

GP Batteries

Product Specification

Model No.: GP70AAST

Document Number: ZQS4002

Revision: 01

Page 1 of 4

1. SCOPE

This specification governs the performance of the following GP High Temperature Rechargeable Nickel Cadmium Cylindrical Cell and its stack-up batteries which constitute less than 20 unit cells.

Cell Size: AA

The data involving nominal voltage and the approximate weight of the stack-up batteries shall be equal to the value of the unit cell multiplied by the number of cells in the battery. For example, a stack-up battery consists of five unit cells:

Nominal Voltage of unit cell = 1.2V

Thus, nominal voltage of stack-up battery = 1.2V x 5 = 6.0V

2. RATINGS

Description	Unit	Specification	Conditions
Nominal Voltage	V	1.2	Unit cell
Typical Capacity	mAh	770	Standard Charge / Discharge
Minimum Capacity	mAh	700	Standard Charge / Discharge
Standard Charge	mA	70 (0.1C)	T _a = 0 ~ 70°C (see Note 1)
	hr	14	
Permanent Charge	mA	21(0.03C)~35(0.05C)	T _a = 0 ~ 70°C
Trickle Charge	mA	21(0.03C)	After standard charge T _a = 0 ~ 70°C
Discharge Cut-off Voltage	V/cell	1.0	Unit cell
Storage Temperature	°C	-20 ~ 60 °C (≤1 wk) -20 ~ 35 °C	Discharged state, open circuit
Typical Weight	g	21.0	Unit cell

GP Batteries

Product Specification

Model No.: GP70AAST

Document Number: ZQS4002

Revision: 01

Page 2 of 4

3. PERFORMANCE

Before proceed the following tests, the cells should be discharged at 0.2C to 1.0V cut-off. 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 : $65 \pm 20\%RH$

Notes : Standard Charge / Discharge Condition

Charge : 70mA (0.1C) x 14hrs

Discharge : 140mA (0.2C) to 1.0V/cell

Test	Unit	Specification	Conditions	Remarks
Capacity	mAh	≥ 700	Standard Charge / Discharge	Up to 3 cycles are allowed
Open Circuit Voltage (OCV)	V/cell	≥ 1.25	Within 1hr after standard charge	Unit cell
Internal Impedance (Ri)	m Ω /cell	Average: 20 Range: 15 ~ 27	Upon fully charge at 1kHz	Unit cell
High Rate Discharge (1C)	min	≥ 42	Standard Charge, rest within 1 hr, discharge to 1V	
Overcharge	mAh	≥ 350	35mA(0.05C) charge for 4 yrs $T_a = 0 \sim 40^\circ\text{C}$	No conspicuous deformation and/or leakage.
Charge Retention	mAh	≥ 560	Standard Charge, Storage: 28 days, Standard Discharge	
IEC Cycle Life Test	Cycle	≥ 500	IEC60285 (1999) 4.4.1	(see Note 3)
IEC Permanent Charge Test		3.75 (Cycle No.2 & 3) 2.5 (Cycle No.8 & 9)	IEC60285 (1999) 4.4.2.2	(see Note 4)

GP Batteries

Product Specification

Model No.: GP70AAST

Document Number: ZQS4002

Revision: 01

Page 3 of 4

Test	Unit	Specification	Conditions	Remarks
Leakage	N/A	No leakage	After battery is fully discharged, battery is placed under load (e.g. resistor, but not include current generator). The battery should be monitored for a period up to two months.	Load current 0.1C max.
Short Circuit	N/A	Leakage & deformation may occur, but no explosion is allowed.	After standard charge, short circuit for 1hr. (leading wire = 3.1mm ² x 65mm)	
Vibration Resistance	N/A	$\Delta V < 0.02V/\text{cell}$ ΔRi (Internal impedance) $< 5m\Omega / \text{cell}$	Charge at 0.1C for 14hrs, and then leave for 24hrs, check battery before / after vibration Amplitude: 1.5mm Vibration: 3000CPM (any direction for 60mins)	Unit cell
Impact Resistance	N/A	$\Delta V < 0.02V/\text{cell}$ ΔRi (Internal impedance) $< 5m\Omega / \text{cell}$	Charge at 0.1C for 14hrs, and then leave for 24hrs, check battery before / after drop Height: 50cm Thickness of the wooden board: 30mm Direction is not specified Test for 3 times	Unit cell

4. CONFIGURATIONS, DIMENSIONS AND MARKINGS

Please refer to its Data Sheet.

5. EXTERNAL APPEARANCE

The cell / battery shall be free from cracks, scars, breakage, rust, discoloration, leakage and deformation.

6. WARRANTY

One year limited warranty against workmanship and material defects.

GP Batteries

Product Specification

Model No.: GP70AAST

Document Number: ZQS4002

Revision: 01

Page 4 of 4

7. CAUTION

1. Reverse charging is not acceptable.
2. Charge before use, although the cells / batteries are delivered in a charged state.
3. Do not charge / discharge with more than the 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 to adverse conditions like: extreme temperature, deep cycling, excessive overcharge / overdischarge.
8. Store the cell / battery uncharged in a cool dry place. Always discharge the cell / battery before bulk storage or shipment.

- Notes :
1. T_a : Ambient Temperature
 2. Approximate charge time from discharged state, for reference only.
 3. IEC60285(1999) 4.4.1 Cycle Life Test :

Cycle No.	Charge	Rest	Discharge
1	0.1C x 16hrs	none	0.25C x 2hrs20mins
2 - 48	0.25C x 3hrs10mins	none	0.25C x 2hrs20mins
49	0.25C x 3hrs10mins	none	0.25C to 1.0V/cell
50	0.1C x 16hrs	1- 4hr(s)	0.2C to 1.0V/cell

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

4. IEC60285(1999) 4.4.2.2 Permanent Charge Test :

Cycle No.	Ambient Temperature	Charge	Discharge	Requirement
1	40°C	0.05C x 48hrs	0.2 C to 1.0V/cell	N/A
2	40°C	0.05C x 24hrs	0.2 C to 1.0V/cell	Discharge time: 3.75hrs
3	40°C	0.05C x 24hrs	0.2 C to 1.0V/cell	Discharge time: 3.75hrs
4	70°C	0.05 C x 60days	0.2 C to 1.0V/cell	N/A
5	70°C	0.05 C x 60days	0.2 C to 1.0V/cell	N/A
6	70°C	0.05 C x 60days	0.2 C to 1.0V/cell	N/A
7	40°C	0.05C x 48hrs	0.2 C to 1.0V/cell	N/A
8	40°C	0.05C x 24hrs	0.2 C to 1.0V/cell	Discharge time: 2.5hrs
9	40°C	0.05C x 24hrs	0.2 C to 1.0V/cell	Discharge time: 2.5hrs