

TECHNICAL SPECIFICATION FOR NI-MH AACS2100

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Version	Date	Description	Draft
00	2006.12.18	Issue	Sun Wei
01	2007.12.18	Change of Version	Sun Wei
02	2008.04.19	Change of Version	Gao Jianxin

	Name	Title	Date	Signature
Customer Approval				

1. APPLICATION

This specification applies to the Nickel-Metal Hydride batteries of Model :
AACS2100 for Consumer AA

2.ASSEMBLY & DIMENSIONS

As Exhibit 1 drawing

3. RATINGS

Item	Specification	Conditions and Remarks (Temperature is 20 °C ± 5 °C except specified)
3.1 Nominal Voltage	1.2 V	
3.2 Nominal Capacity	2100 mAh	
3.3 Minimum Capacity	2000 mAh	
3.4 I _r , A	2000 mA	
3.5 Standard Charge	200 mA * 16 hours	
3.6 Discharge Cut-off Voltage	1.0 V/cell	
3.7 Operating Temperature		
— Charge	0 °C to 45 °C (Charge current 200 mA)	
— Discharge	0 °C to 65 °C	
— Weight	About 27 g	
3.8 Storage Temperature		
— Within 1 month	-20 °C to 50 °C (Humidity ≤ 85%)	
— Within 3 months	-20 °C to 40 °C (Humidity ≤ 85%)	
— Within 1 year	-20 °C to 35 °C (Humidity ≤ 85%)	
— Recommended Storage	5 °C to 25 °C (Humidity ≤ 85%)	
3.9 Charge State	Normally less than 50% charge before shipment	

4. TEST METHOD & PERFORMANCE

Item	Specification	Conditions and Remarks (Temperature is 20 °C ± 5 °C except specified)
4.1 Test condition	Ambient temperature: 20 °C±5 °C Ambient humidity: 65%±20%	The test is carried out with new batteries (within a month after delivery or after testing the capacity)
4.2 Standard Charge		–Discharge at 0.2 I _r A until 1.0 V – Charge at 0.1 I _r A for 16 hours (at 20 °C±5 °C)
4.3 Standard Discharge		–Discharge at 0.2 I _r A until 1.0 V (at 20 °C±5 °C)
4.4 Open Circuit Voltage	≥ 1.25 V	Checked with 1000 Ω/V within 7 days after Standard Charge
4.5 Capacity	The discharge time should be more than 5 hours	–Standard Charge –1 hour Rest –Standard Discharge
4.6 Internal Impedance	≤ 50 mΩ	At 1 kHz within 1 hour after Standard Charge
4.7 High Rate Discharge	The discharge time should be more than 48 minutes	–Standard Charge –1 hour Rest –Discharge at 1 I _r A until 1.0 V
4.8 Discharge (at 0 °C±2 °C)	The discharge time should be more than 4 hours	–Standard Charge –16~24 hours Rest at 0 °C±2 °C –Discharge at 0.2 I _r A until 1.0 V at 0 °C±2 °C
4.9 Charge Retention (at 20 °C±2 °C)	The discharge time should be more than 4 hours	–Standard Charge –Store with Open Circuit for 28 days at 20 °C±2 °C –Standard Discharge
4.10 Charge Retention (at 45 °C±2 °C)	The discharge time should be more than 3 hours 50 minutes	–Standard Charge –Store at 45 °C ±2 °C for 14 days –Standard Discharge
4.11 Cycle life	≥ 500 cycles	See the note 1
4.12 Leakage	No leakage (by eyes)	–Standard Charge –Store at 33 °C ±2 °C and Humidity 80% for 14 days

5. SAFETY TESTS

Item	Specification	Conditions and Remarks (Temperature is 20 °C ± 5 °C except specified)
5.1 Overcharge	Store over 5 hours, No leakage, No disrupt (by eyes)	–Charge 0.1 I _r A * 48 hours after Standard Charge –1 hour Rest –Standard Discharge
5.2 Reverse-Charging	No disrupt, Leakage of electrolyte and deformation of the cell are acceptable	–Standard Discharge –Incorrect Polarity Charge 1 I _r A * 1 hour
5.3 Short-Circuit	No disrupt, Leakage of electrolyte and deformation of the cell are acceptable	–Standard Charge –Short-circuit with Shortest Wire (AWG 18#)

6. MECHANICAL TEST

6.1 Shock	No leakage, No disrupt, No obvious deformation (by eyes) No short-circuit, Nominal voltage ≥ 1.2 V	–Standard Charge –1 drop along each direction of the 3 mutually perpendicular axes from 1.00 m to the hardwood
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7.ACCEPTABLE QUALITY LEVEL (AQL)

The inspection shall be in accordance with the following method.

(ref. ISO2859-1:1999 or GB/T 2821.1-2003)

NO	Inspection item	Number of samples	Allowable number of defective cells
1.	Outer appearance	Level I	AQL=1.5
2.	Dimensions	Level I	0.65
3.	Function*	Level I	0.4

* Include : Capacity, 1 I_rA-rate, O.C.V., Internal impedance

8. WARRANTY

8.1 This product is warranted for a period of one year from date of shipment.

8.2 During the warranty period , YUASA (TIANJIN) THCHNOLOGY LTD.(YTTL) will replace products which prove to be design or manufacture defects.

9. OTHERS

Please consult YTTL if you have any doubt on the content of this specification, and this specification will be changed or revised if necessary.

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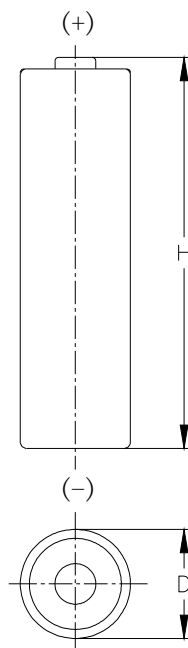
Note 1: cycle life

Cycle numbe	Charge	Stand in charged condition	Discharge
1	200 mA for 16 h	None	500 mA for 2 h 20 min
2-48	500 mA for 3 h 10 min	None	500 mA for 2 h 20 min
49	500 mA for 3 h 10 min	None	500 mA to 1.0 V
50	200 mA for 16 h	1 h to 4 h	400 mA to 1.0 V

50 cycle test as per above table is repeated. The discharge time of the 100th, 200th, 300th, 400th and 500th should be more than 3 hours respectively.

Exhibit 1

Jacketed cylindrical cells interchangeable with primary batteries



Designation	Diameter(mm)	Height (mm)	Top shape
	D	H	Button
AA	14.5 ⁺⁰ _{-0.7}	50.5 ⁺⁰ _{-1.5}	