., Ltd. All the practical technical data, which were used to describe Battery Performance involved in the Specifications are obtained from the relevant experiments to the products of Xellex. Rights reserved to take relevant rectifications or modifications to the structure and performance of the products without prior notice.

1. Scope

This specification governs the performance of following Xellex Nickel Metal Hydride cylinder cell and its stack-up battery pack:

Model: XELLEX-MH AA2000mAh*1 (L)

Size: AA

The data involving nominal voltage and approximate weight of a battery pack shall be equal to the value of the unit cell multiplied by the number of unit cell in the battery pack. Examples, for a battery pack which consisting of three cells:

Nominal voltage of unit cell=1.2V

So, nominal voltage of the battery pack=1.2V×3=3.6V

2. Dimensions

Diameter: 14.1±0.2mm

Height: 50.5±0.5mm

3. Nominal Voltage: 1.2V

4. Typical Weight(unit cell): 29.0g

5. Nominal Capacity: 2000mAh (Standard Charge & Discharge)

6. Ratings

	Unit	Specifications	Conditions
Typical Capacity	mAh	2020	Standard Charge & Discharge
Standard Charge	mA	400(0.2C)	T=0 ~ 50
	Hour	7	
Fast Charge	mA	1000(0.5C)	-ΔV=5 ~ 15mV/cell Time Cutoff=120% Input capacity Temp Cutoff=55 T=10 ~ 50
	Hour	2.4 Approx.	
Trickle Charge	mA	60 (0.03c) ~ 100 (0.05c)	T=0 ~ 45
Discharge Cut-off Voltage	V/Cell	1.0	Unit Cell
Maximum Discharge Current	mA	4000(2C)	T=20 ~ 50
Storage Temperature		-20 ~ 35	Discharging State, Open Circuit

7. Performance and Test Methods

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

Ambient Temperature():20+5

Relative Humidity (%):65±20

Test Item	Test Conditions				Requirements																				
<p>(1) Standard Charge & Discharge</p> <p>(2) Open Circuit Voltage</p> <p>(3) Capacity</p> <p>(4)Capacity (High Rate Discharge)</p>	<p>Charge is conducted continuously for 7 hours at the constant current of 400mA ,then discharge at the constant of 400mA up to a cut-off voltage of 1.0V</p> <p>Voltage between terminals of the charged battery specified in item (1) is measured after rest for 1 hour.</p> <p>Discharge time of the charged battery specified in item (1) is measured at 400mA up to a cut-off voltage of 1.0V after rest for 30 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.</p> <p>Discharge time of the charged battery specified in item (1) is measured at 1000mA up to a cut-off voltage of 1.0V after rest for 30 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</p>				<p>≥1.2V</p> <p>≥300minutes</p> <p>≥144 minutes</p>																				
<p>Cycle Life</p>	<table border="1"> <thead> <tr> <th>Cycle No.</th> <th>Charge</th> <th>Rest</th> <th>Discharge</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>200mA×16h</td> <td>None</td> <td>450mA×140min</td> </tr> <tr> <td>2-48</td> <td>450mA×190min</td> <td>None</td> <td>450mA×140min</td> </tr> <tr> <td>49</td> <td>450mA×190min</td> <td>None</td> <td>450mA to 1.0V/cell</td> </tr> <tr> <td>50</td> <td>200mA×16h</td> <td>1-4h</td> <td>400mA to 1.0V/cell</td> </tr> </tbody> </table>	Cycle No.	Charge	Rest	Discharge	1	200mA×16h	None	450mA×140min	2-48	450mA×190min	None	450mA×140min	49	450mA×190min	None	450mA to 1.0V/cell	50	200mA×16h	1-4h	400mA to 1.0V/cell				<p>≥500 cycles</p> <p>Cycles 1 to 50 shall be repeated until the discharge duration on any 50th cycles becomes less than 3h.</p> <p>Note: refer to IEC 61951-1 (2003) 7.4.1.1</p>
Cycle No.	Charge	Rest	Discharge																						
1	200mA×16h	None	450mA×140min																						
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49	450mA×190min	None	450mA to 1.0V/cell																						
50	200mA×16h	1-4h	400mA to 1.0V/cell																						

Test Item	Test Conditions	Requirements
Potential	Discharge time of the charged battery specified in item (1) is measured at 400mA up to a cut-off voltage of 1.2V .	≥240 minutes
Internal Resistance	The battery is measured at 1000Hz with Fully Charged state.	≤28mΩ/cell
Overcharge	Charge is conducted continuously for 48 Hours at 200mA after the capacity test Specified in item(4).	No deformation and leakage
Overdischarge	Discharge is conducted with a 0.8Ω/cell Load for 24 hours.	No external deformation
Self-discharge	The charged battery specified in item(1) Is stored for 28 days at 20 ,then discharge at 130Ma up to a cut-off voltage of 1.0V .	≥220 minutes
Storage	The capacity test conducted as specified In item(3) after the battery discharged With 400mA and stored for 18 months under Standard condition.	≥300 minutes
Humidity	The charged battery is stored for 15 days At 33±3 and 80±5% of relative humidity.	No electrolyte leakage
Safety Characteristics	Forced discharge is conducted for 30 Minutes at a constant current of 2000mA followed by a discharge at a constant Current of 400mA up to 0V	No explosion *
External Short-circuit	The charged battery specified in item(1) Is short-circuited for 1 hour.	No explosion *
Drop Test	The battery is subjected to a drop, which has a height of 150cm (59inches) to an oak board of 10mm or more thick in a voluntary axis respectively 3 times.	No leakage , No short-circuit, Mechanically and electrically normal
NOTE:* Electrolyte leakage and deformation of battery are acceptable.		

8. General Characteristics and Charge Curve (Page 6)**9. Discharge Curve and Cycle Life** (Page 7)**10. Battery Dimensions** (Page 7)**11. Marking** : The following markings will be printed, stamped or impressed on the body
of the battery :

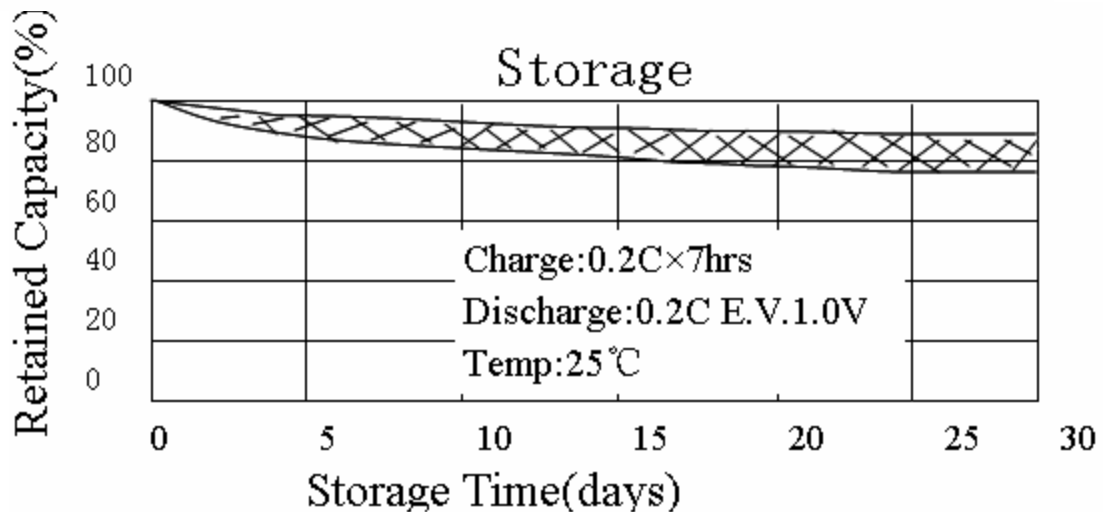
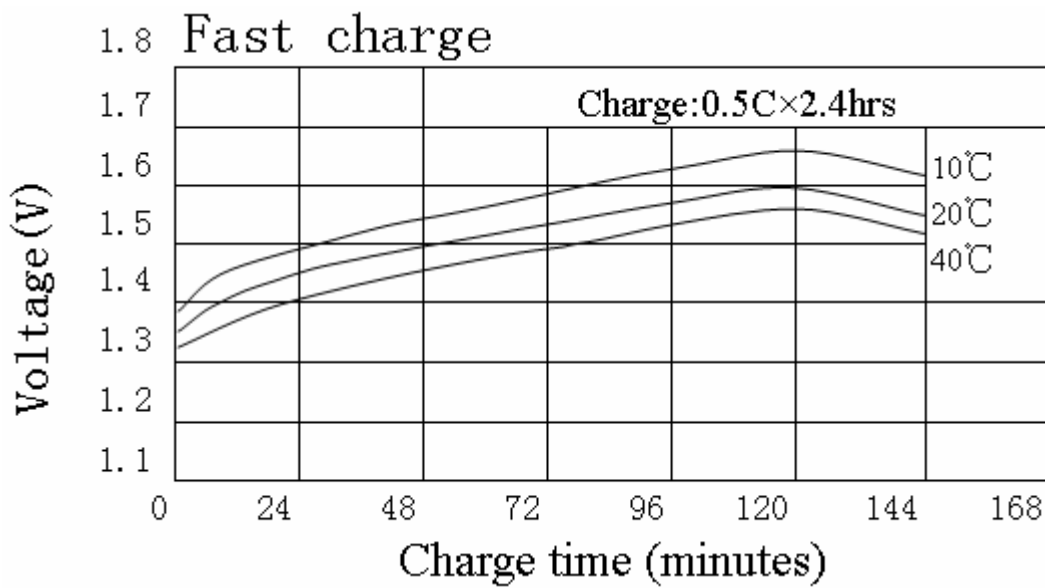
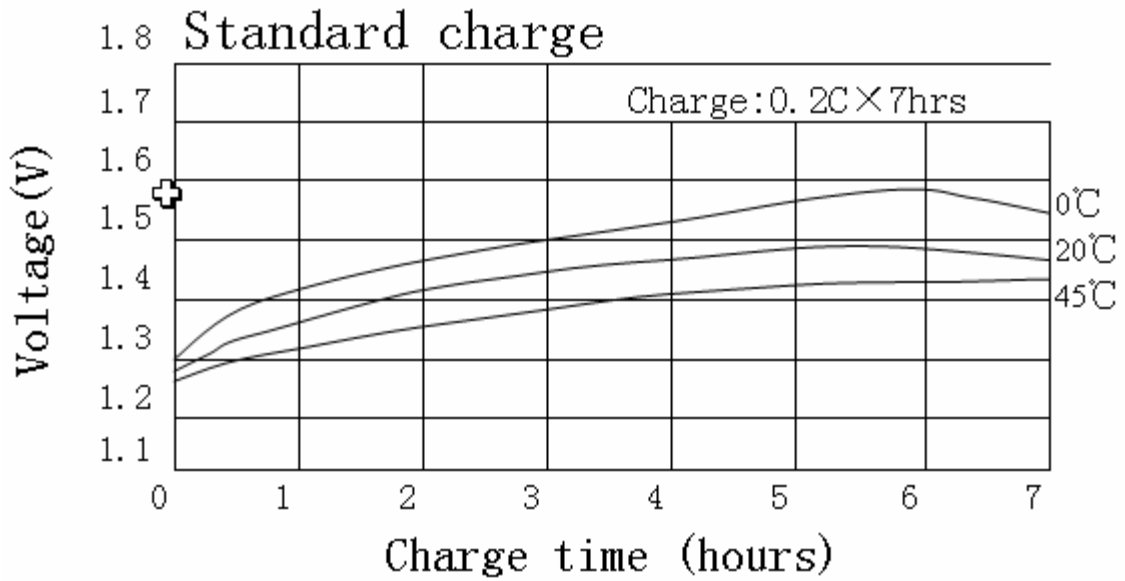
- (1) Designation : AA2000mAh
- (2) Manufacturer's name, abbreviation or brand : XELLEXX
- (3) Nominal Voltage : 1.2V
- (4) Polarity : " + " , " - "
- (5) Warning: Battery may explode or leak if recharged or disposed of in fire.

- (6) Icon  An Icon which indicates the battery can not be disposed of in the Rubbish Can.

12. Cautions For Use

- (1) The cut-off voltage is recommended at 1.0V/cell.
- (2) Charge "Xellex" batteries prior to use.
- (3) Don't solder directly to "Xellex" batteries.
- (4) The battery shall be installed with its "+" and "-" in the right position.
- (5) Do not dispose of in fire and keep away from damage.
- (6) Store "Xellex" batteries uncharged in a cool and dry place.
- (7) The batteries life may be reduced if they are subjected to adverse conditions such as: extreme temperature, deep cycling, excessive overcharge/discharge.

Figures:



Figures:

Discharge Characteristics at 20°C

